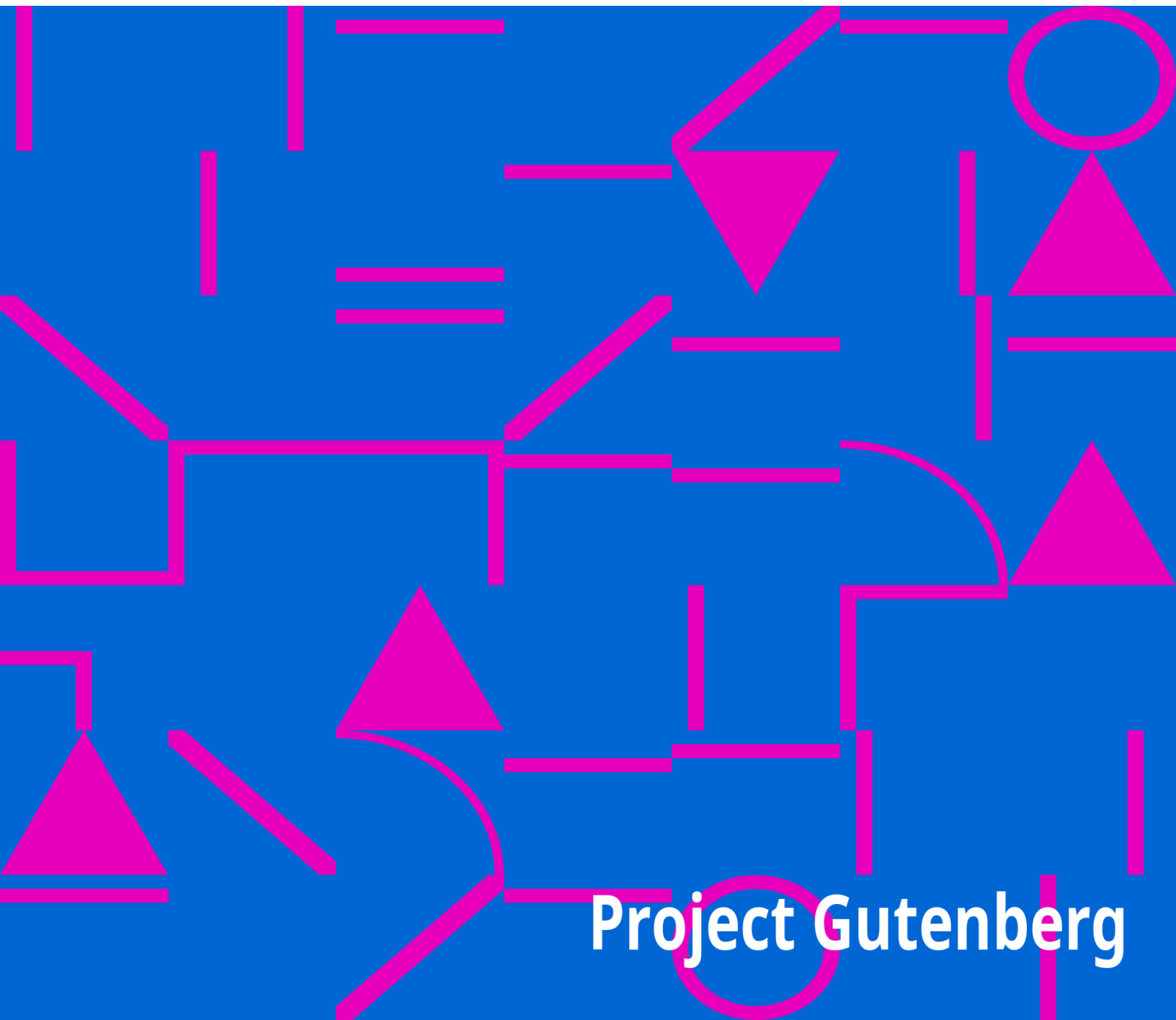


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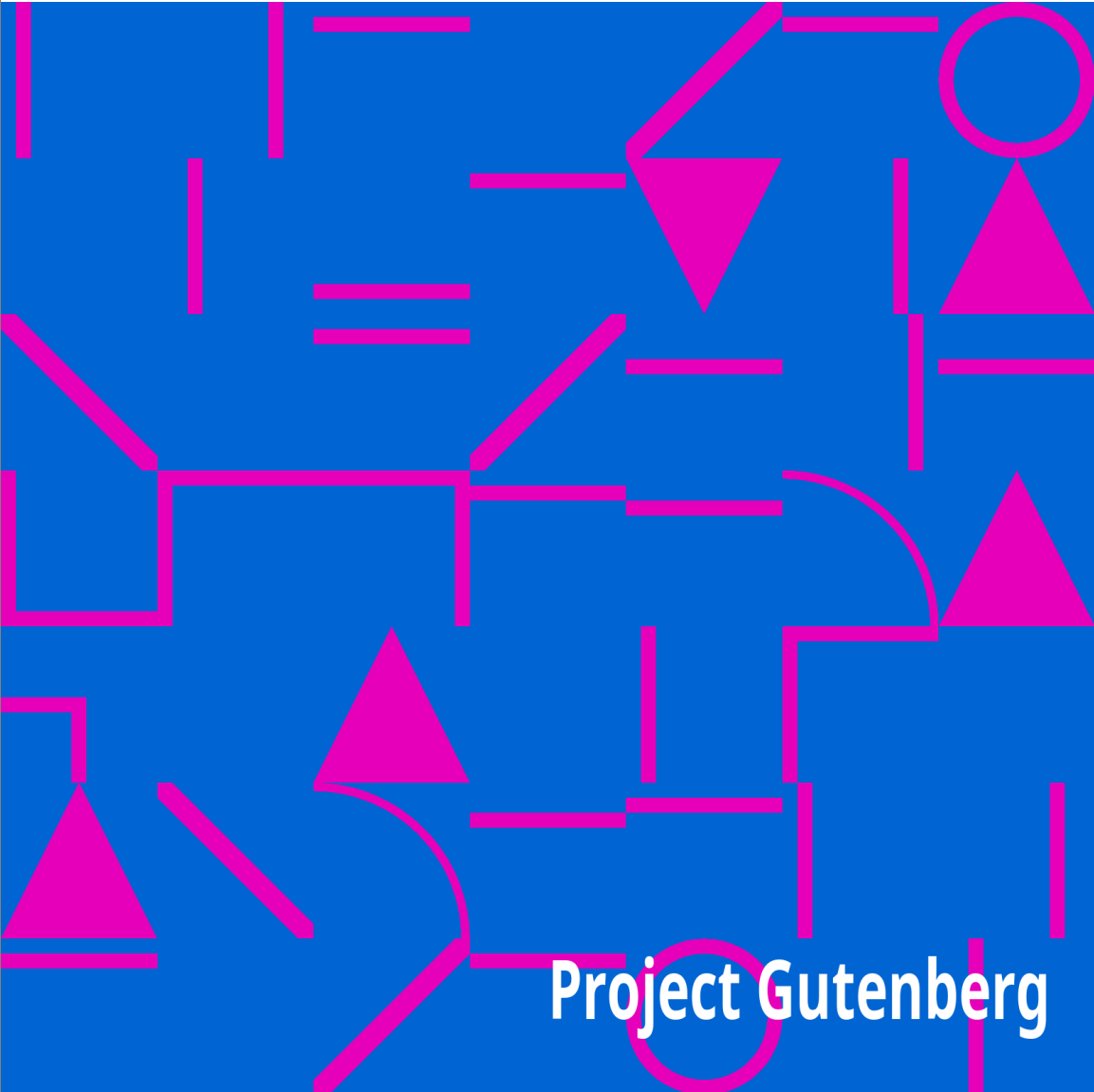
Various

The background of the lower half of the image is a solid blue color. Overlaid on this is a complex, abstract pattern of magenta (bright pink) geometric shapes. These shapes include various line segments of different lengths and orientations, some forming right angles or other geometric figures. There are also solid magenta triangles of different sizes, some pointing upwards and some downwards. A few circles or arcs are also present, including a large one in the upper right and a smaller one in the lower right. The overall effect is a dense, non-representational geometric composition.

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Various

An abstract geometric pattern on a blue background, featuring various pink shapes including lines, triangles, squares, and circles, some of which are interconnected to form larger, complex shapes.

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GRESHAM ENCYCLOPEDIA. A TO AMIDE ***

**THE
NEW GRESHAM
ENCYCLOPEDIA**

VOLUME I

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ALGAE



- 1, The very broad Ulva. 2, Cornucopia. 3, Caulerpa
- Cactoides. 4, Acetabularia
- Mediterranea. 5, Bladder-
- locks. 6, Long-stalked
- Laminaria. 7, Sugared
- Laminaria. 8, Bladder
- Wrack. 9, Serrated Wrack.
- 10, Gulf-weed. 11,
- Thalassiophyllum Clathrus.
- 12, Forked Dictyota. 13,
- Medicinal Coralline. 14,
- Corallina Rubens. 15,
- Delesseria Lyalii. 16,
- Nitophyllum Crosieri. 17,
- Membrane-leaved
- Phyllophira. 18, Peacock's-
- tail Padina. 19, Banded
- Taonia.

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VOLUME . I



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KEY TO PRONUNCIATION

The method of marking pronunciations here employed is either (1) by marking the syllable on which the accent falls, or (2) by a simple system of transliteration, to which the following is the Key:—

VOWELS

ā, as in *fate*, or in *bare*.

ä, as in *alms*, Fr. *âme*, Ger. *Bahn* = á of Indian names.

a', the same sound short or medium, as in Fr. *bal*, Ger. *Mann*.

a, as in *fat*.

a", as in *fall*.

a, obscure, as in *rural*, similar to *u* in *but*, *è* in *her*: common in Indian names.

ē, as in *me* = *i* in *machine*.

e, as in *met*.

è, as in *her*.

ī, as in *pine*, or as *ei* in Ger. *mein*.

i, as in *pīn*, also used for the short sound corresponding to *ē*, as in French and Italian words.

eu, a long sound as in Fr. *jeûne* = Ger. long *ö*, as in *Söhne*, *Goethe* (Goethe).

eu, corresponding sound short or medium, as in Fr. *peu* = Ger. *ö* short.

ō, as in *note*, *moan*.

o, as in *not*, *soft*—that is, short or medium.

ö, as in *move*, *two*.

ū as in *tube*.

u, as in *tub*: similar to *è* and also to *a*.

u", as in *bull*.

ü, as in Sc. *abune* = Fr. *û* as in *dû*, Ger. *ü* long as in *grün*, *Bühne*.

u', the corresponding short or medium sound, as in Fr. *but*, Ger. *Müller*.

oi, as in *oil*.

ou, as in *pound*; or as *au* in Ger. *Haus*.

CONSONANTS

Of the *consonants*, **b, d, f, h, j, k, l, m, n, ng, p, sh, t, v, z**, always have their common English sounds, when used to transliterate foreign words. The letter **c** is not used by itself in re-writing for pronunciation, **s** or **k** being

used instead. The only consonantal symbols, therefore, that require explanation are the following:—

ch is always as in *rich*.

d, nearly as *th* in *this* = Sp. *d* in *Madrid*, &c.

g is always hard, as in *go*.

h represents the guttural in Scotch *loch*, Ger. *nach*, also other similar gutturals.

n´, Fr. nasal *n* as in *bon*.

r represents both English *r*, and *r* in foreign words, which is generally much more strongly trilled.

s, always as in *so*.

th, as *th* in *thin*.

th, as *th* in *this*.

w always consonantal, as in *we*.

x = *ks*, which are used instead.

y always consonantal, as in *yea* (Fr. *ligne* would be re-written *lēny*).

zh, as *s* in *pleasure* = Fr. *j*.

THE NEW GRESHAM ENCYCLOPEDIA

VOLUME I

A, the first letter in many alphabets. The sound most commonly belonging to it, as in French, Italian, German, &c., is that which is heard in *father*, pronounced short or long. In English the letter is made to represent at least seven sounds, as in *father*, *mat*, *mate*, *mare*, *many*, *ball*, *what*, besides being used in such digraphs as *ea* in *heat*, *oa* in *boat*.—A, in music, is the sixth note in the diatonic scale of C, and stands when in perfect tune to the latter note in the ratio of $\frac{3}{5}$ to 1. The second string of the violin is tuned to this note.

A 1, a symbol attached to vessels of the highest class in Lloyd's register of shipping, A referring to the hull of the vessel, 1 to the rigging and whole equipment. When A 1 has a number prefixed, as 100 A 1, 90 A 1, the number denotes that the vessel is built according to certain specifications. See *Shipbuilding*.

Aa (ä) (Old Ger. *aha*, water; allied to Lat. *aqua*, water), the name of a great many streams of Central and Northern Europe.

Aachen (ä'hèn). See *Aix-la-Chapelle*.

Aaland Islands. See *Aland Islands*.

Aalborg (ōl'borh: 'eel-town'), a seaport of Denmark, in Jutland, on the Liimfiord, see of a bishop, with iron-founding, distilling, fishing, &c. Pop. 33,449.

Aalen (ä'lèn), a town of Germany in Württemberg, which manufactures woollen and linen goods. It has important iron-works and tanneries. Pop. 11,347.

Aalesund (ō'le-su'nd), seaport and fishing centre on the west coast of Norway, on a small island. Pop. 13,858.

Aali Pasha. See *Ali Pasha*.

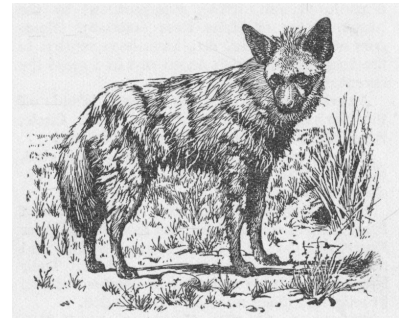
Aalst (älst). See *Alost*.

Aar, or **Aare** (är), the name of several European rivers, of which the chief (180 miles long) is a tributary of the Rhine, next to it and the Rhone the longest river in Switzerland. It has its origin from the Upper and Lower Glaciers of the Aar, in the Bernese Alps, traverses Lakes Brienz and Thun, and receives the Saane, Reuss, Limmat, &c. On it are Interlaken, Thun, Bern, Solothurn, and Aarau, to which, as to the canton of Aargau, it gives its name.

Aarau (ä'rou), a well-built and finely-situated town in Switzerland, capital of canton Aargau, on the River Aar. Pop. 9536.

Aard-vark (ärd'va'rk: earth-pig), Dutch name for a burrowing insect-eating animal of South Africa, *Orycteropus capensis*, order Edentata, resembling the ant-eater and armadillo. It is called also *ground-hog* and *Cape pig*.

Aardwolf (ärd'wu'lf: earth-wolf) (*Proteles cristatus*), a burrowing carnivore of S. and E. Africa, allied to the hyenas and civets. It feeds on carrion, small mammals, insects, &c.



Aardwolf (*Proteles cristatus*)

Aare. See *Aar*.

Aargau (är'gou), or **Argovie** (a' r-go-vē), a northern canton of Switzerland; area, 543 sq. miles; hilly, well wooded, abundantly watered by the Aar and its tributaries, and well cultivated. Pop. 236,860. German is almost universally spoken. Capital, Aarau.

Aarhuus (ōr'hös), a seaport and ancient town of Denmark, on the east coast of Jutland. It has a fine Gothic cathedral, a good harbour, and manufactures woollens, gloves, hats, tobacco, &c. Pop. 65,858.

Aaron (ā'ron), of the tribe of Levi, brother of Moses. At Sinai, when the people became impatient at the long-continued absence of Moses, he complied with their request by making a golden calf, and thus became involved with them in the guilt of gross idolatry. The office of high-priest, which he first filled, was made hereditary in his family. He died at Mount Hor at the age of 123, and was succeeded by his son Eleazer.

Aaron's Beard. See *Saint John's Wort* and *Toad-flax*.

Aaron's Rod. See *Golden-rod* and *Mullein*.

Aasen (ō'zen), Ivar Andreas, Norwegian poet and philologist, was born in 1813 and died in 1896. He wrote miscellaneous poems and a drama, but he is chiefly known as the originator of the patriotic movement known as the *Maulstroev*. He endeavoured to give Norway a literary language distinct from the Danish, which has long served as the literary and official language of the country. This he attempted to do mainly by the help of the native dialects, which he studied thoroughly, setting forth their grammar in special works and embodying their vocabulary in his *Norsk Ordbog med Dansk Forklaring* (Norse Dictionary, with Explanations in Danish, 1873), supplemented by the *Norsk Ordbog* of Hans Ross (1890-2). Numbers of poems, tales, &c., have been written in the language, of which Aasen was in a sense the inventor.

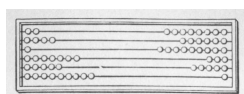
Aasvär (ōs'vār), a group of small islands off the Norwegian coast, under the Arctic Circle, where there is an important herring-fishery.

Ab, the eleventh month of the Jewish civil, the fifth of the ecclesiastical, year—part of July and part of August.

Ababda, or **Ababdeh** (abab'de) (**Gebadei** of Pliny), a nomadic African race inhabiting Upper Egypt and part of Nubia, between the Nile and the Red Sea, dark-brown in colour. Their language is Arabic and they are Mahommedans in religion. They number about 40,000.

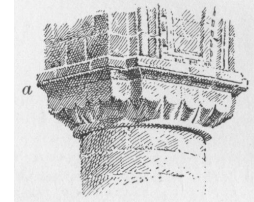
Ab'aca, or **Manilla Hemp**, a strong fibre yielded by the leaf-stalks of a kind of plantain (*Musa textilis*) which grows in the Indian Archipelago, and is cultivated in the Philippines. The outer fibres of the leaf-stalks are made into strong and durable ropes, the inner into various fine fabrics.

Ab'aco, **Great** and **Little**, two islands of the Bahamas group, (q.v.). Pop. about 4000.



Abacus for

Ab'acus, a Latin term applied to an apparatus used in elementary schools for facilitating arithmetical operations, consisting of a number of parallel cords or wires, upon which balls or beads are strung, the uppermost wire being appropriated to units, the next to tens, &c.—The uppermost member or division of the capital of a column, immediately under the architrave.



Norman Capital—
a, the Abacus

Abad'don (Heb. destruction), the name given in *Rev.* ix. 11 as that of the angel of the bottomless pit, otherwise called *Apollyon*. In *Job*, xxvi, 6, it designates the underworld, or Hades.

Abakansk', a fortified place in Siberia, near the Upper Yenisei, founded by Peter the Great in 1707.

Abalone (ab-a-lō'ne), a name in California for a species of ear-shell (*Haliotis*) that furnishes mother-of-pearl.

Ab'ana, or **Amanah**, one of the two rivers of Damascus mentioned in the Bible (*2 Kings*, v, 12). See *Barada*.

Aban'donment, a term of marine insurance, employed to designate the case where the party insured gives up his whole interest in the property to the insurer, and claims as for a total loss.—BIBLIOGRAPHY: G. G. Phillimore, *Marine Insurance*, in *Encyclopedia of the Laws of England*, vol. viii; C. R. Tyser, *Law relating to Losses under a Policy of Marine Insurance*.

Ab'ano, a village of North Italy, 5 miles from Padua, famous for its mud-baths and warm springs. It is supposed to be the birthplace of Livy.

Aba'rim, a mountain range of Eastern Palestine, including Nebo, on which Moses died.

Abatement, in law, has various significations. *Abatement of nuisances* is the remedy allowed to a person injured by a public or private nuisance, of destroying or removing it himself. A *plea in abatement* is brought forward by a defendant when he wishes to defeat or quash a particular action on

some formal or technical ground. Abatement, in mercantile law, is an allowance, deduction, or discount made for prompt payment or other reason.

Ab'attis, or **Abatis**, in field engineering, a mass of trees cut down and laid with their branches turned towards the enemy in such a way as to form a defence for troops stationed behind them.

Abattoir (ab-at-wär'). See *Slaughter-house*.

Abauzit, Firmin (a' -bō-zē), a French Protestant scholar, was born in 1679 and died in 1767. He lived chiefly at Geneva, but visited England and was highly esteemed by Newton, who considered him not unfit to be judge between himself and Leibnitz in the quarrel as to the invention of the integral and differential calculus. Collections of his works were published at Geneva (1770) and at London (1773).

Abba, a Syrian word equivalent to 'father', which, being applied in the Eastern Church to monks, superiors of monks, and other ecclesiastics, gave rise to the word *abbot*. In the Syriac and Coptic Churches it is given to bishops.

Abbadie (a' b-a' -dē), Antoine Thomson and Arnaud Michel d', French travellers, born in Dublin in 1810 and 1815 respectively. They lived for years in Abyssinia, and published valuable works on that country: Arnaud, *Douze Ans dans la Haute-Éthiopie*; Antoine, *Géodésie de la Haute-Éthiopie*, &c. Arnaud died in 1893, Antoine in 1897.

Abbas I, the *Great*, Shah or King of Persia, born in 1557, ascended the throne in 1586, at a time when the Turks and hordes of Usbek Tartars had made great encroachments on the country. Having defeated the Usbeks, recovered the provinces overrun by them, and reduced a great part of Afghanistan, he made war against the Turks, and in 1605 defeated them near Bussorah, thus getting back all the lost provinces. He extended his rule beyond Persia proper, and at his death in 1628 his dominions stretched from the Tigris to the Indus. He is looked upon by the Persians as their greatest sovereign.

Abbas II, **Hilmi**, ex-Khedive of Egypt, was born in 1874. He is the eldest son of Tewfik Pasha, and succeeded his father in 1892. During his reign he

adopted an unfriendly attitude towards England, but he failed in his attempt to form an anti-British Cabinet in 1893. On 19th Dec., 1914, the British Government issued a proclamation deposing Abbas Hilmi and conferring the title of Sultan of Egypt upon Hussein Kamil, eldest living prince of the family of Mohammed Ali-Hussein Kamil, who died in 1917. See *Egypt*.

Abbas Mirza, a Persian prince and soldier, was the son of the shah Feth Ali; born 1783, died 1833; he greatly distinguished himself in the wars against Russia.

Abbasids, or **Abbassides** (ab'as-sidz), the name of the second Arabian dynasty which supplanted the Ommiades. It traced its descent from Abbas (born 566, died 652), uncle of Mahomet, and gave thirty-seven caliphs to Bagdad between 749 and 1258. Harun al Rashid was a member of this dynasty. See *Caliphs*.

Abbate (a'b-bä'tā), the Italian term corresponding to *Abbé*.

Abbé (a'b-ā), a French word for abbot, or for anyone regularly wearing the clerical dress. Before the Revolution, all who had studied theology, either with the view of becoming ordained clergymen or merely of obtaining some ecclesiastical appointment or benefice, were generally so designated. Marked out by their special dress, a short, violet-coloured robe, they were seen everywhere—at court, the ball, the theatre, and in private families, where they acted sometimes as tutors and sometimes as confidential advisers. Others, again, adopted the literary profession or became teachers in the higher educational establishments.

Abbe, Cleveland, American meteorologist and astronomer, born at New York in 1838, and educated at Harvard. He held various positions in connection with observatories and other institutions in America, and was for some time chief meteorologist in the United States Weather Bureau. He wrote much on meteorology and kindred subjects. He died in 1916. His works include: *The Mechanics of the Earth's Atmosphere*; *Relations between Climates and Crops*, &c.

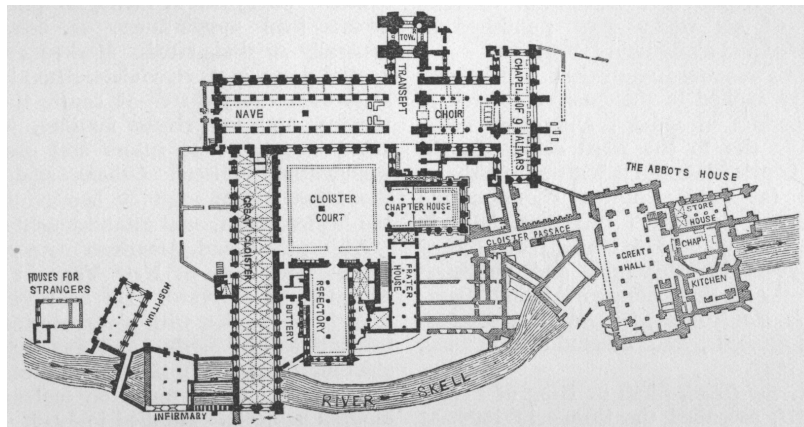
Abbeoku'ta, a town of West Africa, in the Lagos Province of S. Nigeria, on the Ogun River, and on the railway from Lagos to N. Nigeria, 45 miles

north of Lagos, consists chiefly of mud houses, surrounded by a mud wall. Pop. 50,000 to 100,000.

Ab'bess. See *Abbey* and *Abbot*.

Abbeville (ancient **Abbatis Villa**), a town of France, department of the Somme, on the River Somme (which is here tidal), 108 miles N.N.W. of Paris. The town is first mentioned in the ninth century, when it belonged to the Abbey of St. Riquier. It has a Gothic church (St. Vulfran) (begun in the fifteenth century and completed in the seventeenth), which has a magnificent west front in the Flamboyant style. It manufactures woollens, sail-cloth, chemicals, &c. Pop. 20,373.

Ab'bey, a monastery or religious community of the highest class, governed by an *abbot*, assisted generally by a prior, sub-prior, and other subordinate functionaries; or, in the case of a female community, superintended by an *abbess*. An abbey invariably included a church. A priory differed from an abbey only in being scarcely so extensive an establishment, and was governed by a *prior*. In the English conventual cathedral establishments, as Canterbury, Norwich, Ely, &c., the archbishops or bishops held the abbot's place, the immediate governor of the monastery being called a prior. Some priories sprang originally from the more important abbeys, and remained under the jurisdiction of the abbots; but subsequently any real distinction between abbeys and priories was lost. The greater abbeys formed most complete and extensive establishments, including not only the church and other buildings devoted to the monastic life and its daily requirements, such as the refectory or eating-room, the dormitories or sleeping-rooms, the room for social intercourse, the school for novices, the scribes' cells, library, &c., but also workshops, storehouses, mills, cattle and poultry sheds, dwellings for artisans, labourers, and other servants, infirmary, guest-house, &c. Among the most famous abbeys on the continent of Europe were those of Cluny, Clairvaux, and Cîteaux in France; St. Gall in Switzerland, and Fulda in Germany; the most noteworthy English abbeys were those of Westminster, St. Mary's of York, Fountains, Kirkstall, Tintern, Rievaulx, Netley; and of Scotland, Melrose, Paisley, and Arbroath.



Plan of Fountains Abbey

Abbategrasso (a' b-bē-ä'tā-gra's-sō), a town in the north of Italy, 15 miles w.s.w. of Milan. Pop. 13,148.

Ab'bot (from the Syriac *abba*, father), the head of an abbey (see *Abbey*), the lady of similar rank being called *abbess* (*abbatissa*). An abbess, however, was not, like the abbot, allowed to exercise the spiritual functions of the priesthood, such as preaching, confessing, &c.; nor did abbesses ever succeed in freeing themselves from the control of their diocesan bishop. In the early age of monastic institutions (*circ.* A.D. 300-600) the monks were not priests, but simply laymen who retired from the world to live in common, and the abbot was also a layman. In the course of time the abbots were usually ordained, and when an abbey was directly attached to a cathedral the bishop was also the abbot, but the functions devolving on the head of a monastery were, in this case, performed by a prior. At first the abbeys were more remarkable for their numbers than for their magnitude, but afterwards many of them were large and richly endowed, and the heads of such establishments became personages of no small influence and power, more especially after the abbots succeeded (by the eleventh century) in freeing themselves from the jurisdiction of the bishop of their diocese. Hence families of the highest rank might be seen eagerly striving to obtain the titles of abbot and abbess for their members. The great object was to obtain control over the revenues of the abbeys, and for this purpose recourse was had to the device of holding them under a kind of trust, or, as it was called, *in commendam*. According to the original idea, the abbot *in commendam*, or 'commendator', was merely a temporary trustee, who drew

the whole or part of the revenues during a vacancy, and was bound to apply them to specific purposes; but ultimately the commendator or lay abbot in many instances held the appointment for life, and was allowed to apply the whole or a large portion of the revenues to his own private use. Many of the abbots vied with the bishops and nobility in rank and dignity. In England abbots long sat in the House of Lords, ranking next after barons. Seventeen of them were present on 28th June, 1539, the last occasion when the abbots as a body sat in Parliament. The Reformation introduced vast changes, not only in Protestant countries, where abbeyes and all other monastic establishments were generally suppressed, but even in countries which still continued Roman Catholic; many sovereigns, whilst displaying their zeal for the Roman Catholic Church by persecuting its opponents, did not scruple to imitate them in the confiscation of Church property.

Abbot (or Lord) **of Misrule**, the personage who took the chief part in the Christmas revelries of the English populace before the Reformation. In Scotland he was called Abbot of Unreason.

Abbot, George, Archbishop of Canterbury, was born in 1562 and died in 1633. He studied at Oxford, assisted in the translation of the Bible, was made Bishop of Lichfield in 1609, next year Bishop of London, and in 1611 Archbishop of Canterbury. He retained the favour of James I to the last, but after the accession of Charles I his influence at Court was superseded by that of Laud. He published several works, chiefly theological, and *A Brief Description of the Whole World* (1599).

Ab'botsford, the country-seat of Sir Walter Scott, on the south bank of the Tweed, in Roxburghshire, 3 miles from Melrose, in the midst of picturesque scenery, forming an extensive and irregular pile in the Scottish baronial style of architecture.—*Abbotsford Club*, a club established at Edinburgh for printing works throwing light on matters of history or literature connected with the writings of Sir Walter Scott; issued 34 vols. 1835-64.

Ab'bott, Rev. Edwin, D.D., prolific writer on theological, educational, and other subjects, born in London, 1838, was educated at the City of London School and St. John's College, Cambridge, where he highly distinguished himself; he was head master of the City of London School from 1865 to 1889, when he retired. His *Shakespearian Grammar* (1870) is one of his

best contributions to English philology. Among his theological and kindred writings are: *Through Nature to Christ*; *Bible Lessons*; *Cambridge Sermons*; *Oxford Sermons*; the elaborate article *Gospels* in the *Encyclopædia Britannica* (9th edition); *From Letter to Spirit*. Other works are: *Philochristus* and *Onesimus*, both romances on the history of the Early Christian Church; *Francis Bacon, an Account of his Life and Works*; *St. Thomas of Canterbury, his Death and Miracles*; *The Anglican Career of Cardinal Newman* (a very depreciatory estimate); *Flatland, a Romance of Many Dimensions*. He also wrote: *Johannine Grammar* (1906), *The Message of the Son of Man* (1909), *The Fourfold Gospel* (1913-7).

Ab'bott, Jacob, a popular American writer, especially of entertaining and instructive books for the young. He was born in 1803 and died in 1879. For a time he was a teacher and later a clergyman.

Ab'bott, Thomas Kingsmill, D.D., biblical scholar and writer on philosophic and other subjects, born at Dublin, 1829, died 18th Dec., 1913. He studied with distinction at Trinity College, and was successively professor in Dublin University of moral philosophy, 1867-72; of biblical Greek, 1875-88; and of Hebrew, 1879-1900; he was at one time librarian of the College. He has written *Sight and Touch*, directed against the Berkeleian theory of vision; *Elements of Logic*; *Essays, chiefly on the Original Texts of the Old and New Testaments*; *Notes on some Epistles of St. Paul*; *Elementary Theory of the Tides*; *Translation of Kant's Theory of Ethics*; *Kant's Introduction to Logic*; *Commentary on Ephesians and Colossians*; &c.

Abbrevia'tions, devices used in writing and printing to save time and space, consisting usually of curtailments effected in words and syllables by the removal of some letters, often of the whole of the letters except the first. The following is a list of the more important:—

A.B., *artium baccalaureus*, bachelor of arts (more commonly B.A.); also, able-bodied seaman. Abp., archbishop. A.C., *ante Christum*, before Christ. Ac., acre. Acc., A/c, or Acct., account. A.D., *anno Domini*, in the year of our Lord: used also as if equivalent to 'after Christ', or 'of the Christian era'. A.D.C., aide-de-camp. Ad lib., *ad libitum*, at pleasure. A.D.O.S., assistant director of ordnance stores. A.D.V.S., assistant director of veterinary services. Æt. or Ætat. *ætatis*

(*anno*), in the year of his age. A.G., attorney-general, adjutant-general. A.H., *anno Hegiræ*, in the year of the Hegira. A.I.A., associate of the Institute of Actuaries. A.Inst.C.E., associate of the Institution of Civil Engineers. A.I.Mech.E., associate of the Institute of Mechanical Engineers. A.M., *ante meridiem*, forenoon; *anno mundi*, in the year of the world; *artium magister*, master of arts. A.M.I.E.E., associate member of the Institute of Electrical Engineers. A.M.I.Mech.E., associate member of the Institute of Mechanical Engineers. A.M.Inst.C.E., associate member of the Institution of Civil Engineers. Anon., anonymous. A.P.D., army pay department. A.R.A., associate of Royal Academy (London). A.R.A.M., associate of the Royal Academy of Music. A.R.C.O., associate of the Royal College of Organists. A.R.I.B.A., associate of the Royal Institute of British Architects. A.R.S.A., associate of the Royal Scottish Academy. A.U.C., *ab urbe condita*, from the building of Rome (753 B.C.). A.V., authorized version; artillery volunteers.

B.A., bachelor of arts. Bart, or Bt., baronet. B.C., before Christ. B.C.L., bachelor of civil law. B.D., bachelor of divinity. B.L., bachelor of law. B.M., bachelor of medicine. Bp., bishop. B.S., bachelor of surgery. B.Sc., bachelor of science. B.V.M., blessed Virgin Mary.

C., cap., or chap., chapter. C.A., chartered accountant. Cantab., *Cantabrigiensis*, of Cambridge. Cantuar., *Cantuariensis*, of Canterbury. C.B., companion of the Bath. C.B.E., commander of the British Empire. C.C., Catholic curate; county councillor. C.D.V., *carte de visite*. C.E., civil engineer. Cf., *confer*, compare. Ch.B., *chirurgiæ baccalaureus*, bachelor of surgery. C.I., order of the Crown of India. C.I.E., companion of the order of the Indian Empire. C.J., chief justice. C.M., *chirurgiæ magister*, master in surgery; common metre. C.M.G., companion of the order of St. Michael and St. George. C.M.S., Church Missionary Society. Co., company or county. C.O.D., cash on delivery. Col., colonel, colony. Coll., college. Cr., creditor. C.S., civil service; clerk to the signet. C.S.I., companion of the Star of India. C.T.C., Cyclists' Touring Club. Curt., current, the present month. C.V.O., commander of the Royal Victorian Order. Cwt., hundredweight.

d., *denarius*, penny or pence. D.C.L., doctor of civil law. D.C.M., Distinguished Conduct Medal. D.D., doctor of divinity. Del., *delineavit*, drew it. D.F., defender of the faith. D.G., *Dei gratia*, by the grace of God. D.L., deputy lieutenant. D.Lit., D.Litt., *doctor litterarum*, doctor of letters or literature. Do., *ditto*, the same. D.O.M., *Deo Optimo Maximo*, to God, the best and greatest. D.P.H., diploma in public health. D.Phil., doctor of philosophy. Dr., doctor, also debtor. D.Sc., doctor of science. D.S.O., Distinguished Service Order. D.V., *Deo volente*, God willing. Dwt., pennyweight.

E., east. Ebor., *Eboracensis*, of York. E.C., Established Church. E.C.U., English Church Union. E.E., errors excepted. e.g., *exempli gratia*, for example. Etc. or &c., *et cetera*, and the rest.

F. or Fahr., Fahrenheit's thermometer. F.A., Football Association. F.A.S., fellow of the Antiquarian Society. F.B.A., fellow of the British Academy. F.C., Free Church. F.C.P., fellow of the College of Preceptors. F.C.S., fellow of the Chemical Society. F.D., *fidei defensor*, defender of the faith. Fec., *fecit*, he made or did it. F.F.A., fellow of the Faculty of Actuaries. F.F.P.S., fellow of the Faculty of Physicians and Surgeons (Glasgow). F.G.S., fellow of the Geological Society. F.H.S., fellow of the Horticultural Society. F.I.A., fellow of the Institute of Actuaries. Fl., flourished. F.L.S., fellow of the Linnæan Society. F.M., field-marshal. F.O.B., free on board (goods delivered). F.R.A.S., fellow of the Royal Astronomical Society. F.R.C.O., fellow of the Royal College of Organists. F.R.C.P., fellow of the Royal College of Physicians. F.R.C.S., fellow of the Royal College of Surgeons. F.R.G.S., fellow of the Royal Geographical Society. F.R.I.B.A., fellow of the Royal Institute of British Architects. F.R.S., fellow of the Royal Society. F.R.S.E., fellow of the Royal Society of Edinburgh. F.S.A., fellow of the Society of Arts or Antiquaries. F.S.S., fellow of the Statistical Society. Ft., foot or feet. F.Z.S., fellow of the Zoological Society.

Gal., gallon. G.B.E., (knight) grand cross of the British Empire. G.C.B., (knight) grand cross of the Bath. G.C.I.E., (knight) grand commander of the Indian Empire. G.C.M.G., (knight) grand cross of St. Michael and St. George. G.C.S.I., (knight) grand commander of the

Star of India. G.C.V.O., (knight) grand cross of the Royal Victorian Order. G.R., Georgius Rex, King George. G.R.I., Georgius Rex Imperator; George, King and Emperor. G.P.O., general post office.

H.B.M., his or her Britannic majesty. H.E.I.C.S., honourable East India Company's service. Hhd., hogshead. H.I.H., his or her imperial highness. H.M.I.S., his majesty's inspector of schools. H.M.S., his or her majesty's ship. Hon., honourable. H.Q., Head-quarters. H.R.H., his (her) royal highness. H.S.H., his (her) serene highness.

Ib. or Ibid., *ibīdem*, in the same place. Id., *idem*, the same. i.e., *id est*, that is. +I.H.S., *Jesus hominum salvator*, Jesus the Saviour of men: originally it was IHΣ, the first three letters of IHΣΟΥΣ (*Iēsous*), Greek for *Jesus*. Incog., *incognito*, unknown. Inf., *infra*, below. I.N.R.I., *Jesus Nazarenius Rex Iudæorum*, Jesus of Nazareth, King of the Jews. Inst., instant, or of this month; institute. Inv., *invenit*, designed, invented. I.O.G.T., Independent Order of Good Templars. I.O.U., I owe you. I.S.O., Imperial Service Order.

J.P., justice of the peace. Jr., junior. J.U.D., *juris utriusque doctor*, doctor both of the civil and the canon law.

K.B.E., knight commander of the British Empire. K.C., king's counsel. K.C.B., knight commander of the Bath. K.C.M.G., knight commander of St. Michael and St. George. K.C.I.E., knight commander of the Indian Empire. K.C.S.I., knight commander of the Star of India. K.C.V.O., knight commander of the Royal Victorian Order. K.G., knight of the Garter. K.P., knight of St. Patrick. K.T., knight of the Thistle. Kt. or Knt., knight.

L., l, or £, pounds sterling. L.A., literate in arts. L.A.S., licentiate of the Apothecaries' Society. Lat., latitude; Latin. Lb. or lb., *libra*, a pound (weight). L.C., *loco citato*, in the place cited. L.C.J., lord chief-justice. L.C.P., licentiate of the College of Preceptors. Ldp., lordship. L.D.S., licentiate in dental surgery. Litt.D., *litterarum doctor*, doctor of literature. L.L., Low Latin. L.L.A., lady literate in arts. LL.B., *legum baccalaureus*, bachelor of laws. LL.D., *legum doctor*, doctor of laws (that is, the civil and the canon law). LL.M., *legum magister*, master of laws. Lon. or long., longitude. Loq., *loquitur*, speaks. L.R.C.P.,

licentiate Royal College of Physicians (with E., of Edinburgh). L.R.C.S., licentiate Royal College of Surgeons (with E., of Edinburgh). L.R.C.V.S., licentiate of the Royal College of Veterinary Surgeons. L.S., *locus sigilli*, the place of the seal (on documents). L.S.A., licentiate of the Society of Apothecaries. L.S.D., *libræ, solidi, denarii*, pounds, shillings, pence.

M.A., master of arts. M.B., *medicinæ baccalaureus*, bachelor of medicine. M.B.E., member of the British Empire. M.D., *medicinæ doctor*, doctor of medicine. M.E., mining engineer. Messrs., messieurs, gentlemen. M.F.H., master of fox-hounds. M.Inst.C.E., member of the Institution of Civil Engineers. M.I.E.E., member of the Institute of Electrical Engineers. M.I.M.E., member of the Institute of Mining and Mechanical Engineers. M.I.Mech.E., member of the Institution of Mechanical Engineers. Mlle., mademoiselle. Mme., madame. M.P., member of Parliament. M.R.C.S., member of the Royal College of Surgeons. M.R.C.V.S., member of the Royal College of Veterinary surgeons. M.R.I.A., member of the Royal Irish Academy. MS., manuscript; MSS., manuscripts. Mus.D., *musicæ doctor*, doctor of music. M.V.O., member of the Royal Victorian Order.

N., north. N.B., *nota bene*, take notice; also North Britain, New Brunswick. N.D., no date. Nem. con., *nemine contradicente*, no one contradicting, unanimously. No., *numero*, number. N.P., notary public. N.S., new style, Nova Scotia. N.S.W., New South Wales. N.T., New Testament. N.Y., New York. N.Z., New Zealand.

Ob., *obiit*, died. O.B.E., officer of the British Empire. Obs., obsolete. Obt., obedient. O.C., officer commanding. O.H.M.S., on his majesty's service. O.M., Order of Merit. O.P., out of print. Op. cit., *opere citato*, in the work quoted. O.S., old style. O.T., Old Testament. Oxon., *Oxoniensis*, of Oxford. Oz., ounce or ounces.

P., page; pp., pages. Par., paragraph. P.C., privy-councillor. P.E., Protestant Episcopal. Per cent., *per centum*, by the hundred. Ph.D., *philosophiæ doctor*, doctor of philosophy. Pinx., *pinxit*, painted (it). P.M., *post meridiem*, afternoon. P.O., post office. P.O.O., post office order. P.P., parish priest. P.P.C., *pour prendre congé*, to take leave.

Prox., *proximo (mense)*, next month. P.R.A., president of the Royal Academy. P.R.S.A., president of the Royal Scottish Academy. P.S., postscript. P.T.O., please turn over (the leaf).

Q., question, queen. Q.E.D., *quod erat demonstrandum*, which was to be demonstrated. Q.E.F., *quod erat faciendum*, which was to be done. Q.M., quarter-master. Q.M.G., quarter-master-general. Qu., query. Quant. suff., *quantum sufficit*, as much as is needful. Q.V., *quod vide*, which see.

R., *rex, regina*, king, queen. R.A., royal academician; Royal Artillery. R.A.M., Royal Academy of Music. R.A.M.C., Royal Army Medical Corps. R.A.O.D., Royal Army Ordnance Department. R.A.S.C., Royal Army Service Corps. R.C., Roman Catholic. R.C.P., Royal College of Physicians. R.C.S., Royal College of Surgeons. R.E., Royal Engineers. Rev., reverend. R.I.P., *requiescat in pace*, may he rest in peace. R.M., Royal Marines. R.N., Royal Navy. R.S.A., royal Scottish academician. R.S.E., Royal Society of Edinburgh. R.S.L., Royal Society of Literature. R.S.V.P., *répondez s'il vous plaît*, reply, if you please. Rt. Hon., right honourable. Rt. Wpful., right worshipful. R.V., revised version.

S., south. S. or St., saint. Sc., *scilicet*, namely, viz. S.J., Society of Jesus (Jesuits). S.P.C.A., Society for the Prevention of Cruelty to Animals. S.P.C.C., Society for the Prevention of Cruelty to Children. S.P.C.K., Society for Promoting Christian Knowledge. S.P.G., Society for the Propagation of the Gospel. S.P.Q.R., *senatus populusque Romanus*, the senate and people of Rome. S.S.C., solicitor before the supreme courts. S.S.M., Society of the Sacred Mission. St., saint, street. S.T.D., *sacrae theologiae doctor*, doctor of divinity. S.T.P., *sacrae theologiae professor*, an old-fashioned equivalent of D.D.

T.C.D., Trinity College, Dublin. T.O., telegraph office.

U.F.C., United Free Church. U.K., United Kingdom. Ult., *ultimo*, last (month). U.P., United Presbyterian. U.S., United States. U.S.A., United States of America. U.S.N., United States Navy.

V., *vide*, see; also *versus*, against. V.C., Victoria Cross. Viz., *videlicet*, to wit, or namely. V.P., vice-president. V.S., veterinary surgeon. W., west. W.I., West Indies. W.L.F., Women's Liberal Federation. W.O., War Office. W.S.P.U., Women's Social and Political Union. W.S. writer to the signet (Scotland).

Xmas, Christmas.

Y.M.C.A., Young Men's Christian Association. Y.W.C.A., Young Women's Christian Association.

In LL.D., LL.B., &c., the letter is doubled, according to the Roman system, to show that the abbreviation represents a plural noun.

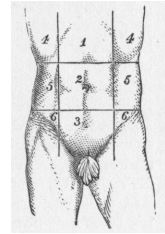
Abd-el-Ka'der, an Arab chief, born in Algeria, 1807; died at Damascus, 1883. He was the chief opponent of the French in their conquest of Algeria, but at last surrendered to them in 1847, and was imprisoned till set at liberty by Napoleon III in 1852. He afterwards resided chiefly at Damascus, but made various journeys, and visited the Paris exhibition of 1867. He wrote a religious philosophical work in Arabic which has been translated into French.

Abde'ra, an ancient Greek city on the Thracian coast, the birthplace of Democritus (the laughing philosopher), Anaxarchus, and Protagoras. Its inhabitants were proverbial for stupidity.

Abdica'tion, properly the voluntary, but sometimes also the involuntary, resignation of an office or dignity, and more especially that of sovereign power. Abdication does not necessarily require the execution of a formal deed, but may be presumed from facts and circumstances, as in the case of the English Revolution in 1688, when, after long debate, it was resolved by both Houses of Parliament that King James II, having endeavoured to subvert the constitution of the kingdom, had "*abdicated* the government, and that the throne is thereby vacant". Yet the sovereign of Great Britain cannot constitutionally abdicate without the consent of both Houses of Parliament. The principal abdications in recent years were: Tsar Nicholas II of Russia, 14th March, 1917; King Constantine of Greece, 11th June, 1917; King Ferdinand of Bulgaria, 6th Oct., 1918; Wilhelm II of Germany, 9th

Nov., 1918; Karl I of Austria, 13th Nov., 1918; and Marie Adelaide, Grand-Duchess of Luxembourg, 15th Jan., 1919.

Abdo'men, in man, the belly, or lower cavity of the trunk, separated from the upper cavity or thorax by the diaphragm or midriff, and bounded below by the bones of the pelvis. It contains the viscera belonging to the digestive and urinary systems. What are called the *abdominal regions* will be understood from the accompanying cut, in which 1 is the *epigastric* region, 2 the *umbilical*, 3 the *pubic*, 4 4 the right and left *hypochondriac*, 5 5 the right and left *lumbar*, 6 6 right and left *iliac*. The name is given to the corresponding portion of the body in other animals. In insects it comprises the whole body behind the thorax, usually consisting of a series of rings. See *Alimentary Canal*.



Abdominal
Regions.

Abdom'inal Fishes (*Abdomināles*), a group of the soft-finned (or malacopterous) fishes, having fins upon the abdomen, and comprising the herring, pike, salmon, carp, &c.

Abduc'tion, a legal term, generally applied to denote the offence of carrying off a female either forcibly or by fraudulent representations. Such a delinquency in regard to a man is styled *kidnapping*. There are various descriptions of abduction recognized in criminal jurisprudence, such as that of a child, of an heiress, or of a wife.

Ab'dul-Az'iz, Sultan of Turkey, was born in Feb., 1830, and succeeded his brother Abdul-Mejid, in June, 1861. He concluded treaties of commerce with France and England, both of which countries he visited in 1867. Deposed in May, 1876, he committed suicide, or more probably was assassinated, in June of the same year. He was succeeded by his son Murad V. See next article.

Ab'dul-Ham'id, Sultan of Turkey, younger son of Abdul-Mejid, born 22nd Sept., 1842, succeeded his brother Murad V, who was deposed on proof of his insanity in 1876. At that time Turkey, which was at war with Serbia, was compelled to agree to an armistice at the demand of Russia. The persecution and oppression of the Christian population of Bulgaria had roused remonstrances from other European countries, and a congress met at Constantinople to consider a constitution which the Porte had proclaimed.

The conference was a failure, and in April, 1877, war was declared by Russia. During the sanguinary struggle which ensued the Turks fought with great bravery, but they had ultimately to sue for peace. A treaty was signed at San Stefano in Feb., 1878, but its provisions were modified by a congress of the Great Powers which met at Berlin. The island of Cyprus was ceded to Britain. Serbia, Rumania, and Montenegro were freed from Turkish suzerainty altogether; Bulgaria was left in nominal dependence; whilst Bosnia and Herzegovina were placed under Austrian administration. In 1881 Thessaly was transferred to Greece; in 1885 E. Roumelia became united to Bulgaria. Ever since the treaty of Berlin, Abdul Hamid saw in Germany the future friend of Turkey. He therefore entrusted Germans with the reorganization of his army and finances. Subsequently there were massacres of Christians, a war with Greece (1897), and troubles in Crete and Macedonia. In April, 1909, the Sultan was deposed, and his brother, Rashid Effendi, proclaimed sultan as Mohammed V. Abdul Hamid died in captivity 10th Feb., 1918.

Abd-ul-Lat'if, an Arab writer and physician, was born at Bagdad in 1161 and died there in 1231. He was patronized by the celebrated Saladin, and published an excellent description of Egypt, which is still extant. It was translated into English by White, Oxford, 1800.

Ab'dul-Mej'id Khan, Sultan of Turkey, born in 1823, succeeded his father, Mahmud II, 1st July, 1839. At the time of his accession Mehemet, Pasha of Egypt, had risen a second time against the Turkish yoke; his son Ibrahim had inflicted a severe defeat on the Turks at Nizib (24th June, 1839), and was advancing on Constantinople. But the intervention of the leading European Powers checked the designs of Mehemet Ali, and saved the Turkish empire. Abdul-Mejid was desirous of carrying out reforms, but most of them were not enforced, or caused bloody insurrections where attempts were made to carry them out. Owing to disputes between the Latin and Greek Churches regarding the rights of precedence and possession of the 'holy places' in Palestine, and to demands made by the Tsar virtually implying the right of protectorate over the Christian subjects of the Sultan, war broke out between Turkey and Russia in 1853. In the following year the Porte effected an alliance with France and England (hence the Crimean War), and later on with Sardinia. (See *Crimean War*.) Abdul-Mejid died 25th June, 1861, and was succeeded by his brother, Abdul-Aziz.

Abeceda'rian, a term formed from the first four letters of the alphabet, and applied to the followers of Storch, a German Anabaptist (1522), because they rejected all worldly knowledge, even the learning of the alphabet.

À Becket, Thomas. See *Becket*.

À Beck'ett, Gilbert Abbott, English writer, born near London in 1811. He studied for the bar, and became one of the original staff of *Punch*, was long a leader-writer to the *Times* and the *Morning Herald*, and contributed articles to the *Illustrated London News*. He wrote *Comic History of England*, *Comic History of Rome*, and *Comic Blackstone*, and between fifty and sixty plays. In 1849 he was appointed a metropolitan police magistrate, which office he retained till his death in 1856.

Abel, properly *Hebel* (Heb. breath, vapour, vanity), the second son of Adam. He was a shepherd, and was slain by his brother Cain from jealousy because his sacrifice was accepted while Cain's was rejected. Several of the fathers, among others St. Chrysostom and Augustine, regard him as a type of the new, regenerate man.

Abel, Sir Frederick Augustus, chemist, was born in London, 1827; died 1902. Having adopted chemistry as a profession, he studied under Hofmann at the Royal College of Chemistry, became professor of chemistry at the Royal Military Academy in 1851, and was chemist to the War Department and chemical adviser to the Government from 1854 to 1888. He did useful work in connection with the chemistry of explosives (especially gun-cotton), the flash-point of petroleum, &c.; was joint-inventor of cordite along with Dewar; and was also an authority on the manufacture of steel. He was honoured with a baronetcy, and was also a K.C.B. and a K.C.V.O. He wrote works on gunpowder, gun-cotton, and explosives generally, and on electricity as applied to explosive purposes. His works include: *The Modern History of Gunpowder*; *Electricity applied to Explosive Purposes*, &c.

Abélard (ab'e-lärd), or **Abailard**, Peter, a celebrated scholastic teacher, born near Nantes, in Brittany, in 1079. He made extraordinary progress with his studies, and, ultimately eclipsing his teachers, he opened a school of scholastic philosophy near Paris, which attracted crowds of students from the neighbouring city. His success in the fiery debates which were then the

fashion in the schools made him many enemies, among whom was Guillaume de Champeaux, his former teacher, chief of the cathedral school of Notre-Dame, and the most advanced of the Realists. Abélard succeeded his adversary in this school (in 1113), and under him were trained many men who afterwards rose to eminence, among them being the future Pope Celestin II, Peter Lombard, and Arnold of Brescia. While he was at the height of his popularity, and in his fortieth year, he fell violently in love with Heloise—then eighteen years of age—niece of Fulbert, a canon of Paris. They obtained a home in Fulbert's house under the pretext of teaching Heloise philosophy, and their intercourse at length became apparent. Abélard, who had retired to Brittany, was followed by Heloise, who there gave birth to a son, named Astrolabius. A private marriage took place, and Heloise returned to her uncle's house, but, refusing to make public her marriage (as likely to spoil Abélard's career), she was subjected to severe treatment at the hands of her uncle. To save her from this Abélard carried her off and placed her in a convent at Argenteuil, a proceeding which so incensed Fulbert that he hired ruffians who broke into Abélard's chamber and subjected him to a shameful mutilation. Abélard, filled with grief and shame, became a monk in the abbey of St. Denis, and Heloise took the veil. When time had somewhat moderated his grief, he resumed his lectures; but trouble after trouble overtook him. His theological writings were condemned by the Council of Soissons, and he retired to an oratory called the Paraclete, subsequently becoming head of the abbey of St. Gildas-de-Rhuys in Brittany. For a short time he again lectured at Paris (1136), but his doctrines once more brought persecution on him, and St. Bernard of Clairvaux, the most powerful man in the Church in those days, had him condemned by the Council of Sens and afterwards by the Pope. Abélard did not long survive this, dying at St. Marcel, near Chalon-sur-Saône, 21st April, 1142. Heloise, who had become abbess of the Paraclete, had him buried there, where she herself was afterwards laid by his side. Their ashes were removed to Paris in 1800, and in 1817 they were finally deposited beneath a mausoleum in the cemetery of Père la Chaise. According to John of Salisbury, Abélard is credited with the invention of a new philosophical system, midway between Realism and Nominalism. In Ethics, Abélard seems to have attached importance to the psychological element in the action, rather than to the action itself. "The intention of sinning", he maintained, "is worse than the actual physical sin." A complete edition of

his works was published by Cousin (2 vols., Paris, 1849-59), and the letters of Abélard and Heloise have been often published in the original and in translations. Pope's *Eloisa to Abélard* is founded on them. Abélard's autobiography, entitled *Story of my Calamities*, is still extant.—BIBLIOGRAPHY: Charles de Rémusat, *Abélard* (2 vols.); J. M'Cabe, *Life of Abélard*.

Abele (a-bēl'), a name of the white poplar.

A'belite, or Abe'lian, a member of a religious sect in Africa which arose in the fourth century after Christ. They married, but lived in continence, after the manner, as they maintained, of Abel, and attempted to keep up the sect by adopting the children of others.

Abelmoschus (-mos'kus), a genus of tropical plants of the mallow family. *A. esculentus*, cultivated in India, Algeria, &c., yields edible pods and also a valuable fibre. The fruit, called *okro* or *ochro*, is used in soups.

Abencerrages (ab-en-ser'a-jez), a powerful and distinguished Moorish family of Granada, the chief members of which, thirty-six in number, are said to have been massacred in the Alhambra by the king Abu-Hassan (latter half of the fifteenth century) on account of the attachment of his sister to one of them. There is a room in the Alhambra which is still called 'the hall of the Abencerrages'. The legend has furnished the subject of many poems both Arabic and Spanish (*Las Guerras Civiles de Granada*, by Gines Perez de Hita), and formed the basis for Chateaubriand's *Aventures du dernier des Abencérages*.

Ab'en Ezra (Ibn Ezra), a celebrated Jewish rabbi, born at Toledo about 1093, travelled in pursuit of knowledge in England, France, Italy, and Greece, and is supposed to have died in Rhodes about 1167. He is best known as a commentator on Scripture.

Abensberg (ä'bëns-berh), a village of Bavaria, in the Danube valley, below Ingolstadt, celebrated for Napoleon's victory over the Austrians, 20th April, 1809.

Abeoku'ta. See *Abbeokuta*.

Ab'er, a prefix in Celtic geographical proper names signifying the mouth or entrance of a river into the sea, or into another stream. It is used chiefly in Wales and Scotland, having the same meaning as *inver*.

Abera'von, a municipal borough of Wales in Glamorganshire, near the mouth of the Avon in Swansea Bay, embracing Aberavon proper and its harbour Port Talbot. There are collieries, ironworks, copper-works, &c. Since 1918 Aberavon gives its name to a parliamentary division of the county. Pop. (municipal borough) (1921), 15,370.

Aberbroth'ock. See *Arbroath*.

Abercarn', an urban district or town of England, Monmouthshire, 10½ miles north-west of Newport, with collieries, ironworks, &c. Pop. (1921), 20,123.

Ab'ercrombie, John, M.D., a Scottish writer on medical and moral science, and an eminent physician, born in Aberdeen, 1781, died at Edinburgh in 1844. He graduated at the university of Edinburgh in 1803, and subsequently pursued his studies in London, returning to Edinburgh in 1804, where he acquired an extensive practice as a physician. Apart from medical treatises, he is known from his *Inquiries concerning the Intellectual Powers* and his *Philosophy of the Moral Feelings*.

Ab'ercrombie, Patrick, a Scottish historical writer and antiquary, born at Forfar, 1656; date of death uncertain. Educated at St. Andrews and abroad, he took the degree of M.D., and practised as a physician in Edinburgh. In 1685 he was appointed physician to James II. His chief work is *Martial Atchievements of the Scots Nation*, 2 vols. folio, 1711-6.

Ab'ercromby, Sir Ralph, a British general, born in 1734 in Clackmannanshire, Scotland. He entered the army in 1756 as cornet in the 3rd Dragoon Guards; and he gradually passed through all the ranks of the service until he became a major-general in 1787. He served as lieutenant-general in Flanders, 1793-5, and was then appointed commander-in-chief of the forces in the West Indies, where he captured the islands of Grenada, St. Lucia, St. Vincent, and Trinidad, with the settlements of Demerara and Essequibo. On his return in 1798 he was appointed commander-in-chief in Ireland; and he afterwards held a corresponding command in Scotland. His

next and concluding service was in the expedition to Egypt, of which he was commander-in-chief. He landed, after a severe fight, at Aboukir, 8th March, 1801; and on the 21st of the same month the battle of Alexandria was fought, in which Sir Ralph was mortally wounded.

Aberdare (-dār'), a town of South Wales, in Glamorganshire, pleasantly situated at the junction of the Cynon and Dare, 4 miles south-west of Merthyr-Tydfil, with extensive coal and iron mines in the vicinity. It belongs to the parliamentary borough of Merthyr-Tydfil. Pop. (1921), 55,010.

Aberdeen', a university city and royal, municipal, and parliamentary burgh of Scotland, capital of the county of same name, mainly on the north bank of the Dee at its entrance into the North Sea, and between this river and the Don, with a part also on the south bank of the Dee, while the municipal limits include the adjacent Woodside. The site is in places somewhat hilly. Aberdeen is one of the oldest towns in Scotland, and was constituted a royal burgh by William the Lion in 1179. The streets are generally spacious and regular, the houses built of fine grayish-white granite. There are many handsome public buildings, as the County and Municipal Buildings, Marischal College, Grammar School, Infirmary, Arts School, Art Gallery, Music Hall Buildings, public library, &c. The finest street, Union Street, made in 1800, is carried over a valley by a granite bridge having an arch of 132 feet span. The small portion of the city called Old Aberdeen, long a separate town, consists mainly of a single street, stretching northwards to the River Don. Its chief buildings are King's College and St. Machar's Cathedral. Noteworthy features of the college buildings are the crown-tower and the chapel, the latter containing some very fine old carved woodwork. The cathedral, now used as a parish church, was commenced about 1357. There are several bridges over the Dee and Don. Over the latter is a fine old bridge (Brig o' Balgownie) of one arch, erected according to some accounts by Robert Bruce. There are docks 34 acres in area, an extensive tidal harbour and basin, and a graving-dock. The shipping trade is extensive. The industries embrace wool, jute, linen, combs, soap, preserved provisions, chemicals, paper, shipbuilding, engineering, and especially the cutting and polishing of granite. The fishing industry is of great importance. The city of Aberdeen returns two members to Parliament. Pop. 158,969.—*The County of Aberdeen* forms the north-eastern portion of Scotland, and is

bounded on the east and north by the North Sea. Area, 1,261,521 acres. It is divided into six districts (Mar, Formartine, Buchan, Alford, Garioch, and Strathbogie), and is generally hilly, there being in the south-west some of the highest mountains in Scotland, as Ben Macdhui (4295 feet), Cairntoul (4245), Cairngorm (4090), Lochnagar, &c. Its most valuable mineral is granite, large quantities of which are exported. The principal rivers are the Dee and the Don, both of which enter the sea at the town of Aberdeen. Cereals (except wheat) and other crops succeed well, and the number of acres under cultivation is nearly double that of any other Scottish county. Great numbers of cattle are fattened and sent to London and the south. On the banks of the upper Dee is situated Balmoral, a favourite residence of Queen Victoria. Aberdeenshire and Kincardine unite in sending three members to Parliament. Pop. 300,980.—*Aberdeen University*, as now constituted, derives its origin from two different foundations; one, the University and King's College (Old Aberdeen), founded in 1494 by Bishop Elphinstone (who was bishop of Aberdeen from 1483-1514) under the authority of a papal bull obtained at the instance of James IV; the other, Marischal College and University (New Aberdeen), founded in 1593 by Geo. Keith, Earl Marischal, by a charter ratified by act of Parliament. The two foundations existed as separate universities, both having the right of conferring degrees, till 1860, when they were united and incorporated into one university, the University of Aberdeen. Holding the funds of both colleges and dating as from the foundation of King's College in 1494, the university has about 300 bursaries or exhibitions, mostly open to public competition, and a number of money prizes and scholarships. The classes for arts and divinity are held in King's College, and those for law and medicine in Marischal College. There is a full teaching staff in the faculties of arts, medicine, science, and divinity, and two professors in that of law. There are in all 25 professors and some 900 matriculated students. The constitution of the university is similar to that of Edinburgh and the other Scottish universities. The library contains over 80,000 volumes. The university unites with those of Edinburgh, Glasgow, and St. Andrews in sending three members to Parliament.

Aberdeen', George Hamilton Gordon, Earl of, British statesman, born 28th Jan., 1784, died 14th Dec., 1860. He began his diplomatic life in 1801 as attaché to Lord Cornwallis's embassy to France, which resulted in the

signing of the treaty of Amiens. In 1806 he entered Parliament as a Scottish representative peer, and in 1813 was entrusted with a successful mission to Austria for the purpose of inducing the emperor to join the coalition of sovereigns against Bonaparte. In 1814 he was created a British peer, and in 1828 he became foreign secretary in the Duke of Wellington's administration. During the short premiership of Sir Robert Peel in 1834-5 he acted as colonial secretary, and when Sir Robert again became premier in 1841 he took office as Secretary for Foreign Affairs. He was a warm supporter of Catholic Emancipation, and endeavoured, though without result, to bring in a compromise bill in 1846, during the struggle which divided the Established Church of Scotland. Quitting office with his chief in 1846, he came, on the death of Peel in 1850, to be regarded as the leader of the Conservative free-trade party. On the Derby ministry failing to maintain its place, Lord Aberdeen returned to office in the end of 1852 as head of a coalition ministry. The principal event which marked his administration was the Crimean war; but the bad management of this irritated the country, and the ministry resigned in 1855. This event marks the close of Lord Aberdeen's public career. From his travels and his acquaintance with Greece and its antiquities he was called by Byron "the travelled thane, Athenian Aberdeen".

Ab'erdevine. See *Siskin*.

Abergaven'ny (sometimes pron. ab-ër-ge'ni, the Roman **Gobannium**), a municipal borough and market town of England, in Monmouthshire, situated amid delightful scenery in the beautiful valley of the Usk. It manufactures woollens and shoes, and has considerable trade. Pop. (1921), 9252.

Abernethy (ab-ër-neth'i), John, an eminent English surgeon, of somewhat eccentric habits, born in 1764 in London, a pupil of the celebrated John Hunter. In 1787 he became assistant surgeon at St. Bartholomew's Hospital, and shortly after lecturer on anatomy and surgery. In 1815 he was elected principal surgeon, and under his auspices the hospital attained a celebrity which it had never before enjoyed. He published *Surgical Observations*; *The Constitutional Origin and Treatment of Local Diseases*; and *Lectures*, explanatory of Hunter's opinions of the vital processes; besides smaller essays. He died in 1831.

Aberra'tion, in astronomy, the difference between the true and the observed position of a heavenly body, the result of the combined effect of the motion of light and the motion of the eye of the observer caused by the annual or diurnal motion of the earth; or of the motion of light and that of the body from which the light proceeds. When the auxiliary cause is the annual revolution of the earth round the sun it is called *annual aberration*, in consequence of which a fixed star may appear as much as 20.4" from its true position; when the auxiliary cause is the diurnal rotation of the earth on its axis it is called *diurnal aberration*, which amounts at the greatest to 0.3"; and when the auxiliary cause is the motion of the body from which the light proceeds it is called *planetary aberration*.

Abersychan (ab-ér-sik'an), a town of Monmouthshire, England, about 10 miles north of Newport, in a rich coal-mining district. Pop. (1921), 27,089.

Abertil'lery, an urban district or town of England, Monmouthshire, 16 miles north-west of Newport, with tinplate works, coal-mines, &c. Since 1918 it gives its name to a parliamentary division of the county. Pop. (1921), 38,805.

Aberystwith (ab-ér-ist'with), a seaport and fashionable watering-place of Wales, county of Cardigan, on Cardigan Bay. The town is well built, and the surrounding country is picturesque. There is here a University College of the University of Wales, occupying a handsome Gothic building. Pop. (1921), 12,289.

Abeyance, in law, a legal term meaning that the title to dignity, office, or real or personal property is not vested in anyone, but is suspended until the right thereto is determined by the appearance of the true owner. Under English law, when a nobleman dies leaving no male issue, the title, if descendible to his heirs general, as in the case of baronies by writ, is said to be in abeyance, until the king, by his prerogative, terminates the abeyance in favour of one of the co-heiresses. See *Property*.

Abgar, title of the Syrian rulers at Edessa. The fourteenth prince of the dynasty, a contemporary of the Roman emperor Tiberius (A.D. 14-37), is said to have written a letter to our Saviour.

Abhor'ers, in English history a name given to the Court party in 1679-80, who, on petitions being presented to Charles II praying him to summon Parliament, signed counter-petitions expressing *abhorrence* for those who were thus attempting to encroach on the royal prerogative.

A'bib, the first month of the Jewish ecclesiastical year, and the seventh of the civil year, corresponding to the latter part of March and the first of April. Also called *Nisan*.

Abies (ab'i-es), a genus of trees. See *Fir* and *Spruce*.

Ab'ingdon, a town of England, in Berkshire, 50 miles north-west of London, on the right bank of the Thames. It was an important place in Anglo-Saxon times, and Offa, King of Mercia, had a palace in it. Formerly a parliamentary borough, it now gives name to a parliamentary division of Berks. Pop. (1921), 7167.

Abiogenesis (a-bī-o-jen'e-sis), the doctrine or hypothesis that living matter may be produced from non-living; spontaneous generation. See *Generation (Spontaneous)*.

Abjura'tion, Oath of, an oath which by an English Act passed in 1701 had to be taken by all holders of public offices, clergymen, teachers, members of the universities, and lawyers, abjuring and renouncing the exiled Stuarts: superseded in 1858 by a more comprehensive oath, declaring allegiance to the present royal family.—*Abjuration of the realm* was an oath that a person guilty of felony, who had taken sanctuary, might take. This oath permitted him to go into exile, and not return on pain of death, unless by the king's permission. In ecclesiastical language the term is applied to renunciation of heresy.

Abkha'sia, a Russian district, at the western extremity and south of the Caucasus, between the mountains and the Black Sea. The Abkhasians form a race distinguished from their neighbours in various respects. At one time they were Christians, but afterwards adopted Mahommedanism. Many of them migrated into Turkish territory in 1864 and 1878.

Ablaincourt. See *Somme*.

Ab'lative, a term applied to a case of nouns, adjectives, and pronouns in Latin, Sanskrit, and some other languages; originally given to the case in Latin because separation from (*ab*, from *latus*, taken) was considered to be one of the chief ideas expressed by the case.

Abnaki, a Confederacy of Algonquin tribes, formerly occupying what is now Maine and Southern New Brunswick. Their territory, to which they removed after 1724, is in Canada on the St. John River and at St. Francis.

Åbo (ō'bō), a town and port in Finland, the see of an archbishop, and the capital of Finland till 1819, when it was supplanted by Helsingfors. Pop. (1919), 56,168.

Abolitionists. See *Slavery*.

Aboma'sum, or **Aboma'sus**, the fourth stomach of ruminating animals, next the *omasum* or third stomach.

Abo'mey, or **Agbo'mey**, the capital of the French territory and former kingdom of Dahomey, in West Africa, in a fertile plain, near the coast of Guinea. Pop. 11,000.

Aborigines (ab-o-rij'i-nēz), the name given in general to the earliest known inhabitants of a country, those who are supposed to have inhabited the land from the beginning (Lat. *ab origine*). (The singular of the word is *Aboriginal*, or sometimes *Aboriginé*.)

Abortion, in medicine, the expulsion of the foetus before it is capable of independent existence. This may take place at any period of pregnancy before the completion of the twenty-eighth week. A child born after that time is said to be *premature*. Abortion may be the result of the general debility or ill-health of the mother, of a plethoric constitution, of special affections of the uterus, of severe exertions, sudden shocks, &c. Various medicinal substances, generally violent emmenagogues or drastic medicines, are believed to have the effect of provoking abortion, and are sometimes resorted to for this purpose. Attempts to procure abortion are punishable by law in all civilized states. When the death of the woman ensues as a result of the attempt, the crime is murder.—The term is applied in botany to denote the suppression by non-development of one or more of the parts of a flower, which consists normally of four whorls—namely,

calyx, corolla, stamens, and pistil.—BIBLIOGRAPHY: Sir W. O. Russell, *Crimes and Misdemeanours* (3 vols.); A. S. Taylor, *Principles and Practice of Medical Jurisprudence*.

Aboukir (a' -bö-kēr'; ancient **Zephyrion**, near ruins of Canōpus), a small village on the Egyptian coast, 10 miles east of Alexandria. In Aboukir Bay took place the naval battle in which Nelson annihilated a French fleet on the night of 1st and 2nd Aug., 1798, thus totally destroying the naval power of France in the Mediterranean. Near this place, on 25th July, 1799, Napoleon defeated the Turks under Mustapha; and on 8th March, 1801, Sir Ralph Abercromby effected the landing of a British army against the French.

Abou-Simbel. See *Ipsambul*.

About (a' -bö), Edmond François Valentin, a French novelist and miscellaneous writer, born 14th Feb., 1828, died 17th Jan., 1885. He was educated at the Lycée Charlemagne and the École Normale, Paris; and was sent at Government expense to the French school at Athens; on his return to Paris, he devoted himself to literature. Principal novels: *Tolla, Le Roi des Montagnes, Germaine, Madelon, Le Fellah, La Vieille Roche, L'Infâme, Les Mariages de Province, Le Roman d'un Brave Homme* (against Zola and the naturalist school), &c.; miscellaneous works: *La Grèce Contemporaine, La Question Romaine, La Prusse en 1860, Rome Contemporaine*, &c. In 1884 he was elected a member of the Academy. About wrote in a bright, humorous, and interesting style, and his novels have been very popular.

Abracadab'ra, a word of Eastern origin used in incantations. When written on paper so as to form a triangle, the first line containing the word in full, the one below it omitting the last letter, and so on each time until only one letter remained, and worn as an amulet, it was supposed to be an antidote against certain diseases.

A B R A C A D A B R A
A B R A C A D A B R
A B R A C A D A B
A B R A C A D A
A B R A C A D
A B R A C A
A B R A C

A B R A
A B R
A B
A

A'braham, originally **Abram** (Assyrian *Aburamu*, lofty father), the greatest of the Hebrew patriarchs, was born at Ur in Chaldea in 2153 B.C. according to Hales, in 1996 B.C. according to Ussher, while Bunsen says he lived 2850 B.C. He migrated, accompanied by his wife Sarah and his nephew Lot, to Canaan, where he led a nomadic life, which extended over 175 years. His two sons, Isaac and Ishmael, were the progenitors of the Jews and Arabs respectively.

Abraham, Heights or Plains of. See *Quebec*.

Abraham à Santa Clara, a German pulpit orator, whose real name was Ulrich Megerle, born in 1644. As a preacher he acquired so great a reputation that, in 1669, he was appointed court-preacher in Vienna, where he died in 1709. His sermons are full of homely, grotesque humour, often of coarse wit, and impartial severity towards all classes of society. His principal work and masterpiece is *Judas, the Archknave* (4 vols.), 1686-95.

Abrahamites, 1, A sect of Syrian Deists of the ninth century, whose doctrines were allied to those of the Paulicians.—2, A sect of Bohemian Deists of the late eighteenth century, who professed to be followers of John Huss and claimed that they followed the religion of Abraham before his circumcision. Believing in one God, they rejected the Trinity, and accepted nothing of the Bible except the Ten Commandments and the Lord's Prayer. Refusing to join either the Jewish or Christian folds, they were excluded from the edict of toleration promulgated by the Emperor Joseph II, and expelled to Transylvania in 1783. Some were martyred, others became Roman Catholics.

Abraham-men, originally a set of vagabonds who had been discharged from Bethlehem Hospital, London; but as many assumed, without right, the badge worn by them, the term came to signify an impostor who travelled about the country seeking alms, under the pretence of lunacy.

Abram, a town (urban district) of England, Lancashire, 3½ miles from Wigan; a colliery centre. Pop. (1921), 6858.

Ab'ramis, a genus of fishes. See *Bream*.

Abran'tes, a fortified town of Portugal, on the right bank of the Tagus (here navigable), 73 miles north-east of Lisbon, with which it carries on an active trade. Pop. 8000.

Abrantes, Duke of. See *Junot*.

Abrax'as (or **Abrasax**) **Stones**, the name given to stones or gems found in Syria, Egypt, and elsewhere, cut into almost every variety of shape, but generally having a human trunk and arms, with a cock's head, two serpents' tails for the legs, &c., and the mystico-theosophical word Abraxas or Abrasax in Greek characters engraved upon them. Eventually they came to be used as charms and amulets. Basilides (A.D. 130) and other gnostics gave the name of Abraxas to Almighty God, the Supreme Deity, since the numerical value of its letters in Greek gave the sum of 365, and they believed that 365 orders of spirits emanated from God. Not all abraxas stones, however, are of gnostic origin, just as the name of abraxas cannot be applied to all gnostic stones. Cf. King: *The Gnostics and their Remains*, London, 1887.

Abrin, or **Abrine**, a poisonous substance, being the active principle in the seeds of *Abrus precatorius* (see *Abrus*). A minute quantity introduced into the blood is fatal to many animals, but it is employed in ailments of the eyes, and as a remedy for lupus and certain skin diseases.

Abroga'tion, the repealing of a law by a competent authority.

Abrolhos (a-brole'-yoce) a group of rocky islands 50 miles off the east coast of Brazil, the largest of which is Santa Barbara. Another group called Abrolhos lies off the west coast of Australia.

Abro'ma, a genus of small trees, natives of India, Java, &c., one species of which, *A. augusta*, has a bark yielding a strong white fibre, from which good cordage is made.

Abrupt', in botany, terminating suddenly, as if a part were cut short off.

Ab'rus, a genus of papilionaceous plants, order Leguminosæ, one species of which, *Abrus precatorius*, a delicate twining shrub, a native of the East Indies, and found also in tropical parts of Africa and America, has round brilliant scarlet seeds, used to make necklaces and rosaries. Its root is sweetish and mucilaginous, and is used as a substitute for liquorice (*Indian liquorice*). The seeds yield a strong poison.

Abruzzi (a' -bru't'sē), a division of Italy on the Adriatic, between Umbria and the Marches on the north, and Apulia on the south. It is united with Molise to form a *compartimento*, comprising the four provinces of Aquila degli Abruzzi, Campobasso, Chicti, and Teramo. The sea-coast of about 80 miles does not possess a single harbour. The interior is rugged and mountainous, being traversed throughout by the Apennines. The lower parts consist of fertile plains and valleys, yielding corn, wine, oil, almonds, saffron, &c.; area, 6387 sq. miles. Pop. 1,480,748.

Ab'salon, or **Axel**, a Danish prelate, statesman, and warrior, born in 1128, died 1201. He became the intimate friend and counsellor of his sovereign Waldemar I, who appointed him Archbishop of Lund. He cleared the sea of the Slavonic pirates who had long infested it, secured the independence of the kingdom by defeating a powerful fleet of the Emperor Barbarossa, and built the castle of Axelborg, the nucleus of Copenhagen. He ultimately became Primate of Denmark and Sweden. Turning his thoughts to literature he caused the *History of Denmark* to be drawn up by Saxo Grammaticus and Svend Aagesen.

Ab'scess, any collection of purulent matter or pus formed in some tissue or organ of the body, and confined within some circumscribed area, of varying size, but always painful and often dangerous.

Absenteeism, a term applied to landlords who absent themselves from their estates and live and spend their money elsewhere; in its more extended meaning it refers to all those whose fixed residence is outside their own country but who derive their income from sources within it. The social, economic, political, and moral evils resulting from such a system are considerable and hurtful to the interests of a region, the absentee being apt to lose his interest in things and persons and the public welfare generally. Some economists, however, have adduced arguments in favour of it, as it

may sometimes be for the good of the community that a rich and luxurious landlord should be absent from his estate.

The absenteeism of the Irish nobility, which became worse after the Union with Great Britain and the transfer of Parliament from Dublin to London, has been a constant source of mischief, whilst France before the Revolution, Russia under the Tsars Alexander I and Nicholas I, and Hungary in the eighteenth century suffered greatly from the practice. The first statute concerning absentees was passed in the English Parliament in 1379, and in 1729 a tax was levied on all moneys paid out of Ireland.

Ab'sinth, French *Absinthe* (a' b-san' t), a liqueur consisting of an alcoholic solution strongly flavoured with an extract of several sorts of wormwood, oil of anise, &c. When taken habitually, or in excess, its effects are very pernicious. A favourite drink of the Parisians, it was suppressed entirely throughout France by a law passed on 12th Feb., 1915.

Ab'solute, in a general sense, loosed or freed from all limitations or conditions. In politics, an *absolute* monarchy is that form of government in which the ruler is unlimited or uncontrolled by constitutional checks. In modern metaphysics *the Absolute* represents the unconditioned, infinite, and self-existent.

Absolu'tion, remission of a penitent's sins in the name of God. It is commonly maintained that down to the twelfth century the priests used only what is called the *precatory* formula, "May God or Christ absolve thee", which is still the form in the Greek Church; whereas the Roman Catholic uses the expression "I absolve thee", thus regarding the forgiveness of sins as in the power of the priest (the *indicative* form). This theory of absolution was confirmed by the Council of Trent. The passages of Scripture on which the Roman Catholic Church relies in laying down its doctrine of absolution are such as *Mat.* xvi. 19, xviii. 18; *John*, xx. 23. Among Protestants absolution properly means a sentence by which a person who stands excommunicated is released from that punishment.

Absolutism, a system of government in which the supreme power is vested in a ruler not controlled or limited by any constitution or laws. It has prevailed in Oriental countries, including Japan, until the latter part of the nineteenth century. There are now no absolute monarchies in Europe.

Absor'bents, the system of minute vessels by which the nutritive elements of food and other matters are carried into the circulation of vertebrate animals. The vessels consist of two different sets, called respectively *lacteals* and *lymphatics*. The former arise from the digestive tract, the latter from the tissues generally, both joining a common trunk which ultimately enters the blood-vessel system. Absorbents in medicine are substances such as chalk, charcoal, &c., that absorb or suck up excessive secretion of fluid or gas.

Absorp'tion, in physiology, one of the vital functions by which the materials of nutrition and growth are absorbed and conveyed to the organs of plants and animals. In vertebrate animals this is done by the lymphatics and lacteals, in plants chiefly by the roots. See *Absorbents*.

In physics, *absorption of colour* is the phenomenon observed when certain colours are retained or prevented from passing through transparent bodies; thus pieces of coloured glass are almost opaque to some parts of the spectrum, while allowing other colours to pass through freely. In chemistry absorption is the taking up of a gas by a liquid, or by a porous solid.

Ab'stinance. See *Fasting*, *Temperance*.

Abstrac'tion, the operation of the mind by which it disregards part of what is presented to its observation in order to concentrate its attention on the remainder. It is the foundation of the operation of generalization, by which we arrive at general conceptions. In order, for example, to form the conception of a horse, we disregard the colour and other peculiarities of the particular horses observed by us, and attend only to those qualities which all horses have in common. In rising to the conception of an animal we disregard still more qualities, and attend only to those which all animals have in common with one another.

Abu (a-bö'), a granitic mountain of India in Sirohi State, Rajputána, rising precipitously from the surrounding plains, its top forming a picturesque and varied tract 14 miles long and 2 to 4 broad; highest point 5653 ft. It is a hot-weather resort of Europeans, and is the site of two most beautiful Jain temples, built in 1031 and 1200.

Abu-Bekr, or **Father of the Virgin**, born 570 died 634, the father-in-law and first successor of Mahomet. His right to the succession was unsuccessfully contested by Ali, Mahomet's son-in-law, and a schism took place, which divided the Mahommedans into the two great sects of Sunnites and Shiites, the former maintaining the validity of Abu-Bekr's and the latter that of Ali's claim.

Abukir'. See *Aboukir*.

Abu Klea, a group of wells, surrounded by steep, black mountains, about 120 miles from Khartoum, in the Sudan, where, on the 17th Jan., 1885, Sir Herbert Stewart, with 1500 men, defeated the Mahdi's troops numbering 10,000.

Abulfara'gius, Gregory, a distinguished scholar, a Jew by birth (hence the name of *Barhebræus*, often given him), author of numerous works in Arabic and Syriac, was born in Armenia in 1226, died in 1286. About 1264 he was consecrated Bishop of Gubas; he was afterwards translated to Aleppo and was appointed primate of the Jacobite Christians. His principal work is a *History of the World* from the Creation to his own day, written in Syriac, with an abridged version in Arabic, entitled *The Abridged History of the Dynasties*.

Abul'feda, Arab writer, Prince of Hamah, in Syria, of the same family as Saladin, famous as an historian and geographer, was born at Damascus 1273, died 1331. Amid the cares of government he devoted himself with zeal to study, drew the learned around him, and rendered his power and wealth subservient to the cause of science. His most important works are his *History of the Human Race* (the portion from the birth of Mahomet to his own time being valuable), and his geography called *The True Situation of Countries*.

Abunda, a Bantu race of Angola, living on the coastlands and on the terraces rising towards the interior, and divided into 'highlanders' and 'lowlanders'. They speak Portuguese and Umbunda, a trade language.

Abushehr (ä-bö-shār'). See *Bushire*.

Abu-Simbel. See *Ibsambul*.

Abu'tilon, a genus of plants, order Malvaceæ, sometimes called Indian mallows, found in the East Indies, Australia, Brazil, Siberia, &c. Several of them yield a valuable hemp-like fibre, as *A. indicum* and *A. Avicennæ*. The latter, now a troublesome weed in the Middle United States, has been recommended for cultivation, and is sometimes called American jute.

Abut'ment, the part of a bridge which receives and resists the lateral outward thrust of an arch; the masonry, rock, or other solid materials from which an arch springs.

Aby'dos, 1, an ancient city of Asia Minor, on the Hellespont, at the narrowest part of the strait, opposite Sestos. Leander, say ancient writers, swam nightly from Abydos to Sestos to see his loved Hero—a feat in swimming accomplished also by Lord Byron.—2, an ancient city of Upper Egypt (Egyptian Abotu), about 6 miles west of the Nile, now represented only by ruins of temples, tombs, &c. It was celebrated as the burial-place of the god Osiris, and its oldest temple was dedicated to him. Here, in 1818, was discovered the famous *Abydos Tablet*, now in the British Museum, and containing a list of the predecessors of Rameses the Great, which was supplemented by the discovery of a similar historical tablet in 1864. The tomb of Osiris was discovered in 1898 by Amélinau. Cf. Flinders Petrie, *The Royal Tombs of the Earliest Dynasties* (2 vols.), London, 1900-9.

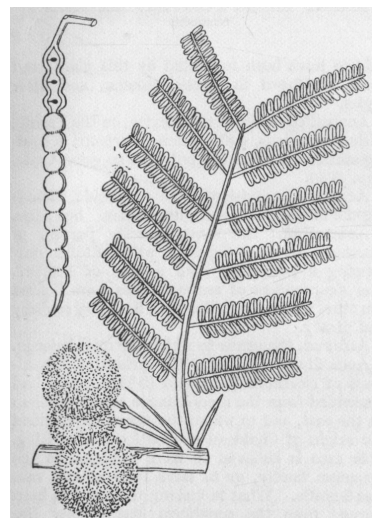
Abyssin'ia (Ar. *Habesha*), a country of Eastern Africa, which, with dependencies, may be said to extend from lat. 5° to 15° N. and long. 35° to 42° E., having the Anglo-Egyptian Sudan on the w., British E. Africa on the s., and on the s.e. and e. Somali-land and Eritrea (Italian Red Sea coast); area, 350,000 sq. miles. Pop. over 8,000,000. The country is now divided into 9 provinces, the principal being Harrar, Tigré, Amhara or Gondar. Each province is governed by a ras, or prince, but Ras Michael, the governor of Wollo and father of the deposed negus, Lij Yasu, was crowned king on 1st June, 1914. Abyssinia proper is an elevated region, with a general slope to the north-west. The more marked physical features are a vast series of tablelands, of various and often of great elevations, and numerous masses or ranges of high and rugged mountains, dispersed over the surface in apparently the wildest confusion. Along the deep and tremendous ravines that divide the plateaux rush innumerable streams, which impart extraordinary fertility to the plains and valleys below. The mountains in

various parts of the country rise to 12,000 and 13,000 feet, while some of the peaks are over 15,000 feet (Ras Dashan being 15,160), and are always covered with snow. The principal rivers belong to the Nile basin, the chief being the impetuous Tacazzé ('the Terrible') in the north, and the Abai in the south, the latter being really the upper portion of the Blue Nile. The principal lake is Lake Tzana or Dembea (from which issues the Abai), upwards of 6000 feet above the sea, having a length of about 45 and a breadth of 35 miles. Round this lake lies a fertile plain, deservedly called the granary of the country.—According to elevation there are several zones of vegetation. Within the lowest belt, which reaches an elevation of 4800 feet, cotton, wild indigo, acacias, ebony, baobabs, sugar-canes, coffee trees, date palms, &c., flourish, while the larger animals are lions, panthers, elephants, rhinoceroses, hippopotamuses, jackals, hyenas, bears, numerous antelopes, monkeys, and crocodiles. The middle zone, rising to 9000 feet, produces the grains, grasses, and fruits of southern Europe, the orange, vine, peach, apricot, the bamboo, sycamore tree, &c. The principal grains are millet, barley, wheat, maize, and teff, the latter a small seed, a favourite bread-stuff of the Abyssinians. Two, and in some places three, crops are obtained in one year. All the domestic animals of Europe, except swine, are known. There is a variety of ox with immense horns. The highest zone, reaching to 14,000 feet, has but little wood, and generally scanty vegetation, the hardier corn-plants only being grown; but oxen, goats, and long-woolled sheep find abundant pasture.—The climate is as various as the surface, but as a whole is temperate and agreeable; in some of the valleys the heat is often excessive, while on the mountains the weather is cold. In certain of the lower districts malaria prevails.—The chief mineral products are sulphur, copper, coal, and salt, the last-named serving to some extent as money. Iron is very abundant and is manufactured into knives, hatchets, and spears. There has been a great intermixture of races in Abyssinia. Those who may be considered the Abyssinians proper seem to have a blood-relationship with the Bedouin Arabs. Their complexion varies from very dark through different shades of brown and copper to olive, and they are usually well built. Other races are the black Gallas from the south; the Falashas, who claim descent from Abraham and retain many Jewish characteristics; the Agows, Gongas, &c. The great majority of the people profess Christianity, belonging, like the Copts, to the sect of the Monophysites. The head of the church is called the Abuna ('our father'), and

is consecrated by the Coptic patriarch of Alexandria. Geez or Ethiopian is the language of their sacred books: it has long ago ceased to be spoken. The chief spoken language is the Amharic; in it some books have been published. Mohammedanism appears to be gaining ground in Abyssinia. A corrupt form of Judaism is professed by the Falashas.—The bulk of the people are devoted to agriculture and cattle-breeding. The trade and manufactures are of small importance. A good deal of common cotton cloth and some finer woven fabrics are produced. Leather is prepared to some extent, silver filagree-work is produced, and there are manufactures of common articles of iron and brass, pottery, &c. Trade is carried on through Zeila and Djibouti (French Ethiopian Railway was completed in 1915) on the Gulf of Aden, and Massowa on the Red Sea (Italian), exports being hides, coffee, wax, gum, ivory, &c., imports textile fabrics, &c. The Abyssinians were converted to Christianity in the fourth century, by some missionaries from Alexandria. In the sixth century the power of the sovereigns of their kingdom, which was generally known as Ethiopia, had attained its height; but before another had expired the Arabs had invaded the country, and obtained a footing. For several centuries subsequently the kingdom continued in a distracted state, being now torn by internal commotions and now invaded by external enemies (Mahommedans and Gallas). To protect himself from the latter the Emperor of Abyssinia applied, about the middle of the sixteenth century, to the King of Portugal for assistance, promising, at the same time, implicit submission to the Pope. The solicited aid was sent, and the empire saved. The Roman Catholic priests endeavoured to induce the emperor and his family to renounce the tenets and rites of the Coptic Church, and to adopt those of Rome. This attempt, however, was resisted by the ecclesiastics and the people, and ended, after a long struggle, in the expulsion of the Catholic priests about 1630. The kingdom gradually fell into a state of anarchy, and was broken up into several independent States. An attempt to revive the power of the ancient kingdom of Ethiopia was made by King Theodore about the middle of the last century. He introduced European artisans, and went to work wisely in many ways, but his cruelty and tyranny counteracted his politic measures. In consequence of a slight, real or fancied, which he had received at the hands of the British Government, he threw Consul Cameron and a number of other British subjects into prison, in 1863, and refused to give them up. To effect their release an army of nearly 12,000 men, under Sir

Robert (afterwards Lord) Napier, was dispatched from Bombay in 1867. The force landed at Zoulla on the Red Sea, and marching up the country came within sight of the hill-fortress of Magdala in April, 1868. After being defeated in a battle, Theodore delivered up the captives and shut himself up in Magdala, which was taken by storm on the 13th April, Theodore being found among the slain. After the withdrawal of the British, fighting immediately began among the chiefs of the different provinces, but at last the country was divided between Kasa, who secured the northern and larger portion (Tigré and Amhara) and assumed the name of King Johannes, and Menelek, who gained possession of Shoa. Latterly Johannes made himself supreme and in 1881 assumed the title of emperor (*negus negusti*—king of kings), having under him the Kings of Shoa and Gojam. Debra Tabor, about 30 miles east of Lake Dembea, was his chief residence. During the troubles in Abyssinia the Egyptians annexed Massowa and the region adjacent, Abyssinia being thus shut out from the sea. Afterwards the Italians gained and still hold Massowa and the Red Sea littoral (Eritrea). Johannes fell at Metemmeh in 1889, whilst fighting against the Mahdists, and was succeeded by Menelek II. In 1916 Lij Yasu, who succeeded Menelek II in 1913, was deposed and Waizeru Zauditu (born 1876) became empress.—
BIBLIOGRAPHY: R. P. Skinner, *Abyssinia of Today*. A. B. Wylde, *Modern Abyssinia*.

Aca'cia, a genus of plants, nat. ord. Leguminosæ, sub-order Mimoseæ, consisting of trees or shrubs with compound pinnate leaves and small leaflets, growing in Africa, Arabia, the East Indies, Australia, &c. The flowers, usually small, are arranged in spikes or globular heads at the axils of the leaves near the extremity of the branches. The corolla is bell- or funnel-shaped; stamens are numerous; the fruit is a dry unjointed pod. Several of the species yield gum-arabic and other gums; some having astringent barks and pods, used in tanning. *A. Catechu*, an Indian species, yields the valuable astringent called catechu; *A. dealbāta*, the wattle tree of Australia, from 15 to 30 feet in height, is the most beautiful



Acacia arabica, showing leaves, flowers, and fruit

and useful of the species found there. Its bark contains a large percentage of tannin, and is exported in large quantities. Some species yield valuable timber; some are cultivated for the beauty of their flowers.

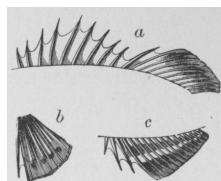
Acad'emy, an association for the promotion of literature, science, or art; established sometimes by Government, sometimes by the voluntary union of private individuals. The name Academy was first applied to the philosophical school of Plato, from the place where he used to teach, a grove or garden at Athens which was said to have belonged originally to the hero Acadēmus. The home of Academies as associations of learned men (not institutes for instruction), was Hellenized Egypt and afterwards Italy of the Renaissance. The flourishing Academies at Florence, Naples, and Rome became the models of academies in other countries. Academies devote themselves either to the cultivation of science generally or to the promotion of a particular branch of study, as antiquities, language, and the fine arts. The most celebrated institutions bearing the name of academies, and designed for the encouragement of science, antiquities, and language respectively, are the French Académie des Sciences (founded by Colbert in 1666), Académie des Inscriptions (founded by Colbert in 1663), and Académie Française (founded by Richelieu in 1635), all of which are now merged in the National Institute. The most celebrated of the academies instituted for the improvement of language is the Italian Accademia della Crusca, or Furfuratorium (now the Florentine Academy), formed in 1582, and chiefly celebrated for the compilation of an excellent dictionary of the Italian language (*Vocabulario della Crusca*, Venice, 1612), and for the publication of several carefully-prepared editions of ancient Italian poets. The (Imperial) Academy of Science of St. Petersburg was projected by Peter the Great and established by Catherine I in 1725. The Academy of Science in Berlin was founded by Frederick I in 1700. It was opened in 1711 and had Leibnitz as its first president. In Britain the name of academy, in the more dignified sense of the term, is confined almost exclusively to certain institutions for the promotion of the fine arts, such as the Royal Academy of Arts and the Royal Scottish Academy. The Royal Academy of Arts (usually called simply the Royal Academy) was founded in London in 1768, "for the purpose of cultivating and improving the arts of painting, sculpture, and architecture". The number of academicians is now limited to forty-two, among whom are two engravers. There are also thirty associates,

from whom the academicians are elected. Of the associates five are engravers. Any person who is possessed of sufficient proficiency may be admitted as a student and receive instruction gratis, and prizes are annually bestowed on meritorious students. The annual exhibition of the Academy is open to all artists whose works show sufficient merit. The Royal Scottish Academy of Painting, Sculpture, and Architecture was founded in 1826 and incorporated in 1838. It consists of thirty academicians and twenty associates. The Royal Hibernian Academy at Dublin was incorporated in 1823 and reorganized in 1861. It consists of thirty members and ten associates. A British Academy for the Promotion of Historical, Philosophical, and Philological Studies was incorporated in 1902. (See *British Academy*.) In the United States, the American Academy of Arts and Sciences at Boston was founded in 1780, and since then various other societies of similar character and name have been instituted, as the New York Academy of Sciences, the Chicago Academy of Science, &c.

Aca'dia (Fr. *Acadie*), the name formerly given to Nova Scotia. It received its first colonists from France in 1604, being then a possession of that country, but it passed to Britain, by the Peace of Utrecht, in 1713. In 1756, 18,000 of the French inhabitants were forcibly removed from their homes on account of their hostility to the British, an incident on which is based Longfellow's *Evangeline*. Many Acadians afterwards wandered back to their old homes, and their descendants are at present supposed to number 270,000, 100,000 of them living in French Canada.

Acale'pha (Gr. *akalēphē*, a nettle, from their stinging properties), a term formerly used to denote the Medusæ, or jelly-fishes, and allied species.

Acantha'ceæ, or **Acanthads**, a nat. ord. of dicotyledonous herbaceous plants or shrubs, with opposite leaves and monopetalous corolla, mostly tropical; species about 1400. See *Acanthus*.

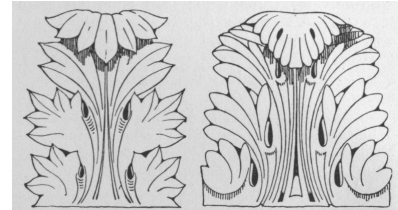


a, b, c, Spines of the dorsal, anal,

and ventral fins of
Acanthopterygii

Acanthop'teri, Acanthopterygii (Gr. *akantha*, a spine, *pterygion*, a fin), a group of fishes, distinguished by the fact that at least the first rays in each fin exist in the form of stiff spines; it includes the perch, mullet, mackerel, gurnard, wrasse, &c.

Acanth'us, a genus of herbaceous plants or shrubs, order Acanthaceæ, mostly tropical, two species of which, *A. mollis* and *A. spinōsus* (the bear's-breech or brankursine), are characterized by large white flowers and deeply-indenteds shining leaves. They are favourite ornamental plants in British gardens.—In architecture the name is given to a kind of foliage decoration said to have been suggested by this plant, and much employed in Greek, Roman, and later styles.



Acanthus. Examples of Greek and Roman decorative treatment

Acapul'co, a seaport of Mexico, on the Pacific, with a capacious, well-sheltered harbour; a coaling station for steamers, but with no great trade. Pop. 5950.

Acar'ida, a division of the Arachnida, including the mites, ticks, and water-mites. See *Mite*.

Acarna'nia, the most westerly portion of Northern Greece, together with Ætolia now forming a nomarchy with a pop. of 188,597. The Acarnanians of ancient times were behind the other Greeks in civilization, living by robbery and piracy.

Ac'arus, the genus to which the mite belongs.

Acca'dians (Akkad), the primitive inhabitants of Northern Babylonia (Akkad), who had descended from the mountainous region of Elam on the east, and to whom the Assyrians ascribed the origin of Chaldean civilization and writing. This race is believed to have belonged to the Turanian family, or to have been at any rate non-Semitic. What is known of them has been learned from the cuneiform inscriptions. See *Babylonia* and *Summerians*.

Accelera'tion is the rate of change of the velocity of a body under the action of a force. A body falling from a height is one of the most common instances of acceleration.—*Acceleration of the Moon*, the increase of the moon's mean angular velocity about the earth, the moon now moving rather faster than in ancient times. This phenomenon has not been fully explained, but it is known to be partly owing to the slow process of diminution which the eccentricity of the earth's orbit is undergoing, and from which there results a slight diminution of the sun's influence on the moon's motions.—*Diurnal acceleration of the fixed stars*, the apparent greater diurnal motion of the stars than of the sun, arising from the fact that the sun's apparent yearly motion takes place in a direction contrary to that of his apparent daily motion. The stars thus seem each day to anticipate the sun by nearly 3 minutes 56 seconds of mean time.

Ac'cent, a term used in several senses. In English it commonly denotes superior stress or force of voice upon certain syllables of words, which distinguishes them from the other syllables. Many English words, as *as'pi-ra'tion*, have two accents, a secondary and primary, the latter being the fuller or stronger. Some words, as *in-com'pre-hen'si-bil'i-ty*, have two secondary or subordinate accents. When the full accent falls on a vowel, that vowel has its long sound, as in *vo'cal*; but when it falls on a consonant, the preceding vowel is short, as in *hab'it*. This kind of accent alone regulates English verse, as contrasted with Latin or Greek verse, in which the metre depended on *quantity* or length of syllables. In books on elocution three marks or accents are generally made use of, the first or *acute* (') showing when the voice is to be raised, the second or *grave* (`), when it is to be depressed, and the third or *circumflex* (^) when the vowel is to be uttered with an undulating sound. In some languages there is no such distinct accent as in English (or German), and this seems to be now the case with French.—In music, accent is the stress or emphasis laid upon certain notes of a bar. The first note of a bar has the strongest accent, but weaker accents are given to the first notes of subordinate parts of the bars, as to the third, fifth, and seventh in a bar of eight quavers.

Accen'tor (*Accentor modulāris*), or **Hedge Accentor**, a British bird of the warbler family. See *Hedge Warbler*.

Accep'tance, in law, the act by which a person binds himself to pay a bill of exchange drawn upon him. (See *Bill*.) No acceptance is valid unless made in writing on the bill, but an acceptance may be either absolute or conditional, that is, stipulating some alteration in the amount or date of payment, or some condition to be fulfilled previous to payment.

Ac'cessary, or **Ac'cessory**, in law, a person guilty of an offence by connivance or participation, either before or after the act committed, as by command, advice, concealment, &c. An accessory *before the fact* is one who procures or counsels another to commit a crime, and is not present at its commission; an accessory *after the fact* is one who, knowing a felony to have been committed, gives assistance of any kind to the felon so as to hinder him from being apprehended, tried, or suffering punishment. An accessory before the fact may be tried and punished in all respects as if he were the principal. In high treason, all who participate are regarded as principals.

Acciden'tals, notes introduced in the course of a piece of music in a different key from that in which the passage where they occur is principally written. They are represented by the sign of a sharp, flat, or natural immediately before the note which is to be raised or lowered.

Accipitres (ak-sip'i-trēz), the name given by Linnæus and Cuvier to the rapacious birds now usually called Raptores (q.v.).

Acclimatiza'tion, the process of accustoming plants or animals to live and propagate in a climate different from that to which they are indigenous, or the change which the constitution of an animal or plant undergoes under new climatic conditions, in the direction of adaptation to those conditions. The systematic study of acclimatization has only been entered upon in very recent times, and the little progress that has been made in it has been more in the direction of formulating anticipative, if not arbitrary hypotheses, than of actual discovery and acquisition of facts. The best-known society founded, for the purpose of naturalizing animals and plants, is the Société d'Acclimation in Paris. It opened the Jardin d'Acclimation in 1860. See *Tropical Hygiene*. The term is sometimes applied to the case of animals or plants taking readily to a new country with a climate and other circumstances similar to what they have left, such as European animals and

plants in America and New Zealand: but this is more properly *naturalization* than acclimatization.—In agriculture the word is used with reference to stock, principally sheep, 'acclimatized' to a particular area, a special allowance being made by the landlord on transference of the farm and stock in respect of the acclimatization of the sheep. The value assigned to the advantages resulting from acclimatization of stocks varies considerably. In Argyllshire, for instance, Dumbartonshire, and the western portion of Perthshire the rates are high, while in the south of Scotland and the north of England they are much lower.

Accolade (ak-o-lād'; Fr., from Lat. *ad*, to, *collum*, the neck), the ceremony used in conferring knighthood, anciently consisting either in the embrace given by the person who conferred the honour of knighthood or in a light blow on the neck or the cheek, latterly consisting in the ceremony of striking the candidate with a naked sword.

Accol'ti, Benedetto, an Italian lawyer, born at Arezzo in Tuscany in 1415, died at Florence in 1466. He was secretary to the Florentine republic, 1459, and author of a work on the Crusades which is said to have furnished Tasso with matter for his *Jerusalem Delivered*.

Accommoda'tion Bill, a bill of exchange drawn and accepted to raise money on, and not given, like a genuine bill of exchange, in payment of a debt, but merely intended to accommodate the drawer: colloquially called a *wind bill* and a *kite*.

Accommoda'tion Ladder, a light ladder hung over the side of a ship at the gangway to facilitate ascending from, or descending to, boats.

Accom'paniment, in music, is that part of music which serves for the support of the principal melody.

Accor'dion, a keyed musical wind-instrument similar to the concertina, being in the form of a small box, containing a number of metallic reeds fixed at one of their extremities, the sides of the box forming a folding apparatus which acts as a bellows to supply the wind, and thus set the reeds in vibration, and produce the notes both of melody and harmony. The accordion was invented by Damian of Vienna in 1829.

Accountant, a person whose chief business is with accounts and the drawing up of financial statements and balance-sheets. An accountant is an important official in banks, railways, and certain other institutions, and many persons carry on the business of accountant as a distinct profession, auditing the books of merchants, joint-stock companies, &c. There are several bodies of accountants in the United Kingdom incorporated by royal charter, and hence specially distinguished as 'chartered accountants' (C.A.). Since 1919 women are admitted as members of the Society of Incorporated Accountants.—BIBLIOGRAPHY: L. R. Dicksee, *Advanced Accounting*; G. Lisle, *Encyclopædia of Accounting* (8 vols.).

Ac'cra, a British settlement in Africa, in a swampy situation, capital of Gold Coast, about 75 miles east of Cape Coast Castle. Exports gold-dust, ivory, gums, palm-oil; imports cottons, cutlery, &c. Pop. 20,000.

Ac'crington, a municipal borough of England, Lancashire, 5 miles east of Blackburn, with large cotton factories, print-works and bleaching-greens, and coal-mines. Pop. 43,610. Accrington was created a parliamentary borough in 1918.

Accu'mulator, a name applied to a kind of electric battery by means of which electric energy can be stored and rendered portable. In the usual form each battery forms a cylindrical leaden vessel, containing alternate sheets of metallic lead and minium wrapped in felt and rolled into a spiral wetted with acidulated water. On being charged with electricity the energy may be preserved till required for use.

Accu'sative Case, in Latin and some other languages, the term applied to the case which designates the object to which the action of any verb is immediately directed, corresponding, generally speaking, to the *objective* in English.

Ace, in aviation the name 'ace' is given to a flying-man who has distinguished himself by bringing down a large number (sometimes given as ten) of enemy machines. The word is used colloquially, and was borrowed from the French Air Force during the European War.

Aceph'ala, in zoology, the headless Mollusca or those which want a distinct head, corresponding to those that have bivalve shells and are also called

Lamellibranchiata.

A'cer, the genus of plants (nat. ord. Aceraceæ) to which belongs the maple.

Acerra (a'-cher'a'), a town in South Italy, 9 miles north-east of Naples, the see of a bishop, in a fertile but unhealthy region. Pop. 17,878.

Acetab'ulum, an anatomical term applied to any cup-like cavity, as that of a bone to receive the protuberant end of another bone, the cavity, for instance, that receives the end of the thigh-bone.

Acetates (as'e-tāts), salts of acetic acid. The acetates of most commercial or manufacturing importance are those of aluminium and iron, which are used in calico-printing; of copper, which as verdigris is used as a colour; and of lead, best known as sugar of lead. The acetates of potassium, sodium, and ammonium, of iron, zinc, and lead, and the acetate of morphia, are employed in medicine.

Acet'ic Acid, an acid produced by the oxidation of common alcohol, and of many other organic substances. Pure acetic acid has a very sour taste and pungent smell, burns the skin, and is poisonous. From freezing at ordinary temperatures (58° or 59°) it is known as *glacial acetic acid*. Vinegar is simply dilute acetic acid. Acetic acid is largely used in the arts, in medicine, and for domestic purposes. See *Vinegar*.

Acet'ic Ethers, or **Acetic Esters**, acetates of alcohol radicals. The common ester—ethyl acetate—is a volatile colourless liquid, manufactured by distilling a mixture of alcohol, oil of vitriol, and acetic acid, and used for flavouring purposes.

Acetone (as'), a constituent of ordinary wood spirit, a colourless volatile liquid used as a solvent, the simplest of the *ketones*.

Acet'ylene, C₂H₂, is a substance composed of two elements, carbon and hydrogen, and belonging to a class of compounds known as hydrocarbons. It is formed in the incomplete combustion of many hydrocarbons and also of coal-gas, and may be produced in a variety of ways, but is now made almost entirely from calcium carbide. Acetylene has been known for a long time, but only since 1870 has it been produced in any quantity. After the development of the electric furnace it was found that calcium oxide,

quicklime, heated with carbon to the high temperature possible in such a furnace, is transformed into calcium carbide, and this compound reacts with water, generating acetylene. A great deal of heat is developed on adding water to calcium carbide, so that care has to be taken in generating acetylene. Various devices are in use for bringing the two substances in contact slowly, and for keeping the temperature low. When carbon and hydrogen combine to form acetylene a large amount of heat is used up, so that much heat is evolved when acetylene decomposes again, and once decomposition starts sufficient heat is developed to decompose the whole volume of gas.

Acetylene is a colourless gas slightly soluble in water and very sparingly soluble in brine. When pure it has little or no odour, but as ordinarily prepared it has a strong unpleasant odour due to traces of impurities such as sulphuretted hydrogen, phosphine, &c. The gas can be liquefied easily, and in the liquid state is highly explosive. It burns with an exceedingly sooty flame, but if it is allowed to pass through a very small orifice the carbon liberated becomes incandescent and acetylene burns with an intense white flame. It is largely used as an illuminant and for the production of great heat. As an illuminant the gas is produced in specially-constructed generators. It is led through iron pipes and burned from an acetylene burner, or it may be used with special types of incandescent mantles. Acetylene readily combines with copper and with silver to form metallic acetylides which are very explosive, hence pipes through which acetylene is passing must not be made of brass or copper. Acetylene mixed with air and brought in contact with an ignited body explodes even more violently than a mixture of air and coal-gas.

Large quantities of acetylene are generated and stored for oxy-acetylene welding. Acetylene, burning in oxygen, gives an intensely hot flame (about 2000° - 3000° C.), sufficiently hot to melt iron. Although liquid acetylene is unstable, and even the gas, under slight pressure, is also unstable, it may be transported safely if dissolved in acetone. Acetone dissolves a large volume of acetylene, and this solution is quite stable and may be stored in iron cylinders and used for various purposes. If it is to be stored it must be carefully purified from phosphine, which is apt to cause sudden decomposition. Recently, numerous patents have been taken out for the preparation of compounds such as acetaldehyde, acetic acid, acetic

anhydride, &c., using acetylene as starting-point, so that many substances may be prepared from acetylene just as many substances may be prepared from benzene.

Achæans (a-kē'anz), one of the four races into which the ancient Greeks were divided. In early times they inhabited a part of Northern Greece and of the Peloponnesus. They are represented by Homer as a brave and warlike people, and so distinguished were they that he usually calls the Greeks in general Achæans. Afterwards they settled in the district of the Peloponnesus, called after them Achaia, and forming a narrow belt of coast on the south side of the Gulf of Corinth. From very early times a confederacy or league existed among the twelve towns of this region. After the death of Alexander the Great it was broken up, but was revived again, 280 B.C., and from this time grew in power till it spread over the whole Peloponnesus. It was finally dissolved by the Romans, 147 B.C., and after this the whole of Greece, except Thessaly, was called Achaia or Achæa. Achaia with Elis now forms a nomarchy of the kingdom of Greece. Pop. 254,728. Cf. Freeman, *History of Federal Government in Greece and Italy*, London, 1893.

Achæmenidæ (ak-ē-men'i-dē) a dynasty of ancient Persian kings, being that to which the great Cyrus belonged.

Achaia (a-kā'ya). See *Achæans*.

Achalzik. See *Akhalzik*.

Achard (a`h'a`rt), Franz Karl, a German chemist, born 1753, died 1821, principally known by his invention (1789-1800) of a process for manufacturing sugar from beetroot. In 1801 the first beet-sugar factory ever established was started by him in Silesia.

Achard (a`-shär), Louis Amédée Eugène, born 1814, died 1875, French journalist, novelist, and playwright. He was best known as a novelist; wrote the novels *Belle Rose*, *La Chasse royale*, *Châteaux en Espagne*, *Robe de Nessus*, *Chaînes de fer*, &c. His *Lettres Parisiennes* were published in 1838 under the pseudonym of Grimm.

Achates (a-kā'tēz), a companion of Æneas in his wanderings subsequent to his flight from Troy. He is always distinguished in Virgil's *Æneid* by the

epithet *fidus*, 'faithful', and has become typical of a faithful friend and companion.

Acheen, or **Atchin** (a'-chēn') (Du. *Atjeh*), a native State of Sumatra, with a capital of the same name, in the north-western extremity of the island, now nominally under Dutch administration. Though largely mountainous, it has also undulating tracts and low fertile plains. By treaty with Britain the Dutch were prevented from extending their territory in Sumatra by conquest; but this obstacle being removed, in 1871 they proceeded to occupy Acheen. It was not till 1879, however, after a great waste of blood and treasure, that they obtained a general recognition of their authority. But they have not been able to establish it firmly, and have had to put down many determined risings, sometimes costing them losses both in men and guns. In the seventeenth century Acheen was a powerful State, and carried on hostilities successfully against the Portuguese, but its influence decreased with the increase of the Dutch power. The principal exports are rice and pepper. Area, 20,471 sq. miles; pop. 789,664.

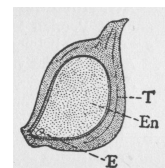
Achelous (ak-e-lō'us) (now **Aspropotāmo**), the largest river of Greece, rising on Mount Pindus, separating Ætolia and Acarnania, and flowing into the Ionian Sea. In Greek legend, Achelōus, the son of Oceanus and Tethys, was the river-god.

Achenbach (a'-hen-ba'ch), Andreas, was a distinguished German landscape and marine painter, born in 1815, died in 1910.

Achenbach, Oswald, born 1827, died 1905, brother of above, was also a distinguished landscape painter. Both are of the Düsseldorf school, and pupils of the famous painter Schadow.

Achene, or **Achenium** (a-kēn', a-kē'ni-um), in botany, a small, dry carpel containing a single seed, the pericarp of which is closely applied but separable, and which does not open when ripe. It is either solitary, or several achenia may be placed on a common receptacle as in the buttercup.

Achensee, a lake in Tyrol, 20 miles north-east of Innsbruck and 3018 feet above sea-level. On its shores are beautiful villas and hotels frequented as summer resorts.



Achene of
Buttercup
(magnified)
E,
Embryo. En,
Endosperm.

Acheron (ak'e-ron) (modern **Fanarioticos**), the ancient name of several rivers in Greece and Italy, all of which were connected by legend with the lower world. The principal was a river of Thesprotia in Epirus, which passes through Lake Acherusia and flows into the Ionian Sea. Homer speaks of Acheron as a river of the lower world, and late Greek writers use the name to designate the lower world. T, Testa and pericarp.

Acheulian, a term applied by archæologists to the late stage of Chellean civilization in the Pleistocene Age. It is named after St. Acheul in the Somme valley, where relics of it were found. The geological horizon, according to Professor James Geikie, is late Second Interglacial and Third Glacial periods.

Ach'iar, or **At'char**, an Indian condiment made of the young shoots of the bamboo pickled.

Achievement (a-chēv'ment), in heraldry, a term applied to the shield of armorial bearings generally, or to a hatchment (q.v.).

Achill (ak'il), the largest island on the Irish coast, separated from the mainland of Mayo by a narrow sound, now bridged over. The chief occupation is fishing. The island is mountainous, has fine scenery, and is visited by many tourists, there being now a railway terminus here, and many recent improvements. Pop. nearly 7000.

Achillæ'a, the milfoil genus of plants.

Achilleion, famous castle at Corfu, which used to belong to the Empress Elizabeth of Austria. It was acquired by the ex-Kaiser William II, who bought it from the Archduchess Giséla, wife of Prince Leopold of Bavaria.

Achilles (a-kil'ēz), a Greek legendary hero, the chief character in Homer's *Iliad*. His father was Peleus, ruler of Phthia in Thessaly, his mother the sea-goddess Thetis. When only six years of age he was able to overcome lions and bears. His guardian, Cheiron the Centaur, having declared that Troy could not be taken without his aid, his mother, fearing for his safety, disguised him as a girl, and introduced him among the daughters of Lycomedes of Scyros. Her desire for his safety made her also try to make him invulnerable when a child by anointing him with ambrosia, and again by dipping him in the River Styx, from which he came out proof against

wounds, all but the heel, by which she held him. His place of concealment was discovered by Odysseus (Ulysses), and he promised his assistance to the Greeks against Troy. Accompanied by his close friend, Patroclus, he joined the expedition with a body of followers (Myrmidons) in fifty ships, and occupied nine years in raids upon the towns neighbouring to Troy, after which the siege proper commenced. On being deprived of his prize, the maiden Briseïs, by Agamemnon, he refused to take any further part in the war, and disaster attended the Greeks. Patroclus now persuaded Achilles to allow him to lead the Myrmidons to battle dressed in his armour, and he having been slain by Hector, Achilles vowed revenge on the Trojans, and forgot his anger against the Greeks. He attacked the Trojans and drove them back to their walls, slaying them in great numbers, chased Hector, who fled before him three times round the walls of Troy, slew him, and dragged his body at his chariot-wheels, but afterwards gave it up to Priam, who came in person to beg for it. He then performed the funeral rites of Patroclus, with which the *Iliad* closes. He was killed in a battle at the Scæan Gate of Troy by an arrow from the bow of Paris which struck his vulnerable heel. In discussions on the origin of the Homeric poems the term *Achilleid* is often applied to those books (i, viii, and xi-xxii) of the *Iliad* in which Achilles is prominent, and which some suppose to have formed the original nucleus of the poem. See *Iphigenia*.

Achilles' Tendon, or **Tendon of Achilles**, the strong tendon which connects the muscles of the calf with the heel, and which may be easily felt with the hand. The origin of the name will be understood from the above article.

Achilles Tattius (a-kil'ēz tā'shi-us), a Greek romance writer of the fifth century A.D., belonging to Alexandria; wrote a love story in 8 books called *Leucippē and Cleitophon*.

Achimenes (a-kim'e-nēz), a genus of tropical American plants, with scaly underground tubers, nat. ord. Gesneraceæ, now cultivated in European greenhouses on account of their white, blue, and red flowers.

Achlamydeous (ak-la-mid'i-us), in botany, wanting the floral envelopes, that is, having neither calyx nor corolla, as the willow.

Achor (ā'kor), a disease of infants, in which the head, the face, and often the neck and breast become incrustated with thin, yellowish or greenish

scabs, arising from minute, whitish pustules, which discharge a viscid fluid.

Achromat'ic (Gr. *a*, priv., and *chrōma*, *chrōmatos*, colour), in optics, transmitting colourless light, that is, not decomposed into the primary colours, though having passed through a refracting medium. A single convex lens does not give an image free from the prismatic colours, because the rays of different colour making up white light are not equally refrangible, and thus do not all come to a focus together, the violet, for instance, being nearest the lens, the red farthest off. If such a lens of crown-glass, however, is combined with a concave lens of flint-glass—the curvatures of both being properly adjusted—as the two materials have somewhat different optical properties, the latter will neutralize the chromatic aberration of the former, and a satisfactory image will be produced. Telescopes, microscopes, &c., in which the glasses are thus composed are called *achromatic*.

Acid (Lat. *acidus*, sour), a name applied to a number of compounds, having more or less the qualities of vinegar (itself a diluted form of acetic acid). Their general properties are sour taste, the power of changing vegetable blues into reds, of evolving hydrogen in presence of magnesium, of decomposing chalk with effervescence, and of being in various degrees neutralized by alkalis. An acid has been defined as a compound of hydrogen, the whole or a part of which is replaceable by a metal when this is presented in the form of a hydroxide; being *monobasic*, *dibasic*, or *tribasic*, according to the number of replaceable hydrogen atoms in a molecule. See *Chemistry*.

Acierage (ā'sē-ēr-āj), (Fr. *acier*, steel), a process by which an engraved copper-plate or an electrotype from an engraved plate of steel or copper has a film of iron deposited over its surface by electricity in order to protect the engraving from wear in printing. By this means an electrotype of a fine engraving, which, if printed directly from the copper, would not yield 500 good impressions, can be made to yield 3000 or more; and when the film of iron becomes so worn as to reveal any part of the copper, it may be removed and a fresh coating deposited so that 20,000 good impressions may be got.

Acipenser (as-i-pen'sēr), the genus of cartilaginous ganoid fishes to which the sturgeon belongs.

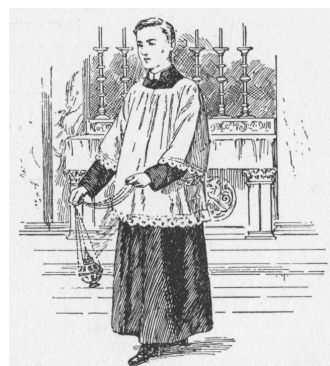
Aci Reale (ä'chē rā-ä'lā), a seaport of Sicily, north-east of Catania, a well-built town, with a trade in corn, wine, fruit, &c. Pop. 35,587.

A'cis, according to Ovid, a beautiful shepherd of Sicily, loved by Galatea, and crushed to death by his rival the Cyclops Polyphemus. His blood, flowing from beneath the rock which crushed him, was changed into a river bearing his name, and renowned for the coldness of its water. It has been identified as the Fiume di Jaci.

Aclin'ic Line (Gr. priv. *a*, *klinō*, to incline), the magnetic equator, an irregular curve in the neighbourhood of the terrestrial equator, where the magnetic needle balances itself horizontally, having no dip. See *Magnetism*.

Acne (ak'nē), a skin disease, consisting of small hard pimples, usually on the face, caused by congestion of the follicles of the skin.

Acolytes (ak'o-līts), in the ancient Latin and Greek Churches, persons of ecclesiastical rank next in order below the subdeacons, whose office it was to attend the officiating priest. The name is still retained in the Roman Church. Cf. Duchesne, *Christian Worship, its Origin and Evolution*.



Acolyte

Aconcagua (a' -kon-kä'gwa'), a province, a river, and a mountain of Chile. The peak of Aconcagua, whose summit is just within the Argentine Republic, rises to the height of 23,080 feet, and is probably the highest mountain of the western hemisphere. Area of province, 5406 sq. miles. Pop. (1919), 132,165.

Ac'onite (*Aconitum*), a genus of hardy herbaceous plants, nat. ord. Ranunculaceæ, represented by the well-known wolf's-bane or monk's-hood, and remarkable for their poisonous properties and medicinal qualities, being used internally as well as externally in rheumatism, gout, neuralgia, &c.

Acon'itine, an alkaloid extracted from monk's-hood and some other species of aconite; used medicinally, though a virulent poison.

Aconquija (a' -kon-kē'ha'), a range of mountains in the Argentine Republic; the name also of a single peak, 17,000 feet high.

A'corn, the fruit of the different kinds of oak. The acorn-cups of one species are brought from the Levant under the name of *valonia*, and used in tanning.

Acorn-shell. See *Balanus*.

Ac'orus, a genus of plants, including the sweet-flag. See *Sweet-flag* and *Calamus*.

Acos'ta, Gabriel, afterwards Uriel, a Portuguese of Jewish descent, born at Oporto in 1590, died by his own hand 1640. Brought up a Christian, he afterwards embraced Judaism. Having gone to Amsterdam, where he attacked the practices of the Jews, and denied the divine mission of Moses, he suffered much persecution at the hands of the Jews. He left an

autobiography, published in 1687, under the title *Exemplar Humanæ Vitæ*. He is the hero of a novel, *Die Sadducäer von Amsterdam*, and of a tragedy, *Uriel Acosta*, both by Gutzkow.

Acotyle'dons, plants not furnished with cotyledons or seed-lobes. They include ferns, mosses, seaweeds, &c., and are also called flowerless plants or cryptogams.

Acousimeter, or **Acoumeter** (Gr. *akouein*, to hear, and *metron*, measure), an instrument used to determine the acuteness of hearing. It consists of a small bar which gives a uniform sound when struck by a hammer.

Acoustics (a-kou'stiks), the science of sound. It deals with the production of sound, its propagation and velocity in various media; the reflection, refraction, and interference of sound waves; the properties of musical notes; and the general phenomena of such vibrations of elastic bodies as affect the organ of hearing.

In order that a sound may be heard, it is necessary that an uninterrupted series of particles of elastic matter should extend from the sounding body to our ear. Sound is propagated by a longitudinal wave-motion in the medium (gaseous, liquid, or solid), that is, the particles oscillate along the line in which the wave is travelling, giving rise to regular series of condensations and rarefactions.

The velocity of sound varies directly as the square root of the elasticity, and inversely as the square root of the density, of the medium in which it is propagated. The velocity of sound in air at 0° C. is 330.6 metres per second, or 1085 feet per second; in water 1.49 kilometres per second, or 0.926 mile per second; in copper 5.01 kilometres per second, or 3.12 miles per second.

The intensity of sound varies inversely as the square of the distance from the sounding body. Recently sound-ranging instruments have been produced by means of which the position of a gun can be determined.

A note produced by a musical instrument consists of a *fundamental* of a certain frequency, together with a number of *overtones* of various higher frequencies and much smaller amplitude. The *timbre* of a note depends on the overtones present, the *loudness* depends on the amplitude of the vibrations, and the *pitch* depends on the frequency. The musical scale

consists of eight notes, C D E F G A B C, whose frequencies are in the proportion of the numbers 24, 27, 30, 32, 36, 40, 45 and 48. The interval between two notes is the ratio of the frequency of the higher note to the frequency of the lower note. In order that the intervals may be the same in all keys, a tempered scale is used in music. (See Table, p. 25.)

BIBLIOGRAPHY: Lord Rayleigh, *Theory of Sound*; H. Smith, *The Making of Sound in the Organ and Orchestra*; J. W. Capstick, *Sound* (Cambridge Natural Science Manuals); E. H. Barton, *Text-book of Sound*.

Acqui (a`k'wē), a town of Northern Italy, 18 miles s.s.w. of Alessandria, a bishop's see. It has warm sulphurous baths, which were known to the Romans, and which still attract a great many visitors. Pop. 16,500.

Acre, a standard British measure of land, also used in the colonies and the United States. The imperial statute acre consists of 4840 sq. yards, divided into 4 roods. The old Scotch acre contains 6146.8 sq. yards, the old Irish acre 7840 sq. yards.

Acre (ā'kèr) (ancient **Accho** and **Ptolemais**), a seaport of Syria, in Northern Palestine, on the Bay of Acre, early a place of great strength and importance. Taken from the Saracens under Saladin in 1191 by Richard I of England and Philip of France; bravely defended by the Turks, assisted by Sir Sidney Smith, in 1799 against Napoleon; in 1832, taken by Ibrahim Pasha; in 1840, bombarded by a British, Austrian, and Turkish fleet, and restored to the Sultan of Turkey. The town was occupied by British troops under General Allenby in September, 1918. Pop. 10,000.

MUSICAL INTERVALS.—See *Acoustics*

Intervals in Perfect Diatonic Scale.		Perfect Diatonic Scale	Diatonic Scale. on System of Equal Temperament.	Intervals in Tempered Scale — Mean tone. ($2^{1/6} = 1.123$).

				Semitone. ($2^{1/12} = 1.059$).
$\frac{9}{8}$ major tone	C	1	1.000	tone.
$\frac{10}{9}$ minor tone	D	$\frac{9}{8} = 1.125$	$2^{2/12} = 1.123$	tone.
$\frac{16}{15}$ limma	E	$\frac{5}{4} = 1.250$	$2^{4/12} = 1.260$	semitone.
$\frac{9}{8}$ major tone	F	$\frac{4}{3} = 1.333$	$2^{5/12} = 1.335$	tone.
$\frac{10}{9}$ minor tone	G	$\frac{3}{2} = 1.500$	$2^{7/12} = 1.498$	tone.
$\frac{9}{8}$ minor tone	A	$\frac{5}{3} = 1.667$	$2^{9/12} = 1.682$	tone.
$\frac{16}{15}$ limma	B	$\frac{15}{8} = 1.875$	$2^{11/12} = 1.888$	semitone.
	C'	2	2.000	

Major tone ratio = $\frac{9}{8} = 1.125$

Minor " " = $\frac{10}{9} = 1.111$

Mean " " = $2^{2/12} = 1.123$

Limma tone ratio = $\frac{16}{15} = 1.067$

Semitone " = $2^{1/12} = 1.059$

NOTES OF PERFECT DIATONIC SCALE (WITH THEIR FREQUENCIES)

C _„ 64. Ut ₁	C, 128. Ut ₂	C 256. Ut ₃	C' 512. Ut ₄
D _„ 72	D, 144	D 288	D' 576
E _„ 80	E, 160	E 320	E' 640
F _„ 85.3	F, 170.7	F 341.3	F' 682.7
G _„ 96	G, 192	G 384	G' 768
A _„ 106.6	A, 213.3	A 426.7	A' 853.2
B _„ 120	B, 240	B 480	B' 960
			C'' 1024. Ut ₅

PERFECT DIATONIC SCALES (TRANSITION TO KEY OF DOMINANT)

Example—Key of C to Key of G

C	D	E	F	G	A	B	C'	D'	E'	F'	G'
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2	$\frac{9}{4}$	$\frac{5}{2}$	$\frac{8}{3}$	3
G	A'	B	C'	D'	E'	F#	G'				
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2				
	A = $\frac{10}{9}$ G.				F' = $\frac{16}{9}$ G.						
	A' = $\frac{9}{8}$ G.				F# = $\frac{15}{8}$ G.						
	A' = $\frac{81}{80}$ A.				= $\frac{15}{8} \times \frac{9}{16}$ F'.						
					= $(1 + \frac{1}{18^2/7})$ F'.						

Ac'ri (ā'krē), a town of S. Italy, province of Cosenza. Pop. 4000.

Ac'rita (Gr. *akritos*, undistinguishable, doubtful), a name sometimes given to the animals otherwise called Protozoa.

Acroceph'ali, tribes of men distinguished by pyramidal or high skulls.

Acrocerau'nia (thunder-smitten peaks) (now **Cape Glossa** or **Linguetta**), a promontory of Western Greece, in Epirus, running into the Adriatic.

Acrocorin'thus, a steep rock in Greece, nearly 1900 feet high, overhanging ancient Corinth, and on which stood the acropolis or citadel, the sacred fountain of Pirēnē being also here. This natural fortress has proved itself of importance in the modern history of Greece.

Ac'rogens (-jenz), lit. summit-growers, a term applied to the ferns, mosses, and lichens (cryptogams), as growing by extension upwards, in contradistinction to endogens and exogens.

Ac'rolith, an early form of Greek statuary in which the head, hands, and feet only were of stone, the trunk of the figure being of wood draped or gilded.

Acrop'olis (Gr. *akros*, high, and *polis*, a city), the citadel or chief place of a Grecian city, usually on an eminence commanding the town. That of Athens contained some of the finest buildings in the world, such as the Parthenon, Erechthēum, &c.

Acros'tic, a poem of which the first or last, or certain other, letters of the line, taken in order, form some name, motto, or sentence. A poem of which both first and last letters are thus arranged is called a double acrostic. In Hebrew poetry, the term is given to a poem of which the initial letters of the lines or stanzas were made to run over the letters of the alphabet in their order, as in *Psalms* cxix.—Acrostics have been much used in complimentary verses, the initial letters giving the name of the person eulogized. They were very popular among French poets of the sixteenth and seventeenth centuries. In modern times Edgar Allen Poe has written quite remarkable acrostic verses.

Act, in special senses: (1) In dramatic poetry, one of the principal divisions of a drama, in which a definite and coherent portion of the plot is represented; generally subdivided into smaller portions called *scenes*. The Greek dramas were not divided into acts. The dictum that a drama should consist of five acts was first formally laid down by Horace, and is generally adhered to by modern dramatists in tragedy. In comedy, especially since the time of Molière, more freedom is allowed, and a division into two or three acts is common.—(2) Something formally done by a legislative or judicial body; a statute or law passed.—(3) In universities, a thesis maintained in

public by a candidate for a degree. See *Act of God, of Parliament, of Settlement*.

Acta Diur'na (Lat., proceedings of the day), a daily Roman newspaper which appeared under both the republic and the empire.

Actæ'a. See *Baneberry*.

Actæ'on, in Greek mythology, a great hunter, turned into a stag by Artēmis (Diana) for looking on her when she was bathing, and torn to pieces by his own dogs.

Acta Erudito'rum (Lat., acts of the learned), the first literary journal that appeared in Germany (1682-1782). It was started by Otto Mencke, after the model of the *Journal des Savants*. Among the contributors, the most distinguished was Leibnitz.

Acta Sanctorum (Lat., acts of the saints), a name applied to all collections of accounts of ancient martyrs and saints, both of the Greek and Roman Churches, more particularly to the valuable collection begun by John Bolland, a Jesuit of Antwerp, in 1643, and which, being continued by other divines of the same order (*Bollandists*), now extends to sixty volumes, the lives following each other in the order of the calendar.

Actin'ia, the genus of animals to which the typical sea-anemones belong. See *Sea-anemone*.

Ac'tinism, the property of those rays of light which produce chemical changes, as in photography, in contradistinction to the light rays and heat rays. The actinic property or force begins among the green rays, is strongest in the violet rays, and extends a long way beyond the visible spectrum.

Actinium, an element or elementary substance obtained in minute quantities in connection with the study of radioactivity. It was discovered by Debierne in 1899. In 1902 Giesel discovered another substance which he called *emanium*, and which was considered to be identical with *actinium*. Marckwald, however, came to the conclusion that these two substances are not identical but closely related to each other. See *Radium, Chemistry*.

Actin'olite, a mineral nearly allied to hornblende.

Actinom'eter, an instrument for measuring the intensity of the sun's actinic rays. See *Actinism*.

Actinozo'a (lit. ray-animals), a class of animals belonging to the sub-kingdom Cœlenterata, and including sea-anemones, corals, &c., all having rayed tentacles round the mouth.

Action, the mode of seeking redress at law for any wrong, injury, or deprivation. Actions are divided into civil and criminal, the former again being divided into real, personal, and mixed.

Ac'tium (now **La Punta**), a promontory on the western coast of Northern Greece, not far from the entrance of the Ambracian Gulf (Gulf of Arta), memorable on account of the naval victory gained here by Octavianus (afterwards the Emperor Augustus) over Antony and Cleopatra, 2nd Sept., 31 B.C., in sight of their armies encamped on the opposite shores of the Ambracian Gulf. Soon after the beginning of the battle Cleopatra escaped with sixty Egyptian ships, and Antony basely followed her, and fled with her to Egypt. The deserted fleet was not overcome without making a brave resistance. Antony's land forces soon went over to the enemy, and the Roman world fell to Octavianus. In 1538 a victory was gained at Actium by the Turks over the Spanish and Venetian fleets.

Act of God, a legal term defined as "a direct, violent, sudden, and irresistible act of nature, which could not, by any reasonable cause, have been foreseen or resisted". No one can be legally called upon to make good loss so arising.

Act of Parliament, a law or statute proceeding from the Parliament of the United Kingdom passed in both houses, and having received the royal assent. Before it is passed it is a *Bill* and not an Act. Acts are either public or private, the former affecting the whole community, the latter only special persons and private concerns. The whole body of public Acts constitutes the *statute law*. An Act of Parliament can only be altered or repealed by the authority of Parliament. Acts are usually cited in this way, "13 and 14 Vict. c. (or chap.) 21", which means the 21st Act in succession passed in year 13th-14th of the queen's reign (that is, 1850). Short titles, such as "the Merchant Shipping Act, 1854", are also used. Up to the time of Edward I Acts of Parliament were in Latin; then French was introduced, and for some

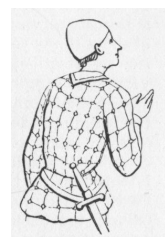
time was exclusively employed. It was not till Henry VII's reign that all Acts were in English.

Act of Settlement, an Act passed by the English Parliament in 1700, by which the succession to the throne of the three kingdoms, in the event of King William and Princess (afterwards Queen) Anne dying without issue, was settled on the Princess Sophia, electress of Hanover, and the heirs of her body, being Protestants. The Princess Sophia was the youngest daughter of Elizabeth, Queen of Bohemia, daughter of James I. By this act George I, son of the Princess Sophia, succeeded to the crown on the death of Queen Anne.—Another Act of Settlement was that by which, under Cromwell's government, a new allotment was made of almost all landed property in Ireland, in 1652.

Act of Toleration, an Act of Parliament Passed in 1689, by which Protestant dissenters from the Church of England, on condition of their taking the oaths of supremacy and allegiance, and repudiating the doctrine of transubstantiation, were relieved from the restrictions under which they had formerly lain with regard to the exercise of their religion according to their own forms.

Act of Uniformity, an English Act passed in 1662, enjoining upon all ministers to use the *Book of Common Prayer* on pain of forfeiture of their livings. See *Nonconformity*.

Acton, a kind of padded or quilted vest or tunic formerly worn under a coat of mail to save the body from bruises, or used by itself as a defensive garment. Jackets of leather or other material plated with mail were also so called. *Gambeson* was an equivalent term.



Quilted
Acton of the
fifteenth
century

Acton, a name of various places in England, one of them a western suburb of London, pop. (1921), 61,314. Since 1918 Acton gives its name to a parliamentary division of Middlesex, returning one member to Parliament.

Acton, John Emerich Edward Dalberg, first Baron Acton, born 1834, died 1902, was son of Richard Acton (seventh baronet) and the daughter of the Duc de Dalberg, afterwards wife of Earl Granville, Mr. Gladstone's

colleague. As a Roman Catholic he was educated at Oscott, and afterwards on the Continent, partly under Döllinger, and acquired a special taste for and profound knowledge of history. He conducted the *Home and Foreign Review* from 1862 to 1864, and, in doing so, showed himself a strong opponent of ultramontane pretensions. He next edited the *North British Review*, which under him was rather overweighted with learning, and soon came to an end. In 1869 he was raised to the peerage. He strongly opposed the papal-infallibility movement, and took the side of Mr. Gladstone in his attacks on Vaticanism. In 1895 he accepted the professorship of modern history at Cambridge, delivered lectures, and planned and undertook the editorship of the great work on modern history, *The Cambridge Modern History*, comprising a series of contributions by various scholars, and issued by the university press. Except essays, letters, or articles for periodicals, he himself wrote little. Since his death have been published: *Lectures in Modern History* (1906); *The History of Freedom and other Essays* (1907); *Lectures on the French Revolution* (1910). His library of 60,000 volumes he left to Mr. (now Lord) Morley, who handed it over to the University of Cambridge.

Actor, one who represents some part or character on the stage. Actresses were unknown to the Greeks and Romans in the earliest times, men or boys always performing the female parts. They appeared under the Roman empire, however. Charles II first encouraged the public appearance of actresses in England; in Shakespeare's time there were none. See *Drama*.—**BIBLIOGRAPHY:** C. F. Armstrong, *Century of Great Actors*; H. Simpson, *Century of Great Actresses*.

Acts of the Apostles, fifth of the books of the New Testament, written in Greek and assigned to the author of the gospel of St. Luke. Its date is probably A.D. 63 or 64. It embraces a period of about thirty years, beginning immediately after the resurrection, and extending to the second year of the imprisonment of St. Paul in Rome. Very little information is given regarding any of the apostles, excepting St. Peter and St. Paul, and the accounts of them are far from being complete. It describes the gathering of the infant Church; the fulfilment of the promise of Christ to his apostles in the descent of the Holy Ghost; the choice of Matthias in the place of Judas, the betrayer; the testimony of the apostles to the resurrection of Jesus in their discourses; their preaching in Jerusalem and in Judea, and afterwards

to the Gentiles; the conversion of Paul, his preaching in Asia Minor, Greece, and Italy, his miracles and labours.—BIBLIOGRAPHY: R. T. Knowling, *The Expositor's Greek Testament*; J. Moffatt, *The Historical New Testament*; J. M. Wilson, *Origin and Aim of the Acts of the Apostles*.

Ac'tuary, an accountant whose business is to make the necessary computations in regard to a basis for life assurance, annuities, reversions, &c.

Acu'leus, in botany, a prickle, or sharp-pointed process of the epidermis, as distinguished from a thorn or spine, which is of a woody nature.

Acupress'ure, a means of arresting bleeding from a cut artery introduced by Sir James Simpson in 1859, and consisting in compressing the artery above the orifice, that is, on the side nearest the heart, with the middle of a needle (Lat. *acus*, a needle) introduced through the tissues.

Acupunc'ture, a surgical operation, consisting in the insertion of needles into certain parts of the body for alleviating pain, or for the cure of different species of rheumatism, neuralgia, eye diseases, &c. It is easily performed, gives little pain, causes neither bleeding nor inflammation, and seems at times of surprising efficacy.

Adagio (It. *a`-dä'jō*), a musical term, expressing a slow time, slower than *andante* and less so than *largo*, *lento*, and *grave*.

Adâl', a country in Africa, east of Abyssinia and north-westward of Tajurrah Bay, inhabited by a dark-brown race of the same name, a tribe of the Danakils, Mahommedans in religion; towns Aussa and Tajurrah. Part of the coast here is held by the French.

Ad'albert of Prague, called the apostle of the Prussians, son of a Bohemian nobleman named Slavník, born about 939. His real name was Voitech, but he assumed the name of the Archbishop Adalbert, under whom he studied at Magdeburg. He was appointed Bishop of Prague in 983, laboured in vain among the heathenish Bohemians, resolved to convert the pagans of Prussia, but was murdered in the attempt (997). *Boga-Rodzica*, a Polish war-song, is said to have been composed by him.

Ada'lia, a seaport on the south coast of Asia Minor. Pop. 28,000. The district of Adalia has a population of over 200,000.

Adam (a'-da'n'), Adolphe Charles, a French composer, more especially of comic operas; born 1803, died 1856. Wrote *Le postillon de Longjumeau*, *Le Brasseur de Preston* (Brewer of Preston), *La Rose de Peronne*, *Le roi d'Yvetot*, &c.

Adam, Albrecht, a German painter of battles and animals, born 1786, died 1862. Three sons of his have also distinguished themselves as painters, especially Franz, born 1815, died 1886, among whose best pictures are several representing scenes of the Franco-Prussian war.

Adam, Alexander, a Scottish classical scholar, born in 1741; became in 1768 rector of the High School of Edinburgh, and died there in 1809. Wrote *Principles of Latin and English Grammar*; *Roman Antiquities*, a useful school-book; *Summary of Geography and History*; *Classical Biography*, &c.

Adam, Robert, an eminent Scottish architect, born in 1728, a son of William Adam, architect. He resided several years in Italy, visited Spalatro, in Dalmatia, and published a work on the ruined palace of Diocletian there. In conjunction with his brother James he was much employed by the English nobility and gentry in constructing modern and embellishing ancient mansions. Among their works are the Register House and the University Buildings, Edinburgh, and the Adelphi Buildings, London. Robert Adam died in 1792, and was buried in Westminster Abbey; his brother James died in 1794.

Adam and Eve, the names given in Scripture to our first parents, an account of whom and their immediate descendants is given in the early chapters of *Genesis*. Cain, Abel, and Seth are all their sons that are mentioned by name; but we are told that they had other sons as well as daughters. There are numerous Rabbinical additions to the Scripture narrative of an extravagant character, such as the myth of Adam having a wife before Eve, named *Lilith*, who became the mother of giants and evil spirits. Other legends or inventions are contained in the Koran.

Adam de la Hale, an early French writer and musician, born 1235, died 1287. His *Jeu de Robin et de Marion* (first produced at Naples), may be regarded as the first comic opera ever written. Cf. H. Guy, *Bibliographie Critique du Trouvère*, Paris, 1900.

Ad'amant, an old name for the diamond; also used in a vague way to imply a substance of impenetrable hardness.

Adaman'tine Spar, a name of the mineral corundum or of a brownish variety of it.

Adama'wa (also called **Fumbina**), a region of West Africa, between lat. 6° and 10° N., and lon. 11° and 17° E. Much of the surface is hilly or mountainous, Mount Atlantika being 9000 or 10,000 feet. The principal river is the Benue. A great part of the country is covered with thick forests. The oil palm and bananas are staple products. Chief town Yola (Nigeria).

Adamello. See *European War*.

Ad'amites, a religious sect dating from the second century, probably of Gnostic origin. It was so called because both men and women were said to appear naked in their assemblies, either to imitate Adam in the state of innocence or to prove the control which they possessed over their passions. Practices similar to those of the Adamites arose several times in later ages. See *Beghards*.

Adam'nan, St., born in Ireland about 624, was elected abbot of Iona in 679, and died there about 703 or 704. He is best known from his *Life of St. Columba*, valuable as throwing light on the early ecclesiastical history of Scotland. (There are editions by Reeves, 1857; reissued with English translation 1874; and by Fowler, 1895.) His feast is celebrated on 23rd Sept.

Adams, Charles Francis, American litterateur and statesman, was a son of John Quincy Adams, and was born in 1807. His boyhood was spent in Europe, partly in England; but he finished his education at Harvard, and afterwards studied law. After serving some years in the Massachusetts legislature he was sent to Congress in 1859. In 1861 Lincoln sent him to England as American minister, and here he remained for seven years, performing the arduous duties of his office with the utmost tact and ability. Between 1874 and 1877 he edited a complete edition of his grandfather's

works in 12 vols. He was one of the arbitrators on the *Alabama* claims. Died in 1886.

Adams, John, second president of the United States, was born at Braintree (now Quincy), Massachusetts, 19th Oct., 1735. He was educated at Harvard University, and adopted the law as a profession. His attention was directed to politics by the question as to the right of the English Parliament to tax the colonies, and in 1765 he published some essays strongly opposed to the claims of the mother country. As a member of the new American congress in 1774, 1775, and 1776 he was strenuous in his opposition to the home Government, and in organizing the various departments of the colonial Government. On 13th May, 1776, he seconded the motion for a declaration of independence proposed by Lee of Virginia, and was appointed a member of committee to draw it up. The declaration was actually drawn up by Jefferson, but it was Adams who fought it through Congress. In 1778 he went to France on a special mission, but soon came back and again returned, and for nine years resided abroad as representative of his country in France, Holland, and England. After taking part in the peace negotiations he was appointed, in 1785, the first ambassador of the United States to the Court of St. James. He was recalled in 1788, and the following year elected vice-president of the republic under Washington. In 1792 he was re-elected vice-president, and at the following election in 1797 he became president in succession to Washington. The commonwealth was then divided into two parties, the Federalists, who favoured aristocratic and were suspected of monarchic views, and the Republicans. Adams adhered to the former party, with which his views of government had always been in accordance, but the real leader of the party was Hamilton, with whom Adams did not agree, and who tried to prevent his election. His term of office proved a stormy one, which broke up and dissolved the Federalist party. His re-election in 1801 was again opposed by the efforts of Hamilton, which ended in effecting the return of the Republican candidate Jefferson. Thus it happened that when Adams retired from office his influence and popularity with both parties were at an end, and he sunk at once into the obscurity of private life. He had the consolation, however, of living to see his son president. He died 4th July, 1826, the fiftieth anniversary of the declaration of independence, and on the same day as Jefferson. His works have been ably edited by his grandson Charles Francis Adams.

Adams, John Couch, English astronomer, born 1819, died 1892, studied at Cambridge, and was senior wrangler in 1843. His investigations into the irregularities in the motion of the planet Uranus led him to the conclusion that they must be caused by another more distant planet, and the results of his labours were communicated in September and October, 1845, to Professor Challis and Airy the Astronomer Royal. The French astronomer Leverrier had by this time been engaged in the same line of research, and had come to substantially the same results, which, being published in 1846, led to the actual discovery of the planet Neptune by Galle of Berlin. In 1858 Adams was professor of mathematics at Aberdeen University, and in 1859 was appointed Lowndean professor of astronomy and geometry at Cambridge.

Adams, John Quincy, sixth president of the United States, son of John Adams, second president, was born 11th July, 1767. Accompanying his father to Europe he received part of his education there, but graduated at Harvard in 1788. Having adopted the legal profession, in 1791 he was admitted to the bar. He now began to take an active interest in politics, and some letters that he wrote having attracted general attention, in 1794 Washington appointed him minister to the Hague. He afterwards was sent to Berlin, and also on a mission to Sweden. In 1798 he received a commission to negotiate a treaty of commerce with Sweden. On the accession of Jefferson to the presidency in 1801 he was recalled. The Federalist party (that of his father), which was now declining, had sufficient influence in Massachusetts to elect him to the senate in 1803. On an important question of foreign policy, that of embargo, he abandoned his party, and having lost his re-election on this account, he retired to the professorship of rhetoric at Cambridge, which he held from 1806 to 1809. In 1809 he went as ambassador to Russia. He assisted in negotiating the peace of 1814 with England, and was afterwards appointed resident minister at London. Under Monroe as president he was secretary of state, and at the expiration of Monroe's double term of office he succeeded him in the presidency (1825). He was not very successful as president, and at the end of his term (1829) he was not re-elected. In 1831 he was returned to Congress by Massachusetts, and continued to represent this State till his death, his efforts being now chiefly on behalf of the Abolitionist party. He died 21st Feb., 1848.

Adams, Samuel, an American statesman, second cousin of President John Adams, was born in Boston, 27th Sept., 1722, and was educated at Harvard College. He early devoted himself to politics, and in connection with the dispute between America and the mother country he showed himself one of the most unwearied, efficient, and disinterested assertors of American freedom and independence. He was one of the signers of the declaration of 1776, which he laboured most indefatigably to bring forward. He sat in congress eight years; from 1789-94 was lieutenant-governor of Massachusetts; from 1794-7 governor, when he retired from public life. He died 2nd Oct., 1803.

Adam's Apple, the popular name of the prominence seen in the front of the throat in man, and which is formed by the portion of the larynx known as the *thyroid cartilage*. It is much smaller and less visible in females than in males, and is so named from the supposition that it was caused by a piece of the forbidden fruit having stuck in Adam's throat. In botany it is the name given to the plantain tree and the *Citrus pomum*. It is the Heb. *Ethrog*, which, according to Hebrew legend, was the fruit Adam and Eve ate in the garden of Eden.

Adam's Bridge, a chain of reefs, sandbanks, and islands stretching between India and Ceylon; so called because the Mohammedans believe that when Adam was driven from paradise he had to pass by this way to Ceylon (where is also Adam's Peak). The Brahmans call it the bridge of Rama, the hero of the Indian Epic, the *Ramayana*.

Adam's Needle, a popular name of the Yucca plant.

Adam's Peak, one of the highest mountains in Ceylon, 45 miles east-south-east of Colombo, conical, isolated, and 7420 feet high. On the top, a rocky area of 64 feet by 45, is a hollow in the rock 5 feet long bearing a rude resemblance to a human foot, which the Brahmans believe to be the footprint of Siva; the Buddhists, who call it Sri-pada (sacred footmark), that of Buddha; the Mahommedans that of Adam. The last-named believe that Adam stood here on one foot for a thousand years, lamenting his exclusion from Eden. Devotees of all creeds meet here and present their offerings (chiefly rhododendron flowers) to the sacred footprint. The ascent is very

steep, and towards the summit is assisted by steps cut and iron chains riveted in the rock.

Adamson, Patrick, a Scottish divine and Latin poet, born 15th March, 1536, died 19th Feb., 1592. He was educated at St. Andrews, lived some years in France, was minister of Paisley, and afterwards Archbishop of St. Andrews, in which position he made himself very obnoxious to the Presbyterian party. Deprived of the revenues of the see, he died in indigence. He turned portions of the Bible into Latin verse.

Ad'ana, town and capital of Adana vilayet, Asia Minor, on the Seihun-Irmak; served by the Bagdad Railway. The district is claimed by Armenia. Cotton, rice, wine, and fruit are exported. Pop. (town), 70,000; (vilayet), 1,000,000.

Adanson (a'-da'n-sōn'), Michel, French naturalist and traveller (of Scottish extraction), born 1727; died 1806. He lived five years in Senegal, and wrote a natural history of this region as well as works on botany. The baobab genus is named *Adansonia* after him. Adanson's statue was erected in the Jardin des Plantes, Paris, in 1856.

Adanso'nia. See preceding article and *Baobab*.

Adaptation (from the Lat. *ad*, to, and *aptāre*, to fit), the process of modification or alteration of a thing so as to change its original purpose and adapt it to other uses. Adaptation in biology is the power and process by which an organism or species of animals or plants changes and becomes modified, so as to suit the conditions of its life. In other words it is the adjustment, or favourable reaction, of the living world to its environment, the advantageous variation of animals and plants under changed conditions. The term now includes both that which is hereditary and that which is acquired. The powers of lower forms of life to adapt themselves to changes of environment are limited, and frequently, when the conditions vary suddenly, they are either arrested in their development or die altogether.—In literature it is the process by which an author modifies the work of another not in its essence but in its form and details, either in the original or in a foreign language.

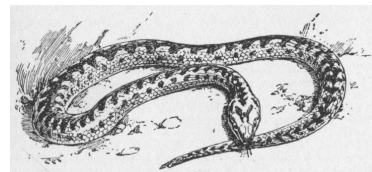
A'dar, the twelfth month of the Hebrew sacred and sixth of the civil year, answering to part of February and part of March.

Adda (ancient **Addua**), a river of North Italy, which, descending from the Rhætian Alps, falls into Lake Como, and leaving this joins the Po, after a course of about 170 miles. On the banks of the Adda Napoleon won the battle of Lodi in 1796.

Adda, a species of lizard, more commonly called Skink.

Ad'dax, a species of antelope (*Hippotragus nasomaculatus*) of the size of a large ass, with much of its make. The horns of the male are about 4 feet long, beautifully twisted into a wide-sweeping spiral of two turns and a half, with the points directed outwards. It has tufts of hair on the forehead and throat, and large broad hoofs. It inhabits the sandy regions of Nubia and Kordofan, and is also found in Caffraria.

Adder, a name often applied to the common viper as well as to other kinds of venomous serpents. See *Viper*.



Adder (*Vipera communis*)

Adder-pike (*Trachinus vipera*), a small species of the weever fish, called also the Lesser Weever or Sting-fish. See *Weever*.

Adder-stone, the name given in different parts of Britain to certain rounded perforated stones or glass beads found occasionally, and supposed to have a kind of supernatural efficacy in curing the bites of adders. They are believed to have been anciently used as spindle-whorls, that is, a kind of small fly-wheels to keep up the rotatory motion of the spindle.

Adder's-tongue, a species of British fern (*Ophioglossum vulgatum*), whose spores are produced on a spike, supposed to resemble a serpent's tongue.

Adder's-wort, a name of snakeweed or bistort (*Polygonum Bistorta*), from its supposed virtue in curing the bite of serpents.

Ad'dington, Henry, Viscount Sidmouth, born 1757, died 1844. Entered Parliament, 1783, as a warm supporter of Pitt. Was elected speaker of the House of Commons, 1789, and in 1801 invited by the king to form an

administration, chiefly signalized by the conclusion of the Peace of Amiens. Quarrelled with Pitt, whom he bitterly attacked. Was home secretary from 1812 till 1822, his repressive policy making him remarkably unpopular with the nation at large. Retired from official life in 1824.

Addis Abe'ba, or **Adis Abba'ba**, a town in the south of Abyssinia, in Shoa, ranking as capital of the country, being chief residence of the negus or sovereign. It stands among mountains, at the height of 10,000 feet, and is a primitive place, but now has telegraphic connection with Jibouti and Massawa, and since 1917 is the terminus of the railway running inland from Jibouti by way of Harar. Pop. 50,000.

Ad'dison, Rt. Hon. Christopher, P.C., M.D., Cabinet Minister. Dr. Addison was born 19th June, 1869, and educated at Trinity College, Harrogate, and St. Bartholomew's Hospital, London, where he was a lecturer for a time. He was elected Member of Parliament for the Hoxton Division, Shoreditch, in 1910, and was parliamentary secretary to the Board of Education from 1914 to 1915. From 1916 to 1917 he was Minister of Munitions; he was President of the Local Government Board from January to June, 1919, when he became Minister of Health. He has written and edited several works on medical subjects.

Ad'dison, Joseph, an eminent English essayist, son of the Rev. Lancelot Addison, afterwards Dean of Lichfield, born at Milston, Wiltshire, 1st May, 1672, died 17th June, 1719. He was educated at the Charterhouse, where he became acquainted with Steele, and afterwards at Oxford. He held a fellowship from 1697 till 1711, and gained much praise for his Latin verse. He secured as his earliest patron the poet Dryden, who inserted some of his verses in his *Miscellanies* in 1693. A translation of the fourth *Georgic*, with the exception of the story of *Aristæus*, by Addison, appeared in the same collection in 1694, and he subsequently translated for it two and a half books of Ovid. Dryden also prefixed his prose essay on Virgil's *Georgics* to his own translation of that poem, which appeared in 1697. An early patron of his was Charles Montague, afterwards Earl of Halifax; another was Lord Somers, who procured him a pension of £300 a year to enable him to qualify for diplomatic employments by foreign travels. He spent from the autumn of 1699 to that of 1703 on the Continent, where he became acquainted with Malebranche, Boileau, &c. During his residence abroad his

tragedy of *Cato* is supposed to have been written. During his journey across Mont Cenis he wrote his *Letter from Italy*, esteemed the best of his poems, and in Germany his *Dialogues on Medals*, which was not published till after his death. His *Remarks on Several Parts of Italy in the Years 1701-3* was published in 1705. His political friends lost power on the death of William III, but *The Campaign*, a poem on the battle of Blenheim, procured him an appointment as a commissioner of appeal on excise. In 1706 he received an under-secretaryship, in 1707 accompanied Halifax on a mission to Hanover, in 1709 became secretary to the Viceroy of Ireland, and keeper of the records. In 1708 he was elected Member of Parliament for Lostwithiel, a seat he exchanged in 1710 for Malmesbury, which place he continued to represent till his death. From Oct., 1709, to Jan., 1711, he contributed 75 papers to the *Tatler*, either wholly by himself or in conjunction with Steele, thus founding the new literary school of the Essayists. For the *Spectator* (2nd Jan., 1711, to 6th Dec., 1712) he wrote 274 papers, all signed by one of the four letters C., L., I., O. His tragedy of *Cato*, produced April, 1713, ran for twenty nights, and was translated into French, Italian, German, and Latin. His other contributions to periodicals included 51 papers to the *Guardian* (May to Sept., 1713), 24 papers to a revived *Spectator* conducted by Budgell, and 2 papers to Steele's *Lover*. On the death of Queen Anne he successively became secretary to the lords justices, secretary to the Irish viceroy, and one of the lords commissioners of trade. He published the *Freeholder* (23rd Dec., 1715, to 9th June, 1716), a political *Spectator*. In August, 1716, he married the Countess of Warwick, a marriage which did not increase his happiness. He retired from public life, March, 1718, with a pension of £1500 a year. He formed a close friendship with Swift, and was chief of a distinguished literary circle. He had literary quarrels with Pope and Gay, the former of whom in revenge wrote the satire contained in his lines on Atticus in the *Epistle to Dr. Arbuthnot*. He also had a paltry quarrel over politics with his old friend Steele. His death took place at Holland House, its cause being dropsy and asthma. He was buried in Westminster Abbey. Of his style as a writer so much has been said that nothing remains to say but to quote the dictum of Johnson: "Whoever wishes to attain an English style, familiar but not coarse, and elegant but not ostentatious, must give his days and nights to the volumes of Addison". He had great conversational powers, and his intimates speak in the strongest terms of the enjoyment derived from his society, but he was extremely reserved before

strangers. His *Dialogues on Medals and Evidences of the Christian Religion* were published posthumously in Tickell's collected edition of his works.—
BIBLIOGRAPHY: W. J. Courthope, *Addison* (English Men of Letters Series); *Essays from the Spectator*, edited by Henry Morley.

Addison's Disease (from Dr. Addison, Guy's Hospital, London, who traced the disease to its source), a fatal disease, the seat of which is the two glandular bodies placed one at the front of the upper part of each kidney, and called *suprarenal capsules*. It is characterized by anæmia or bloodlessness, extreme prostration, and the brownish or olive-green colour of the skin. Death usually results from weakness, and commonly takes place within a year.

Addled Parliament, a Parliament called 5th April, 1614, in order to legalize the customs duties imposed by James I, but which, proceeding to the redress of grievances instead of granting supply, was dissolved, 7th June, without passing a single Bill.

Address, a document containing an expression of thanks, congratulation, satisfaction, or dissatisfaction, &c. It is the custom of the British Parliament to return an address to the speech delivered by the Sovereign at the commencement of every session.

Address, Forms of. The following are the principal modes of formally addressing titled personages or persons holding official rank in Great Britain:—

The King or Queen.—Address in writing: To the King's (Queen's) most excellent Majesty. Say: Sire or Madam, Your Majesty.

The Royal Family.—His Royal Highness (H.R.H.) the Prince of Wales, His Royal Highness the Duke of C——, His Royal Highness Prince A——. A royal duke should be addressed as Sir, not My Lord Duke; and referred to as Your Royal Highness. A princess is addressed Her Royal Highness the Duchess of ——, Her Royal Highness Princess A——; and personally as Madam, Your Royal Highness.

Duke and Ducal Family.—His Grace the Duke of ——; My Lord Duke, Your Grace. Her Grace the Duchess of ——; Madam, Your

Grace. The duke's eldest son is in law only an esquire, but in courtesy takes a secondary title of his father, and is addressed as if he held it by right. A younger son is addressed Lord J—— B——; My Lord, Your Lordship; a daughter, Lady M—— B—— (Christian and surname); Madam, Your Ladyship. A duke's, marquis's, or earl's daughter marrying a commoner simply changes her surname for his.

The Lord-lieutenant of Ireland is styled His Excellency, or, if a duke, His Grace, and addressed according to his titular rank.

Marquess.—The Most Honourable the Marquess of ——; My Lord Marquess, My Lord. The eldest son has a secondary title of his father, as in the case of a duke's eldest son; the younger sons and the daughters are all addressed as the younger sons and daughters of a duke.

Earl.—The Right Honourable the Earl of ——; My Lord, Your Lordship. The Right Honourable the Countess of——; Madam, Your Ladyship. The eldest son is addressed by a secondary title of his father; younger son, The Honourable G—— T——; Sir; the daughter, as duke's and marquess's daughter.

Viscount.—The Right Honourable the Viscount ——; My Lord, Your Lordship. The Right Honourable the Viscountess ——; Madam, Your Ladyship. Son: The Honourable A—— B—— (Christian and surname); Sir. Daughter: The Honourable J—— C—— (Christian and surname); Madame; if married, The Honourable Mrs. —— (married name).

Baron.—The Right Honourable Lord ——; My Lord, Your Lordship. The Right Honourable the Lady ——; Madam, your Ladyship. Son: The Honourable J—— C——; Sir. Daughter: The Honourable M—— H——; if married, The Honourable Mrs. ——, same as viscount's daughter.

Baronet.—Sir A—— B——, Baronet; Sir; more familiarly Dear Sir A——.

Knight.—Sir C—— D——, Kt., or K.C.S.I., K.C.B., G.C.B., &c., according to rank. The wives of baronets and knights are styled Lady,

Lady ——.

Archbishop.—His Grace the Lord Archbishop of ——; My Lord Archbishop; Your Grace. An archbishop is also styled Most Reverend.

Bishop.—The Right Rev. the Lord Bishop of ——; My Lord. The wives of prelates have no special title. Bishops not connected with the English established church may be addressed—The Right Reverend Bishop ——; Right Reverend Sir.

Dean.—The Very Reverend; Sir; Mr. Dean.

Members of the Privy Council, members and ex-members of cabinet, the Speaker of the House of Commons, the Lord Chancellor, the Lord Chief Justice and the Lords Justices, the Lord Advocate, the lords of the treasury and admiralty, are called Right Honourable; the justices (not being *lords* justices) are styled Honourable. Ambassadors, governors of colonies, &c., are styled Excellency.

The Lord Mayors of London, York, Dublin, &c., and the Lord Provost of Edinburgh, are styled Right Honourable; the Lord Provost of Glasgow, Honourable. A Mayor is addressed as Right Worshipful. Lords of Session (Scotland) have the courtesy title of Lord, are addressed as My Lord, Your Lordship, and also called Honourable. Sheriffs and their substitutes are addressed in their courts in Scotland as My Lord.

In the United States persons holding official rank are similarly addressed; thus the President is styled His Excellency, as are also governors of states and foreign ministers; the vice-president, lieutenant-governors, senators, representatives, judges, and mayors are styled Honourable.

Adduc'tor, a muscle which draws one part of the body towards another: applied in zoology to one of the muscles which bring together the valves of the shell of the bivalve molluscs.

Adel'. See *Adal*.

Adela, born 1062, died 1137, fourth daughter of William the Conqueror, wife of Stephen, Count of Blois and Chartres, and mother of Stephen, King of England. She proved herself an able ruler and a generous patroness of learning while her husband was abroad with the First Crusade; and after his death she acted as regent for his sons.

Adelaide (ad'e-lād), the capital of South Australia, 6 miles east from Port Adelaide (on St. Vincent Gulf), its port, with which it is united by railway, founded in 1837, and named after the queen of William IV. Situated on a large plain, it is built nearly in the form of a square, with the streets at right angles, and is divided into North and South Adelaide, separated by the river Torrens, which is crossed by several bridges, and by means of a dam is converted into a fine sheet of water. The public buildings comprise the Government House, the town hall, the post and telegraph offices, the Government offices, court-houses, the houses of legislature, the University, South Australian Institute, &c. There is a good service of tramway cars. Adelaide is connected by railway with Melbourne, and is the terminus of the overland telegraph to Port Darwin. It has a large trade. Pop. (including suburbs), (1919), 256,660.

Adelaide, daughter of George, Duke of Saxe-Coburg-Meiningen, and wife of the Duke of Clarence, afterwards William IV, King of England; born 1792, died 1849; married 11th July, 1818, had two daughters, who died in infancy. She became queen-consort on William attaining the throne in 1830, and was for a time unpopular from being supposed to be averse to reform. On the death of William she passed into private life, with an allowance of £100,000 a year.

Adelard of Bath, an English philosophical writer of the twelfth century. He travelled through Spain, the north of Africa, Greece, and Asia Minor, and acquired from the Arabs much knowledge, which he put in systematic shape. Chief works, *Perdifficiles Quæstiones Naturales* and *De Eodem et Diverso*.

Adelsberg (ä'délz-berh), a small town of North Italy, in Carniola, midway between Trieste and Laibach, remarkable for the wonderful stalactite cave in its vicinity. The most extended of the ramifications which compose it reaches to over 2 miles from the entrance, at which the River Poik

disappears, and is heard rushing below. The stalactites and stalagmites are of the most varied and often beautiful forms, and have received fanciful appellations, as they resemble columns, statues, &c.

Adelung (a' d'e-lu'ng), Friedrich von, nephew of J. C. Adelung, was a distinguished philologist. He was tutor to the Grand-duke Nicholas, afterwards Emperor of Russia, and became president of the Academy of Sciences at St. Petersburg (now Petrograd). Born 1768, died 1843.

Adelung, Johann Christoph, a German philologist, born 1732, died 1806. In 1759 he was appointed professor in the Protestant academy at Erfurt, and two years after removed to Leipzig, where he applied himself to the works by which he made so great a name, particularly his German dictionary, *Grammatisch-kritisches Wörterbuch der hochdeutschen Mundart* (Leipzig, 1774-86), and his *Mithridates*, a work on general philology. In 1787 he was appointed librarian of the public library in Dresden—an office which he held till his death.

A'den, a seaport town and territory belonging to Britain, on the south-west coast of Arabia, in a dry and barren district, the town being almost entirely closed in by an amphitheatre of rocks, and possessing an admirable harbour. Occupying an important military position, Aden is strongly fortified and permanently garrisoned. It is of importance also as a coaling station for steamers, and carries on a great amount of commerce, forming an entrepôt and place of transhipment for goods valued at £6,000,000 a year. Its greatest drawback is the scarcity of fresh water, which is obtained partly from wells, partly from rock-cisterns that receive the rain, and partly by condensation from salt water—the only unfailing means of supply. The peninsula on which it stands somewhat resembles the rock of Gibraltar, and could be rendered as formidable. Aden was a Roman colony, and in the Middle Ages it was a great entrepôt of the Eastern trade. It was acquired by Britain in 1839, after which it was attacked repeatedly by the Arabs. With the additional territory latterly acquired, the total British area is 75 sq. miles (or with the island of Perim, 80); while a large tract is under British influence. Aden is attached to the Bombay Presidency. Pop. 46,165.

Adenanthē'ra, a genus of trees and shrubs, natives of the East Indies, nat. ord. Leguminosæ. *A. pavonīna* is one of the largest and handsomest trees of

India, and yields hard solid timber called red sandal-wood. The bright scarlet seeds, from their equality in weight (each=4 grains), are used by goldsmiths in the East as weights.

Adeni'tis (Gr. *adēn*, a gland), in medicine, inflammation of one or more of the lymphatic glands.

Ad'enoids, small growths often occurring in the back wall of the throat in children, blocking the nostrils and commonly causing deafness. They can be removed by a simple operation.

Aderer'. See *Adrar*.

Aderno', a town of Sicily, 18 miles N.W. of Catania and about 10 miles W.S.W. of Mount Etna. Pop. 25,000.

Adessena'rian, one of a sect of Christians which holds that there is a real presence of Christ in the Eucharist, but denying that it is effected by transubstantiation.

Adhesion, the tendency of two bodies to stick together when put in close contact, or the mutual attraction of their surfaces; distinguished from *cohesion*, which denotes the mutual attraction between the particles of a homogeneous body. Adhesion may exist between two solids, between a solid and a fluid, or between two fluids. A plate of glass or of polished metal laid on the surface of water and attached to one arm of a balance will support much more than its own weight in the opposite scale from the force of adhesion between the water and the plate. From the same force arises the tendency of most liquids, when gently poured from a jar, to run down the exterior of a vessel or along any other surface they meet.

Adian'tum, a genus of ferns; the maiden-hair fern.

Adiaph'orist (Gr. *adiaphoros*, indifferent), a name given in the sixteenth century to Melanchthon's party, who held some opinions and ceremonies to be indifferent which Luther condemned as sinful or heretical.

Adige (ä'dē-jā), Ger. *Etsch* (ancient **Athēsis**), a river of Northern Italy, which rises in the Rhætian Alps, and after a south and east course of about

180 miles, during which it passes Verona and Legnago, falls into the Adriatic, forming a delta connected with that of the Po.

Ad'ipocere (-sēr) (Lat. *adeps*, fat, and *cera*, wax), a substance of a light-brown colour formed by animal matter when protected from atmospheric air, and under certain circumstances of temperature and humidity. It was first observed by Fourcroy, and a quantity discovered at the Cimetière des Innocents, Paris. A similar substance is found in peat-bogs in Wales and Ireland.

Ad'ipose tissue, the cellular tissue containing the oily or fatty matter of the body. It underlies the skin, surrounds the large vessels and nerves, invests the kidneys, &c., and sometimes accumulates in large masses.

Adiron'dack Mountains, in the United States, a group belonging to the Appalachian chain, extending from the N.E. corner of the State of New York to near its centre. The scenery is wild and grand, diversified by numerous beautiful lakes, and the whole region is a favourite resort of sportsmen and tourists.

Ad'it, a more or less horizontal opening, giving access to the shaft of a mine. It is made to slope gradually from the farthest point in the interior to the mouth, and by means of it the principal drainage is usually carried on. See *Mine*.

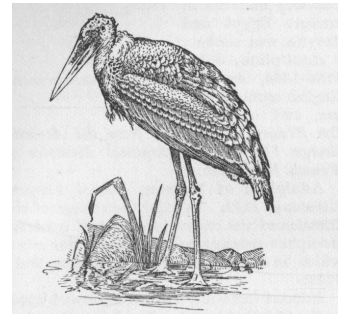
Ad'jective, in grammar, a word used to denote some quality in the noun or substantive to which it is accessory. The adjective is indeclinable in English (but has *degrees* of comparison), and generally precedes the noun, while in most other European languages it follows the inflections of the substantive, and is more commonly placed after it, though in German it precedes it, as in English.

Adjudica'tion, in English law, is the decree of the court in bankruptcy declaring a person bankrupt.

Adjust'ment, in marine insurance, is the settling of the amount of the loss which the insurer is entitled under a particular policy to recover, and if the policy is subscribed by more than one underwriter, of the amounts which the underwriters respectively are liable to pay.

Ad'jutant, an officer appointed to each regiment or battalion, whose duty is to assist the commander. He is charged with instruction in drill, and all the interior discipline, duties, and efficiency of the corps. He has the charge of all documents and correspondence, and is the channel of communication for all orders.

Adjutant-bird (*Leptoptilus argāla*), a large grallatorial or wading bird of the stork family, native of the warmer parts of India, where it is known as Hurgāla or Argāla. It stands about five feet high, has an enormous bill, nearly bare head and neck, and a pouch hanging from the under part of the neck. It is one of the most voracious carnivorous birds known, and in India, from its devouring all sorts of carrion and noxious animals, is protected by law. From underneath the wings are obtained those light downy feathers known as *marabou* feathers, from the name of an allied species of bird (*L. marabou*) inhabiting Western Africa, and also producing them.



Adjutant-bird (*Leptoptilus argāla*)

Adjutant-general, in Great Britain the second military member of the Army Council, and styled Adjutant-general to the Forces. He is a general officer, and at the head of his department at the War Office, which is charged with all duties relative to personnel.—Among the Jesuits this name was given to a select number of fathers, who resided with the general of the order, and had each a province or country assigned to him.

Ad'jutators, in English history, representatives elected by the parliamentary forces in 1647 to act with the officers in compelling Parliament to satisfy the demands of the army.

Adler, Victor, Austrian socialist leader, born in 1852. Educated as a physician, he gave up his profession for socialist propaganda. He visited England, and wrote a book on factory inspection in this country. He was the founder and editor of the *Arbeiter-Zeitung*; was a member of the Lower Austrian Diet and of the Imperial Council in 1907. His son, Dr. Friedrich Adler, assassinated Count Stuerghk, the Austrian premier, on 20th Oct., 1916. He died in 1918.

Ad'lington, a straggling place in Lancashire to the south-east of Chorley, engaged in the cotton manufacture. Pop. (1921), 4393.

Adme'tus, in Greek mythology, King of Pheræ, in Thessaly, and husband of Alcestis, who gave signal proof of her attachment by consenting to die in order to prolong her husband's life. See *Alcestis*.

Administra'tion, in politics, the executive power or body, the ministry or cabinet.

Admin'istrator, in law, the person to whom the goods of a man dying intestate are committed by the proper authority, and who is bound to account for them when required.

Ad'miral, the commander-in-chief of a squadron or fleet of ships of war, or of the entire naval force of a country, or simply a naval officer of the highest rank. In the British navy admirals are of four ranks—admiral of the fleet, admiral, vice-admiral, and rear-admiral. They were also divided formerly into three classes, named after the colours of their respective flags, admirals of the *red*, of the *white*, and of the *blue*. In 1864, however, this distinction was given up, and now there is one flag common to all ships of war, namely, the white ensign divided into four quarters by the cross of St. George, and having the union in the upper corner next the staff.—The title *admiral of the fleet* is conferred on a few admirals, and carries an increase of pay along with it.—A *vice-admiral* is next in rank and command to the admiral: he carries his flag at the foretop-gallant-mast head, while an admiral carries his at the main. A *rear-admiral*, next in rank to the vice-admiral, carries his flag at the mizzen-top-gallant-mast head.—*Lord high admiral*, in Great Britain, an officer who (when this rare dignity is conferred) is at the head of the naval administration of Great Britain. There have been few high admirals since 1632, when the office was first put in commission. James Duke of York (afterwards James II) held it for several years during Charles II's reign. In the reign of William and Mary it was vested in lords commissioners of the admiralty, and since that time it has been held for short periods only by Prince George of Denmark (1702-8) in the time of Queen Anne, and by William IV, then Duke of Clarence, in 1827-8.

Ad'miralty, that department of the Government of a country that is at the head of its naval service. In Britain the board of Admiralty now consists of the First Lord of the Admiralty and seven other commissioners, four of them being Sea Lords, and one a Civil Lord. The First Lord is always a member of the cabinet, and it is he who principally exercises the powers of the department. Under the 1912 Admiralty Organization Scheme, the various members of the board are responsible for special business. Several changes in Admiralty organization were made during the European War, but after the cessation of hostilities the system reverted to that of peace time.

Admiralty Charts are charts issued by the hydrographic department of the Admiralty of Britain; they are prepared by specially appointed surveyors and draughtsmen, and besides being supplied to every ship in the fleet, are sold to the general public at prices much less than their cost. In connection with these charts there are published books of sailing directions, lists of lights, &c. The navigating charts are generally on the scale of half an inch to a mile, and show all the dangers of the coasts with sufficient distinctness to enable the seamen to avoid them; the charts of larger size exhibit all the intricacies of the coast.

Admiralty Court, a court which takes cognizance of civil and criminal causes of a maritime nature, including captures made in war, and offences committed on the high seas, and has to do with many matters connected with maritime affairs. In England the Admiralty Court was once held before the Lord High Admiral, and at a later period was presided over by his deputy or the deputy of the Lords Commissioners. It now forms a branch of the Probate, Divorce, and Admiralty division of the High Court of Justice. There is a separate Irish Admiralty Court. In Scotland Admiralty cases are now prosecuted in the Court of Session, or in the Sheriff Court. In the United States, Admiralty cases are taken up in the first instance by the district courts.

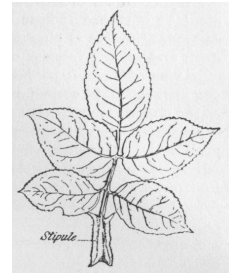
Admiralty Island, an island belonging to the United States off the north-west coast of North America, 80 or 90 miles long and about 20 broad, covered with fine timber and inhabited by Sitka Indians.

Admiralty Islands, a cluster of 40 islands, north of New Guinea, in what was once called the Bismarck Archipelago. Discovered by the Dutch

explorer Shouten in 1616, they were in German possession from 1884 to 12th Sept., 1914, when they were occupied by an Australian force. They have since been in British occupation. The largest is about 60 miles in length; the rest are much smaller. They are covered with a luxuriant vegetation, and possess dense groves of coco-nut trees. There are valuable pearl and other shell fisheries. Capital, Lorengau. Pop. (native), 4000; (European), 50.

Ad'nate, in botany, applied to a part growing attached to another and principal part by its whole length, as stipules adnate to the leaf-stalk.

Adobe (a'-dō'bā), the Spanish name for a brick made of loamy earth, containing about two-thirds fine sand and one-third clayey dust, sun-dried; in common use for building in Mexico, Texas, and Central America. Building material in ancient Egypt and Assyria was adobe.



Stipule adnate to
Leaf-stalk of
Rose

Adol'phus, John, 1768-1845, an able English criminal lawyer, and author of the *History of England from the Accession of George III* and *Biographical Memoirs of the French Revolution*.

Adolphus of Nassau, elected Emperor of Germany, 1292. In 1298 the college of electors transferred the crown to Albert of Austria, but, Adolphus refusing to abdicate, a war ensued in which he fell, after a heroic resistance, 2nd July, 1298.

Adonai (ad'o-nī), a name bestowed upon God in the Old Testament. See *Jehovah*.

Ado'ni, a town and district in Madras; pop. of former 30,416, of latter 179,418. It is well known for excellent silk and cotton fabrics.

Ado'nis, son of Myrrha, a mythological personage, originally a deity of the Phœnicians, but borrowed into Greek mythology. He was represented as being a great favourite of Aphroditē (Venus), who accompanied him when engaged in hunting, of which he was very fond. He received a mortal wound from the tusk of a wild boar, and when the goddess hurried to his assistance she found him lifeless, whereupon she caused his blood to give rise to the anemone. The worship of Adonis, which arose in Phœnicia, was

afterwards widely spread round the Mediterranean. He is the reproductive principle, nature's decay in winter and its revival in spring. The name Adonis is akin to the Heb. *Adonai*, Lord. See *Tammuz*.

Ado'nis, a small river rising in Lebanon and flowing to the Mediterranean. When in flood it is tinged with a red colour, and so is connected with the legend of Adonis.

Ado'nis, a genus of ranunculaceous plants. In the corn-adonis or pheasant's eye (*A. autumnālis*) the petals are bright scarlet like the blood of Adonis, from which the plant is fabled to have sprung.

Adoptianism, the theory according to which Christ as a man is the adopted Son of God. Elipandus, Archbishop of Toledo, and Felix, Bishop of Urgella, asserted this double sonship in Christ, maintaining that He was indeed the Son of God in His divine nature, but as man He was the Son of God only by grace and adoption. 'The Man Christ' is therefore only the adopted and not the natural Son of God. The doctrine was vigorously opposed by Alcuin, and condemned by the councils of Ratisbon (792) and Frankfort (794). The theory, however, found advocates during the Middle Ages, and has given rise to theological disputes in modern times. Adoptianism was attributed both to Abelard and Duns Scotus.

Adop'tion, the admission of a stranger by birth to the privileges of a child. Among the ancient Greeks and Romans, and also some modern nations, adoption is placed under legal regulation. In Rome the effect of adoption was to create the legal relation of father and son, just as if the person adopted was born of the blood of the adopter in lawful marriage. The adopted son took the name of his adopter, and was bound to perform his new father's religious duties. Adoption is not recognized by the law of England and Scotland; there are legal means to enable a person to assume the name and arms, and to inherit the property of another. In some of the United States adoption is regulated by laws not very dissimilar to those which prevailed among the Romans.

Adour (a'-dör), a river of France, rising in the Hautes Pyrenees, and falling into the sea a little below Bayonne; length about 200 miles; partly navigable.

Ado'wa, a town of Abyssinia, in Tigré, at an elevation of 6270 feet; the chief commercial depot on the caravan route from Massawa to Gondar. Pop. about 4000. Here the Italians suffered a crushing defeat at the hands of the Abyssinians, 1st March, 1896.

Adra (ä'dra'), a seaport of Southern Spain, in Andalusia, near the mouth of the Adra, on the Mediterranean; with marble quarries and lead works. Pop. 9000.

Adramit'ti (ancient **Adramyttium**; Turk. *Edremid*), a town of Turkey in Asia, near the head of the gulf of the same name, 80 miles north of Smyrna. Pop. about 5000.

Adrar', a district in the Western Sahara, peopled by Berbers possessing camels, sheep, and oxen, and cultivating dates, wheat, barley, and melons. Chief towns, Wadan and Shingit, which has inexhaustible beds of rock-salt.

Adren'alín, or **Suprarenin**, a crystalline substance obtained from the adrenals or suprarenal capsules of cattle and sheep, which possesses the property of checking bleeding by its styptic or contractive powers, and is used in medical practice, more especially in the case of bleeding at the nose and nervous catarrh.

Adria (ä'dri-a'), a cathedral city of Northern Italy, province of Rovigo, between the Po and the Adige, on the site of the ancient town of same name, whence the Adriatic derives its appellation. Owing to alluvial deposits the sea is now 17 miles distant. Pop. 11,878.

A'drian, the name of six Popes. The first, a Roman, ruled from 772-795; a contemporary and friend of Charlemagne. He expended vast sums in rebuilding the walls and restoring the aqueducts of Rome.—**Adrian II**, a Roman, was elected Pope in 867, at the age of seventy-five years. He died in 872, in the midst of conflicts with the Greek Church.—**Adrian III**, a Roman, elected 884, was Pope for one year and four months only. He was the first Pope who changed his name on the occasion of his exaltation.—**Adrian IV**, originally named **Nicolas Breakspear**, the only Englishman who ever occupied the papal chair, was born about 1100, and died 1159. He is said to have been a native of Hertfordshire, studied in France, and became abbot of St. Rufus in Provence, cardinal and legate to Norway.

Chosen Pope in 1154, his reign is chiefly remarkable for his almost constant struggle for supremacy with Frederick Barbarossa, who on one occasion had been forced to hold his stirrup, and had been crowned by him at Rome (1155). He issued the famous bull (1158) granting the sovereignty of Ireland, on condition of the payment of Peter's pence, to Henry II.—**Adrian V**, previously called **Ottobuono Fieschi**, of Genoa, settled, as legate of the Pope, the dispute between King Henry III of England and his nobles, in favour of the former; but died a month after his election to the papal chair (1276).—**Adrian VI** (the last pontifice barbaro), born at Utrecht in 1459, was elected to the papal chair, 9th Jan., 1522. He tried to reform abuses in the Church, but opposed the zeal of Luther with reproaches and threats, and even attempted to excite Erasmus and Zuinglius against him. Died 1523, after a reign of one year and a half.

A'drian, a town of the United States, in Michigan, 70 miles w.s.w. of Detroit. Its extensive water-power is employed in works of various kinds. Pop. 9654.

A'drian, Publius Ælius Hadrianus. See *Hadrian*.

Adriano'ple (Turk. *Edreneh*), an important city in the Balkans, about 135 miles W.N.W. from Constantinople, on the Maritza (ancient *Hebrus*), at its junction with the Tundja and the Arda. It has a great mosque, among the most magnificent in the world; a palace, now in a state of decay; a grand aqueduct, and a splendid bazaar; manufactures of silk, woollen, and cotton stuffs, otto of roses, leather, &c., and an important trade. Adrianople received its present name from the Roman emperor Adrian (Hadrian). In 1361 it was taken by Amurath I, and was the residence of the Turkish sovereigns till the conquest of Constantinople in 1453. In 1829 it was taken by the Russians, and here was then concluded the peace of Adrianople, by which Russia received important accessions of territory in the Caucasus and on the coast of the Black Sea. The Russians occupied it also in 1878. Adrianople was bombarded by the Balkan allied forces in Feb., 1913, and fell 28th March; it was recaptured by the Turks, under Enver Bey, 20th July. Pop. 83,000.

Adrian's (or **Hadrian's**) **Wall**. See *Roman Walls*.

Adriat'ic Sea, or **Gulf of Venice**, an arm of the Mediterranean, stretching in a north-westerly direction from the Straits of Otranto, between Italy and the Balkan Peninsula (Yugo-Slavia). Length, about 480 miles; average breadth, about 100; area, about 60,000 sq. miles. The rivers which it receives, particularly the Po, its principal feeder, have produced, and are still producing, great geological changes in its basin by their alluvial deposits. Hence Adria, between the Po and the Adige, which gives the sea its name, though once a flourishing seaport, is now 17 miles inland. An oceanographic investigation of the Adriatic Sea took place in Feb. and March, 1911. The principal trading ports on the Italian side are Brindisi, Bari, Ancona, Sinigaglia, and Venice; on the east side Ragusa, Fiume, Pirano, Pola, and Trieste (Italian).

Adscripti Glebæ (Lat., persons attached to the soil), a term applied to a class of Roman slaves attached in perpetuity to and transferred with the land they cultivated. Colliers and salt workers in Scotland were in a similar position till 1775.

Adula'ria, a very pure, limpid, translucent variety of the common felspar, called by lapidaries *moonstone*, on account of the play of light exhibited by the arrangement of its crystalline structure. It is found on the Alps, but the best specimens are brought from Ceylon. It is so called from *Adula*, one of the peaks of St. Gothard, where fine specimens are got.

Adul'lam, Cave of, a cave to which David fled when persecuted by Saul, and whither he was followed by "every one who was in distress, in debt, or discontented" (1 *Sam.* xxii, 1, 2).—The name *Adullamites* was given to an English political party, consisting of R. Lowe, Lord Elcho, and other Liberals, who opposed the majority of their party on the Franchise Bill of 1866. The term originated from a speech of John Bright on 13th March, 1866.

Adultera'tion, a term applied to the fraudulent mixture of articles of commerce, foods, drugs, beverages, seeds, &c., with inferior ingredients, and also to any accidental impurity found in a substance. The chief objects of adulteration are to render a substance more pleasing in appearance, to increase the weight, to make an inferior article appear as good as the article of superior quality. Any substance added to an article to increase its bulk,

weight, colour, &c., is spoken of as an adulterant. Milk is often adulterated with water and with colouring-matter. Butter may be adulterated by mixing with it other fats or by the addition of colouring-matter. Nearly every article of food can be adulterated in some way to make it appear of finer quality. *Preservatives* added to foods and drugs generally may be classed as adulterants. Thus cream is preserved by adding small quantities of boric acid. Beer sometimes contains salicylic acid added as a preservative. Chloroform contains a small quantity of alcohol to prevent decomposition. Methylated spirits is alcohol adulterated in several ways to render it unfit for human consumption. Tobacco contains benzoic acid as preservative, and sometimes saltpetre to aid burning. Many of these adulterants are harmful, so that such added to foods and beverages must be present only in very small quantities. Food and Drug Acts lay down the limits of the quantities of foreign matter permitted either as preservative or impurity. Practically every article of commerce is adulterated in some way, and pure substances are seldom used. Cf. Walker, *The Food Inspector's Encyclopædia*.

Adul'tery, the voluntary sexual intercourse of a married person with any other than the offender's husband or wife; when committed between two married persons, the offence is called double, and when between a married and single person, single adultery. The Mosaic, Greek, and early Roman law only recognized the offence when a married woman was the offender. By the Jewish law it was punished with death. In Greece the laws against it were severe. By the laws of Draco and Solon adulterers, when caught in the act, were at the mercy of the injured party. In early Rome the punishment was left to the discretion of the husband and parents of the adulteress. The punishment assigned by the Lex Julia, under Augustus, was banishment or a heavy fine. Under Constantius and Constans, adulterers were burned or sewed in sacks and thrown into the sea; under Justinian the wife was to be scourged, lose her dower, and be shut up in a monastery; at the expiration of two years the husband might take her again; if he refused she was shaven and made a nun for life. By the ancient laws of France this crime was punishable with death. In Spain personal mutilation was frequently the punishment adopted. In several European countries adultery is regarded as a criminal offence, but in none does the punishment exceed imprisonment for a short period, accompanied by a fine. In England formerly it was punishable with fine and imprisonment, and in Scotland it was frequently

made a capital offence. In Great Britain at the present day, however, it is punishable only by ecclesiastical censure. The aggrieved husband, however, can obtain damages against his wife's seducer. In England a man can obtain a dissolution of his marriage on the ground of his wife's adultery, and a wife can obtain a judicial separation on the ground of her husband's adultery, or a dissolution of the marriage if the offence is coupled with cruelty, desertion, or bigamy. In Scotland it is not necessary to prove cruelty. In the United States the punishment of adultery has varied materially at different times. It is, however, very seldom punished criminally in the States. A person divorced for adultery is by the laws of France and Scotland prohibited from intermarrying with the co-respondent.

Ad valo'rem (Lat., according to the value), a term applied to customs or duties levied according to the worth of the goods, as sworn to by the owner, and not according to number, weight, measure, &c.

Advance-note, a draft on the owner of a vessel, generally for one month's wages, given by the master to the sailors on their signing the articles of agreement. The granting of such notes to British sailors was made illegal by an Act passed in 1880.

Ad'vent (Lat. *adventus*, an arrival, 'the coming of our Saviour'), the name applied to the holy season which occupies the four or, according to the Greek Church, six weeks preceding Christmas, and which forms the first portion of the ecclesiastical year, as observed by the Anglican, the Roman Catholic, and the Greek Church.

Ad'ventists, a group of six American religious sects who believe in the speedy coming of Christ, and generally practise adult immersion. The first sect of Adventists was founded by William Miller in 1831.—There is also a sect called *Seventh-day Adventists*, who hold that the coming of Christ is at hand, and maintain that the Sabbath is still the seventh day of the week.

Ad'verb, one of the parts of speech used to limit or qualify the signification of an adjective, verb, or other adverb; as, *very cold*, *naturally brave*, *much more clearly*, *readily agreed*. Adverbs may be classified as follows: (1) Adverbs of time, as, *now*, *then*, *never*, &c.; (2) of place, as, *here*, *there*, *where*, &c.; (3) of degree, as, *very*, *much*, *nearly*, *almost*, &c.; (4) of

affirmation, negation, or doubt, as, *yes, no, certainly, perhaps, &c.*; (5) of manner, as, *well, badly, clearly, &c.*

Advertis'ing. Advertising on a small scale is a practice as old as commerce; but modern advertising on a large scale cannot be dated further back than 1785, when the *Times* was founded. The last thirty years have witnessed a great increase in the importance of advertisements as part of the policy of a progressive business. Much more intelligence and vastly more money is now spent on advertising than ever was before. America led the way, but the British are not now far behind in the number and ingenuity of their advertisements.

There are roughly speaking five distinct types of advertisement:—

- (1) Press advertising, under which heading is included daily and weekly newspapers, monthly magazines and year books, directories, &c.
- (2) Mail-order advertising, which comprises form-letters, catalogues.
- (3) Poster and showcard advertising. This includes large and small posters, on hoardings, in railway stations or tubes, &c.
- (4) Illuminated signs either outside buildings on a large scale or in frames of various sizes inside business premises, theatres, &c.
- (5) Cinema advertising—a recent development which has proved extremely effective.

Advertising to be successful must be carefully organized. A firm wishing to advertise must first of all settle how much money it is willing to spend on this object. A common practice is to devote a fixed proportion of the profits—at least five per cent—to advertising. The firm must then carefully consider the period of time over which the expenditure agreed upon is to be spread. Occasional or spasmodic advertising does not produce satisfactory results; advertising must be constant and must move with the times in order to be effective. A firm not uncommonly reviews the results of its advertising every six months, when it also arranges its plans for future advertisements. Mistakes in policy can thus be corrected and successful schemes can be readopted or improved upon. Advertising on any large scale must be handled by experts. Many thousands of pounds are wasted yearly by firms

which hand over this work to a director who has no knowledge of how to advertise. The proper way for a firm to act, if it wishes to enter upon a campaign of publicity, is to engage an efficient advertising staff or to employ a reliable advertising agent. These agents in many cases obtain their profits from the commission given to them by newspapers—this often being about ten per cent of the cost of the space booked. In return for this they give their advice and copy—everything, indeed, except blocks and sketches.—BIBLIOGRAPHY: Henry Sampson, *A History of Advertising*; *Edinburgh Review*, Feb., 1843, *On the Advertising System*. A good account of the more recent developments of advertising is to be found in H. G. Wells's novel *Tono-Bungay*; T. Russell, *Commercial Advertising*.

Ad vitam aut culpam (Lat., for life or till a fault), a formula often used in regard to appointments to posts or offices, intimating that they are held for life or till the person forfeits his position by some fault or misdeed.

Ad'vocate (Lat., *advocatus*—*ad*, to, *voco*, to call), a lawyer authorized to plead the cause of his clients before a court of law. It is only in Scotland that this word seems to denote a distinct class belonging to the legal profession, the advocates of Scotland being the pleaders before the supreme courts, and corresponding to the *barristers* of England and Ireland. These advocates all belong to the *Faculty of Advocates*, Edinburgh, to whom the oral pleadings in the Court of Session are for the most part limited, while they are also competent to plead in all the inferior Scottish courts and in the House of Lords in cases of appeal from the Court of Session. The supreme judges in Scotland, as well as the sheriffs of the various counties, are always selected from among them. Candidates for admission must undergo two separate examinations, one in general scholarship and the other in law.—The *Lord-Advocate*, called also the *King's* or *Queen's Advocate*, is the principal law officer of the crown in Scotland. He is the public prosecutor of crimes in the Supreme Court, and senior counsel for the crown in civil causes. Being appointed by the crown, he goes out of office with the administration to which he belongs. As public prosecutor he is assisted by the solicitor-general and by four junior counsel called advocates-depute. The lord-advocate and the solicitor-general, in addition to their official duties, accept of ordinary bar practice.

Advocates' Library, the chief library in Scotland, located in Edinburgh, and founded about 1682 by the Faculty of Advocates. It was increased by donations and by sums granted by the Faculty from time to time. As the donations were not confined to advocates the library was considered a kind of public library, and it has continued to retain this character. In 1709 it obtained, along with eight other libraries, the right to demand a copy of every new book published in Britain, which right it still possesses. The number of volumes is over 600,000 and MSS. over 3200.

Advoca'tus Diab'oli (Devil's advocate), in the Roman Catholic Church, a functionary who, when a deceased person is proposed for canonization, brings forward and insists upon all the weak points of the character and life of the deceased, endeavouring to show that he is not worthy of sainthood. The first formal mention of such an officer occurs under Pope Leo X (1513-21). The opposite side is taken by the *Advocatus Dei* (God's advocate).

Advow'son, in English law, a right of presentation to a vacant benefice, or, in other words, a right of nominating a person to officiate in a vacant church. Those who have this right are styled *patrons*. Advowsons are of three kinds—*presentative*, *collative*, and *donative*: *presentative*, when the patron presents his clerk to the bishop of the diocese to be instituted; *collative*, when the bishop is the patron, and institutes or *collates* his clerk by a single act; *donative*, when a church is founded by the king, or any person licensed by him, without being subject to the ordinary, so that the patron confers the benefice on his clerk without presentation, institution, or induction. An advowson cannot be held by either a Roman Catholic or an alien.

Ad'ytum, a secret place of retirement in the ancient temples, esteemed the most sacred spot; the innermost sanctuary or shrine. From this place the oracles were given, and none but the priests were permitted to enter it. The Holy of Holies or Sanctum Sanctorum of the Temple at Jerusalem was of a similar character.

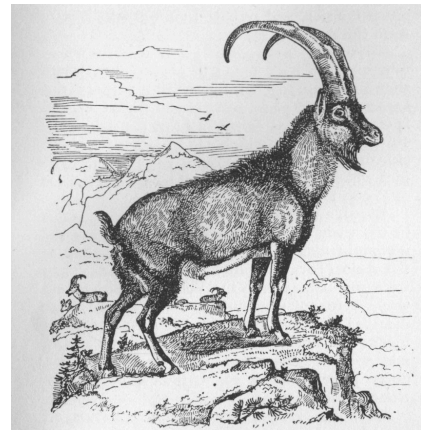
Adze, a cutting instrument used for chipping the surface of timber, somewhat of a mattock shape, and having a blade of steel forming a portion of a cylindrical surface, with a cutting edge at right angles to the length of the handle.

Ædiles (ē'dīlz), Roman magistrates who had the supervision of the national games and spectacles; of the public edifices, such as temples (the name comes from *ædes*, a temple); of private buildings, of the markets, cleansing and draining the city, &c.

Æ'dui, one of the most powerful nations of Gaul, between the Liger (Loire) and the Arar (Saône). On the arrival of Julius Cæsar in Gaul (58 B.C.) they were subject to Ariovistus, but their independence was restored by Cæsar. Their chief town was Bibracte (Mont Beuvray, near Autun).

Ægade'an Islands, a group of small islands lying off the western extremity of Sicily, and consisting of Maritimo, Favignana, Levanzo, and Le Formiche.

Ægag'rus, a wild species of ibex (*Capra ægagrus*), found in herds on the Caucasus, and many Asiatic mountains, believed to be the original source of at least one variety of the domestic goat.



Grecian Ibex (*Capra ægagrus*)

Ægean Civilization, a term applied to the pre-Hellenic civilization of south-eastern Europe, including Crete, Greece and the Cyclades, and the Danubian or Mid-European area. See *Crete* and *Danubian Civilization*.

Ægean Sea (ē-jē'an), that part of the Mediterranean which washes the eastern shores of Greece, and the western coast of Asia Minor. See *Archipelago*.

Æ'gilops, a genus of grasses, very closely allied to wheat, and somewhat remarkable from the alleged fact that by cultivation one of the species becomes a kind of wheat.

Ægina (ē-jī'na), a Greek island in the Gulf of Ægina, south of Athens, triangular in form; area about 32 sq. miles; pop. 8500. It forms part of the nomarchy of Attica and Bœotia. Except in the west, where the surface is more level, the island is mountainous and unproductive. The inhabitants are chiefly engaged in trade, seafaring, and agriculture, the chief crops being almonds, olives, and grain. The greater number of them reside in the seaport

town of Ægina. Ægina was anciently colonized by Dorians from the opposite coast of Peloponnesus. In the latter half of the sixth century B.C. it had a flourishing commerce, a large navy, and was the seat of a distinct school of art. At the battle of Salamis (480 B.C.) the Æginetans behaved with great valour. In 456 the island fell under the power of the Athenians, and in 431 the Æginetans were expelled to make room for Athenian settlers, but were afterwards restored. On a hill are the remains of a splendid temple of Athena (Minerva), many of the columns of which are still standing. Here was found in 1811 a considerable amount of sculpture from the pediments (the *Æginetan marbles*), which is now at the Glyptothek at Munich, and is prized as throwing light on the early history of Greek art. Though in these figures there is a wonderfully exact imitation of nature, yet there is a certain stiffness about them and an unnatural sameness of expression in all. They should probably be assigned to the period 500-480 B.C.

Ægis (ē'jis), the shield of Zeus, according to Homer, but according to later writers and artists a metal cuirass or breastplate, in which was set the head of the Gorgon Medusa, and with which Athena (Minerva) is often represented as being protected. In a figurative sense the word is used to denote some shielding or protecting power.

Ægle (ē'glē), a genus of plants. See *Bel*.

Ægospot'ami ('goat-rivers'), a place on the Hellespont, of some note in Greek history, the Athenian fleet being here completely defeated in 405 B.C. by the Spartan Lysander, thus ending the Peloponnesian war.

Ælfric (al'frik), Abbot, called *Grammaticus* (the grammarian), was a celebrated English author of the eleventh century. He became a monk of Abingdon, was afterwards connected with Winchester, and died Abbot of Eynsham. His principal works are two books of homilies, a *Treatise on the Old and New Testaments*, a translation and abridgment of the first seven books of the Bible, a *Latin Grammar and Glossary*, &c. He has been frequently confounded both with Ælfric, Archbishop of Canterbury, and Ælfric, Archbishop of York, surnamed Putta, who lived about the same time. There was also an Ælfric of Malmesbury.

Ælia'nus, Claudius, often called simply **Ælian**, a Roman author who lived about A.D. 221, and wrote in Greek a collection of stories and anecdotes and

a natural history of animals.

Ælia'nus Tacticus, so called to distinguish him from Claudius Ælianus, lived at Rome, and wrote a work *On the Military Tactics of the Greeks*, which he dedicated to the Emperor Hadrian, who was emperor from A.D. 117 to 138. This book was closely studied by soldiers of the sixteenth and seventeenth centuries.

Aelst (älst), Belgian town, same as **Alost**.

Æne'as, the hero of Virgil's *Ænēid*, a Trojan, who, according to Homer, was, next to Hector, the bravest of the warriors of Troy. When that town was taken and set on fire, Æneas, according to the narrative of Virgil, with his father, son, and wife Creusa, fled, but the latter was lost in the confusion of the flight. Having collected a fleet he sailed for Italy, but after numerous adventures he was driven by a tempest to the coast of Africa, where Queen Dido of Carthage received him kindly, and would have married him. Jupiter, however, sent Mercury to Æneas, and commanded him to sail to Italy. Whilst the deserted Dido ended her life on the funeral pile, Æneas set sail with his companions, and after further adventures by land and sea reached the country of King Latinus, in Italy. The king's daughter Lavinia was destined by an oracle to wed a stranger, this stranger being Æneas, but was promised by her mother to Turnus, King of the Rütüli. This occasioned a war, which was ended by Æneas slaying Turnus and marrying Lavinia. His son by Lavinia, Æneas Sylvius, was the ancestor of the kings of Alba Longa, and of Romulus and Remus, the founders of the city of Rome.

Æolian Harp, or **Æolus' Harp**, a musical instrument, generally consisting of a box of thin fibrous wood (often of deal), to which are attached from eight to fifteen fine catgut strings or wires, stretched on low bridges at either end, and tuned in unison. Its length is made to correspond with the size of the window or other aperture in which it is intended to be placed. When the wind blows athwart the strings it produces very beautiful sounds, sweetly mingling all the harmonic tones, and swelling or diminishing according to the strength or weakness of the blast.

Æolians (Gr. *Aioleis*), one of the four races into which the ancient Greeks were divided, originally inhabiting the district of Æölis, in Thessaly, from which they spread over other parts of Greece. In early times they were the

most numerous and powerful of the Hellenic races, chiefly inhabiting Northern Greece and the western side of Peloponnesus, though latterly a portion of them went to Lesbos and Tenedos and the north-west shores of Asia Minor, where they possessed a number of cities. Their language, the Æolian dialect, was one of the three principal dialects of the Greek. It was cultivated for literary purposes chiefly at Lesbos, and was the dialect in which Alcæus and Sappho wrote.

Æol'ipile (Lat. *Æōli pila*, the ball of Æōlus), a spherical vessel of metal, with a pipe of small aperture, through which the vapour of heated water in the ball passes out with considerable noise; or having two nozzles so placed that the steam rushing out causes it to revolve on the principle of the Barker's mill. It was known to the ancient Greeks.

Æ'olus, in Greek mythology, the god of the winds, which he kept confined in a cave in the Æolian Islands, releasing them when he wished or was commanded by the superior gods.

Æ'on, a Greek word signifying life, an age, and sometimes eternity, but used by the Gnostics to express spirits or powers that had emanated from the Supreme Mind before the beginning of time. They held both Christ and the Holy Spirit to be æons; but as they denied the divine origin of the books of Moses, they said that the spirit which had inspired him and the prophets was not that exalted æon whom God sent forth after the ascension of Christ, but an æon very much inferior, and removed at a great distance from the Supreme Being.

Æpyor'nis, a genus of gigantic birds whose remains have been found in Madagascar, where they are supposed to have lived perhaps not longer than 200 years ago. It had three toes, and is classed with the cursorial birds (ostrich, &c.). Its eggs measured 14 inches in length, being about six times the bulk of those of the ostrich. The bird which laid them may well have been the roc of Eastern tradition.

Æ'qui, an ancient people of Italy, conspicuous in the early wars of Rome, and inhabiting the mountain district between the upper valley of the Anio (Teverone) and Lake Fucinus. They were probably akin to the Volscians, with whom they were in constant alliance. They were defeated by Cincinnatus in 458 B.C., and again by the dictator Postumius Tubertus in 428

B.C., and were finally subdued about 304-302 B.C. Soon after they were admitted to Roman citizenship.

A'erated Bread, bread which receives its sponginess or porosity from carbonic acid supplied artificially, and not produced by the fermentation caused by leaven or yeast.

A'erated Waters, waters impregnated with carbonic acid gas, and forming effervescing beverages. Some mineral waters are naturally aerated, as Vichy, Apollinaris, Rosbach, &c.; others, especially such as are used for medicinal purposes, are frequently aerated to render them more palatable and exhilarating. Water simply aerated, as soda-water, or aerated and flavoured with lemon or fruit syrups, is largely used, especially in summer, as a refreshing beverage. There are numerous varieties of apparatus for manufacturing aerated waters. The essential parts of an aerated-water machine are a generator in which the gas is produced, a vessel containing the water to be impregnated, and an apparatus for forcing the gas into the water. This last may be effected by force-pumps or by the high pressure of the impregnating gas itself. The quantity of gas with which the water is charged is usually equal to a pressure of 5 atmospheres. See also *Mineral Waters*.—Cf. W. Kirkby, *Evolution of Artificial Mineral Waters*.

Aerial Ropeways or Cableways, a means of transport or carriage in which a great rope or cable, elevated above the ground on fixed supports, is made use of in conveying from place to place materials or articles of various kinds. Such a cable may be said to serve the purpose of a rail, from which are suspended the carriages, buckets, or carriers of whatever sort are employed to convey the materials dealt with, the cable being actuated by means of a steam-engine and winding-gear of suitable construction. Such cables are now much used in carrying materials over a comparatively short space, as in quarries, excavations for canals, docks, &c.; in the construction of bridges, in shipbuilding, &c. Besides being employed in such works—not to mention the coaling of a battleship at sea from a coal transport standing by—elevated ropeways miles in length have also been constructed between places where no roads exist, or where road carriage is much more expensive. The greatest aerial line yet in existence is in the Argentine Republic, being built to connect a mining locality in the Andes, about 15,000 feet above sea-level, with a station on the Northern Railway 11,500

feet lower down and about 22 miles off, the line running across deep chasms and hollows, and being in places supported on iron towers 130 feet high. The wire rope is said to have a length of 87 miles.

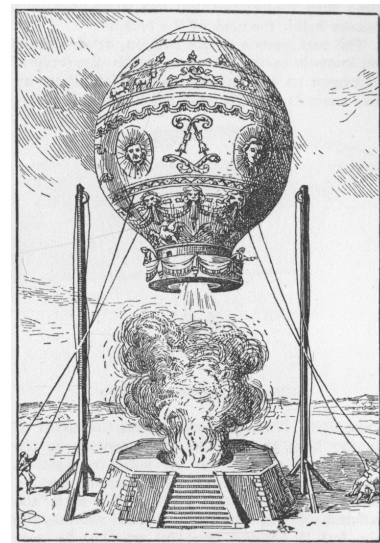
Aë'rians, the followers of Aërius of Pontus, who in the fourth century originated a small heretical sect, objecting to the established feast-days, fasts or abstinences, the distinction between bishops and presbyters, prayers for the dead, &c.

Aerodynam'ics, a branch of physical science which treats of the properties and motions of elastic fluids (air, gases), and of the appliances by which these are exemplified. This subject is often explained in connection with hydrodynamics. See also *Meteorology*.

Aerøe, or **Arrøe** (är'eu-e), an island of Denmark, in the Little Belt, 15 miles long by 5 broad, with 12,000 inhabitants. Though hilly, it is very fertile.

A'erolite, a meteoric stone, meteorite, or shooting-star. See *Meteoric Stones*.

Aeronau'tics, the art or science of navigating the air, including Aviation (see *Aeroplane* and *Sea-planes*) and Aerostation (see *Balloons* and *Air-ships*). From the days of the mythical exploit of Dædalus and Icarus, students of 'experimental philosophy', or scientists, of all ages, turned their thoughts and inventive genius to the evolution of a machine by means of which man could fly. Most of the early schemes of which any details have survived were based upon the observation of birds and embodied the flapping of wings affixed to the arms or legs. Among the very early experimenters may be mentioned the monk Oliver of Malmesbury (A.D. 1050), de Pérouse (1420), who is said to have succeeded



"Montgolfière", or Hot-air Balloon, above Furnace

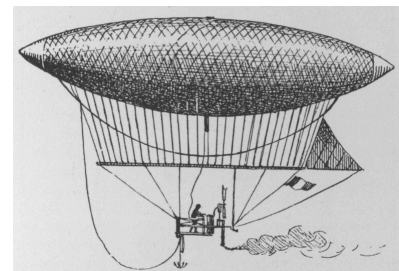
in flying over Lake Trasimene, and the great Leonardo da Vinci. All these produced designs for what are known as Ornithopters, or flapping-wing machines. There was, however, another school which believed in the future of machines which would be themselves lighter than air. The idea in the

minds of the experimenters of this school was in the early days the replacing of the air in brass globes by a vacuum. If the brass were thin enough it was believed that the globe would then be sufficiently light to rise. It was, however, not realized that under such circumstances the globe would inevitably collapse under the pressure of the atmosphere with no corresponding internal pressure to withstand it. Among this 'lighter-than-air' school of experimenters were the famous Roger Bacon (twelfth century), Robert Hooke of the Royal Society (1644), and Francesco de Lana, a Jesuit priest (1660). It was this school which ultimately achieved success by providing the first machine of any sort to leave the ground and rise into the air. On 5th June, 1783, the first balloon ascended from the village of Annonay in France. It owed its inception to the genius of two brothers, paper-makers by trade, named Etienne and Joseph Montgolfier. Struck by the sight of smoke ascending from a chimney, after many failures with flapping-wing models, they conceived the idea of filling a receptacle with smoke and seeing if it would rise. They built a balloon or 'globe' of paper and canvas, and lit a fire of wood and straw below the aperture in it. The balloon gradually filled and rose into the air to a height reported to be 6000 feet, though this is probably an exaggeration. It remained in the air for ten minutes and landed 1½ miles away. This was the forerunner of the 'Montgolfières', or hot-air balloons, which are a feature of fêtes and Guy Fawkes' Day celebrations. It was followed by the sending up of a 'Montgolfière' from Versailles on 18th Sept. of the same year, carrying a basket containing a sheep, a cock, and a duck. The first human beings to make an ascent were Pilâtre de Rozier and the Marquis d'Arlande, who went away from Paris on 21st Nov., 1783. They passed right over Paris, and were in the air for twenty-five minutes, during which time they replenished the fire suspended in a brazier below the neck of the balloon.

The real genesis of the balloon, or air-ship as we know it to-day, was due to the discovery of hydrogen as the lightest gas, which discovery was made in 1766 by an English chemist, Henry Cavendish. Various people claim the credit of having been the first to call attention to the possibilities of this gas for aerial navigation. In 1781 Dr. Joseph Black of Edinburgh suggested to his pupils that a thin bladder filled with 'the inflammable gas' (hydrogen) would rise into the air, but it appears doubtful whether he ever actually made the experiment. Tiberius Cavallo the same year, before the Royal

Society, demonstrated that soap-bubbles filled with hydrogen would rise and float in the air. The honour of building the first hydrogen balloon belongs, however, to three Frenchmen—the brothers Robert, and Charles, a physicist. They sent up a hydrogen-filled balloon of varnished silk from the Champ de Mars, Paris, on 7th Aug., 1783. One of the Roberts and Charles themselves made the second human ascent in their balloon—the first in a hydrogen balloon as opposed to a Montgolfière (as above)—on 1st Dec. the same year. In 1784 the same Frenchmen constructed the first 'air-ship' or navigable balloon to the order of the Duc de Chartres (Philippe Egalité). The gas container of this was elongated in form, and it could be propelled to some small extent by means of oars, and steered by a rudder. In the same year a French military officer, named Meusnier, produced a completely detailed design for an air-ship. This embodied the first suggestion of screw-propellers, to be worked by man-power, and also provided for a 'ballonet' into which air could be driven to replace hydrogen lost owing to expansion during the ascent. Meusnier's design was the genesis of the modern non-rigid air-ship, all the essential features remaining. This air-ship was, however, never built.

The first ascent in the British Isles was made in a Montgolfière by James Tytler at Edinburgh, on 27th Aug., 1784, though he travelled only a few hundred yards. He was followed by Vincent Lunardi, an Italian, who ascended from the artillery ground in London three weeks later (Sept., 1784), landing near Ware in Hertfordshire. The first Channel crossing by air was made in a hydrogen balloon from Dover to Calais on 7th Jan., 1785, by Blanchard and Dr. Jeffries.

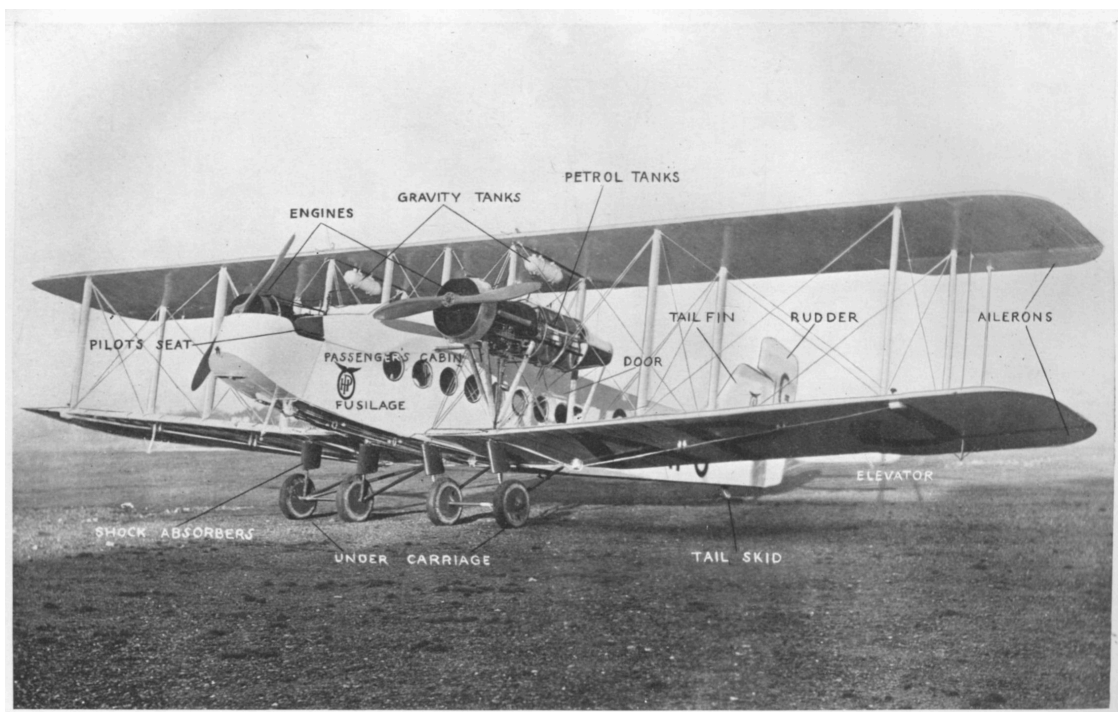


Giffard's Steam-driven Air-ship

Subsequent developments in air-ships are due to the pioneer work of Giffard (1852) (the first steam-driven air-ship), Dupuy de Lôme (1872), the brothers Tissandier (electric propulsion) (1883), Rénard and Krebs (1884), Wölfert (1897), Santos Dumont (1898-1905), Zeppelin (1900), Lebaudy (1903), Barton (English) (1905), Willows (English) (1910).

In the meantime experimental work was being carried on by the exponents of the heavier-than-air school, who soon abandoned the flapping-wing

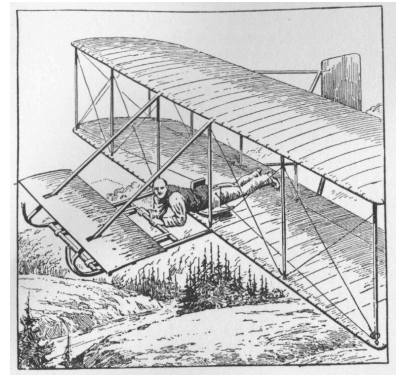
principle and eventually evolved the modern aeroplane. The modern aeroplane was evolved from the brain of an Englishman, Sir George Cayley, who in 1809 contributed an article to *Nicholson's Journal* in which he outlined the outstretched wings, vertical and horizontal steering surfaces, screw-propeller, 'explosion' motor, and 'stream-line' form of the modern aeroplane. In 1842 Henson and Stringfellow, both Englishmen, constructed a steam-driven model on this principle, which is now in the South Kensington Museum. Wenham in 1866 contributed a valuable paper to the Royal Aeronautical Society on the subject. In 1896 Lillienthal in Germany carried out a number of glides with rigid wings, provided with a movable tail, fixed to his body. He was followed by Chanute, who in America emphasized the biplane principle in his glider. In 1896 Ader, a Frenchman, built an 'avion' which is claimed to have risen from the ground at Satory, but this is doubtful. In 1895 a huge steam-propelled aeroplane built by Sir Hiram Maxim burst the rails holding it down and lifted for a few feet.



A Handley Page Biplane, showing the principal parts

The real credit for the evolution of a man-carrying aeroplane is, however, due to the American brothers Wilbur and Orville Wright of Dayton, Ohio. Encouraged by the advice of Chanute, they commenced experimenting with

biplane gliders on the sand-hills at Kittyhawk. Meeting with considerable success, they fitted a petrol motor of their own design in 1903 and made several straight flights during the same year. In 1904 they succeeded in making the first turn in the air. These experiments were carried out in great secrecy, and it was not until 1908 that their first public flights were made in France, the first taking place in October of that year. The first aviator to fly in Europe was Santos Dumont, who, on 12th Nov., 1906, covered 220 metres, having previously in the same year flown for shorter distances. At this time and during the two or three ensuing years many experiments were carried out, and flights made, by Farman, Voisin, Esnault-Pelterie, and Blériot in France; Wright and Curtiss in America; and Roe, Ogilvie, and Moore-Brabazon in England. A prize of £2000 offered by MM. Deutsch de la Meurthe and Ernest Archdeacon for the first circular flight over a distance of 1 kilometre, returning to the point of starting, was won in Jan., 1908, by Henry Farman.

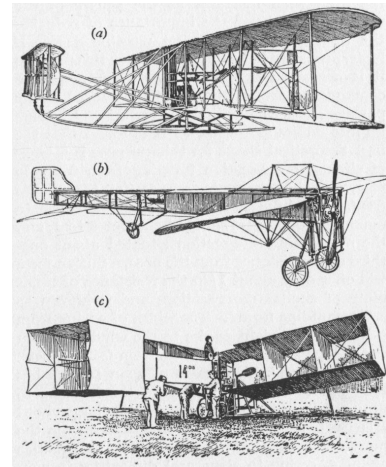


Wright's Biplane Glider

The second crossing of the Channel, and the first by a 'heavier-than-air' machine, was effected by Louis Blériot in a machine of his own construction with an Anzani engine from Calais to Dover on 25th July, 1909. From that date the science of aviation (flight by heavier-than-air machines) may be said to have begun, and progress was merely a record of improvements. By the end of 1919 the Atlantic had been crossed four times; once by sea-plane, once by a non-stop aeroplane flight, and twice (outward and return) by non-stop air-ship flights. Aeroplanes had achieved a speed of 190 miles an hour, had attained to a height of over 34,000 feet, and had covered upwards of 1900 miles in one non-stop flight.—BIBLIOGRAPHY: De St. Fond, *Description de la Machine Aerostatique*; Cavallo, *History and Practice of Aerostation*; Lunardi, *The First Aerial Voyage in England*; Moedebeck, *Pocket Book of Aeronautics*; Santos Dumont, *My Air-ships*; *The Aeronautical Classics* (Aeronautical Society); G. Tissandier, *Histoire des Ballons*; A. Berget, *The Conquest of the Air*.

Aeroplane, a flying-machine deriving its power of sustentation from the reaction of the air driven downwards by the rapid transit of fixed wings or

'planes' through the air. The term 'plane' for the wing of an aeroplane is strictly a misnomer, as the word implies a flat plate, whereas a wing is 'cambered' or curved in section from front to back. This is due to the discovery of Lillienthal (see *Aeronautics*) that a cambered 'aerofoil' when set at an angle to a wind current gives more 'lift' than a flat plane. The wing of an aeroplane is normally set at an angle horizontally (or rather at an angle to the relative wind) varying from 0° to 4° . This angle is known as the 'angle of incidence'. As the wing is driven through the air under the influence of the propeller, the air meets the 'leading' or 'entering' edge and is divided into two streams along the top and bottom surfaces. It does not, however, follow the surface closely, but in the case of the lower stratum is deflected downwards at an angle to the surface, which results in an upward reaction. The upper of the two streams of air is correspondingly deflected upwards at an angle to the surface for a short distance. This causes an 'area of discontinuity of flow', or eddy, which results in 'negative pressure', causing an upward suction. This fact was first discovered by Sir Hiram Maxim, though it was G. Eiffel who measured the effects of the positive pressure on the lower surface and the negative pressure on the upper surface, and found, contrary to all expectation, that the latter is responsible for three-quarters of the total lifting effect of the wing. In addition to the lift, the wings offer resistance to progress through the air, which effect is known as 'drag'. The ratio of lift to drag is a measure of the efficiency of a wing-section. A well-designed wing will have a L/D ratio at an angle of incidence of 4° of about 16, i.e. the lift effect in pounds will be 16 times that of the drag. The fundamental equation of an aeroplane is $R = KSV^2$, where R = the resistance, K = a constant (usually 0.003), S = area of surface, and V = the velocity in feet per second. From this it will be seen that the resistance for the same area increases as the square of the speed, which shows the importance of reducing the resistance to the lowest possible degree if high speeds are to be obtained. For this purpose it is necessary that the flow of air round the component parts of the aeroplane caused by its passage should



Early Types of Aeroplanes
 (a) Wright Biplane (1908). (b) Blériot Monoplane (1909).
 (c) Santos Dumont Biplane (1906).

be as little disturbed and broken up into eddies as possible. It is found that the best theoretical shape for this purpose is a body of circular cross-section tapering from front to rear, with the maximum cross-section toward the *front*. The 'fineness ratio' (ratio of length to maximum diameter) should be about 6 to 1, and the maximum cross-section situated about one-third of the distance from the nose. Such a form will offer only about $\frac{1}{20}$ the resistance of a flat plate of similar cross-section, and is known as a 'stream-line form'. The width of a wing from side to side at right angles to the wind is known as the 'span', and the breadth from front to back as the 'chord'. The ratio of span to chord is the 'aspect ratio'. Owing to the increase in drag resulting from low aspect ratio (large chord relative to span) the higher the aspect ratio the more efficient the wing. This is in practice about 6, owing to structural difficulties in constructing a wing of larger relative span. The essential parts of an aeroplane are the wings, fuselage (body), tail (comprising fixed vertical and horizontal surfaces behind which are hinged movable rudders and elevators), and chassis, or landing-carriage. The majority of modern machines are biplanes, i.e. with one set of wings superposed on the other and connected by upright wooden members called 'struts'. Aeroplanes with one set of wings only are called 'monoplanes'; those with three, 'triplanes'; with four, 'quadruplanes'; and with more than four, 'multiplanes'. Aeroplanes are also divided into 'tractor' and 'pusher', according to whether the propeller is situated in front or rear of the wings.

When the engine is started, the revolution of the propeller causes the aeroplane to move along the ground until such a speed is reached (usually about 35-50 miles per hour) that it is able to support its own weight in the air when it leaves the ground. When in the air it is made to ascend or descend by moving the elevators, which are operated by a vertical stick in front of the pilot through control cables or levers. Steering to right or left is effected by the rudder, which is operated by a foot-bar through cables or levers. Lateral balance is obtained by means of 'ailerons' or flaps on the outer extremities of the wings. If one wing tends to dip, the aileron on that side is depressed. This increases the resistance of that wing and so causes it to rise. By a combination of movements of the elevators, rudder, and ailerons almost any evolution can be performed with a modern aeroplane. A well-designed machine will, on cutting off the engine-power, turn its nose slightly down and automatically assume its own 'gliding-angle' to the

ground. The gliding-angle is the ratio of descent to forward travel and is usually 1 in 12 to 1 in 14.

Speeds of 190 miles per hour have been attained and a height of 34,600 feet reached. The greatest distance covered in one flight is the crossing of the Atlantic—slightly more than 1900 miles—while an aeroplane has remained in the air for 24 hours. Aeroplanes range in size from small single-seater 'scouts' with a duration of only some three hours, to large multiple-engined machines with a weight, fully loaded, of from 15 to 20 tons. The essential feature of the aeroplane is, as already stated, that it is heavier than air and therefore subject to the laws of gravity in the event of engine failure. Its choice of a landing-ground is then dependent upon its height at the moment and gliding-angle.

Aeroplanes are normally constructed throughout of wood, though steel is occasionally used. The wings are built of wooden 'spars', of which there are usually two along the length of each wing, connected together by wooden 'ribs'. The wings of a biplane are braced by the struts (see above) and by wires. 'Landing-wires' support the weight of the wing on the ground, while 'flying-wires' prevent them folding upwards under the influence of the lift in flight. 'Drift-wires' are to prevent the wings folding backwards under the pressure of the air in flight. See also *Aeronautics*, *Sea-planes*.—**BIBLIOGRAPHY:** H. Barber, *The Aeroplane Speaks*; H. Barber, *Aerobatics*; Hamel and Turner, *Flying*; Borlase Mathews, *Aviation Pocket Book*; Pippard and Pritchard, *Aeroplane Structures*; Judge, *Design of Aeroplanes*; Judge, *Properties of Aerofoils*; Loening, *Military Aeroplanes*.

Aerostatic Press, a contrivance for extracting the colouring matter from dye-woods and for similar purposes. A liquid intended to carry with it the extract is brought into contact with the substance containing it, and a vacuum being made by an air-pump suitably applied, the pressure of the atmosphere forces the liquid through the intervening mass, carrying the colour or other soluble matter with it.

Aerostat'ics, that branch of physics which treats of the weight, pressure, and equilibrium of air and gases. See *Air*; *Air-pump*; *Barometer*; *Gases*, *Properties of*; *Hydrostatics*; *Meteorology*; &c.

Aerotherapeutics is the treatment of disease by atmospheres artificially prepared and differing from the normal in compression or pressure or temperature. It is divided into:

1. *Medical atmospheres* artificially produced by changing the proportions of the normal gases of the atmosphere, or by adding gases to the atmosphere. These are applied by inhalation in various ways:

(a) By the inhalation of gases—*ether*; *chloroform*; *nitrous oxide* (see *Anæsthetics*). *Oxygen* under pressure in a cylinder, with outlet applied close to the patient's mouth and nose, is used in severe cases of pneumonia, cardiac disease, or wherever breathing is difficult. *Amyl nitrate* is inhaled on the breaking of the glass capsules in which it is contained close to the patient's mouth; this treatment is used in cardiac disease and other conditions to recover blood pressure. *Chlorine* and *iodine* are used in cases of throat and bronchial affections by inhaling the vapour itself for a short time, or by inhaling air strongly impregnated with the substance.

(b) By inhalation of substances requiring heat for volatilization, e.g. *mercury* and *sulphur*. The patient, enveloped in a sheet, sits on a chair, while the substance, placed in a vessel on the floor inside the enveloping sheet near the patient, is heated by a spirit lamp or similar method. *Mercury* is used for chronic and syphilitic laryngitis and pharyngitis; *sulphur* for scabies and other skin diseases.

(c) By inhalation of steam or warm-water vapour with a drug added. Apparatus of various kinds is used, the simplest of which is a wide-mouthed jug filled with boiling water to which the drug has been added. The patient takes a deep breath, drawing the vapour into his mouth up a napkin arranged in the form of a tube. More complicated forms of apparatus are steam-sprays and nebulizers for laryngeal and bronchial troubles.

(d) Cold medicated sprays and inhalations. Throat- and nose-sprays are much used, also sprays for the administration of local anæsthetics (ethyl chloride). Respirators are made of wire gauze with cotton wool or a sponge; the substance is poured on and inhaled by the patient.

For (c) and (d) the following drugs are used: carbolic acid, creosote, terebine, thymol, eucalyptol, zinc sulphate, in phthisis and bronchial

affections; and eusol, izal, lysol, &c., for disinfection and fumigation.

2. Changes produced by variation in barometric pressure considered in treatment of disease:

Normal barometric pressure at sea-level, 29-30 inches; at Davos (5200 feet), 25 inches; at summit of Pike's Peak, Colorado (14,000 feet), 17½ inches; in balloon ascent (Glaisher and Coxwell) of 29,000 feet, 9¾ inches.

The effects of high pressure are seen in divers, caisson workers, miners. The effects of low pressure are seen in balloonists, airmen. The effect of sudden return to normal from high pressure is seen in cases of caisson disease (q.v.). The effects of low pressure were first applied to the human body in 1835 by V.T. Junot. He contrived a hollow copper ball, 4 yards in diameter, capable of containing a man, and by pumping out air gradually, produced the effects of low pressure. This principle was then applied by him locally by cupping-glasses similar in shape to the upper part of a wineglass. There are two types of cupping:

(a) In *wet cupping* an incision is made in the skin of the part to be treated. The air inside the glass is exhausted by introducing a lighted match, then the open end of the glass is immediately applied to the surface of the skin.

(b) In *dry cupping* the treatment is similarly carried out, but no incision is made.

The low pressure (partial vacuum) draws blood to the part. Cupping is used in congestion of internal organs, e.g. lungs, kidneys.

The artificial application of air to lungs at varying pressure is carried out by inspiring rarefied air or compressed air and expiring into rarefied air or into compressed air. Only inspiring compressed air, or expiring into rarefied air, can be practically applied. There are many kinds of apparatus for this. The best is the compressed-air bath (seen at Brompton Hospital, London), consisting of three parts—the engine, receiver, and air-chamber.

The patient is placed in this air-chamber, where he remains for two hours, during which time the pressure is usually raised from half again to double normal. For the first half-hour the pressure is gradually raised, and is maintained at the same abnormal height for one hour; for the last half-hour

it is reduced again gradually to normal. The patient first experiences an unpleasant sensation in the throat. This is relieved by swallowing or by drinking water; then pain in the ear-drums; the voice becomes shriller. These are early signs of the effects of high pressure, and are seen to a more marked degree in cases where a man has descended suddenly into a mine, caisson, &c. Compressed air-baths are used in cases of asthma, bronchitis, emphysema, anæmia.

Respiratory gymnastics are of value for defective breathing due to badly formed chests or injury and disease of the lungs. There are various forms of artificial breathing exercises and many ways of using artificial aids, e.g. breathing into bottles connected together by tubes and partly filled with water. The water is forced from one bottle to another by the respiratory effort of the patient.

Aerschot, town in Belgium, province of Brabant, on the Demer, a tributary of the Dyle. It was occupied by the Germans in Aug., 1914. Pop. 7800.

Æschines (es'ki-nēz), a celebrated Athenian orator, the rival and opponent of Demosthenes, was born in 389 B.C. and died in 314. He headed the Macedonian party in Greece, or those in favour of an alliance with Philip, while Demosthenes took the opposite side. Having failed in 330 B.C. in a prosecution against Ctesiphon for proposing to bestow a crown of gold upon Demosthenes for his services to the State (whence the oration of Demosthenes 'On the Crown') he left Athens, and subsequently established a school of eloquence at Rhodes. Three of his orations are extant. Æschines should not be confounded with his namesake, the Athenian philosopher and intimate friend of Socrates.

Æschylus (es'ki-lus), the first in time of the three great tragic poets of Greece, born at Eleusis, in Attica, 525 B.C., died in Sicily 456. Before he gained distinction as a dramatist he had fought at the battle of Marathon (490), as he afterwards did at Artemisium, Salamis, and Plataea. He first gained the prize for tragedy in 484 B.C. *The Persians*, the earliest of his extant pieces, formed part of a trilogy which gained the prize in 472 B.C. In 468 B.C. he was defeated by Sophocles, and then is said to have gone to the Court of Hiero, King of Syracuse. Altogether he is reputed to have composed ninety plays and gained thirteen triumphs. Only seven of his

tragedies are extant: *The Persians*, *Seven against Thebes*, *Suppliants*, *Prometheus*, *Agamemnon*, *Choephoroi*, and *Eumenides*, the last three forming a trilogy on the story of Orestes, represented in 458 B.C. Æschylus may be called the creator of Greek tragedy, both from the splendour of his dramatic writings and from the scenic improvements and accessories he introduced. Till his time only one actor had appeared on the stage at a time, and by bringing on a second he was really the founder of dramatic dialogue. His style was grand, daring, and full of energy, and his choruses, though difficult, are among the noblest pieces of poetry in the world. His plays have little or no plot, and his characters are drawn by a few powerful strokes. There are English poetical translations of his plays by Blackie, Plumptre, Swanwick, Campbell, Robert Browning, and Elizabeth Barrett Browning.—BIBLIOGRAPHY: Bishop Copleston, *Æschylus*, in English Classics for Modern Readers Series (Blackwood & Son); Miss J. Case, Translation of *Prometheus Vincetus* (Dent).

Æscula'pius (Gr. *Asklēpios*), the god of medicine among the Greeks and afterwards adopted by the Romans, usually said to have been a son of Apollo and the nymph Coronis. He was worshipped in particular at Epidaurus, in the Peloponnesus, where a temple with a grove was dedicated to him. The sick who visited his temple had to spend one or more nights in the sanctuary, after which the remedies to be used were revealed in a dream. Those who were cured offered a sacrifice to Æsculapius, commonly a cock. He is often represented with a large beard, holding a knotty staff, round which is entwined a serpent, the serpent being specially his symbol. The staff and serpent have been adopted as a badge by the Royal Army Medical Corps. Sometimes Æsculapius is represented under the image of a serpent only.—BIBLIOGRAPHY: L. Dyer, *The Gods of Greece*; W. H. D. Rouse, *Greek Votive Offerings*.

Æs'culus, the genus of plants to which belongs the horse-chestnut.

Æsir, in Scandinavian mythology, the eleven chief gods, besides Odin. They are: Thor, Balder, Ty or Tyr, Bragi, Heimdal, Hod, Vidar, Vali, Ull, Forseti, and Loki or Lopt. See *Scandinavian Mythology*.

Æ'sop, the Greek fabulist, is said to have been a contemporary of Cræsus and Solon, and thus probably lived about the middle of the sixth century

(620-550) B.C. But so little is known of his life that his existence has been called in question. He is said to have been originally a slave, and to have received his freedom from a Samian master, Iadmon. He then visited the court of Cræsus, and is also said to have visited Pisistratus at Athens. Finally he was sent by Cræsus to Delphi to distribute a sum of money to each of the citizens. For some reason he refused to distribute the money, whereupon the Delphians, enraged, threw him from a precipice and killed him. No works of Æsop are extant, and it is doubtful whether he wrote any. Bentley inclined to the supposition that his fables were delivered orally and perpetuated by repetition. Such fables are spoken of both by Aristophanes and Plato. Phædrus turned into Latin verse the Æsopian fables current in his day, with additions of his own. In modern times several collections claiming to be Æsop's fables have been published. Cf. J. Jacobs, *The Fables of Æsop*.

Æsthet'ics (Gr. *aisthētikos*, pertaining to perception), the philosophy of the beautiful; the name given to the branch of philosophy or of science which is concerned with that class of emotions, or with those attributes, real or apparent, of objects generally comprehended under the term *beauty*, and other related expressions. The term æsthetics first received this application from Baumgarten (1714-62), a German philosopher, who was the first modern writer to deal systematically with the subject, though the beautiful had received attention at the hands of philosophers from early times. Socrates, according to Xenophon, regarded the beautiful as coincident with the good, and both as resolvable into the useful. Plato, in accordance with his idealistic theory, held the existence of an absolute beauty, which is the ground of beauty in all things. He also asserted the intimate union of the good, the beautiful, and the true. Aristotle treated of the subject in much more detail than Plato, but chiefly from the scientific or critical point of view. In his treatises on *Poetics* and *Rhetoric* he lays down a theory of art, and establishes principles of beauty. His philosophical views were in many respects opposed to those of Plato. He does not admit an absolute conception of the beautiful; but he distinguishes beauty from the good, the useful, the fit, and the necessary. He resolves beauty into certain elements, as order, symmetry, definiteness. A distinction of beauty, according to him, is the absence of lust or desire in the pleasure it excites. Beauty has no utilitarian or ethical object; the aim of art is merely to give immediate pleasure; its essence is imitation. Plotinus agrees with Plato, and disagrees

with Aristotle, in holding that beauty may subsist in single and simple objects, and consequently in restoring the absolute conception of beauty. He differs from Plato and Aristotle in raising art above nature. Baumgarten's treatment of æsthetics is essentially Platonic. He made the division of philosophy into logic, ethics, and æsthetics; the first dealing with knowledge, the second with action (will and desire), the third with beauty. He limits æsthetics to the conceptions derived from the senses, and makes them consist in confused or obscured conceptions, in contradistinction to logical knowledge, which consists in clear conceptions. Kant, in his *Critique of the Power of Judgment*, defines beauty in reference to his four categories, quantity, quality, relation, and modality. In accordance with the subjective character of his system he denies an absolute conception of beauty, but his detailed treatment of the subject is inconsistent with the denial. Thus he attributes a beauty to single colours and tones, not on any plea of complexity, but on the ground of purity. He holds also that the highest meaning of beauty is to symbolize moral good, and arbitrarily attaches moral characters to the seven primary colours. The value of art is mediate, and the beauty of art is inferior to that of nature. The treatment of beauty in the systems of Schelling and Hegel could with difficulty be made comprehensible without a detailed reference to the principles of these remarkable speculations. English writers on beauty are numerous, but they rarely ascend to the heights of German speculation. Shaftesbury adopted the notion that beauty is perceived by a special internal sense; in which he was followed by Hutcheson, who held that beauty existed only in the perceiving mind, and not in the object. Numerous English writers, among whom the principal are Alison and Jeffrey, have supported the theory that the source of beauty is to be found in association—a theory analogous to that which places morality in sympathy. The ability of its supporters gave this view a temporary popularity, but its baselessness has been effectively exposed by successive critics. Dugald Stewart attempted to show that there is no common quality in the beautiful beyond that of producing a certain refined pleasure; and Bain agrees with this criticism, but endeavours to restrict the beautiful within a group of emotions chiefly excited by association or combination of simpler elementary feelings. Herbert Spencer has a theory of beauty which is subservient to the theory of evolution. He makes beauty consist in the play of the higher powers of perception and emotion, defined as an activity not directly subservient to any processes conducive to life, but

being gratifications sought for themselves alone. He classifies æsthetic pleasures according to the complexity of the emotions excited, or the number of powers duly exercised; and he attributes the depth and apparent vagueness of musical emotions to associations with vocal tones built up during vast ages. Among numerous writers who have made valuable contributions to the scientific discussion of æsthetics may be mentioned Winckelmann, Lessing, Richter, the Schlegels, Gervinus, Helmholtz, Ruskin, Home, Hogarth, Burke, Taine, and others.—BIBLIOGRAPHY: Herbert Spencer, *Principles of Psychology*; Grant Allen, *Physiological Æsthetics*; A. Bain, *Emotions and Will*; B. Bosanquet, *History of Æsthetics*; W. Knight, *Philosophy of the Beautiful*.

Æstiva'tion, a botanical term applied to the arrangement of the parts of a flower in the flower-bud previous to the opening of the bud.—The term is also applied to the summer sleep of animals. See *Dormant State*.

Æth'eling. See *Atheling*.

Æ'ther. See *Ether*.

Æthio'pia. See *Ethiopia*.

Æ'thrioscope (Gr. *aithrios*, clear, cloudless), an instrument (devised by Sir John Leslie) for measuring radiation towards a clear sky, consisting of a metallic cup with a highly-polished interior of paraboloid shape, in the focus of which is placed one bulb of a differential thermometer, the other being outside. The inside bulb at once begins to radiate heat when exposed to a clear sky, and the extent to which this takes place is shown by the scale of the thermometer. The æthrioscope also indicates the presence of invisible aqueous vapour in the atmosphere, radiation being less than when the air is dry.

Æthu'sa, a genus of umbelliferous plants. See *Fool's Parsley*.

Ætiology (Gr. *aitia*, cause, and *logos*, discourse), the theory of the physical causes of any class of phenomena, or the science of causation. It is, however, mainly used in medicine, and deals with the causes and origin of disease.

Æt'ius, a general of the western Roman Empire, born A.D. 396; murdered 454. As commander in the reign of Valentinian III he defended the empire against the Huns, Visigoths, Franks, Burgundians, &c., completely defeating the Huns under Attila in a great battle at Châlons in 451. For twenty years he was at the head of public affairs, and in the end was murdered by Valentinian, who was jealous of his power.

Æt'na. See *Etna*.

Æto'lia, a western division of northern Greece, separated on the west by the Achelous from Acarnania and washed by the Corinthian Gulf on the south. The inhabitants are little heard of in Greek history till the Peloponnesian war, at which time they were notorious among the Greeks for the rudeness of their manners. Ætolia, in conjunction with Acarnania, now forms a nomarchy of the kingdom of Greece.

Afanasiev, Alexander Nicolaievitch, Russian folklorist, born in 1826. Besides numerous articles and essays he wrote several monumental works: *The Ancient Slav's Poetic View of Nature* (3 vols., 1866-9), *Russian Tales and Fables for Children* (3 vols., 1870), &c. He died in 1871.

Affida'vit, a written statement of facts upon oath or affirmation. Affidavits are generally made use of when evidence is to be laid before a judge or a court, while evidence brought before a jury is delivered orally. The person making the affidavit signs his name at the bottom of it, and swears that the statements contained in it are true. The affidavit may be sworn to in open court, or before a magistrate or other duly qualified person; it may be made abroad before a qualified British state official.

Affin'ity, in chemistry, the force by which unlike kinds of matter combine so intimately that the properties of the constituents are lost, and a compound with new properties is produced. Of the force itself we know little or nothing. It is not the same under all conditions, being very much modified by circumstances, especially temperature. The usual effect of increase of temperature is to diminish affinity and ultimately to cause the separation of a compound into its constituents; and there is probably for every compound a temperature above which it could not exist, but would be broken up. Where two elements combine to form a compound, heat is almost always evolved, and the amount evolved serves as a measure of the affinity. In

order that chemical affinity may come into play it is necessary that the substances should be in contact, and usually one of them at least is a fluid or a gas. The results produced by chemical combination are endlessly varied. Colour, taste, and smell are changed, destroyed, or created; harmless constituents produce strong poisons, strong poisons produce harmless compounds.

Affinity, in law, is that degree of connection which subsists between one of two married persons and the blood relations of the other. It is no real kindred (consanguinity). A person cannot, by legal succession, receive an inheritance from a relation by affinity; neither does it extend to the nearest relations of husband and wife so as to create a mutual relation between them. The degrees of affinity are computed in the same way as those of consanguinity or blood. All legal impediments arising from affinity cease upon the death of the husband or wife, excepting those which relate to the marriage of the survivor.

Affirma'tion, a solemn declaration by Quakers, Moravians, Dunkers, and others, who object to taking an oath, in confirmation of their testimony in courts of law, or of their statements on other occasions on which the sanction of an oath is required of other persons. In England the form for Quakers is, 'I do solemnly, sincerely, and truly declare and affirm'. Affirmation is generally allowed to be substituted for an oath in all cases where a person refuses to take an oath from conscientious motives, if the judge is satisfied that the motives are conscientious. False affirmation is subjected to the same penalties as perjury.

Affreightment means the contract of carriage of goods by sea, by which the shipowner undertakes to carry goods in his ship for hire or *freight*. Unless otherwise stipulated, the merchant or freighter is only bound to pay the freight upon delivery of the goods at the agreed destination. If the voyage is abandoned, the merchant may claim his goods without any payment. The merchant must load and discharge his cargo within the *lay-days* or stipulated time, if any; otherwise within a reasonable time. Failure entails liability in damages—known as *demurrage*—for undue detention of the ship. The merchant will also be liable in damages—known as *dead-freight*—if he fails to furnish the full cargo promised. The shipowner has a lien on the goods for their own freight and charges, but not for a general

balance. Nor has he any lien for dead-freight or demurrage. All such liens may be validly stipulated for in the contract. They are purely possessory as contrasted with the so-called maritime liens for seamen's and shipmasters' wages, which are valid without possession. There is no lien for *advance freight*, which in Scotland is repayable if the cargo is lost at sea or delivery otherwise prevented, but not so in England. In Scotland, accordingly, the burden of insuring advance freight falls upon the shipowner, in England upon the merchant.

The main obligations upon the shipowner are to provide a seaworthy vessel, carry without undue delay, and deliver the goods in the same condition as they were shipped. Unless otherwise agreed, he is liable for damage or loss through negligence, and if he be a common carrier, as he frequently is, even the absence of negligence may not save him. There is nothing in British law, however, to prevent him from contracting out of all responsibility for the safety of goods committed to his care, and he generally does so, either by inserting what is known as an 'exception clause' in the document evidencing the contract, viz. the Bill of Lading, or by giving public notice that he only accepts goods upon that footing. In this respect the position of shipowners is more favourable than that of railway companies and other land carriers, whose freedom of contract is curtailed by statute.—
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Affrique (a' f-rēk), St., a town of southern France, department of Aveyron.

Afghanistan (a' f-gän'i-stän), that is, the land of the Afghans, a country in Asia, bounded on the east by the N. W. Frontier Province, &c., on the south by Baluchistan, on the west by the Persian province of Khorasan, and on the north by Bukhara and Russian Turkestan. The eastern and southern boundaries were settled in 1893, whilst the boundary towards Persia was demarcated between March, 1903, and May, 1905. The area may be set down at about 250,000 sq. miles. The population is estimated at 6,000,000. Afghanistan consists chiefly of lofty, bare, uninhabited tablelands, sandy barren plains, ranges of snow-covered mountains, offsets of the Hindu Kush or the Himálaya, and deep ravines and valleys. Many of the last are well watered and very fertile, but about four-fifths of the whole surface is rocky, mountainous, and unproductive. The surface on the north-east is covered

with lofty ranges belonging to the Hindu Kush, whose heights are often 18,000 and sometimes reach perhaps 25,000 feet. The whole north-eastern portion of the country has a general elevation of over 6000 feet; but towards the south-west, in which direction the principal mountain chains of the interior run, the general elevation declines to not more than 1600 feet. In the interior the mountains sometimes reach the height of 15,000 feet. Great part of the frontier towards India consists of the Suleiman range, 12,000 feet high. There are numerous practicable avenues of communication between Afghanistan and India, among the most extensively used being the famous Khyber Pass, by which the River Kabul enters the Punjab; the Gomul Pass, also leading to the Punjab; and the Bolan Pass on the south, through which the route passes to Sind. Of the rivers the largest is the Helmund, which flows in a south-westerly direction more than 400 miles, till it enters the Hamoon or Seistan swamp. It receives the Arghandab, a considerable stream. Next in importance are the Kabul in the north-east, which drains to the Indus, and the Hari Rud in the north-west, which, like other Afghan streams, loses itself in the sand. The climate is extremely cold in the higher, and intensely hot in the lower regions, yet on the whole it is salubrious. The most common trees are the pine, oak, birch, and walnut. In the valleys fruits, in the greatest variety and abundance, grow wild. The principal crops are wheat (forming the staple food of the people), barley, rice, and maize. Other crops are tobacco, sugar-cane, and cotton. The chief domestic animals are the dromedary, the horse, ass, and mule, the ox, sheep with large fine fleeces and enormous fat tails, and goats; of wild animals there are the tiger, bears, leopards, wolves, jackal, hyena, foxes, &c. The chief towns are Kabul (the capital), Kandahar, Ghuzni, and Herat. The inhabitants belong to different races, but the Afghans proper form the great mass of the people. They are allied in blood to the Persians, and are divided into a number of tribes, among which the Duranis and Ghiljis are the most important. The Afghans, claiming descent from King Saul, are called by their own ancient chroniclers Beni-Israel. They are bold, hardy, and warlike, fond of freedom and resolute in maintaining it, but of a restless, turbulent temper, and much given to plunder. Tribal dissensions are constantly in existence, and seldom or never do all the Afghans pay allegiance to the nominal ruler of their country. Their language (Pushtu) is distinct from the Persian, though it contains a great number of Persian words, and is written, like the Persian,

with the Arabic characters. In religion they are Mahommedans of the Sunnite sect.

After having been subjugated by Alexander the Great, the country of the Afghans fell successively under the sway, actual or nominal, of Parthians, Seleucidæ, Persians, and Arabs. Djinghiz Khan conquered Afghanistan in the twelfth century and Timur in the fourteenth. In 1504 Sultan Baber took Cabul and founded the Mogul dynasty in India; Afghanistan thus formed part of the great empire of Delhi. In 1738 the country was conquered by the Persians under Nadir Shah. On his death in 1747 Ahmed Shah, one of his generals, obtained the sovereignty of Afghanistan, and became the founder of a dynasty which lasted about eighty years. At the end of that time Dost Mohammed, the ruler of Cabul, had acquired a preponderating influence in the country. On account of his dealings with the Russians the British resolved to dethrone him and restore Shah Shuja, a former ruler. In April, 1839, a British army under Sir John Keane entered Afghanistan, occupied Cabul, and placed Shah Shuja on the throne, a force of 8000 being left to support the new sovereign. Sir W. Macnaghten remained as envoy at Cabul, with Sir Alexander Burnes as assistant envoy. The Afghans soon organized a widespread insurrection, which came to a head on 2nd Nov., 1841, when Burnes and a number of British officers, besides women and children, were murdered, Macnaghten being murdered not long after. The other British leaders now made a treaty with the Afghans, at whose head was Akbar, son of Dost Mohammed, agreeing to withdraw the forces from the country, while the Afghans were to furnish them with provisions and escort them on their way. On 6th Jan., 1842, the British left Cabul and began their most disastrous retreat. The cold was intense, they had almost no food—for the treacherous Afghans did not fulfil their promises—and day after day they were assailed by bodies of the enemy. By the 13th 26,000 persons, including camp-followers, women and children, were destroyed. Some were kept as prisoners, but only one man, Dr. Brydon, reached Jelalabad, which, as well as Kandahar, was still held by British troops. In a few months General Pollock, with a fresh army from India, retook Cabul and soon finished the war. Shah Shuja having been assassinated, Dost Mohammed again obtained the throne of Cabul, and acquired extensive power in Afghanistan. He joined with the Sikhs against the British, but afterwards made an offensive and defensive alliance with the latter. He died in 1863,

having nominated his son Shere Ali his successor. Shere Ali entered into friendly relations with the British, but in 1878, having repulsed a British envoy and refused to receive a British mission (a Russian mission being meantime at his Court), war was declared against him, and the British troops entered Afghanistan. They met with comparatively little resistance; the Ameer fled to Turkestan, where he soon after died; and his son Yakoob Khan having succeeded him concluded a treaty with the British (at Gandamak, May, 1879), in which a certain extension of the British frontier, the control by Britain of the foreign policy of Afghanistan, and the residence of a British envoy in Cabul, were the chief stipulations. Not long after this settlement, the British resident at Cabul, Sir Louis P. Cavagnari, and the other members of the mission were treacherously attacked and slain by the Afghans, and troops had again to be sent into the country. Cabul was again occupied, and Kandahar and Ghazni were also relieved; while Yakoob Khan was sent to imprisonment in India. In 1880 Abdur-Rahman, a grandson of Dost Mohammed, was recognized by Britain as ameer of the country. He was on friendly terms with the British during his reign, which ended with his death in 1901, his son Habibullah being his successor. He had adopted the title of Sirajul-Millat wa ud-din, 'Lamp of the Nation and Religion'. In a treaty signed on 21st March, 1905, the Ameer recognized the engagements which his father had entered into with the British Government. Encroachments by the Russians on territory claimed by Afghanistan almost brought about a rupture between Britain and Russia in 1885, and led to the delimitation of the frontier of Afghanistan on the side next Russia. On 31st Aug., 1907, an Anglo-Russian Convention relating to Afghanistan was signed. The Russian Government recognized Afghanistan as outside the Russian sphere of influence, whilst Great Britain undertook neither to annex nor occupy any portion of Afghanistan. In spite of German intrigues, the Ameer refused, in 1915, the inducements held out to him to abandon his British ally. He was assassinated on 20th Feb., 1919, and was succeeded by his third son Amanullah. The new Ameer sought to gain popularity with his subjects by embarking on an unprovoked war of aggression upon India. Hostilities broke out in May, 1919, and ended with a peace treaty signed at Rawalpindi on 8th Aug., 1919. In 1922 the first Afghan minister was appointed to London (instead of to Delhi).—
BIBLIOGRAPHY: MacGregor, *Gazetteer of Afghanistan*; Malleon, *History of*

Afghanistan; Forbes, *The Afghan Wars*; Field-Marshal Earl Roberts, *Forty-one Years in India*; J. G. Lyons, *Afghanistan: the Buffer State*.

Afium-Kara-Hissar ('opium-black-castle'), a city of Asia Minor, 170 miles E.S.E. of Constantinople, with manufactures of woollen goods, and a trade in opium (*afium*), &c. Pop. about 20,000.

Afrag'ola, a town of Italy, about 6 miles N.N.E. of Naples. Pop. 23,155.

Afra'nus, Lucius, a Roman comic dramatist who flourished about the beginning of the first century B.C., and of whose writings only fragments remain.



Af'rica, one of the three great divisions of the Old World, and the second in extent of the five principal continents of the globe, forming a vast peninsula joined to Asia by the Isthmus of Suez. It is of a compact form, with few important projections or indentations, and having therefore a very small extent of coast-line (about 16,000 miles, or much less than that of Europe) in proportion to its area. This continent extends from $37^{\circ} 21' \text{ N. lat.}$ to $34^{\circ} 51' \text{ s. lat.}$, and the extreme points, Cape Blanco and Cape Agulhas, are nearly 5000 miles apart. From west to east, between Cape Verde, lon. $17^{\circ} 34' \text{ w.}$, and Cape Guardafui, lon. $51^{\circ} 16' \text{ E.}$, the distance is about 4600 miles. The area is estimated at 11,500,000 sq. miles, or more than three times that of Europe. The islands belonging to Africa are not numerous, and, except Madagascar, none of them are large. They include Madeira, the Canaries, Cape Verde Islands, Fernando Po, Principe, São Thomé, Ascension, St. Helena, Mauritius, Réunion, the Comoros, Socotra, &c.

The interior of Africa is as yet imperfectly known, but we know enough of the continent as a whole to be able to point to some general features that characterize it. One of these is that almost all round it at no great distance from the sea, and, roughly speaking, parallel with the coast-line, we find

ranges of mountains or elevated lands forming the outer edges of interior plateaux. The most striking feature of Northern Africa is the immense tract known as the Sahara or Great Desert, which is enclosed on the north by the Atlas Mountains (greatest height, 12,000 to 15,000 feet), the plateau of Barbary and that of Barca, on the east by the mountains along the west coast of the Red Sea, on the west by the Atlantic Ocean, and on the south by the Sudan. The Sahara is by no means the sea of sand it has sometimes been represented: it contains elevated plateaux and even mountains radiating in all directions, with habitable valleys between. A considerable nomadic population is scattered over the habitable parts, and in the more favoured regions there are settled communities. The Sudan, which lies to the south of the Sahara, and separates it from the more elevated plateau of Southern Africa, forms a belt of pastoral country across Africa, and includes the countries on the Niger, around Lake Tchad (or Chad), and eastwards to the elevated region of Abyssinia. Southern Africa as a whole is much more fertile and well watered than Northern Africa, though it also has a desert tract of considerable extent (the Kalahari Desert). This division of the continent consists of a tableland, or series of tablelands, of considerable elevation and great diversity of surface, exhibiting hollows filled with great lakes, and terraces over which the rivers break in falls and rapids, as they find their way to the low-lying coast tracts. The mountains which enclose Southern Africa are mostly much higher on the east than on the west, the most northerly of the former being those of Abyssinia, with heights of 10,000 to 14,000 or 16,000 feet, while the eastern edge of the Abyssinian plateau presents a steep unbroken line of 7000 feet in height for many hundred miles. Farther south, and between the great lakes and the Indian Ocean, we find Mounts Kenya and Kilimanjaro (19,500 feet), the loftiest in Africa, covered with perpetual snow. Of the continuation of this mountain boundary we shall only mention the Drakenberg Mountains, which stretch to the southern extremity of the continent, reaching, in Cathkin Peak, Natal, the height of over 10,000 feet. Of the mountains that form the western border the highest are the Cameroon Mountains, which rise to a height of 13,000 feet at the inner angle of the Gulf of Guinea. The average elevation of the southern plateau is from 3000 to 4000 feet.

The Nile is the only great river of Africa which flows into the Mediterranean. It receives its waters primarily from the great lake Victoria

Nyanza, which lies under the equator, and in its upper course is fed by tributary streams of great size, but for the last 1200 miles of its course it has not a single affluent. It drains an area of more than 1,000,000 sq. miles. The Indian Ocean receives numerous rivers; but the only great river of South Africa which enters that ocean is the Zambezi, the fourth in size of the continent, and having in its course the Victoria Falls, one of the greatest waterfalls in the world. In Southern Africa also, but flowing westward and entering the Atlantic, is the Congo, which takes its origin from a series of lakes and marshes in the interior, is fed by great tributaries, and is the first in volume of all the African rivers, carrying to the ocean more water than the Mississippi. Unlike most of the African rivers, the mouth of the Congo forms an estuary. Of the other Atlantic rivers, the Senegal, the Gambia, and the Niger are the largest, the last being third among African streams.

With the exception of Lake Tchad there are no great lakes in the northern division of Africa, whereas in the number and magnificence of its lakes the southern division almost rivals North America. Here are the Victoria and Albert Nyanza, Lakes Tanganyika, Nyasa, Shirwa, Bangweulu, Moero, and other lakes. Of these the Victoria and Albert belong to the basin of the Nile; Tanganyika, Bangweulu, and Moero to that of the Congo; Nyasa, by its affluent the Shiré, to the Zambezi. Lake Tchad on the borders of the northern desert region is now known to be much smaller than was formerly believed, but varies in area according to the season. Lake Ngami in the far south is now a mere swamp.

The climate of Africa is mainly influenced by the fact that it lies almost entirely within the tropics. In the equatorial belt, both north and south, rain is abundant and vegetation very luxuriant, dense tropical forests prevailing for about 10° on either side of the line. To the north and south of the equatorial belt the rainfall diminishes, and the forest region is succeeded by an open pastoral and agricultural country. This is followed by the rainless regions of the Sahara on the north and the Kalahari Desert on the south, extending beyond the tropics, and bordering on the agricultural and pastoral countries of the north and south coasts, which lie entirely in the temperate zone. The low coast regions of Africa are almost everywhere unhealthy, the Atlantic coast within the tropics being the most fatal region to Europeans.

Among mineral productions may be mentioned gold, which is found in the rivers of West Africa (hence the name Gold Coast), and in Southern Africa, most abundantly in the Transvaal; diamonds have been found in large numbers in recent years in the south; iron, copper, lead, tin, and coal are also found.—Among plants are the baobab, the date-palm (important as a food plant in the north), the doum-palm, the oil-palm, the wax-palm, the shea-butter tree, trees yielding caoutchouc, the papyrus, the castor-oil plant, indigo, the coffee-plant, heaths with beautiful flowers, aloes, &c. Among cultivated plants are wheat, maize, millet, and other grains, cotton, coffee, cassava, ground-nut, yam, banana, tobacco, various fruits, &c. As regards both plants and animals, Northern Africa, adjoining the Mediterranean, is distinguished from the rest of Africa in its great agreement with Southern Europe.—Among the most characteristic African animals are the lion, hyena, jackal, gorilla, chimpanzee, baboon, African elephant (never domesticated, yielding much ivory to trade), hippopotamus, rhinoceros, giraffe, zebra, quagga, antelopes in great variety and immense numbers.—Among birds are the ostrich, the secretary-bird or serpent-eater, the honey-guide cuckoo, sacred ibis, guinea fowl.—The reptiles include the crocodile, chameleon, and serpents of various kinds, some of them very venomous. Among insects are locusts, scorpions, the tsetse-fly whose bite is so fatal to cattle, and white-ants.

The great races of which the population of Africa mainly consists are the Eastern Hamites (who are not a distinct race but a blend), the Semites, the Negroes, and the Bantus. To the Semitic stock belong the Arabs, who form a considerable portion of the population in Egypt and along the north coast, while a portion of the inhabitants of Abyssinia is of the same race. The Hamites are represented, according to Sergi, by the Copts of Egypt, the Berbers, Kabyles, &c., of Northern Africa, and the Somâli, Danâkil, &c., of East Africa. The Negro races occupy a vast territory in the Sudan and Central Africa, while the Bantus occupy the greater part of Southern Africa from a short distance north of the equator, and include the Kaffirs, Bechuanas, Swahili, and allied races. In the extreme south-west are the Hottentots and Bushmen (the latter a dwarfish race), distinct from the other races as well as, probably, from each other. In Madagascar there is a large Malay element. To these may be added the Fulahs on the Niger and the Nubians on the Nile and elsewhere, who are of a brownish colour, and are

often regarded as distinct from the other races, though sometimes classed with the Negroes. In religion a great proportion of the inhabitants are heathens of the lowest type; Mohammedanism numbers a large number of adherents in North Africa, and is rapidly spreading in the Sudan; Christianity prevails only among the Copts, the Abyssinians, and the natives of Madagascar, the last-named having been converted in recent times. Elsewhere the missionaries seem to have made but little progress. Over a great part of the continent civilization is at a low ebb, yet in some parts the natives have shown considerable skill in agriculture and various mechanical arts, as in weaving and metal working. Of African trade two features are the caravans that traverse great distances, and the trade in slaves that still widely prevails, though it has been greatly restricted in recent years. Among articles exported from Africa are palm-oil, diamonds, ivory, ostrich feathers, wool, cotton, gold, esparto, caoutchouc, &c. The population is estimated at 180,000,000. Of these a small number are of European origin—French in Algeria and Morocco, British and Dutch at the southern extremity.

Great areas in Africa have been apportioned among European Powers as protectorates or spheres of influence. Among native States still more or less independent are Egypt, Abyssinia, Waday, Bagirmi, Liberia. To Britain belong the Cape Province, Natal, the Orange Free State and Transvaal, with Rhodesia, &c., farther north, a region in Eastern Africa extending from the sea to Lake Victoria and the headwaters of the Nile, Nigeria, Gold Coast, and other tracts on the west, with Mauritius, &c.; to France belong Algeria and Tunis, Senegambia, Zone of Morocco, territory north of the Lower Congo, Madagascar, &c.; the Portuguese possess Angola on the west coast and Mozambique on the east; Italy has a territory on the Red Sea, and part of Somaliland; Spain has a part of the coast of the Sahara; the Congo State is a colony of Belgium; Zanzibar is merged in Kenya Colony. Germany was deprived of her possessions in Africa during the European War, and the Peace Conference of 1919 appointed Great Britain, France, and Belgium to act as mandatories of the League of Nations.

The name Africa was given by the Romans at first only to a small district in the immediate neighbourhood of Carthage. The Greeks called Africa Libya, and the Romans often used the same name. The first African exploring expedition on record was sent by Pharaoh Necho about the end of the seventh century B.C. to circumnavigate the continent. The navigators, who

were Phœnicians, were absent three years, and according to report they accomplished their object. Fifty or a hundred years later, Hanno, a Carthaginian, made a voyage down the west coast and seems to have got as far as the Bight of Benin. The east coast was probably known to the ancients as far as Mozambique and the island of Madagascar. Of modern nations the Portuguese were the first to take in hand the exploration of Africa. In 1433 they doubled Cape Bojador, in 1441 reached Cape Blanco, in 1442 Cape Verde, in 1462 they discovered Sierra Leone. In 1484 the Portuguese Diego Cam discovered the mouth of the Congo. In 1486 Bartholomew Diaz rounded the Cape of Good Hope and reached Algoa Bay. A few years later a Portuguese traveller visited Abyssinia. In 1497 Vasco da Gama, who was commissioned to find a route by sea to India, sailed round the southern extremity as far as Zanzibar, discovering Natal on his way. The first European settlements were those of the Portuguese in Angola and Mozambique, soon after 1500. In 1650 the Dutch made a settlement at the Cape. In 1770 James Bruce reached the source of the Blue Nile in Abyssinia. For the exploration of the interior of Africa, however, little was done before the close of the eighteenth century.

Modern African exploration may be said to begin with Mungo Park, who reached the upper course of the Niger (1795-1805). Dr. Lacerda, a Portuguese, about the same time reached the capital of the Cazembe, in the centre of South Africa, where he died. During 1802-6 two Portuguese traders crossed the continent from Angola, through the Cazembe's dominions, to the Portuguese possessions on the Zambezi. During 1822-4 extensive explorations were made in Northern and Western Africa by Denham, Clapperton, and Oudney, who proceeded from Tripoli by Murzuq to Lake Tchad, and explored the adjacent regions; Laing, in 1826, crossed the desert from Tripoli to Timbuktu; Caillié, leaving Senegal, made in 1827-8 a journey to Timbuktu, and thence through the desert to Morocco. In 1830 Lander traced a large part of the course of the Niger downward to its mouth, discovering its tributary the Benue. In the south Livingstone, who was stationed as a missionary at Kolobeng, setting out from that place in 1849 discovered Lake Ngami. In 1851 he went north again, and came upon numerous rivers flowing north, affluents of the Zambezi. In 1848 and 1849 Krapf and Rebmann, missionaries in East Africa, discovered the mountains Kilimanjaro and Kenya. An expedition sent out by the British Government

started from Tripoli in 1850 to visit the Sahara and the regions around Lake Tchad, the chiefs being Richardson, Overweg, and Barth. The last alone returned in 1855, having carried his explorations over 2,000,000 sq. miles of this part of Africa, hitherto almost unknown. During 1853-6 Livingstone made an important series of explorations. He first went north-westwards, tracing part of the Upper Zambezi, and reached St. Paul de Loanda on the west coast in 1854. On his return journey he followed pretty nearly the same route till he reached the Zambezi, and proceeding down the river, and visiting its falls, called by him the Victoria Falls, he arrived at Quelimane at its mouth on 20th May, 1856, thus crossing the continent from sea to sea. In 1858 he resumed his exploration of the Zambezi regions, and in various journeys visited Lakes Shirwa and Nyasa, sailed up the Shiré to the latter lake, and established the general features of the geography of this part of Africa, returning to England in 1864. By this time the great lakes of equatorial Africa were becoming known, Tanganyika and Victoria having been discovered by Burton and Speke in 1858, and the latter having been visited by Speke and Grant in 1862 and found to give rise to the Nile, while the Albert Nyanza was discovered by Baker in 1864. In 1866 Livingstone entered on his last great series of explorations, the main object of which was to settle the position of the watersheds in the interior of the continent, and which he carried on till his death in 1873. His most important explorations on this occasion were west and south-west of Tanganyika, including the discovery of Lakes Bangweulu and Moero, and part of the upper course of the River Congo (here called Lualaba). For over two years he was lost to the knowledge of Europe till met with by H. M. Stanley at Tanganyika in 1871. Gerhard Rohlfs, in a succession of journeys from 1861 to 1874, traversed the Sahara in different directions, and also crossed the continent entirely from Tripoli to Lagos by way of Murzuq, Bornu, &c. During 1873-5 Lieutenant Cameron, who had been sent in search of Livingstone, surveyed Lake Tanganyika, explored the country to the west of it, and then travelling to the south-west, finally reached Benguela on the Atlantic coast. During 1874-7 Stanley surveyed Lakes Victoria Nyanza and Tanganyika and explored the intervening country; then going westward to where Livingstone had struck the Congo he followed the river down to its mouth, thus finally settling its course and completing a remarkable and valuable series of explorations. In 1879 Serpa Pinto completed a journey across the continent from Benguela to Natal, and in 1881-2 Wissman and

Pogge crossed it again from St. Paul de Loanda to Zanzibar. In recent years our knowledge of all parts of Africa has been greatly increased, thanks to the efforts of travellers, missionaries, and commercial agents. Steamers now ply on the Congo, and on Lakes Tanganyika, Nyasa, and Victoria, and numerous railways ('Cape to Cairo', &c.) extend far into the continent.—BIBLIOGRAPHY: Mungo Park, *Travels*; D. Livingstone, *Missionary Travels*; Sir H. M. Stanley, *In Darkest Africa*; Sir H. H. Johnston, *Africa*.

Afridis (a' -frē'diz), a tribe or clan on the north-west frontier of India, about the Khyber Pass, who have at various times given trouble to the British, and are included in a new (1922) scheme of Khassadars (irregulars). In 1897-8 a campaign ('the Tirah campaign') had to be undertaken against them, costly both in men and money, before British authority was asserted. In 1905 the Afridis of the force called the Khyber Rifles formed an escort for the Prince and Princess of Wales on their visit to the famous pass, which was long in their charge.—Cf. Holdich, *The Indian Borderland*.

Afrikander Bund, an association dating from 1880 and founded for the purpose of consolidating Afrikander influence in South Africa. For a time it supported the policy of Cecil Rhodes, but after 1895 separated itself from him. After the war in 1902 the Bund was reorganized, and identified with the South African party whose policy is to further the federation of the South African colonies under the British crown.

A'ga, formerly title of Turkish officers of a lower military rank, now of men of great wealth and influence except learned men and ecclesiastics, to whom the corresponding title of *effendi*, meaning 'elder brother' and subsequently 'master', is given.

Ag'ades, a town of Africa, near the middle of the Sahara, capital of the Saharan oasis of Aïr or Asben; at one time a seat of great traffic, probably containing 60,000 inhabitants, now with a pop. of about 7000.

Agadir, a little town on the Atlantic coast of Morocco, the Santa Cruz May of the Spaniards. It was seized by the Portuguese in the sixteenth century, and captured by Mulai Ahmed in 1536. It was once one of the most important seaports of Morocco, but is now closed to commerce and only used as a customs station, its place being taken by Mogador. In July, 1910, the appearance of a French cruiser in the port of Agadir gave rise to a

Franco-German dispute, and in 1911 Germany sent the gunboat *Panther*, and a few days later the *Berlin*, to Agadir for the protection of German subjects. See *France, Germany*.

Agallochum (a-gal'o-kum), a fragrant wood obtained from *Aloexylon Agallöchum*, a leguminous tree of Cochin-China, and *Aquilāria Agallöcha*, a large tree found in north-east Bengal, abounding in resin and an essential oil which yields a perfume used as incense.

Agal'matolite (Gr. *agalma*, image), a kind of stone, a clay-slate altered by heat and by the addition of alkalies, which is carved into images, &c., by the Chinese.

Ag'ama, a name of several lizards allied to the iguana, natives of both hemispheres.

Agamem'non, in Greek mythology, son of Atreus, King of Mycenæ and Argos, brother of Menelaus, and commander of the allied Greeks at the siege of Troy. Returning home after the fall of Troy, he was treacherously assassinated by his wife, Clytemnestra, and her paramour, Ægisthus, Agamemnon's cousin. He was the father of Orestes, Iphigenia, and Electra.

Ag'ami. See *Trumpeter*.

Agamogenesis (-jen'e-sis; Gr. *a*, priv., *gamos*, marriage, *genesis*, reproduction), the production of young without the congress of the sexes, one of the phenomena of alternate generation. See *Generation* and *Parthenogenesis*.

Aganippe (-nip'ē), daughter of the river-god Parmessos, or Termessos, nymph of a fountain on Mount Helicon, in Greece, sacred to the Muses, which had the property of inspiring with poetic fire whoever drank of it. The name is often given to the wife of Acrisius and mother of Danae.

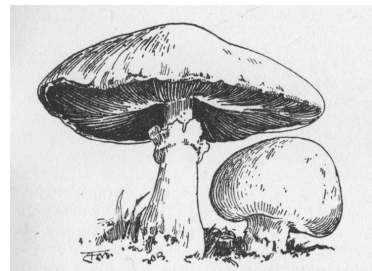
Agape (ag'a-pē; Gr. *agapē*, love), in ecclesiastical history, the love-feast or feast of charity, in use among the primitive Christians, when a liberal contribution was made by the rich to feed the poor. For a time the agape coincided with the *eucharist*, which, at its origin, was clearly funerary in its intention. "For as often as ye eat this bread and drink this cup, ye do show the Lord's death till he come." During the first three centuries love-feasts

were held in the churches without scandal, but in after-times they acquired a bad reputation, not undeservedly, and they were condemned at the Council of Carthage in 397. Some modern sects, as the Wesleyans, Sandemanians, Moravians, &c., have attempted to revive this feast.

Agapemone (ag-a-pem'o-nē; lit. 'the abode of love'), the name of a singular conventual establishment which has existed at Spaxton, near Bridgewater, Somersetshire, since 1859, the originator of it being a certain Henry James Prince, at one time a clergyman of the Church of England, who called himself the Witness of the First Resurrection. The life spent by the inmates appears to be a sort of religious epicureanism. Some of the proceedings of the inmates of the 'Abode of Love' have resulted in applications to the courts of law, where parties formerly members of the society have returned to the world and sought to regain their rights from Prince and his followers, and such cases have caused some scandal. In 1902 Prince was succeeded by T. H. Smyth-Pigott.

A'gar-a'gar, a dried seaweed of the Asiatic Archipelago, the *Gracilaria lichenoides*, much used in the East for soups and jellies, and also by paper and silk manufacturers.

Agar'ic (*Agaricus*), a large and important genus of fungi, characterized by having a fleshy cap or pileus, and a number of radiating plates or gills on which are produced the naked spores. The majority of the species are furnished with stems, but some are attached to the objects on which they grow by their pileus. Over a thousand species are known, and are arranged in five sections according to whether the colour of their spores is white, pink, brown, purple, or black. The chief British representatives are the common wild mushroom (*A. campestris*, L.), the Horse mushroom (*A. arvensis*, Schæff.), *A. elvensis*, B. and Br., *A. silvaticus*, Schæff., &c. Many of the species are edible, like the common mushroom, and supply a delicious article of food, while others are deleterious and even poisonous.



Agaricus campestris, the
Common Mushroom

Agaric Mineral, or **Mountain-meal**, one of the purest of the native carbonates of lime, found chiefly in the clefts of rocks and at the bottom of some lakes in a loose or semi-indurated form resembling a fungus. The name is also applied to a stone of loose consistence found in Tuscany, of which bricks may be made so light as to float in water, and of which the ancients are supposed to have made their floating bricks. It is a hydrated silicate of magnesium, mixed with lime, alumina, and a small quantity of iron.

Aga'sias, a Greek sculptor of Ephesus, about 400 B.C., whose celebrated statue, known as the Borghese Gladiator, representing a soldier contending with a horseman, is now in the Louvre, Paris.

Agassiz (ag'as-ē), Louis John Rudolph, an eminent naturalist, born 1807, died 1873, son of a Swiss Protestant clergyman at Motiers, near the eastern extremity of the Lake of Neufchâtel. He completed his education at Lausanne, and early developed a love of the natural sciences. He studied medicine at Zürich, Heidelberg, and Munich. His attention was first specially directed to ichthyology by being called on to describe the Brazilian fishes brought to Europe from Brazil by Martius and Spix. This work was published in 1829, and was followed in 1830 by *Histoire Naturelle des Poissons d'eaux douces de l'Europe Centrale* (Fresh-water Fishes of Central Europe). Directing his attention to fossil ichthyology, five volumes of his *Recherches sur les Poissons Fossiles* appeared between 1834 and 1844. His researches led him to propose a new classification of fishes, which he divided into four classes, distinguished by the characters of the skin, as ganoids, placoids, cycloids, and ctenoids. His system has not been generally adopted, but the names of his classes have been taken as useful terms. In 1836 he began the study of glaciers, and in 1840 he published his *Études sur les Glaciers*, in 1847 his *Système Glaciaire*. From 1838 he had been professor of natural history at Neufchâtel, when in 1846 pressing solicitations and attractive offers induced him to settle in America, where he was connected as a teacher first with Harvard University, Cambridge, and afterwards with Cornell University as well as Harvard. After his arrival in America he engaged in various investigations and explorations, and published numerous works, including: *Principles of Zoology*, in connection with Dr. A. Gould (1848); *Contributions to the Natural History of the United States* (4 vols., 1857-62); *Zoologie Générale*

(1854); *Methods of Study in Natural History* (1863). In 1865-6 he made zoological excursions and investigations in Brazil, which were productive of most valuable results. Agassiz held views on many important points in science different from those which prevailed among the scientific men of the day, and in particular he strongly opposed the evolution theory. Cf. *Letters and Recollections*, edited by G. R. Agassiz.

Agassiz (ag'a-sē), Mount, an extinct volcano in Arizona, United States, 10,000 feet in height; a place of summer resort, near the Great Cañon of the Colorado.

Ag'ate, a semi-translucent compound mineral mass formed in the cavities of rocks by the successive deposition of various types of silica, or by the staining of a siliceous mass thus deposited along concentric zones. Bands or layers of various colours blended together, the base generally being chalcedony, and this mixed with variable proportions of jasper, amethyst, quartz, opal, heliotrope, and carnelian. The varying manner in which these materials are arranged causes the agate when polished to assume some characteristic appearances, and thus certain varieties are distinguished, as the ribbon agate, the fortification agate, the zone agate, the star agate, the moss agate, the clouded agate, &c. In Scotland they are cut and polished under the name of Scottish pebbles.

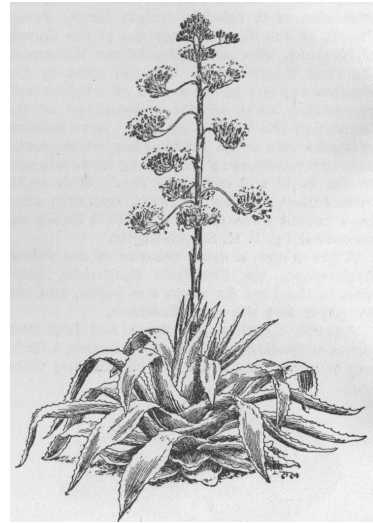
Agathar'chus, a Greek painter, native of Samos, the first to paint a scene for the acting of tragedies. The view, however, that he applied the rules of perspective to theatrical scene-painting is doubtful. He flourished about 480 B.C.

Agath'ias, a Greek poet and historian, born at Myrina, Asia Minor, about A.D. 530; author of an anthology, a collection of love poems, and a history of his own times, which is our chief authority for the period 552-8, during which time the Byzantine army was struggling against the Goths, Vandals, and Franks.

Agathocles (a-gath'o-klēz), a Sicilian Greek, one of the boldest adventurers of antiquity, born 361 B.C. By his ability and energy, and being entirely unscrupulous, he raised himself from being a potter to being tyrant of Syracuse and master of Sicily. Wars with the Carthaginians were the chief events of his life. He died at the age of seventy-two.

Ag'athon, a Greek tragic poet, a friend of Euripides, and contemporary with Socrates and Alcibiades, born about 445 B.C., died about 402 B.C. The banquet which he gave to celebrate his first dramatic victory was made the groundwork of Plato's *Symposium*.

Agave (a-gā'vē), a genus of plants, nat. ord. Amaryllidaceæ (which includes the daffodil and narcissus), popularly known as American aloes. They are generally large, and have a massive tuft of fleshy leaves with a spiny apex. They live for many years—ten to seventy according to treatment—before flowering. When this takes place, the tall flowering stem springs from the centre of the tuft of leaves, and grows very rapidly until it reaches a height of 15, 20, or even 40 feet, bearing towards the end a large number of flowers. The best-known species is *A. americāna*, known as the Maguey or 'tree of wonders', introduced into Spain in 1561, and now



Agave (*Agave americana*)

extensively grown in the warmer parts of this continent as well as in Asia (India in particular). This and other species yield various important products, the chief being the fibre obtained by maceration from the leaves and roots, and known commercially as American aloe, pita flax, or vegetable silk. The sap when fermented yields a beverage resembling cider, the *pulque* beer of the Spaniards, or is distilled into an intoxicating spirit (Mezcal or Aguardiente). The leaves are used for feeding cattle; the fibres of the leaves are formed into thread, cord, and ropes, and are also good material for paper-making; an extract from the leaves is used as a substitute for soap; slices of the withered flower-stem are used as razor-strops.

Agde (a'gd), a seaport of southern France, department of Hérault, with a cathedral, an ancient and remarkable structure. The trade, chiefly coasting, is extensive. Pop. 9265.

Age, a period of time representing the whole or a part of the duration of any individual thing or being, but used more specifically in a variety of senses. In law *age* is applied to the periods of life when men and women are enabled to do that which before, for want of years and consequently of

judgment, they could not legally do. A male at twelve years old may take the oath of allegiance; at fourteen is at years of discretion, and therefore may choose his guardian or be an executor, although he cannot act until of age; and at twenty-one is at his own disposal, and may alienate and devise his lands, goods, and chattels. In English law a male at fourteen and a female at twelve may consent or disagree to marriage, but it cannot be celebrated without the consent of the parents or guardians until the parties are of age. A female at fourteen is at years of legal discretion, and may choose a guardian; at seventeen may be an executrix; and at twenty-one may dispose of herself and her lands. So that full age in male or female is twenty-one years, which age is completed on the day preceding the anniversary of a person's birth, who till that time is an infant, and so styled in law. In France majority is attained at twenty-one, whilst the marriageable age is eighteen for males and fifteen for females, subject to consent of parents or guardians. In England no one can take a seat in Parliament under twenty-one, be ordained a priest under twenty-four, nor made a bishop under thirty. In France a seat in the Chamber of Deputies may be taken only at twenty-five and in the Senate at forty. The law of Scotland divides life into three periods—pupilarity, minority, and majority. The first extends up to the time of legal puberty, that is, twelve years for a female and fourteen for a male, when they may marry; the second extends from this point up to twenty-one years, which is the time when majority is attained.

The term is also applied to designate the successive epochs or stages of civilization in history or mythology. Hesiod speaks of five distinct ages:—
1. The *golden* or *Saturnian age*, a patriarchal and peaceful age. 2. The *silver age*, licentious and wicked. 3. The *brazen age*, violent, savage, and warlike. 4. The *heroic age*, which seemed an approximation to a better state of things. 5. The *iron age*, when justice and honour had left the earth. The term is also used in such expressions as the *dark ages*, the *middle ages*, the *Elizabethan age*, &c.

The *Archæological Ages* or *Periods* are three—the Stone Age, the Bronze Age, and the Iron Age, these names being given in accordance with the materials chiefly employed for weapons, implements, &c., during the particular period. The Stone Age of Europe has been subdivided into two—the Palæolithic or earlier, and Neolithic or later. The word *age* in this sense has no reference to the lapse of time—or not necessarily so—but simply

refers to the stage at which a people has arrived in its progress towards civilization; thus there are races still in their stone age. The Palæolithic or earlier stone age in Europe was doubtless immensely earlier than the Neolithic, the latter being marked by implements of much greater finish than the former. See *Stone Age*.

Agen (a'-zhan'), one of the oldest towns in France, capital of department Lot-et-Garonne on the Garonne, 74 miles south-east of Bordeaux; see of a bishop; manufactures sailcloth and other articles, and has an extensive trade. The river is here crossed by a stone bridge, a suspension bridge, and a canal aqueduct. Pop. 23,294.

Agenor (a-jē'nor), a mythical Greek hero, King of Phœnicia, and father of Europa and Cadmus. Also one of the bravest among the Trojans, slain by Neoptolemus.

A'gent, a person appointed by another to act for or perform any kind of business for him, the latter being called in relation to the former the *principal*. Ambassadors were originally styled diplomatic agents.—In India, it is the name for an officer to whom political power is given to deal with native states.—*Army Agent* is a kind of military banker, authorized by the Government to manage the monetary affairs of a regiment. There are only a few of these agents, and consequently each has in charge the affairs of a number of different regiments.—*Crown Agents* are officials appointed by the secretary of state for the colonies to act as commercial and financial agents in this country for the different British colonies that are not self-governing; those that are self-governing appoint their own agents, who are designated *agents-general*.—*Agent* in mechanics is the general force producing a movement.

Ageratum (a-ger'a-tum), a genus of composite plants of the warmer parts of America, one species of which, *A. mexicanum*, is a well-known flower-border annual with dense lavender-blue heads. From it have been derived several varieties with flowers of different colours used chiefly as bedding plants.

Ager Publicus. See *Agrarian Law*.

Agesilaus (a-jes-i-lā'us), a king of Sparta, born in 444 B.C., and elevated to the throne after the death of his brother Agis II. He acquired renown by his exploits against the Persians, Thebans, and Athenians. Though a vigorous ruler, and almost adored by his soldiers, he was of small stature and lame from his birth. He died in Egypt in the winter of 361-360 B.C. His life has been written by Xenophon, Plutarch, and Cornelius Nepos.

Agglom'erate, in geology, a collective name for masses consisting of angular fragments ejected from volcanoes. When a rock mass consists largely of fragments worn and rounded by water it is called a *conglomerate*, and such masses were originally, no doubt, gravels and shingles on sea beaches and river channels.

Agglu'tinate Languages, languages in which the modifying suffixes are, as it were, glued on to the root, both it and the suffixes retaining a kind of distinctive independence and individuality, as in the Japanese, Turkish, and other Turanian languages, and the Basque language.

Agg'regate, a term applied in geology to rocks composed of several different mineral constituents capable of being separated by mechanical means, as granite, where the quartz, felspar, and mica can be separated mechanically.—In botany it is applied to flowers composed of many small florets having a common undivided receptacle, the anthers being distinct and separate, the florets commonly standing on stalks, and each having a partial calyx.

Aggry Beads, glass beads of various forms and colours, prized by the natives of West Africa as ornaments, and as having magical and medicinal virtues. Their origin and history are not well known. Such beads have been found in various parts of the world, including North and South America, and often in graves. Some authorities believe that the oldest of them are the work of the ancient Egyptians, or the Phœnicians, while the later are probably of Venetian origin.

Agha, see *Aga*.

Aghrim, see *Aughrim*.

Agincourt (a'-zhan'-kör), a village of Northern France, department Pas de Calais, famous for the battle of 25th Oct., 1415, between the French and

English. Henry V, King of England, eager to conquer France, landed at Harfleur, took the place by storm, and wished to march through Picardy to Calais, but was met by a French army under the Constable d'Albret. The English numbered about 15,000 men, while the French numbers are variously given as from 50,000 to 150,000. The confined nature and softness of the ground were to the disadvantage of the French, who were drawn up in three columns unnecessarily deep. The English archers attacked the first division in front and in flank, and soon threw them into disorder. The second division fled on the fall of the Duc d'Alençon, who was struck down by Henry himself; and the third division fled without striking a blow. Of the French 10,000 were killed, including the Constable d'Albret, with six dukes and princes. The English lost 1600 men killed, among them the Duke of York, Henry's uncle. After the battle the English continued their march to Calais.

Agio (ā'ji-ō), the difference between the real and the nominal value of money, as between paper money and actual coin. It is used to denote both the difference between two currencies in the same country and the variations in the currencies of different countries. The term is derived from the It. *aggiungere*, to add, augment, hence *agiotage*. See *Disagio* and *Balance of Trade*.

Agira (a' -jē'ra'), (ancient **Agyrium**), a town of Sicily south-west of Etna. Pop. 22,485.

Agis (ā'jis), the name of four Spartan kings, the most important of whom was Agis IV, who succeeded to the throne in 244 B.C., and reigned four years. He attempted a reform of the abuses which had crept into the State—his plan comprehending a redistribution of the land, a division of wealth, and the cancelling of all debts. Opposed by his colleague Leonidas, advantage was taken of his absence, in an expedition against the Ætolians, to depose him. Agis at first took sanctuary in a temple, but he was treacherously seized and strangled, after going through the form of a trial.

Agistment (from the Lat. *ad*, to, and Fr. *giste*, lodging), a term designating the pasturing of horses, cattle, or sheep of another. See *Bailment*.

Agitators, an alternative form of *Adjutators*, a name given to the representatives elected in 1647 by the different regiments of the English

parliamentary army.

Aglaia (a-glā'ya), wife of Hephaistos, in Greek mythology, one of the three Graces, the other two being Euphrosyne and Thalia.

Aglossa, a sub-order of anurous amphibia, the frogs, without a tongue.

Agnano (a'-nyä'nō), until 1870 a lake of Italy, west of Naples, occupying probably the crater of an extinct volcano, but now drained.

Ag'nates, in the civil law, relations on the male side, in opposition to *cognates*, relations on the female side.

Agnello Pass, see *European War*.

Agnes, St., a virgin martyr who, according to the story, suffered martyrdom because she steadfastly refused to marry Sempronius, the prefect of Rome, and adhered to her religion in spite of repeated temptations and threats, A.D. 303. She was first led to the stake, but as the flames did not injure her she was beheaded. Her festival is celebrated on 21st Jan. For superstitions connected with St. Agnes' Eve see Keats's poem *The Eve of St. Agnes*. Tintoret's most remarkable picture is *The Martyrdom of St. Agnes*.

Agnes, St., the most southerly of the Scilly Islands. A lighthouse was erected here as early as 1680; another on the Wolf Rock near the island was completed in 1858.

Agnesi (a'-nyä'sē), Maria Gaetana, a learned Italian lady, born at Milan in 1718. In her ninth year she was able to speak Latin, in her eleventh Greek; she then studied the oriental languages, and at the age of thirteen mastered Hebrew, besides French, Spanish, and German. She was called the 'Walking Polyglot'. She next studied geometry, philosophy, and mathematics. She was appointed, in 1750, professor of mathematics in the University of Bologna, ultimately took the veil, and died in 1799. Her sister, Maria Theresa, composed several cantatas and three operas.

Ag'ni, the Hindu god of fire, second only to Indra, and one of the eight guardians of the world, and especially the lord of the south-east quarter. He is celebrated in many of the hymns of the Rig Veda. He is often represented as of a red or flame colour, and rides on a ram or a goat. He is still

worshipped as the personification of fire, and the friction of two sticks for procuring the temple fire is still regarded as the symbol of Agni's miraculous rebirth.



Agni—Moore's *Hindoo Pantheon*

Agnœtæ, a monophysitic sect of the sixth century.

Agnolo, Baccio d' (ba' ch'ō da' n'yo-lō), a Florentine wood-carver, sculptor, and architect; designed some of the finest palaces, &c., in Florence, such as the Villa Borghese, the Palais Bartolini, &c.; born 1460, died 1543.

Agnō'men (Lat.), an additional name given by the Romans to an individual in allusion to some quality, circumstance, or achievement by which he was distinguished, as *Africanus* added to P. Cornelius Scipio.

Agnone (a' -nyō'nā), a town of S. Italy, province of Molise, famous for the excellence of its copper wares. Pop. 6000.

Agnostics (ag-nos'tiks; Gr. *a*, not, *gignōskein*, to know), a modern term invented by Huxley in 1869 and applied to those who disclaim any knowledge of God, the origin of the universe, immortality, &c. The agnostics, or adherents of this doctrine, hold that the mind of man is limited to a knowledge of phenomena and of what is relative, and that, therefore, the infinite, the absolute, and the unconditioned, being beyond all experience, are consequently beyond its range. Agnosticism is therefore the attitude of 'solemnly suspended judgment', and cannot be identified with atheism. The agnostics do not deny the existence of a Divine Being, but merely maintain that we have no scientific ground for either belief or denial.—BIBLIOGRAPHY: Sir Leslie Stephen, *An Agnostic's Apology*; R. Flint, *Agnosticism*; J. Ward, *Naturalism and Agnosticism*.

Agnus Castus, a shrub, *Vitex Agnuscastus*, nat. ord. Verbenaceæ, a native of the Mediterranean countries, with white flowers and acrid, aromatic fruits. It had anciently the imagined virtue of preserving chastity—hence the term *castus* (Lat., chaste).

Agnus Dei (dē'ī; Lat., 'the Lamb of God'), a term applied to Christ in *John*, i, 29, and in the Roman Catholic liturgy a prayer beginning with the words 'Agnus Dei', generally sung before the communion. The term is also

commonly given to a medal, or more frequently a disk of wax, round, oblong, or oval, consecrated by the pope, stamped with the figure of a lamb supporting the banner of the cross; supposed to possess great virtues, such as preserving those who carry it in faith from accidents, &c. Jean Châtel, the assassin of Henri IV, was found covered with such medals.

Agon'ic Line (Gr. *a*, not, and *gōnia*, an angle), in terrestrial magnetism a name applied to the line which joins all the places on the earth's surface at which the needle of the compass points due north and south, without any declination. See *Magnetism*.

Ag'ony Column, a column in the advertising sheet of some of the daily journals, in which disappearances, losses, mysterious appeals and correspondence, and generally any advertising eccentricity appear.

Ag'ora, the market-place of a Greek town, corresponding to the Roman *forum*. The Agora of Athens is situated in a valley partially enclosed by the Acropolis, Areopagus, Pnyx, and Museum.

Agos'ta. See *Augusta*.

Agouara (a' -gu''-ä'ra'), a name given to the crab-eating racoon (*Procyon cancrivorus*) of S. America.

Agoult (a' -gö), Marie de Flavigny, Comtesse d', a French writer of fiction, history, politics, philosophy, and art; daughter of Vicomte de Flavigny; born at Frankfort in 1805, died at Paris 1876. She contributed many articles to the *Revue des Deux-Mondes*, &c., under the pseudonym of *Daniel Stern*, and wrote *Lettres Républicaines* (1848); *Histoire de la Révolution de 1848*; *Esquisses Morales et Politiques*; *Trois Journées de la Vie de Marie Stuart*; *Florence et Turin* (a series of artistic and political studies); *Dante et Goethe*; dialogues, and numerous romances, &c.

Agouta (a-gö'ta), *Solenodon paradoxus*, an insectivorous mammal peculiar to Hayti, of the tanrec family, somewhat larger than a rat. It has its tail devoid of hair and covered with scales, its eyes small, and an elongated nose like the shrews. Another species (*S. cubānus*) belongs to Cuba.

Agouti (a-gö'ti), the name of several rodent mammals, forming a family by themselves, genus *Dasyprocta*. There are eight or nine species, all

belonging to S. America and the W. Indies. The common agouti, or yellow-rumped cavy (*D. agouti*), is of the size of a rabbit. It burrows in the ground or in hollow trees, lives on vegetables, doing much injury to the sugar-cane, is as voracious as a pig, and makes a similar grunting noise. Its flesh is white and good to eat.

Agra (ä'gra), a city of India, in the United Provinces, on the right bank of the Jumna, 841 miles by rail from Calcutta. It is a well-built and handsome town and has various interesting structures, among which are the imperial palace, a mass of buildings erected by several emperors; the Motí Masjid or Pearl Mosque (both within the old and extensive fort); the mosque called the Jama Masjid (a cenotaph of white marble); and, above all, the Taj Mahal, 'a dream in marble', a mausoleum of the seventeenth century, built by the Emperor Shah Jehan (1628-58) for his favourite queen, Mumtaz Mahal. It is made of white marble, and is adorned throughout with exquisite mosaics. Its cost is estimated at £800,000, and 20,000 workmen, under the direction of Austin of Bordeaux, were engaged on it for twenty-two years. There are several Protestant and Roman Catholic churches, a government college, and three other colleges or high schools, besides a medical college. Agra has a trade in grain, sugar, &c., and some manufactures, including beautiful inlaid mosaics. It was founded in 1566 by the Emperor Akbar, and was a residence of the emperors for over a century. Pop. 185,449. The Agra division has an area of 10,078 sq. miles, and a pop. of 5,007,900.

Agraffe', a sort of ornamental buckle, clasp, or similar fastening for holding together articles of dress, &c., often adorned with precious stones.

Agram, or **Zagreb**, a city in Yugo-Slavia, capital of the former Hungarian province of Croatia and Slavonia, near the River Save; contains the residence of the ban or governor of Croatia and Slavonia, Government buildings, cathedral (being the see of a Roman Catholic archbishop), university, theatre, &c.; carries on an active trade, and manufactures tobacco, leather, and linens. Pop. 79,038.

Agra'phia. See *Aphasia*.

Agrarian Laws, laws enacted in ancient Rome for the division of the public lands, that is, the lands belonging to the State (*ager publicus*). As the territory of Rome increased, the public land increased, the land of

conquered peoples being always regarded as the property of the conqueror. The right to the use of this public land belonged originally only to the patricians or ruling class, but afterwards the claims of the plebeians on it were also admitted, though they were often unfairly treated in the sharing of it. Hence arose much discontent among the plebeians, and various remedial laws were passed with more or less success. Indeed an equitable adjustment of the land question between the aristocracy and the common people was never attained.

Agravaine, Sir, one of the knights of the Round Table.

Agreement of the People. See *Levellers*.

Agric'ola, Gnæus Julius, lived from A.D. 37 to 93, a Roman consul under the Emperor Vespasian, and governor in Britain, the greater part of which he reduced to the dominion of Rome; distinguished as a statesman and general. His life, written by his son-in-law, the historian Tacitus, gives the best extant account of Britain in the early part of the period of the Roman rule. He was the twelfth Roman general who had been in Britain, but was the only one who effectually subdued the southern portion of it and reconciled the Britons to the Roman yoke. This he did by teaching them the arts of civilization and to settle in towns. He constructed the chain of forts between the Forth and the Clyde, defeated Galgacus at the battle of Mons Graupius, and sailed round the island, discovering the Orkneys.

Agric'ola, Georg (originally Bauer, that is, peasant = Lat. *agricola*), born in Saxony 1490, died at Chemnitz 1555, German physician and mineralogist. Though tinged with the superstitions of his age, he made the first successful attempt to reduce mineralogy to a science, and introduced many improvements in the art of mining. A complete edition of his works was published at Basel in 1550 and 1558.

Agricola, Johann, the son of a tailor at Eisleben, was born in 1492, and called, from his native city, *master of Eisleben* (*magister Islebius*); one of the most active among the theologians who propagated the doctrines of Luther. In 1537, when professor in Wittenberg, he stirred up the Antinomian controversy with Luther and Melanchthon. He afterwards lived at Berlin, where he died in 1566, after a life of controversy. Besides his theological works he composed a work explaining the common German proverbs.

Agricola, Johann Friedrich, German musician and composer, born near Altenburg 1720, died at Berlin 1774; pupil of Sebastian Bach; wrote several operas, including *Iphigenia in Tauris*. He wrote under the pseudonym of 'Olibrio'.

Agricola, Rodolphus, German scholar, born at Groningen 1443, died at Heidelberg 1485. After travelling in France and Italy he was appointed professor of philosophy at Heidelberg, and did good service in transplanting the revived classical learning into Germany.

Ag'riculture is the art of cultivating the ground, more especially with the plough and in large areas or fields, in order to raise grain and other crops for man and beast; including the art of preparing the soil, sowing and planting seeds, removing the crops, and also the raising and feeding of cattle or other live stock. This art is the basis of all other arts, and in all countries coeval with the first dawn of civilization. At how remote a period it must have been successfully practised in Egypt, Mesopotamia, and China we have no means of knowing, but there is sufficient evidence of agriculture having attained considerable development many centuries before the Christian era. Egypt was renowned as a corn country in the time of the Jewish patriarchs, and had probably been so for centuries before. The hieroglyphics on ancient monuments furnish records of the early development of agriculture in Egypt and of the use of the plough and other agricultural implements. The advanced methods of the Egyptians and Syrians were introduced into Europe by the Saracens. Land culture also attained a more or less considerable development in ancient China and Hindustan. Among the ancient Greeks the implements of agriculture were very few and simple. Hesiod, who wrote a poem on agriculture as early as the eighth century B.C., mentions a plough consisting of three parts, the share-beam, the draught-pole, and the plough-tail, but antiquarians are not agreed as to its exact form. The ground received three ploughings, one in autumn, another in spring, and a third immediately before sowing the seed. Manures were applied, and the advantage of mixing soils, as sand with clay or clay with sand, was understood. Seed was sown by hand, and covered with a rake. Grain was reaped with a sickle, bound in sheaves, thrashed, then winnowed by wind, laid in chests, bins, or granaries, and taken out as wanted by the family, to be ground. Agriculture was highly esteemed among the ancient Romans, and very full accounts are contained in the works of Pliny, Virgil,

Cato, Varro, and Palladius. The Romans used a great many different implements of agriculture. The plough is represented by Cato as of two kinds, one for strong, the other for light soils. Varro mentions one with two mould-boards, with which, he says, "when they plough, after sowing the seed, they are said to ridge". Pliny mentions a plough with one mould-board, and others with a coulter, of which he says there were many kinds. Fallowing was a practice rarely deviated from by the Romans. In most cases a fallow and a year's crop succeeded each other. Manure was collected from various sources, and irrigation was practised on a large scale.

The Romans introduced their agricultural knowledge among the Britons, and during the most flourishing period of the Roman occupation large quantities of corn were exported from Britain to the Continent. During the time that the Angles and Saxons were extending their conquests over the country agriculture must have been greatly neglected; but afterwards it was practised with some success among the Anglo-Saxon population, especially, as was generally the case during the Middle Ages, on lands belonging to the Church. Swine formed at this time a most important portion of the live stock, finding plenty of oak and beech mast to eat. The feudal system introduced by the Normans, though beneficial in some respects as tending to ensure the personal security of individuals, operated powerfully against progress in agricultural improvements. War and the chase, the two ancient and deadliest foes of husbandry, formed the most prominent occupations of the Norman princes and nobles. Thriving villages and smiling fields were converted into deer forests, vexatious imposts were laid on the farmers, and the serfs had no interest in the cultivation of the soil. But the monks of every monastery retained such of their lands as they could most conveniently take charge of, and these they cultivated with great care, under their own inspection, and frequently with their own hands. The various operations of husbandry, such as manuring, ploughing, sowing, harrowing, reaping, thrashing, winnowing, &c., are incidentally mentioned by the writers of those days; but it is impossible to collect from them a definite account of the manner in which those operations were performed.

While there is much in the writings of the old English chroniclers concerning the tenure of land, upon which subject the *Domesday Book* gives much enlightenment, there is a great lack of information as to the manner in which the land was cultivated. Information began to be recorded

in the middle of the thirteenth century, but only one treatise is known to have been written, namely, *La Dite de Husbanderye*, an essay in Norman French by Walter de Henley. This work was superseded by another treatise, the best of the early works on the subject, and published in the reign of Henry VIII (in 1523) by Sir A. Fitzherbert, judge of the Common Pleas. It is entitled the *Book of Husbandry*, and contains directions for draining, clearing, and enclosing a farm, for enriching the soil, and rendering it fit for tillage. Lime, marl, and fallowing are strongly recommended. The subject of agriculture attained some prominence during the reign of Elizabeth. The principal writers of that period were Tusser, Googe, and Sir Hugh Platt. Tusser's *Five Hundreth Pointes of Good Husbandry* (first complete edition published in 1580) conveys much useful instruction in metre, but few works of this time contain much that is original or valuable. The first half of the seventeenth century produced no systematic work on agriculture, though several on different branches of the subject. About 1645 the field cultivation of red clover was introduced into England, the merit of this improvement being due to Sir Richard Weston, author of a *Discourse on the Husbandry of Brabant and Flanders*, to whom also belongs the credit of first growing turnips in England. The Dutch had devoted much attention to the improvement of winter roots, and also to the cultivation of clover and other artificial grasses, and the farmers and proprietors of England soon saw the advantages to be derived from their introduction. Potatoes had been introduced during the latter part of the sixteenth century, but were not for long in general cultivation. A number of writers on agriculture appeared in England during the Commonwealth, the most important works on the subject being Blythe's *Improver Improved* and Hartlib's *Legacy*. The former writer speaks of a rotation, or rather alternation of crops, and well knew the use of lime, as also of other manures. In the eighteenth century the first name of importance in British agriculture is that of Jethro Tull, a gentleman of Berkshire, who began to drill wheat and other crops about the year 1701, and whose *Horse-hoeing Husbandry* was published in 1731. Tull was a great advocate of the system of sowing crops in rows or drills with an interval between every two or three rows wide enough to allow of ploughing or hoeing to be carried on. This enabled the ground to be cleared with crops still growing, thus obviating the necessity for 'bare fallow' and leading to the *four-course* or Norfolk Rotation of Charles, second Viscount Townshend, the first agriculturist to cultivate turnips on a large scale. After

the time of Tull and Townshend no great alteration in British agriculture took place till Robert Bakewell and others effected some important improvements in the breeds of cattle, sheep, and swine in the latter half of the eighteenth century. The raising and maintenance of live stock, especially of sheep, was a characteristic of English farming from a very early time, and for several centuries the country had almost a monopoly in the supply of wool. To Bakewell we owe the well-known breed of Leicester sheep. By the end of the century it was a common practice to alternate green crops with grain crops, instead of exhausting the land with a number of successive crops of corn. A well-known writer on agriculture at this period, and one who did a great deal of good in diffusing a knowledge of the subject, was Arthur Young. Scotland was for a long time behind England in agricultural progress. Great progress was made during the eighteenth century, however, especially in the latter half of it, turnips being introduced as a field-crop, and new implements such as the swing-plough and the thrashing-machine coming into general use. The construction of good roads through the country also gave agriculture a great impulse. During the wars caused by the French revolution (1795-1815) the high price of agricultural produce led to an extraordinary improvement in agriculture all over Britain. The establishment of the institution called the National Board of Agriculture was also of very great service to British husbandry at this period. Though a private association, it was assisted by an annual parliamentary grant, and prizes were given by it for the encouragement of experiments and improvements in agriculture. It existed from 1793 to 1816.

Among other societies which have greatly furthered the progress of agriculture in Britain, the chief in existence at the present day are the Smithfield Club, inaugurated in 1798; the Royal Agricultural Society of England, established in 1838; the Highland and Agricultural Society of Scotland, founded in 1783; and the Royal Agricultural Society of Ireland, instituted in 1841. The objects of these and similar societies are such as the following: To encourage the introduction of improvements in agriculture; to encourage the improvement of agricultural implements and farm buildings; the application of chemistry to agriculture; the destruction of insects injurious to vegetation; to promote the discovery and adoption of new varieties of grain, or other useful vegetables; to collect information regarding the management of woods, plantations, and fences; to improve

the education of those supported by the cultivation of the soil; to improve the veterinary art; to improve the breeds of live stock, &c. Shows are held, at which prizes are distributed for live stock, implements, and farm produce.

Through the efforts of the above-mentioned and other societies, the investigations of scientific men, the general diffusion of knowledge among all classes, and the necessity of competing with producers in foreign countries, agriculture made vast strides in Britain during the nineteenth century and the beginning of the twentieth. Among the chief improvements we may mention deep ploughing and thorough draining. By the introduction of new or improved implements the labour necessary to the carrying out of agricultural operations has been greatly diminished, and advancement in this direction has been promoted by the necessities of the Great War. Labour-saving machinery is likely to be used in future on an increasingly large scale. Science, too, has been called in to act as the handmaid of art, and in its application we owe very much to the researches conducted at the Rothamsted Experimental Station, founded in 1834 by Lawes, who endowed the Lawes Trust in 1889. Gilbert and he worked together from 1843 to the end of last century. It is primarily by the investigations of the chemist and physicist that agriculture has been put on a really scientific basis. The physiology of plants and animals, and the complex properties of soils, have all been investigated, and most important results obtained. Artificial manures, in great variety to supply the elements wanted for plant growth, have come into common use, and the free nitrogen of the air is now worked up into various substances by which the nitrate of soda imported from South America can be replaced. An improvement in all kinds of stock is becoming more and more general, feeding is conducted on more scientific principles, and improved varieties of crop-plants are created by applying the principles of Mendel and other scientists. Much attention is also devoted to seed-testing, and the applications of electricity to agriculture are being developed.

As a result of the new conditions, to be a thoroughly-trained and competent agriculturist requires a special education, partly theoretical, partly practical. In many countries there are now agricultural schools or colleges supported by the State, and many such institutions exist in Britain. In Scotland, the Edinburgh chair of Rural Economy was founded in 1790; in Ireland, the

Glasnevin Institution was inaugurated in 1838; and the establishment of the Royal Agricultural College, Cirencester, dates from 1845. In the United States nearly all the States have now colleges, or departments of colleges, devoted to the teaching of agriculture, and large allotments of public land have been made for their support. There are also numerous experimental stations. In Britain there has been a Board of Agriculture since 1889, under a cabinet minister, which was constituted a ministry in 1919; previously there was only a department under a committee of the Privy Council.

It is probable that on the whole the agriculture of Britain is farther advanced than that of any other region of similar size. Wheat, barley, and oats are the chief cereals in Britain; the chief roots are turnips and potatoes; other crops (besides grass and clover) are beans, peas, mangold, hops, and flax. In Europe at large the principal cereals are wheat, oats, barley, and rye, wheat being mostly grown in the middle and southern regions, such as France, Spain, part of Germany, Austria, Hungary, Italy, and southern Russia, the others in the more northern portion, while maize is grown in the warmest parts. Turnips are comparatively little grown out of Britain, beet-root in some sense taking their place; potatoes, however, are largely cultivated, except in the south. In the United States maize is the chief corn crop, next to which comes wheat, then oats; potatoes are an important crop, but turnips are only grown to a very small extent. In Canada large quantities of wheat are grown (more especially in Manitoba and the North-West), much is also now produced in the Australian colonies, in India, Argentina, &c.—
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Agrigentum (-jen'tum) (modern **Girgenti**), an ancient Greek city of Sicily, founded about 580 B.C., and long one of the most important places on the island. The town is also famous as the birthplace of the philosopher Empedocles. Extensive ruins of splendid temples and public buildings yet attest its ancient magnificence. See *Girgenti*.

Ag'rimony (Agrimonia), a genus of plants, nat. ord. Rosaceæ, consisting of slender perennial herbs found in temperate regions. *A. Eupatoria*, or common agrimony, was formerly of much repute as a medicine in England.

Its leaves and rootstock are astringent, and the latter yields a yellow dye. The plant is a common weed on the borders of cornfields and on roadsides.

Agrippa, Herod. See *Herod Agrippa*.

Agrippa, Marcus Vipsanius, a Roman statesman and general, the son-in-law of Augustus; born 63 B.C., died 12 B.C. He was prætor in 41 B.C.; consul in 37, 28, and 27; ædile in 33; and tribune from 18 till his death. He commanded the fleet of Augustus in the battle of Actium. To him Rome is indebted for three of her principal aqueducts, the Pantheon, and several other works of public use and ornament.

Agrip'pa, von Nettesheim, Cornelius Henry, born in 1486 at Cologne, soldier, doctor, and, by common reputation, a magician. In his youth he was secretary to the Emperor Maximilian I; he subsequently served seven years in Italy, and was knighted. On quitting the army he devoted himself to science, became famous as a magician and alchemist, and was involved in disputes with the churchmen. After an active, varied, and eventful life he died at Grenoble in 1534 or 1535. His works were published at Lyons in 1550.

Agrippi'na, the name of several Roman women, among whom we may mention: 1. The youngest daughter of Marcus Vipsanius Agrippa, and wife of C. Germanicus; a heroic woman, adorned with great virtues. Tiberius, who hated her for her virtues and popularity, banished her to the Island of Pandataria, where she starved herself to death in A.D. 33. 2. A daughter of the last mentioned, and the mother of Nero, by Domitius Ahenobarbus. Her third husband was her uncle, the Emperor Claudius, whom she subsequently poisoned to secure the government of the Empire through her son Nero. After ruling a few years in her son's name he became tired of her ascendancy, and caused her to be assassinated (A.D. 60).

Agropyron, a genus of grasses most of which are perennials. The root-stalks of *Agropyron repens* (*Radix Graminis*) have aperient and diuretic properties.

Agrostem'ma. See *Corncockle*.

Agros'tis, a genus of grasses, consisting of many species, and valuable as pasture-grasses. The bent-grasses belong to the genus.

Ag'telek, a village in Hungary, near the road from Pesth to Kassa, with about 600 inhabitants, celebrated for one of the largest and most remarkable stalactitic caverns in Europe.

Agua (a'g'wa'), an active volcano of Central America, in Guatemala, rising to the height of 15,000 feet. It has twice destroyed the old city of Guatemala, in its immediate vicinity.

Aguara (a'-gwä'ra'). See *Agouara*.

Aguardiente (a'-gwär-dē-en'te), a popular spirituous beverage of Spain and Portugal, a kind of coarse brandy, made from red wine, from the refuse of the grapes left in the wine-press, &c., generally flavoured with anise; also a Mexican alcoholic drink distilled from the fermented juice of the agave.

Aguas Calientes (a'g'wa's ka'-lē-en'tās; lit. 'warm waters'), a town 270 miles N.W. of Mexico, capital of the State of its own name, named from the thermal springs near it; has manufactures of cottons and a considerable trade. Pop. 45,198.—Aguas Calientes State has an area of 2,968 sq. miles, and a pop. of 124,500.

Ague (ā'gū), a kind of fever, which may be followed by serious consequences, but generally is more troublesome than dangerous. According to the length of the interval between one febrile paroxysm and another, agues are denominated *quotidian* when they occur once in twenty-four hours, *tertian* when they come on every forty-eight hours, *quartan* when they visit the patient once in seventy-two hours. Ague arises from marsh miasmata, a temperature above 60° being, however, apparently required to produce it. To cure the disease and prevent the recurrence, quinine and various other bitter and astringent drugs are given with complete success in the majority of cases.

Ague-cake, a tumour caused by enlargement and hardening of the spleen, often the consequence of ague or intermittent fever.

Aguesseau (a'-ges-ō), Henri François d', a distinguished French jurist and statesman, born at Limoges in 1668; was in 1690 advocate-general at Paris, and at the age of thirty-two procureur-général of the Parliament. He risked disgrace with Louis XIV by successfully opposing the famous papal bull *Unigenitus*. He was made chancellor in 1717, was deprived of his office in

1718 on account of his opposition to Law's system of finance, but had to be recalled in 1720. In 1722 he had to retire a second time; but was recalled in 1727 by Cardinal Fleury, and in 1737 again got the chancellorship, which he held till 1750. He died in 1751.

Aguilar (a'-gē-lär'), a town of Spain, province of Cordova, in Andalusia, in a good wine-producing district, and with a trade in corn and wine. Pop. 12,635.

Aguilar (a-gi-lär'), Grace, an English writer, born at Hackney 1816, died at Frankfort 1847. Of Jewish parentage, she at first devoted herself to Jewish subjects, such as *The Women of Israel*, *The Jewish Faith*, &c.; but her fame rests on her novels, *Home Influence*, *A Mother's Recompense*, *Home Scenes and Heart Studies*, &c., most of which were published posthumously by her mother.

Aguilas (a'-gē'la's), a flourishing seaport of Southern Spain, province of Murcia, with copper and lead smelting works. Pop. 15,967.

Agulhas (a'-gu'l'ya's), Cape, a promontory, forming the most southern extremity of Africa, about 90 miles south-east of the Cape of Good Hope, rising to 455 feet above the sea, with a lighthouse.

Agu'ti. See *Agouti*.

A'hab, the seventh King of Israel, succeeded his father Omri, 918-897 or 875-853 B.C. At the instigation of his wife Jezebel he erected a temple to Baal, and became a cruel persecutor of the true prophets. He was killed by an arrow at the siege of Ramoth-Gilead. He was succeeded by his son Ahaziah.

Ahag'gar, a mountainous region of the Sahara, south of Algeria, with some fertile valleys, inhabited by the Tuaregs.

Ahanta. See *Gold Coast, West Africa*.

Ahasue'rus, in Scripture history, a king of Persia, probably the same as Xerxes, the husband of Esther, to whom the Scriptures ascribe a singular deliverance of the Jews from extirpation.—*Ahasuerus* is also a Scripture name for Cambyses, the son of Cyrus (*Ezra*, iv, 6), and for Astyages, King

of the Medes (*Dan.* ix, 1). Ahasuerus is also the traditional name of the wandering Jew.

A'haz, the twelfth King of Judah, succeeded his father Jotham, 742-727 or 734-715 B.C. Forsaking the true religion, he gave himself up completely to idolatry, and plundered the temple to obtain presents for Tiglath-Pileser, King of Assyria.

Ahazi'ah.—1. Son of Ahab and Jezebel, and eighth King of Israel, died from a fall through a lattice in his palace at Samaria after reigning two years (896, 895 B.C.).—2. Fifth or sixth King of Judah, and nephew of the above. He reigned but one year, and was slain (884 B.C.) by Jehu.

Ahith'ophel, privy-councillor to David, and confederate and adviser of Absalom in his rebellion against his father. When Hushai's advice prevailed, Ahithophel, despairing of success, hanged himself.

Ahmedabad, or **Ahmadabad** (ä-mad-ä-bäd), a town of India, presidency of Bombay, in district of its own name, on the left bank of the Sábarmatí, 310 miles north of Bombay. It was founded in 1412 by Ahmed Shah, and was converted by him into a great capital, adorned with splendid edifices. It came finally into the hands of the British in 1818. It is still a handsome and populous place, enclosed by a wall, with many noteworthy buildings; manufactures of fine silk and cotton fabrics, cloths of gold and silver, pottery, paper, enamel, mother-of-pearl, &c. There were disturbances here in 1919. (See *Rowlatt Act.*) Pop. 216,777.—Area of district, 3949 sq. miles; pop. 795,094.

Ahmed Mirza, Shah of Persia, born in 1898. He succeeded his father, Mohammed Ali, when the latter was deposed on 16th July, 1909.

Ahmednag'ar, a town of India, presidency of Bombay, in district of its own name, surrounded by an earthen wall; with manufactures of cotton and silk cloths. Near the city is the fort, built of stone and 1½ miles round. Pop. (including military) 42,032.—Area of district, 6645 sq. miles; pop. 945,305.

Ahmed Shah, born 1724, died 1773, founder of the Durâni dynasty in Afghanistan. On the assassination of Nadir he proclaimed himself shah, and set about subduing the provinces surrounding his realm. Among his first acts was the securing of the famed Koh-i-noor diamond, which had fallen

into the hands of his predecessor. He crossed the Indus in 1748, and his conquests in Northern India culminated in the defeat of the Mahrattas at Panipat (6th Jan., 1761). Affairs in his own country necessitated his withdrawal from India, but he extended his empire vastly in other directions far beyond the limits of modern Afghanistan. He was succeeded by his son Timur.

Ahriman (ä'ri-man; in the Zend *Angromainyus*, 'spirit of evil or annihilation'), according to the dualistic doctrine of Zoroaster, the origin or the personification of evil, sovereign of the Devas or evil spirits, lord of darkness and of death, being thus opposed to Ormuzd (*Ahuramazda*), the spirit of good and of light.

Ah'waz, a small Persian town on the River Karun, province of Khuzistan, at the head of river navigation, a place of some commercial note. In the neighbourhood are the vast ruins of a city supposed to date from the time of the Parthian Empire.

Ai (ä'ē). See *Sloth*.

Aid, a subsidy paid in ancient feudal times by vassals to their lords on certain occasions, the chief of which were: when their lord was taken prisoner and required to be ransomed, when his eldest son was to be made a knight, and when his eldest daughter was to be married and required a dowry. From the Norman Conquest to the fourteenth century the collecting of aids by the Crown was one of the forms of taxation, being afterwards regulated by Parliament.

Ai'dan, Saint, Bishop of Lindisfarne, was originally a monk of Iona, in which monastery Oswald I, who became king of Northumberland in 635, had been educated. At the request of Oswald, Aidan was sent to preach Christianity to his subjects, and established himself in Lindisfarne as the first Bishop of Durham. He died in 651.

Aide-de-camp (ād-dè-ka'n'), a military officer who conveys the orders of a general to the various divisions of the army on the field of battle, and at other times acts as his secretary and general confidential agent.

Aidin (a' -i-dēn'), or **Guzel Hissar**, a town in Asia Minor, about 60 miles south-east of Smyrna, with which it is connected by rail; has fine mosques

and bazaars, is the residence of a pasha, and has an extensive trade in cotton, leather, figs, grapes, &c. Pop. 35,000.

Aigrette' (French), a term used to denote the feathery crown attached to the seeds of various plants, such as the thistle, dandelion, &c. (called in botany *pappus*).—It is also applied to any head-dress in the form of a plume, whether composed of feathers, flowers, or precious stones.

Aigues Mortes (āg mort; Lat. *Aquæ Mortuæ*, 'dead waters'), a small town of Southern France, near the mouths of the Rhone, department of Gard; with ancient walls and castle; near it are lagoons, from which great quantities of salt are extracted. Pop. 4000.

Aiguille (ā'gwil; Fr., lit. a needle), a name given in the Alps to the needle-like points or tops of granite, gneiss, quartz, and other crystalline rocks and mountain masses; also applied to sharp-pointed masses of ice on glaciers and elsewhere.—It is also the name given to a peculiarly-shaped French mountain in Isère, 6500 feet high.

Aigun (ī-gu'n'), a town of China, in Manchuria, on the Amur, with a good trade. Pop. 15,000.

Ai'kin, John, M.D., an English miscellaneous writer, born 1747, died 1822. He practised as physician at Chester, Warrington (where he taught physiology and chemistry at the Dissenters' Academy), and London; turned his attention to literature and published various works of a miscellaneous description, some in conjunction with his sister Mrs. Barbauld, including the popular *Evenings at Home* (1792-5), written with the view of popularizing scientific subjects. His *General Biographical Dictionary* (in 10 vols.) was begun in 1799 and finished in 1815. He was editor of the *Monthly Magazine* from 1796 till 1807.

Ai'kin, Lucy, daughter of the preceding, was born in 1781, and died 1864. In 1810 she published *Poetical Epistles on Women*, which was followed by a number of books for the young and a novel *Lorimer* (1814). In 1818 appeared her *Memoirs of the Court of Queen Elizabeth*, a very popular work. She afterwards produced similar works on the reigns of James I (1822) and Charles I (1833), and a *Life of Addison* (1843). In 1824 she had published the literary remains and biography of her father. She carried on an

interesting correspondence with Dr. Channing from 1826-42, which was published in 1874.

Aikman, William, an eminent Scottish portrait-painter, born in Forfarshire in 1682, died in 1731. He studied at Edinburgh and in Italy, visited Turkey, and spent the later portion of his life in London, where he enjoyed the friendship of most of the distinguished men of Queen Anne's time. The portrait of President Duncan Forbes (1685-1747) in the National Gallery is attributed to him.

Ailan'to, or **Ailanthus** (meaning tree of the gods), a tree, genus *Ailantus*, nat. ord. Simarubaceæ. The *A. glandulōsa*, a large and handsome tree, with pinnate leaves 1 or 2 feet long, is a native of China, but has been introduced into Europe and North America. A species of silk-worm, the ailanthus silk-worm (*Saturnia cynthia*), feeds on its leaves, and the material produced, though wanting the fineness and gloss of mulberry silk, is produced at less cost, and is more durable. The wood is hard, heavy, yellowish-white, and will take a fine polish. The tree has been in cultivation in England since 1751.

Aileron. See *Aeronautics*, *Aeroplane*.

Ail'red (contracted form of **Ethelred**), a religious and historical writer, supposed to have been born in 1097, but whether in Scotland or in England is not known, died 1166; abbot of Rievaulx, in the North Riding of Yorkshire. Wrote lives of Edward the Confessor and St. Margaret, Queen of Scotland, *Genealogy of the Kings of England*, *The Battle of the Standard*, &c.

Ailsa Craig, a rocky islet in the Firth of Clyde, 10 miles from the coast of Ayr, of a conical form, 1097 feet high, and about 2 miles in circumference, precipitous on all sides except the north-east, where alone it is accessible, frequented by innumerable sea-fowl, including solan-geese, and covered with grass. On it is a lighthouse.

Ailu'rus. See *Panda*.

Aimard (ā-mär), Gustave, French novelist, born 1818, died 1883. He lived for ten years among the Indians of North America, and wrote a number of stories dealing with Indian life, such as *Les Trappeurs de l'Arkansas* (1858),

La Loi de Lynch (1859), *Les Nuits Mexicaines* (1863), *Les Bohèmes de la Mer* (1865), which have been popular in English translations. His work is not unlike that of Fenimore Cooper.

Ain (an'), a south-eastern frontier department of France, mountainous in the east (ridges of the Jura), flat or undulating in the west, divided into two nearly equal parts by the River Ain, a tributary of the Rhône; area, 2248 sq. miles; pop. (1921), 315,757. Capital, Bourg.

Ainger (ān'jèr), Rev. Alfred, born in 1837, died in 1904, was educated at King's College, London, and Trinity Hall, Cambridge, took orders after gaining his degree, and in 1866 was appointed reader of the Temple Church, London. He was made Master of the Temple in 1893, while holding also a canonry in Bristol Cathedral, to which he had been appointed in 1887. He was highly successful as a preacher, but is chiefly known by his literary labours, especially those connected with Lamb and Hood, whose works he edited. The volumes on Lamb and on Crabbe in the 'English Men of Letters' series are by him, and he wrote a memoir of Hood for his edition of the works. A volume of his sermons under the title of *The Gospel of Human Life* was published after his death in 1904. Cf. Edith Sichel, *Life and Letters of Canon Ainger*.

Ainmiller (īn'mil-er), Max Emanuel, a German artist who may be regarded as the restorer of the art of glass-painting, born 1807, died 1870. As inspector of the State institute of glass-painting at Munich he raised this art to a high degree of perfection by the new or improved processes introduced by him. Under his supervision this establishment (which afterwards became his own) produced a vast number of painted windows for ecclesiastical and other buildings, among the principal being a series of forty windows, containing a hundred historical and scriptural pictures, in Glasgow Cathedral. Some of his work is in St. Paul's Cathedral, and his finest productions are the windows in the Cathedrals of Cologne and Regensburg.

Ainos (ī'nōz; that is, men), the native name of an uncivilized race of people inhabiting the Japanese island of Yesso, as also Sakhalien, and the Kurile Islands, and believed to be the aboriginal inhabitants of Japan. They do not average over 5 feet in height, but are strong and active. They are very hairy, wear matted beards, and have black hair which they allow to grow till it

falls over their shoulders. Their complexion is dark brown, approaching to black. They support themselves by hunting and fishing. There are numerous legends relating to the Ainos. According to one of these, of Japanese origin, they descended from the constellation of the Bear, whilst another mentions as their ancestor a certain Okikurumi who came down from heaven. The Ainos call themselves Ainu Utara, and the Chinese refer to them as the Tunggi (barbarians of the East). They are very superstitious, and worship a number of gods, such as the universal god (Opitta-Kamui), the sun (Tsup-Kamui), the bear (Isho-Kamui), &c. Cf. J. Batchelor, *The Ainu and their Folklore*.

Ainsworth, Henry, a Puritan divine and scholar, born 1571, died 1622. He passed great part of his life in Amsterdam, being from 1610 pastor of a 'Brownist' church there (the Brownists being forerunners of the Independents). He was a voluminous writer, a controversialist and commentator, and a thorough Hebrew scholar.

Ainsworth, Robert, born in Lancashire, 1660, earned his living by keeping a private school in or near London, and died there in 1743. Among other learned works he compiled the well-known *Latin and English Dictionary*, first published in 1736, which passed through many editions, but is now entirely superseded.

Ainsworth, William Francis, an English physician, geologist, and traveller, born 1807. He was surgeon and geologist to the Euphrates expedition under Colonel Chesney, and published *Researches in Assyria, Babylonia, and Chaldaea* (1838); *Travels in Asia Minor, Mesopotamia, and Armenia* (1842); *Travels in the Track of the Ten Thousand Greeks* (1844), &c. Died 1896.

Ainsworth, William Harrison, an English novelist, born 1805, died 1882. He was the son of a Manchester solicitor and intended for the profession of law, but devoted himself to literature. He wrote *Rookwood* (1834), *Jack Sheppard*, illustrated by Cruickshank (1839), and about forty other novels, including *Guy Fawkes*, *Tower of London*, *Windsor Castle*, *Lancashire Witches*, *Flitch of Bacon*, &c. His literary models were at first Sir Walter Scott and afterwards Victor Hugo's *Nôtre Dame de Paris*.

Ain-Tab (a' -in-täb'), a town of Northern Syria, 60 miles north of Aleppo; with manufactures of cottons, woollens, leather, &c., and an extensive

trade. There is here an American Protestant mission. Pop. 45,000.

Ainu. See *Ainos*.

Air, the gaseous substance of which our atmosphere consists, being a mixture mainly of about 78 per cent by volume of nitrogen and 21 per cent of oxygen. The latter is absolutely essential to animal life, while the purpose chiefly served by the nitrogen appears to be to dilute the oxygen. Oxygen is more soluble in water than nitrogen, and hence the air dissolved in water contains about 10 per cent more oxygen than atmospheric air. The oxygen therefore available for those animals which breathe by gills is somewhat less diluted with nitrogen, but it is very much diluted with water. For the various properties and phenomena connected with air see such articles as *Atmosphere*, *Aeronautics*, *Air-pump*, *Barometer*, *Combustion*, *Respiration*, &c.

Air, in music (in It. *aria*), a continuous melody, in which some lyric subject or passion is expressed. The lyric melody of a single voice, accompanied by instruments, is its proper form of composition. Thus we find it in the higher order of musical works; as in cantatas, oratorios, operas, and also independently in concertos.—*Air* is also the name often given to the upper or most prominent part in a concerted piece, and is thus equivalent to *treble*, *soprano*, &c.

Aïr, or **Asben**. See *Asben*.

Aira. See *Hair-grass*.

Air Beds and Cushions, often used by the sick and invalids, are composed of india-rubber or of cloth made air-tight by a solution of india-rubber, and when required for use filled with air, which thus supplies the place of the usual stuffing materials. They tend to prevent bed-sores from continuous lying in one position. They are also cheap and easily transported, as the bed or cushion, when not in use, can be packed in small compass, to be again inflated with air when wanted.

Air-bladder. See *Swimming-bladder*.

Air-brake, a brake operated by air pressure, usually applied to brake, simultaneously, all the wheels of a moving train. In the Westinghouse type,

by means of an ingenious 'triple valve' carried one on each carriage, the train pipe is made to serve the dual purpose of supply and control. An air-pump on the engine compresses air into the main receiver, from which it flows through a reducing valve into the train pipe. The pressure, acting on the under side of the triple valve, moves the valve to its extreme position, thereby opening a passage to an auxiliary receiver on the carriage and also putting the brake cylinder into communication with the atmosphere. A spring in the brake cylinder keeps the brakes in the 'off' position.

To apply the brakes, the pressure is lowered in the train pipe. The air pressure in the auxiliary receiver reverses the triple valve, thus admitting air to the brake cylinder and closing the outlet to atmosphere.

To remove the brakes, air from the main receiver is passed into the train pipe, and the triple valve is restored to the 'off' position. See *Traction*.—**BIBLIOGRAPHY:** W. W. Wood, *Westinghouse Air-brake*; R. H. Blackhall, *Air-brake Catechism*.

Air-cells, cavities in the cellular tissue of the stems and leaves of plants which contain air only, the juices of the plants being contained in separate vessels. They are largest and most numerous in aquatic plants, as in the *Vallisneria spirālis* and the *Victoria regia*, the gigantic leaves of which latter are buoyed up on the surface of the water by their means.—The minute cells in the lungs of animals are also called air-cells. There are also air-cells in the bodies of birds. They are connected with the respiratory system, and are situated in the cavity of the thorax and abdomen, and sometimes extend into the bones. They are most fully developed in birds of powerful and rapid flight, such as the albatross.

Aird, Thomas, a Scottish poet and miscellaneous writer, friend of Professor Wilson, De Quincey, and Carlyle, long editor of a newspaper in Dumfries; born 1802, died 1876. He wrote *The Devil's Dream on Mount Aksbeck*; *The Old Bachelor*, &c.

Airdrie, a municipal and parliamentary burgh of Scotland, in Lanarkshire, near the Monkland Canal, 11 miles east of Glasgow, in the centre of a rich mining district, with a large cotton-mill, foundries and machine shops, breweries, &c., and collieries and ironworks in its vicinity. Pop. 24,160.

Air-engine, an engine in which air heated, and so expanded, or compressed air is used as the motive power. A great many engines of the former kind have been invented, some of which have been found to work pretty well where no great power is required. They may be said to be essentially similar in construction to the steam-engine, though of course the expansibility of air by heat is small compared with the expansion that takes place when water is converted into steam. Engines working by compressed air have been found very useful in mining, tunnelling, &c., and the compressed air may be conveyed to its destination by means of pipes. In such cases the waste air serves for ventilation and for reducing the oppressive heat.

Aire (ār), a river of England, W. Riding of Yorkshire, rising to the south-east of Penyghent and flowing in a south-easterly direction to join the Ouse above Goole, having passed through Leeds on its way; length, 70 miles. It is navigable up to Leeds, and forms an important portion of the Aire and Calder Navigation system, which connects Goole, Hull, &c., with Liverpool. The Calder enters the Aire at Castleford. The district specially known as *Airedale* is the valley of the Aire above Leeds.—A large breed of terrier, of which there are several varieties, is known as the *Airedale terrier*, a strongly-built animal, rather long in the legs, with a hard, close coat.

Aire, a river of France, in the Argonne region, a tributary of the Aisne.

Aire-sur-l'Adour (ār-su' r-la' -dör), a small but ancient town of France, department of Landes, the see of a bishop. Pop. 3000.

Aire-sur-la-Lys (ār-su' r-la' -lē), an old fortified town of France, department of Pas de Calais, 10 miles south-east of St. Omer. Pop. 5000.

Air-gun, a gun from which the bullet is propelled by means of compressed air. Until about the middle of the nineteenth century air-guns were made with a metal reservoir in the butt; this reservoir was charged with air by means of a pump, and although one pumping put in enough air for six or seven shots, the process of loading was awkward and laborious. The well-known 'Gem' air-gun was worked by means of a spring, which compressed the air; the great defect of this gun was that the barrel was used as a cocking-lever, and so was apt to become bent and inaccurate. The 'Gem' was a smooth-bore gun, and early attempts at rifled air-guns failed, as the pellet was apt to stick in the barrel, owing to the low velocity not allowing

it to take the grooves. The 'Quackenbush' air-gun made an attempt to get over this difficulty; its slugs were felted, and the felt took the rifling and greatly increased the accuracy of the weapon, but, of course, the ammunition was much more expensive than ordinary air-gun pellets. The B.S.A. air-rifle is an excellent weapon which has overcome all the early difficulties of construction. It has a fixed barrel, a separate cocking-lever, and a rotating breech-plug, and the muzzle velocity of its 16-grain pellet is 600 feet per second, which compares not unfavourably with the 1000 feet per second of the 40-grain bullet of a .22 long-rifle cartridge. An air-gun is a splendid weapon for practising markmanship, as it is almost noiseless, and as its ammunition costs little. It does not need to be elaborately cleaned, as a miniature rifle does; an occasional oiling is all that it requires to keep it in order, and with care it should fire an indefinite number of shots without losing its accuracy.

Airolo (a' -i-rō'lō), a small town of Switzerland, canton Ticino, at the southern end of the St. Gothard Tunnel, and the first place on this route at which Italian is spoken. Pop. 2000.

Air-plants, or **Epiphytes**, are plants that grow upon other plants or trees, apparently without receiving any nutriment otherwise than from the air. The name is restricted to flowering plants (mosses or lichens being excluded) and is suitably applied to many species of orchids. The conditions necessary to the growth of such plants are excessive heat and moisture, and hence their chief localities are the damp and shady tropical forests of Africa, Asia, and America. They are particularly abundant in Java and tropical America.

Air-pump, an apparatus by means of which air or other gas may be removed from or compressed into an enclosed space. It was invented by Otto von Guericke of Magdeburg about the year 1654, and described in 1657 by Gaspar Schott. An ordinary suction-pump for water is on the same principle as the air-pump; indeed, before water reaches the top of the pipe the air has been pumped out by the same machinery which pumps the water. An ordinary air-pump (see fig. 1) consists essentially of a cylinder or barrel with a piston and valves. The barrel is connected to the vessel from which the air is to be pumped. A

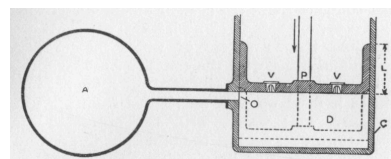


Fig. 1.—Air-pump (sectional view)

is the vessel to be exhausted, C the air-pump cylinder, P the piston, VV valves in the piston, and O the connection to the vessel A. When the piston moves downwards from the position shown, it cuts off the connection with A by passing over O. The length L is made long enough so that O is kept covered up during the downstroke. The air filling the space D is compressed, and so lifts the valves VV and passes out through them. This goes on till the end of the downward stroke, when the volume is very small indeed. When the upward motion begins, the valves VV close, and the piston rises and creates a vacuum in D. When the piston rises sufficiently to uncover O (as in figure), air rushes from A into the highly-exhausted space D and fills it. The process is repeated indefinitely, and A is gradually exhausted.

Air-pumps for compressing air are constructed on the same principle, but the valves act the reverse way. The bicycle pump is a well-known example of this form of pump. In the Fleuss or Geryk pump greater efficiency is attained by having layers of oil in the barrel and above the piston. In nearly all pumps for producing the high vacua necessary, e.g. for the electric glow-lamp and the X-ray tube, mercury is employed. In one form, the Toepler pump, a reservoir containing mercury is connected by a flexible tube to the receiver. (See fig 2. T tube connecting pump to vessel to be exhausted; R, reservoir, raised above A to drive air in B and C through D and out into open air; R is then lowered, and B and C fill with air from receiver. Process then repeated.) By alternately lowering and raising the reservoir, gas is first withdrawn from the receiver and then expelled through D, which also acts as a barometer. The process is repeated until the desired degree of exhaustion is reached. In a second type, the Sprengel pump, a stream of mercury from a reservoir situated above the vessel to be exhausted falls in drops through a narrow vertical tube which communicates with the vessel. (See fig. 3. A, reservoir; B, tube leading to vessel to be exhausted; C, bubbles of air carried down by mercury.) The air is entrapped between the falling

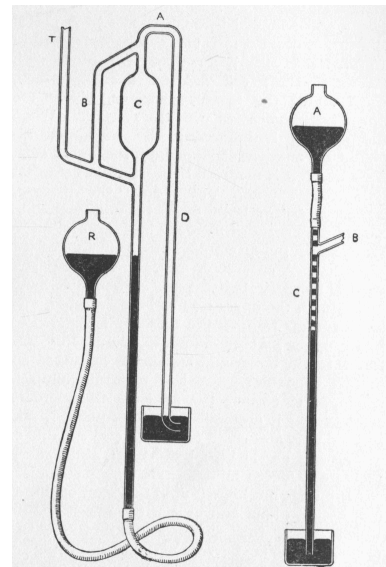


Fig. 2.—Toepler Pump

Fig. 3.—Sprengel Pump

The air is entrapped between the falling

drops of mercury, and is carried down and expelled with it. In the filter-pump, water is used instead of mercury, the pump being connected to an ordinary water-tap.

A more recent form, the Gaede pump, is of the rotary type. (See fig. 4. C, iron case; G, glass front; P two-chamber porcelain drum rotated counter-clockwise about axle A. As mercury leaves chamber R, air enters from receiver by tube T and opening B. When B is immersed, mercury enters and air is driven into case C and removed through tube S.) A porcelain drum, divided into two cells, rotates within an air-tight case more than half filled with mercury. Each cell has an opening which, when above the mercury surface, places the cell in communication with the receiver. When the opening is immersed, the entrapped air passes by another channel into the outer case, from which it is removed by another less efficient pump. The pump will reduce the pressure within a 6-litre bulb from 10 millimetres to .00001 millimetre of mercury in fifteen minutes. Langmuir's pump employs the principle of the aspirator. A current of mercury vapour passes from a mercury boiler past a tube communicating with the apparatus to be exhausted, and sucks the air from it; the mercury is condensed in the upper part of the pump, returns by side tubes to the boiler and leaves the extracted air in this condenser. A less efficient pump is employed to remove the air from the mercury condenser as it accumulates. This pump is said to be simple and rapid in action, and capable of exhausting an 11-litre bulb from atmospheric pressure to .00001 millimetre in eighty seconds.

Air-pumps are largely used in steam engineering, both on land and at sea, to extract the air which enters the condenser with the steam (see *Condenser*). Several varieties of air-pumps are in use. 1. The ordinary piston-pump (fig. 1) in which the piston extracts air by first sucking it into the cylinder and then expelling it to the atmosphere. The opening leading to the condenser is closed during the stroke in which the air is expelled. Two or three cylinders are usually provided on each air-pump set, the former type being known as a 2-throw pump and the latter a 3-throw pump. One of the best-known makes is the *Edwards* air-pump. Piston air-pumps are driven either by the main engine through a suitable mechanism, or by a separate electric motor. The amount

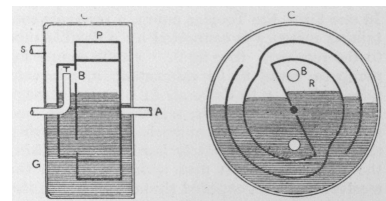


Fig. 4.—Gaede Pump

of power required to drive them varies with the size of the set, and with large engines of over 10,000 h.p. it is about $\frac{1}{2}$ per cent or less. Vacua as high as 29 inches (Bar. 30 inches) can be readily maintained on large plants by this type of pump, provided the condenser is suitably designed. In well-maintained plants bad vacua are commonly due to deficient air extraction, which may arise from the low-pressure air-piping not being air-tight, or from the air-pump being too small. 2. The water-ejector type uses the momentum of a jet of water to extract the air entrained with it. Well-known types of this plant are the ordinary barometric jet-condenser and the *Leblanc* air-pump. In the latter type, a rotating wheel, which carries vanes, forcibly throws sheets of water into a pipe communicating with the condenser. The sheets of water lie across the pipe, and the space between them is filled up with air sucked from the condenser. This water, with the entrained air, is thrown out, against the atmospheric pressure, by the momentum imparted to the water sheets by the rotating wheel. Very high vacua can be obtained with the Leblanc pump, but the power required to drive it is more than is required with a 3-throw piston-pump. (Cp. Sprengel pump above). 3. A steam-ejector is also used, a jet of steam taking the place of the sheets of water in the Leblanc type. Parsons' *augmentor condenser* works on this principle. A small jet of steam sucks the air from the main condenser and compresses it into a small so-called augmentor condenser. The pressure in this condenser is a little higher than the pressure in the main condenser, but it is sufficient to enable an ordinary 3-throw pump to be used efficiently. The steam used to extract the air is condensed in the augmentor condenser by cold water, and the interior of the augmentor condenser is connected to the inlet of an ordinary 3-throw pump. The 3-throw pump is called upon to deal with the air at a slightly higher pressure than the condenser pressure, and the vacuum in the main condenser is improved by the drop of pressure which exists between the augmentor condenser and the main condenser. In a well-designed plant, for instance, a 3-throw pump might be used to maintain a vacuum of 29 inches in the augmentor condenser, while the steam jet would provide another $\frac{1}{2}$ inch of vacuum, giving $29\frac{1}{2}$ inches vacuum in the main condenser. The *pressure* in the main condenser is thereby reduced from 1 inch Hg. to $\frac{1}{2}$ inch Hg.; a reduction of *one-half*. (Cp. Langmuir's pump above—using a mercury-vapour jet instead of a steam jet.)—BIBLIOGRAPHY: S. P. Thompson, *The Development of the*

Mercurial Air-Pump; E. Hausbrand, *Evaporating, Condensing, and Cooling Apparatus*.

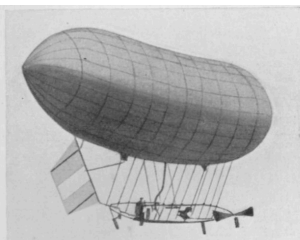
Air-raids. Apart from various sporadic bomb-dropping attacks by the Italians in Tripoli in 1913, the first air-raid proper was made by a Zeppelin on Antwerp during the investiture of that city by the Germans in 1914. Later on this new method of warfare was developed to a considerable extent by both sides during the Great European War, both air-ships and aeroplanes being used. Air-craft for this purpose have been likened to long-range guns, with the advantage of greater precision, because the target is in view, and very much longer effective range—the Germans, for example, used to raid London, and on one occasion Edinburgh, from bases situated in North Germany and on the Schleswig coast. Air-raids are of great value in affecting the *moral* of the enemy country by bringing home the effects of war in its most terrifying aspect to the civilian population at home, and thus causing the dislocation of traffic and diminishing the output of munitions. Their practical value is in attacking and destroying munition-factories, army head-quarters, naval bases, &c., in addition to such important work as the demolition of ammunition-dumps, and cutting lines of communication behind the front.

Various protective devices against raiding aircraft have been invented. Among these are high-angle guns, capable of throwing shells to a height of some 30,000 feet, though possibly the most effective defence is small high-speed aeroplanes armed with machine-guns and capable of reaching great heights in a short space of time. For use at night, kite-balloons (see *Balloons*) are sent up in clumps connected together by cables. From the cables is suspended a network of steel wires, which is invisible to the hostile air-craft, and in which they may become entangled and so brought down. These have been raised to a height of as much as 12,000 feet. For raiding purposes two types of aeroplane—in addition to air-ships—have been developed. 'Day bombers' carry out raids in daylight at heights of 12,000 to 20,000 feet on points from 50 to 100 miles behind the lines. 'Night-bombers' are slower machines which raid well into the enemy's territory—up to 200 or more miles—at heights varying from 8000 to 12,000 feet. It is usual for night-raids to be carried out by squadrons of machines flying in formation, each machine carrying about a ton of bombs (in 1918).

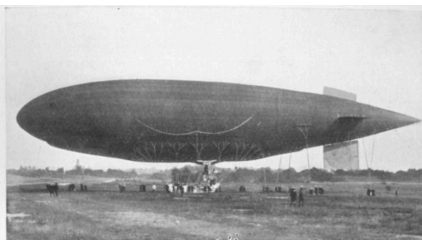
Air-ships can carry 5-10 tons of bombs to places up to 1000 miles distant from their bases.

During the last months of the war, our Independent Air Force dropped 500 tons of bombs on German objectives, and this raiding over a wide area of industrial Germany played no small part in causing that loss of spirit among the enemy which led eventually to their request for an armistice, and their virtual capitulation.

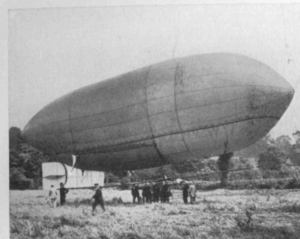
AIR-SHIPS



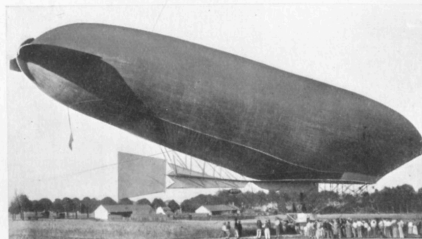
SPENSER AIR-SHIP (1903)



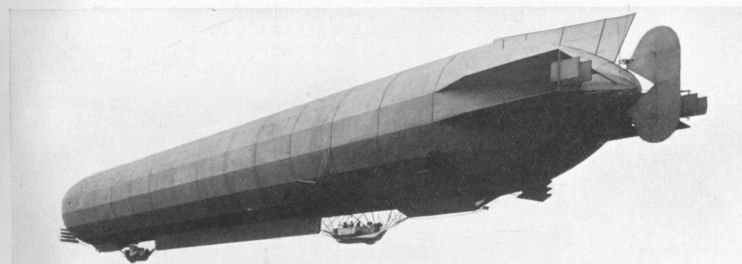
PARSEVAL AIR-SHIP (1906)



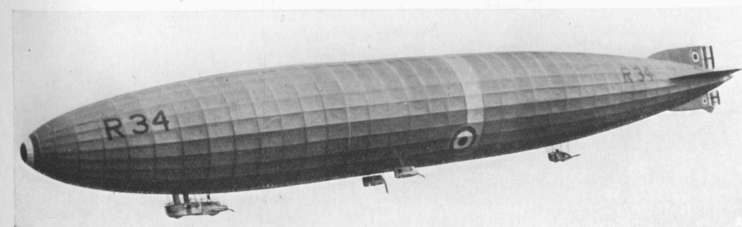
WILLOWS AIR-SHIP (1910)



LEBAUDY AIR-SHIP (1903)



ZEPPELIN AIR-SHIP (1909)



THE BRITISH AIR-SHIP R 34 (1919)

Air-ships, lighter-than-air craft provided with means of propulsion and steering. The air-ship, unlike the aeroplane, is not dependent upon its engines for its power to remain in flight, but derives its sustentation from the hydrogen gas with which it is filled. Hydrogen, first weighed by Henry Cavendish in 1766, is the lightest gas known, being 14.47 times lighter than air. In the pure state it has a lifting force of 71.155 lb. per 1000 cu. feet, but for calculation purposes is usually assumed to contain 5 per cent of impurities, giving a 'lift' of approximately 68 lb. per 1000 cu. feet. Hydrogen is, when mixed with air, highly inflammable, and helium has therefore been suggested as a substitute. This has a lift, when pure, of about 65 lb. per 1000 cu. feet, but is only found in a few places in America and is therefore at present too expensive to be used in quantities. The lift of any given quantity of hydrogen depends upon the difference between its weight and that of an equal volume of air. As the amount, and therefore weight, of air contained in a given space varies with the barometric pressure and temperature, the lift of hydrogen given above varies also. These figures are based upon a temperature of 60° F. and a barometric pressure of 30 inches. As an air-ship rises from the ground, the density, and therefore pressure, of the air decreases, which causes the hydrogen in the envelope to expand proportionately. Rise in temperature has the same effect. When an air-ship ascends, the gas therefore expands, and at a certain point would burst the envelope were valves not provided to allow some of the gas to escape. It is important to realize that as the expansion occurs at a rate corresponding to the decrease in density no alteration in lift occurs so long as gas is not lost through the valves. This would continue indefinitely if the gas-chamber were capable of stretching indefinitely, but with the cotton-fabric used in practice a height is reached when gas commences to escape from the automatic valves. From this moment the lift of the air-ship begins to decrease. At a certain point this decrease will have reached such a point that the air-ship is 'in equilibrium', i.e. she weighs precisely the same as the volume of air she displaces. This is known as the 'maximum height'. Up to 10,000 feet it is roughly true that $\frac{1}{30}$ of the lift is lost per 1000 foot rise.

The simplest form of air-ship is the *non-rigid*, which consists of a rubberized cotton-fabric gas-container (the 'envelope'), from which the 'car', containing engines, crew, &c., is hung by flexible steel-wire ropes. To resist the bending moment introduced by the weight of the car, the envelope is

inflated with hydrogen under pressure—usually about 25 mm. of water. So long as this pressure is greater than any local compression due to bending or loading in the fabric, the envelope will retain its shape. On coming down from a height, owing to the loss of gas, as already explained, the pressure will be reduced, and something must be done to restore it or the envelope will buckle. Fabric bags, known as 'ballonets', are therefore fitted inside the envelope, and as the air-ship descends air is forced into these bags, which supplies the lost pressure and maintains the shape of the envelope. The height to which a non-rigid air-ship can go, on returning from which the ballonets will be just full of air and the pressure the same as at starting, is known as the 'maximum ballonet height'. Ballonets are usually equivalent in volume to rather less than a quarter of the total volume of the air-ship—giving a maximum ballonet height of 6000 to 7000 feet. Usually from two to three ballonets are provided, according to the size of the air-ship. During the Great European War British non-rigid air-ships were constructed varying in size from a capacity of 70,000 cu. feet to 360,000 cu. feet. The former had one 75-h.p. engine, and the latter two of 375 h.p. each. Owing to difficulties in maintaining the shape and distributing the weight of the car over a long envelope, it is generally considered that 500,000 cu. feet probably represents the maximum size in which the non-rigid form of construction can be used. Above this size the *semi-rigid* type is used. In this case the envelope remains as in the non-rigid, but a girder or 'keel' is introduced between the envelope and the car, the weight of which is therefore taken by the keel and thence distributed to the envelope instead of being taken direct from the envelope as in non-rigids. There has been little development of non-rigids in Great Britain. The most prominent types are the Italian 'Forlanini', 'Verduzzio', and military air-ships. The keel, in all these examples, is not a rigid girder in the vertical sense, as it consists of a number of sections connected together by links. It is designed to resist compression only so long as it is held straight by the pressure of the envelope, and is not capable of taking a bending moment. When a size of about 1,000,000-cu.-foot-hydrogen capacity is reached it becomes economical to use the *rigid* method of construction. This is totally distinct from the other two types, as the non-rigid envelope is replaced by a rigid hull of sufficient strength to retain its shape without the assistance of any internal gas-pressure. The hull consists of a number of longitudinal members—usually built-up girders of 'duralumin', an aluminium alloy—

connected together at distances of 25-30 feet by a number of 'transverse frames', or rings, forming bulkheads. The transverse frames are also of duralumin girders, and are braced by 'radical wires' running from the joints of these girders to a ring in the centre. Between each pair of these transverse frames is a gas-bag containing hydrogen. The gas-bags are made of rubberized cotton on to which is stuck 'gold-beater's skin', made from the lining of the intestines of an ox. This is done to prevent hydrogen leakage. This is necessary, as the fabric of the gas-bags of a rigid air-ship is lighter and contains less rubber than the envelope of a non-rigid.

A 'Δ'-shaped keel runs along the interior of the ship, its weight being taken on the two bottom longitudinal girders. The chief function of the keel is to distribute the load of the various weights to the transverse frames of the air-ship. In it are slung the petrol-tanks, water-ballast tanks, bombs, &c., and living accommodation for the crew is also provided there. Along the bottom runs a walking-way from which access is gained to the cars and various parts of the air-ship. The cars containing the engines, wireless-cabin, and pilot's cabin are suspended from the transverse frames. Some of the cars, instead of being slung below the centre-line, are slung in pairs some little way up the side of the air-ship.

All air-ships are steered by means of rudders and, in the vertical sense, elevators, in precisely the same way as aeroplanes. Up to the end of 1919 speeds of 84 miles per hour had been reached and air-ships had climbed to 24,000 feet. The greatest distance covered in one flight was 4500 miles, while the longest time in the air was effected by R34 on her voyage to America, which occupied 108 hours—4 days 8 hours. Rigid air-ships of 2,750,000-cu.-foot capacity had been built with a length of nearly 300 feet and a gross lift of 60 tons. See also *Aeronautics, Balloons*.—BIBLIOGRAPHY: L. Sazerac de Forges, *La Conquête de l'Air*; Santos Dumont, *My Airships*; Hildebrandt, *Airships: Past and Present*; Major G. Whale, *British Airships: Past, Present, and Future*.

Airy, Sir George Biddell, a distinguished English astronomer, was born at Alnwick, 27th July, 1801, and educated at Hereford, Colchester, and Trinity College, Cambridge, where he was senior wrangler in 1823. At Cambridge he was Lucasian professor of mathematics, and subsequently Plumian professor of astronomy and experimental philosophy, in the latter capacity

having charge of the observatory. In 1835 he was appointed Astronomer Royal, and as such his superintendence of the observatory at Greenwich was able and successful. He resigned this post with a pension in 1881. His important achievement is the discovery of a new inequality in the motions of Venus and the earth. He wrote much and made numerous valuable investigations on subjects connected with astronomy, physics, and mathematics. Among separate works published by him may be mentioned *Popular Astronomy*, *On Sound and Atmospheric Vibrations*, *A Treatise on Magnetism*, *On the Undulatory Theory of Optics*, *On Gravitation*. He died 2nd Jan., 1892. He left an autobiography, published in 1896.

Aisle (īl; from Lat. *ala*, a wing), in architecture, one of the lateral divisions of a church in the direction of its length, separated from the central portion or nave by piers or pillars. There may be one aisle or more on each side of the nave. The cathedrals at Chichester, Milan, and Amiens have five aisles, Antwerp and Paris seven, and that of Cordova nineteen aisles in all. The nave is sometimes called the central aisle. See *Cathedral*.

Aisne (ān), a north-eastern frontier department of France; area, 2838 sq. miles. It is an undulating, well-cultivated, and well-wooded region, chiefly watered by the Oise in the north, its tributary the Aisne in the centre, and the Marne in the south. It contains the important towns of St. Quentin, Laon (the capital), Soissons, and Château Thierry. In the European War (1914-18) severe fighting took place on the Aisne, and a great battle was fought on 12th Sep., 1914. General Nivelle's offensive on the Aisne began in April, 1917. Pop. (1921), 421,575.

Aïva'lik, or **Kidonia**, a seaport of Asia Minor, on the Gulf of Adramyti, 66 miles north by west of Smyrna, carrying on an extensive commerce in olive-oil, soap, cotton, &c. Pop. 21,000.

Aix (āks), a town of Southern France, department Bouches-du-Rhône, on the River Arc, the seat of an archbishop. It is well built, has an old cathedral and other interesting buildings, including a university, a library (over 100,000 vols.), museum, &c.; manufactures cotton and woollen goods, oil, soap, hats, flour, &c.; warm springs, now less visited than formerly. Aix was founded in 123 B.C. by the Roman consul Gaius Sextius Calvinus, and from its mineral springs was called *Aquæ Sextiæ* (Sextian Waters). Between

this town and Arles, Marius gained his great victory over the Teutons, 102 B.C. In the Middle Ages the counts of Provence held their court here, to which the troubadours used to resort. Pop. 29,836.

Aix, or **Aix-les-Bains** (āks-lā-ban´), a finely-situated village of France, department of Savoie, 8 miles north of Chambéry, on the side of a fertile valley, with much-frequented hot springs known to the Romans by the name of *Aquæ Gratianæ*, and with ruins of a Roman triumphal arch, and of a temple of Diana. Pop. 8900.

Aix-la-Chapelle (āks-la´-sha´-pel; Ger. *Aachen*), a city of Rhenish Prussia, 38 miles west by south of Cologne, pleasantly situated in a fine vale watered by the Wurm, formerly surrounded by ramparts, now converted into pleasant promenades. It is well built, and though an ancient town has now quite a modern appearance. The most important building is the cathedral, the oldest portion of which, often called the nave, was erected in the time of Charles the Great (Charlemagne) as the palace chapel about 796. It is in the Byzantine style, and consists of an octagon, surrounded by a sixteen-sided gallery and surmounted by a cupola, in the middle being the tomb of Charlemagne. The adjoining Gothic choir, begun in 1353 and finished in 1413, forms the other chief division of the cathedral; it is lofty and of great elegance, and has fine painted windows. Another noteworthy building is the Rathaus (town hall), erected in the fourteenth century. Aix-la-Chapelle, with the adjoining Burtscheid, which may be considered a suburb, is a place of great commerce and manufacturing industry, the chief productions being woollen yarns and cloths, needles, machinery, cards (for the woollen manufacture), railway and other carriages, cigars, chemicals, silk goods, hosiery, glass, soap, &c. A considerable portion of its importance and prosperity arises from the influx of visitors to its sulphur and chalybeate springs and baths.—Aix-la-Chapelle was known to the Romans as *Aquisgranum*. It was the favourite residence of Charles the Great, who made it the capital of all his dominions north of the Alps, and who died here in 814. During the Middle Ages it was a free imperial city and very flourishing. Thirty-seven German emperors and eleven empresses have been crowned in it, and the imperial insignia were preserved here till 1795, when they were carried to Vienna. The town was in possession of France from 1794 to 1814. Pop. 156,143.—*Congress of Aix-la-Chapelle*, a congress held in 1818, by which the army of the allies in France was

withdrawn after France had paid the contribution imposed at the peace of 1815, and by which independence was restored to France.—A *treaty* of peace concluded at this city, 2nd May, 1668, as a result of the Triple Alliance, put an end to the war carried on against Spain by Louis XIV in 1667, after the death of his father-in-law, Philip IV, in support of his claims to a great part of the Spanish Netherlands, which he urged in the name of his queen, the infanta Maria Theresa. By this France obtained Lille, Charleroi, Douai, Tournai, Oudenarde, &c. The *second peace* of Aix-la-Chapelle, 18th Oct., 1748, terminated the Austrian war of succession.

Ajaccio (a'-ya'ch'ō), the capital of Corsica, on the south-west coast of the island, on a tongue of land projecting into the Gulf of Ajaccio, the birthplace of Napoleon and the seat of a bishop, with coral and sardine fisheries, and a considerable trade. There are here a cathedral, a college with library and museum, marble statue of Napoleon, monument of the Bonaparte family, &c. Ajaccio is connected by railway with Bastia and other places, and is becoming a winter resort for people with weak lungs. Pop. 20,946.

Ajan'ta, a village and ravine of India, in the north-west of the Nizam's dominions, about 50 miles north-north-east of Aurangabad. The ravine, 4 miles N.W. of the village, is celebrated for its cave temples and monasteries, twenty-nine in number, excavated out of a wall of almost perpendicular rock about 250 feet high. They are all richly ornamented with sculpture, and covered with highly-finished paintings, representing subjects of almost all kinds. The oldest are assigned to about 200 B.C., the most modern to about A.D. 600, and they may be said to furnish a continuous record of Buddhist art during 800 years, the faith at the latter date being practically expelled from India.

A'jax (Gr. *Aias*), the name of two Grecian chiefs who fought against Troy, the one being son of Oileus, King of Locris, surnamed the Little, the other son of Telamon, the Great or Telamonian Ajax. The latter was from Salamis, and sailed with twelve ships to Troy, where he is represented by Homer as the boldest and handsomest of the Greeks, after Achilles. He had more than one combat with Hector, against whom he was well matched. On the death of Achilles, when his arms, which Ajax claimed, were awarded to Ulysses, he became insane and killed himself. This is the subject of

Sophocles' tragedy *Ajax*. The other Ajax was hardly of less importance as a champion on the Greek side in the Trojan war. At the fall of Troy he entered the temple of Pallas Athena and seized Cassandra. He lost his life during his homeward voyage, either by shipwreck or by a flash of lightning sent by Athena, who was offended at the violation of her temple.

Ajmere, Ajmir, or Ajmer, a British commissionership or province in India, Rajputána, divided into the two districts of Ajmere and Mairwara (or Merwara); area, 2711 sq. miles. The surface of the province, which is entirely surrounded by native States, is hilly in the north and west, where there is a branch of the Aravali range, but level in the south and east. The soil is partly fertile, but there are large barren sandy plains, and there are no rivers of any importance. There are a large number of tanks which collect the water of small streams, and are useful for irrigation. The province suffered severely from famine in 1899-1900, the population being reduced by 12 or 13 per cent. Pop. 501,395.—*Ajmere*, the capital, an ancient city, a favourite residence of the Mogul emperors, is 279 miles s.w. of Delhi, at the foot of Taragarh Hill (2853 feet), on which is a fort. It is surrounded by a wall, has well-built streets, and possesses a Government college, as also Mayo College for Rajput nobles, a Scottish mission, a mosque that forms one of the finest specimens of early Mahommedan architecture extant, and an old palace of Akbar, now the treasury. There is a trade in cotton, sugar, salt, &c., and the town is an important station on the Rajputána railway. Pop. 86,200.

Ajowan' (*Ptychōtis Ajowan*), an umbelliferous plant cultivated in India, Persia, and Egypt, the seeds of which are used in cookery and in medicine, having carminative properties. The seeds much resemble caraway seeds, have a strong smell of thyme, and are exported in some quantity to Europe as a source of *thymol*, now so well known.

Aju'ga, a genus of plants belonging to the labiate family. See *Bugle*.

Aj'utage, a short tube of a tapering shape fitting into the side of a reservoir or vessel to regulate the discharge of water from it. Also, the nozzle of a tube for regulating the discharge of water to form a *jet d'eau*.

Akabah', Gulf of, an arm of the Red Sea, on the east side of the Peninsula of Sinai, which separates it from the Gulf of Suez; nearly 100 miles long.

The village of Akabah, at the northern extremity of the gulf, is supposed to be near the site of the *Ezion-geber* of the Old Testament; and here also was Elath, long a place of note. Akabah still carries on a small trade. It was captured by the Arabs in 1917.

Akagamaseki. Same as *Simonoseki*.

Akaroid Resin, a resin obtained from some of the grass-trees of Australia, used in varnishes.

Akassa, a seaport of Southern Nigeria, on a small island nearly opposite the chief mouth of the Niger. There are here engineering and other works, at which ships may be repaired, belonging to the Government.

Ak'bar (that is 'very great'), a Mogul emperor, the greatest Asiatic prince of modern times. He was born at Amerkote, in Sind, in 1542, succeeded his father, Humayun, a grandson of Sultan Baber, at the age of thirteen, and governed first under the guardianship of his minister, Beyram, but took the chief power into his own hands in 1560. He fought with distinguished valour against his foreign foes and rebellious subjects, conquering all his enemies, and extending the limits of the empire farther than they had ever been before, although on his accession they embraced only a small part of the former Mogul Empire. Although a Mohammedan by birth, he abandoned Islam and founded a new religion which he called 'Divine Faith' (*Diu-i-Olahi*). His contemporaries bestowed upon him the title of 'Guardian of Mankind'. He was also a generous patron of literature, and commissioned the Jesuit missionary, Jerome Xavier, to translate the four gospels into Persian. His government was remarkable for its mildness and tolerance towards all sects; he was indefatigable in his attention to the internal administration of his empire, and instituted inquiries into the population, character, and productions of each province. The result of his statistical labours, as well as a history of his reign, were collected by his minister, Abul Fazl, in a work called *Akbar-Nameh* (Book of Akbar), the third part of which, entitled *Ayini-Akbari* (Institutes of Akbar), was published in an English translation at Calcutta (1783-6, 3 vols.), and reprinted in London. He died in 1605. His mausoleum at Secundra, near Agra, is a fine example of Mohammedan architecture. Cf. V. A. Smith, *Akbar, The Great Mogul*.

Akee' (*Blighia sapida*), a tree of the nat. ord. Sapindaceæ, much esteemed for its fruit. The leaves are somewhat similar to those of the ash; the flowers are small and white, and produced in branched spikes. The fruit is lobed and ribbed, of a dull orange colour, and contains several large black seeds, embedded in a succulent and slightly bitter arillus of a pale straw colour, which is eaten when cooked. The akee is a native of Guinea, from whence it was carried to the West Indies by Captain Bligh in 1793.

À Kempis, Thomas. See *Thomas à Kempis*.

Aken (ä'ken), a Prussian town, province of Saxony, on the left bank of the Elbe, with manufactures of tobacco, cloth, beetroot sugar, leather, &c. Pop. 7358.

A'kenside, Mark, a poet and physician, born in 1721, at Newcastle-upon-Tyne, died in London in 1770. He was the son of a butcher, and was sent to the University of Edinburgh to qualify for the ministry, but chose the study of medicine instead. After three years' residence at Edinburgh he went to Leyden, and in 1744 became Doctor of Physic. In the same year he published the *Pleasures of Imagination*, which he is said to have written in Edinburgh, and which was translated into French by Baron d'Holbach (1769). In 1746 he wrote his much-praised *Hymn to the Naiads*. Having settled in London, he became a fellow of the Royal Society, and was admitted into the College of Physicians. In 1759 he was appointed first assistant and afterwards head physician to St. Thomas's Hospital. In his later days he wrote little poetry, but published several medical essays and observations. The place of Akenside as a poet is not very high, though Dr. Johnson praised the blank verse of his poems, and his somewhat cumbrous *Pleasures of Imagination* was once considered one of the most pleasing didactic poems in our language.

Akermann', a fortified town and seaport in Bessarabia, near the mouth of the Dniester, with a good port. The vicinity produces quantities of salt, and also fine grapes from which excellent wine is made. A treaty was signed here, 6th Oct., 1826, between Russia and the Porte, by which Moldavia, Walachia, and Serbia were released from all but nominal dependence on Turkey. Pop. 40,000.

Akhalzik, or **Achalzik** (a' -ha' l'tsik), a town of Russia in Asia, in the Trans-Caucasian government of Tiflis, 97 miles west of Tiflis, with a citadel. It was taken by the Russians in 1828. Pop. 15,977.

Ak-Hissar ('white castle'), a town in Asia Minor, 46 miles N.E. of Smyrna, occupying the site of the ancient Thyatira, relics of which city are here abundant. Here the Emperor Valens defeated the usurper Procopius in 366, and Murad defeated the Prince of Aïdin in 1425. Pop. 20,000.

Akhtyrka (a' h-tir'ka'), a cathedral town of the Ukraine, government of Kharkov, with a good trade and some manufactures. Pop. 31,918.

Akjermann (a' k-yer-ma' n'). Same as *Akermann*.

Akkad, the northern portion of ancient Babylonia occupied by the earliest Semitic invaders when the southern portion was Sumer (or Sumeria) and occupied by non-Semites. There was also a city of the same name, the Biblical Accad (*Gen.* x), which was prominent before 2000 B.C. Its ruins were unearthed between 1917 and 1919. See *Babylonia*.

Akkas, a dwarfish race of Central Africa, dwelling in scattered settlements to the north-west of Lake Albert Nyanza, about lat. 3° N., lon. 29° E. Their height averages about 4½ feet; they are of a brownish or coffee colour; head large, jaws projecting (or prognathous), ears large, hands small. They are timid and suspicious, and live almost entirely by the chase, being exceedingly skilful with the bow and arrow. They were first seen by the traveller G. A. Schweinfurth in 1870.

Akmolinsk', a Russian province in Central Asia, largely consisting of steppes and wastes; the chief rivers are the Ishim and Sari-Su; and it contains the larger part of Lake Balkash. Capital, Omsk. Area, about 225,070 sq. miles. Pop. 1,523,700.—*Akmolinsk* is a place of some importance for its caravan trade. Pop. 11,000.

Ako'la, a town of India, in Berar, the residence of the commissioner of Berar, on the River Morna, 150 miles W. by S. of Nagpur; with walls and a fort, and some trade in cotton. Pop. 29,289.

Ak'ron, a town of the United States, in Ohio, 100 miles N.E. of Columbus, on an elevated site. Being furnished with ample water-power by the Little

Cuyahoga, it possesses large flour-mills, woollen factories, manufactures of iron goods, &c. In the vicinity extensive beds of mineral paint are worked. Pop. (1920), 208,435.

Aksu' ('white water'), a town of Eastern or Chinese Turkestan, 300 miles from Kashgar, in the valley of the Aksu. It is an important centre of trade between Russia, China, and Tartary, and has manufactures of cotton cloth, leather, and metal goods. Formerly the residence of the kings of Kashgar and Yarkand. Pop. 30,000.

Akyab', a seaport of Lower Burmah, capital of the province of Arracan, at the mouth of the River Kuladan or Akyab, of recent upgrowth, well built, possessing a good harbour, and carrying on an important trade, its chief exports being rice and petroleum. Pop. 35,680.

Al, the article in the Arabic language. It appears in English words derived from the Arabic, such as Algebra, Alchemy, Alcove.

Alabama (al-a-ba' 'ma), one of the United States, bounded by Tennessee, Georgia, Florida, the Gulf of Mexico, and Mississippi; area, 51,998 sq. miles. The southern part, bordering on the Gulf of Mexico and Florida, is low and level, and wooded largely with pine, hence known as the 'pine-woods region'; the middle is hilly, with some tracts of level sand or prairies; the north is broken and mountainous. The State is intersected by the Rivers Alabama, Tombigbee, Mobile, Coosa, Tallapoosa, Tennessee, &c., some of them navigable for several hundred miles. The soil is various, being in some places, particularly in the south, sandy and barren, but in most parts is fertile, especially in the river valleys and in the centre, where there is a very fertile tract known as the 'cotton belt'. The climate in general is warm, and in the lowlying lands skirting the rivers is rather unhealthy. In the more elevated parts it is healthy and agreeable, the winters being mild and the summers tempered by breezes from the Gulf of Mexico. The staple production is cotton, especially in the middle and south, where rice and sugar are also grown; in the north the cereals (above all maize) are the principal crops. Alabama possesses extensive beds of iron ore and coal, with marble, granite, and other minerals; and coal and iron mining, and the smelting and working of iron, are now important industries. The manufacture of cotton goods is extensively carried on. The foreign trade is

concentrated in Mobile, whence cotton is the principal export. The State sends eight representatives to Congress. Its principal towns are Montgomery, the seat of government, and Mobile, the chief port. There is a State university at Tuscaloosa, a university connected with the Methodist Episcopal body, several State normal colleges, besides professional schools, &c., in the principal towns. Alabama became a State in 1819. It was one of the slave States. Pop. (1920), 2,348,174.

Alabama, a river of the United States, in the State of Alabama, formed by the junction of the Coosa and the Tallapoosa. After a course of 300 miles it joins the Tombigbee and assumes the name of the Mobile.

Alabama, The, a ship built at Birkenhead to act as a privateer in the service of the Confederate States of North America during the civil war begun in 1861. She was a wooden screw steamer with two engines of 350 h.p. each, 1040 tons burden, and carried eight 32-pounders. Before she was launched her destination was made known to the British Government, but owing to some legal formalities the orders given for her detention did not reach Liverpool till the day after she had left that port (29th July, 1862). She received her armament and stores at the Azores, and entered on her destructive career, capturing and burning merchant vessels, till she was sunk in a fight with the Federal war steamer *Kearsarge*, off Cherbourg, 19th June, 1864. As early as the winter of 1862 the United States Government declared that they held themselves entitled at a suitable period to demand full compensation from Britain for the damages inflicted on American property by the *Alabama* and several other cruisers that had been built, supplied, or recruited in British ports or waters. After a long series of negotiations it was agreed to submit the final settlement of the question to a court of arbitration, consisting of representatives of Britain and the United States, and of three other members, appointed by the King of Italy, the President of Switzerland, and the Emperor of Brazil. This court met at Geneva, 17th Dec., 1871, and a claim for indirect damages to American commerce having been abandoned by the United States Government, the decree was given in Sept., 1872, that Britain was liable to the United States in damages to the amount of 15,500,000 dollars (about £3,229,200). After all awards were made to private claimants about 8,000,000 dollars still remain unclaimed.

Alabandite, or **Manganblende**, a black submetallic mineral.

Alabas'ter, a name applied to a granular variety of gypsum or hydrated sulphate of lime. It was much used by the ancients for the manufacture of ointment and perfume boxes, vases, and the like. It has a fine granular texture, is usually of a pure white colour, and is so soft that it can be scratched with the nail. It is found in many parts of Europe; in great abundance and of peculiarly excellent quality in Tuscany. From the finer and more compact kinds, vases, clock-stands, statuettes, and other ornamental articles are made, and from inferior kinds the cement known as plaster of Paris. A variety of carbonate of lime, closely resembling alabaster in appearance, is used for similar purposes under the name of *Oriental alabaster*. It is usually stalagmitic or stalactitic in origin and is often of a yellowish colour. It may be distinguished from true alabaster by being too hard to be scratched with the nail.

Alac'taga (*Alactăga jacūlus*), a rodent mammal, closely allied to the jerboa, but somewhat larger in size, with a still longer tail. Its range extends from the Crimea and the steppes of the Don across Central Asia to the Chinese frontier.

Aladdin, son of Mustafa, a poor tailor of China. A magician, who pretended to be his uncle, gave him a magic ring and sent him to fetch 'the wonderful lamp' from a cave. Aladdin secured the lamp, but refused to give it to the magician, who shut him in the cave. Aladdin was rescued by the Genie of the Ring, and by means of the Genie of the Lamp acquired great wealth, built a magnificent palace, and married the Sultan's daughter. Afterwards the magician got possession of the lamp, and caused the palace to be transported into Africa. Aladdin was arrested, but was again saved by the Genie of the Ring. He poisoned the magician, recovered the lamp, and by its means restored his palace to its original site.

Alago'as, a maritime State of Brazil; area, 22,577 sq. miles; pop. 946,617. —*Alagoas*, the former capital of the province, is situated on the south side of an arm of the sea, about 20 miles distant from Maceio, to which the seat of government was transferred in 1839. Pop. about 4000.

Alais (a'-lā), a town of Southern France, department of Gard, 87 miles N.W. of Marseilles, with coal, iron, and lead mines, which are actively worked,

and chalybeate springs, which have many visitors during the autumn months. The treaty of Alais, signed on 28th June, 1629, ended the Huguenot wars in France. Pop. 29,800.

Alajuela (a' -la' -hu-ā'la'), a town of Central America, in the State of Costa Rica. Pop. 12,000.

Ala-Kul, a lake in Russian Central Asia, near the borders of Mongolia, in lat. 46° N. lon. 81° 40' E.; area, 660 sq. miles.

Alamanni. See *Alemanni*.

Alaman'ni, Luigi, an Italian poet, of noble family, born at Florence in 1495. Suspected of conspiring against the life of Cardinal Giulio de' Medici, who then governed Florence in the name of Pope Leo X, he fled to Venice, and when the cardinal ascended the papal chair under the name of Clement VII he took refuge in France, where he henceforth lived, being employed by Francis I and Henry II in several important negotiations. He died in 1556. His principal works are a didactic poem, *La Coltivazione*, a splendid imitation of Virgil's *Georgics* (1546); a comedy entitled *Flora*; two epics, *Girone il Cortese* (1548) and *L'Avarchide*, an imitation of the *Iliad* (1570); and a collection of eclogues, satires, psalms, &c., partly in blank verse, the invention of which is contested with him by Trissino, a contemporary.

Al'amo, a fort in Bexar county, Texas, United States, celebrated for the resistance its occupants (140 Texans) made to a Mexican force of 4000 from 23rd Feb. to 6th March, 1836. At the latter date only six Texans remained alive, and on their surrendering they were slaughtered by the Mexicans.

Al'amos, a town of Mexico, State of Sonora, the capital of a mining district. Pop. 12,000.

Åland (o'land) Islands, a numerous group of islands and islets, about eighty of which are inhabited, formerly in Russia, situated in the Baltic Sea, near the mouth of the Gulf of Finland; area, 468 sq. miles. The principal island, Åland, distant about 30 miles from the Swedish coast, is 18 miles long and about 14 broad. The fortress of Bomarsund, here situated, was destroyed by an Anglo-French force in Aug., 1854. The inhabitants, who are of Swedish extraction, employ themselves mostly in fishing. The islands

were ceded by Sweden to Russia in 1809, and proclaimed a province of Finland in 1918. A referendum of the inhabitants, taken in Dec., 1918, decided in favour of union with Sweden, but on 22nd Oct., 1921, an agreement for the neutralization of the islands was signed at Genoa. Pop. 18,000.

Ala'ni, or **Alans**, one of the warlike tribes which migrated from Asia westward at the time of the decline of the Roman Empire. They are first met with in the region of the Caucasus, where Pompey fought with them. From this centre they spread over the south of modern Russia to the confines of the Roman Empire. About the middle of the fifth century they joined the Vandals, among whom they became lost to history.

Alarcon' Y Mendo'za, Don Juan Ruiz de, one of the most distinguished dramatic poets of Spain, born in Mexico about the end of the sixteenth or the beginning of the seventeenth century. He came to Europe about 1622, and in 1628 he published a volume containing eight comedies, and in 1634 another containing twelve. One of them, called *La Verdad Sospechosa* (The Truth Suspected), published in 1630 in a collection bearing the name of Lope de Vega, furnished Corneille with the groundwork and greater part of the substance of his *Menteur*. Hence Corneille's declaration in the preface to that play that he had borrowed the subject from Lope de Vega. His *Tejedor de Segovia* (Weaver of Segovia) and *Las Paredes Oyen* (Walls have Ears) are still performed on the Spanish stage. He died in 1639.

Al'aric I, King of the Visigoths, was born about the middle of the fourth century, probably in 370, and is first mentioned in history in A.D. 394, when Theodosius the Great gave him the command of his Gothic auxiliaries. The dissensions between Arcadius and Honorius, the sons of Theodosius, inspired Alaric with the intention of attacking the Roman Empire. In 396 he ravaged Greece, from which he was driven by the Roman general Stilicho, but made a masterly retreat to Illyria, of which Arcadius, frightened at his successes, appointed him governor. In 400 he invaded Italy, but was defeated by Stilicho at Pollentia (403), and induced to transfer his services from Arcadius to Honorius on condition of receiving 4000 lb. of gold. Honorius having failed to fulfil this condition, Alaric made a second invasion of Italy, during which he besieged Rome three times. The first time (408) the city was saved by paying a heavy ransom; the second (409) it

capitulated, and Honorius was deposed, but shortly afterwards restored. His sanction of a treacherous attack on the forces of Alaric brought about the third siege, and the city was taken 24th Aug., 410, and sacked for six days, Alaric, however, doing everything in his power to restrain the violence of his followers. He quitted Rome with the intention of reducing Sicily and Africa, but died at Cosenza in 410. Legend has it that he was buried beneath the river-bed of the Busenzo, the course of which was temporarily turned aside for the purpose.

Al'aric II, King of the Visigoths from A.D. 484 to 507. At the beginning of his reign the dominions of the Visigoths were at their greatest extent, embracing three-fourths of the modern Spain and all Western Gaul to the south of the Loire. His unwarlike character induced Clovis, King of the Franks, to invade the kingdom of the Visigoths. In a battle near Poitiers (507) Alaric was slain and his army completely defeated. The *Breviarium Alaricianum*, a code of laws derived exclusively from Roman sources, was compiled by a body of Roman jurists at the command of this King Alaric.

Alarm, in military language, a signal, given by beat of drum, bugle-call, or firing of a gun, to warn a camp or garrison of a surprise intended or actually made by the enemy. A place, called the *alarm-post*, is generally appointed at which the troops are to assemble when an alarm is given.—*Alarm* is also the name given to several contrivances in which electricity is made use of, as a *fire-alarm*, by which intelligence is at once conveyed to the proper quarter when a fire breaks out; a *burglar-alarm*, an arrangement of wires and a battery in a house intended to set a bell or bells ringing should a burglar attempt to gain entrance.

Alarm-clock, one which can be set so as to ring loudly at a certain hour to wake from sleep or excite attention.

Ala-Shehr (a'-la'-shār') (ancient **Philadelphia**), a town in Asia Minor, 100 miles east of Smyrna, famous as the seat of one of the first Christian churches, and still having a vast number of interesting remains of antiquity, consisting of fragments of beautiful columns, sarcophagi, fountains, &c. It is a place of some importance, carrying on a thriving trade, chiefly with Smyrna, to which runs a railway. Pop. 15,000.

Alas'ka, a territory belonging to the United States, comprising all that portion of the north-west of North America which lies west of the 141st meridian of west longitude, together with an irregular strip of coast-land (and the adjacent islands), extending south to lat. 54° 40' N., and lying between Canada and the Pacific (the boundary being adjusted in 1903); total area, about 590,884 sq. miles. The chief river is the Yukon, a great stream, now navigated in summer for most of its course. The principal mountains (among which are several volcanoes) are Mounts M'Kinley (20,470 feet) and Wrangell (17,400 feet). The climate of the interior is very severe in winter, but in summer the heat is intense; on the Pacific coast it is mild but moist. Alaska produces excellent timber. Numbers of fur-bearing animals abound, such as the fur-seal, sea-otter, beaver, fox, mink, marten, &c.; and the fur trade has long been valuable. The coasts and rivers swarm with fish, and salmon and cod are caught and exported. Gold is now mined in several localities, especially Cape Nome, where a town has sprung up. The aboriginal inhabitants consist of Esquimaux and Indians. Alaska, called Russian America until 1867, was sold to the United States for 7,200,000 dollars, the acquisition being ratified by Congress on 20th June, 1867. It has a legislative assembly consisting of eight senators and sixteen representatives, and the legislature meets biennially since 1913. The capital was formerly Sitka, on Baranoff Island, but is now Juneau, on Gastineau Channel. Pop. 64,356, latest estimate being 75,000.—BIBLIOGRAPHY: A. W. Greely, *Handbook of Alaska*; J. Muir, *Travels in Alaska*.

Alaskite, an igneous rock consisting of quartz and felspar. See *Granite*.

Alas'sio, a seaport of North Italy, on the Gulf of Genoa, a winter resort of people from England. Pop. 5000.

Alastor, in Greek mythology, is a surname of Zeus (cf. Lat. Jupiter *Vindex*) describing him as the avenger of evil deeds. The name or epithet is also used to designate any deity or demon who avenges wrongs committed by men. *Alastor* is the title of a poem by Shelley.

Alatau (a' -la' -tou'), the name of three considerable mountain ranges of Central Asia, on the Russian and Chinese frontiers.

Alatyr (a' -la' -tir'), a town in Russia, government Simbirsk, at the confluence of the Alatyr with the Sura, with a considerable trade. Pop.

11,000.

Alau'da, a genus of insessorial birds, which includes the larks. See *Lark*.

A'lava, a hilly province in the north of Spain, one of the three Basque provinces; area, 1175 sq. miles; covered by branches of the Pyrenees, the mountains being clothed with oak, chestnut, and other timber, and the valleys yielding grain, vegetables, and abundance of fruits. There are iron and copper mines, and inexhaustible salt springs. Capital, Vittoria. Pop. 97,692.

Alb (from Lat. *albus*, white), a clerical vestment of the Catholic Church worn by priests while officiating in the more solemn functions of divine service. It is a long robe of white linen reaching to the feet, bound round the waist by a cincture, and fitting more closely to the body than the surplice. It is now little used except during Mass. After the Reformation the *alb* was not used in the Church of England, but since the ritualistic revival in the nineteenth century it has again been introduced into a number of churches.



A, Alb with its Apparels *a*, *b*, and Girdle *c*; B, Amice; C, Stole

Alba, the name of several towns in ancient Italy, the most celebrated of which was Alba Longa, a city of Latium, according to tradition built by Ascanius, the son of Æneas, 300 years before the foundation of Rome, at one time the most powerful city of Latium. It ultimately fell under the dominion of Rome, when the town was destroyed, it is said. In later times its site became covered with villas of wealthy Romans.

Alba (anciently **Alba Pompeia**), a town of Northern Italy, about 30 miles S.E. of Turin, is the see of a bishop, has a cathedral, bishop's palace, church with fresco paintings by Perugino, &c. Pop. 6872.

Alba, Duke of. See *Alva*.

Albacete (a'l-ba'-thā'tā), a town in Southern Spain, capital of the province of the same name, 106 miles N.N.W. of Cartagena, with a considerable trade, both direct and transit, and manufactures of knives, daggers, &c. Pop. 24,805.—The province has an area of 5737 sq. miles, and a pop. of 273,380.

Alba Longa. See *Alba*.

Alban, St., the earliest British martyr, flourished in the third century, and was, it is said, converted from Paganism by a confessor whom he had saved from his persecutors. He refused to sacrifice to the gods, and was executed outside the city of Verulamium (St. Albans) in 285 or 305.

Albani (a`l-bä'nē), Francesco, a famous Italian painter, born at Bologna in 1578, died in 1660. He studied with Guido Reni under the Flemish painter Calvaert and the Caracci. It is said that his second wife, Doralice Fioraventi, bore him twelve children of such beauty that they served him as models for his paintings. Among the best known of his compositions are *The Sleeping Venus*, *Diana in the Bath*, *Danaë Reclining*, *Galatea on the Sea*, *Europa on the Bull*.

Alba'ni, Madame, maiden name Marie Louise Emma Cecile Lajeunesse, famous singer, was born near Montreal in 1852, was trained at home by her father, and studied also in Paris and Milan. She made her first public appearance in Europe at Messina, in Bellini's *La Sonnambula*, and in 1872 sang in the Royal Italian Opera in London. Since then she has attained the position of one of the world's foremost singers, both in opera and oratorio. In 1878 she was married to Mr. Ernest Gye, the operatic manager. She adopted the professional name of Albani from Albany, in the United States, where as a girl she sang in the Roman Catholic cathedral. In 1911 she published her memoirs under the title of *Forty Years of Song*.

Alba'nia, an extensive region stretching along the coast of the Adriatic for about 290 miles, and having a breadth varying from about 90 to about 50 miles. The boundary on the east is formed by a range of mountains, and the country is composed of at least nine ridges of hills, of which six are in Lower or Southern Albania (ancient Epirus) and the remainder in Central and Upper or Northern Albania. There are no large rivers, and in summer many of the streams are completely dry. The Drin or Drino is the largest. The most beautiful lake is that of Ochrida, 20 miles long, 8 broad at the widest part. The Lake of Scutari, in Upper Albania, is the largest. Among trees Albania has many species of oak, the poplar, hazel, plane, chestnut, cypress, and laurel. The vine flourishes, together with the orange, almond, fig, mulberry, and citron; maize, wheat, and barley are cultivated. Its fauna comprises bears, wolves, and chamois; sheep, goats, horses, asses, and mules are plentiful. The chief exports are live stock, wool, hides, timber, oil, salt-fish, cheese, and tobacco. The chief ports are Prevesa, Valona, and Durazzo. The population, about 850,000, consists chiefly of Albanians or Arnauts, or, as they call themselves, Skupetars, i.e. inhabitants of the mountains (by the Turks they are called Arnauts, by the Greeks Arbanites, and by the Serbs Arbanasi). They are spread along the coasts of the Adriatic

and Ionian Seas. History and legend afford little or no record of the arrival of the Albanian race in the Balkan Peninsula. It may, however, be safely asserted that the Albanians are the direct descendants of the earliest Aryan immigrants, who were represented in historical times by the kindred Illyrians, Macedonians, and Epirots. The majority live in Albania, the rest in Montenegro, Greece, Southern Italy, Sicily, Bessarabia, and Asia Minor. As regards religion they are either Christians or Mohammedans. They are divided into several tribes, among whom the Suliotes are partly of Greek origin. The Albanian language is a branch of the Indo-European languages, and related to the long-ago extinct language of the Messapians. The language consists of numerous dialects, which may be divided into those of the Tosks in the south and the Gheggas in the north. Though their country became a province of the Turkish dominions in 1431, they maintained for centuries a certain degree of independence, which the Porte never found it possible to overcome. On 28th Nov., 1912, the complete independence of Albania was proclaimed at Valona, a provisional government was founded under Ismail Kemal Bey, and Albanian autonomy was agreed to at the Ambassadorial Conference in London on 20th Dec. On 21st Feb., 1914, the crown was offered to Prince William of Wied, who arrived at Durazzo on 7th March. The prince was supported and advised by an International Commission of Control, but he left the country at the outbreak of hostilities in 1914. Attempts made by Essad Pasha to establish a military government failed, and the country was overrun by the Austrians, who captured Durazzo on 28th Feb., 1916. On 3rd June, 1917, the general in charge of the Italian forces proclaimed Albania an independent country, and a provisional government was set up at Durazzo. Albanian independence was recognized by the Powers and Albania admitted to the League of Nations in Dec., 1920. —BIBLIOGRAPHY: H. F. Tozer, *Researches in the Highlands of Turkey*; W. Peacock, *Albania, The Foundling State*.

Alba'no, a city and lake in Italy, the former about 15 miles south-east of Rome, and on the west border of the lake, amid beautiful scenery. An ancient tomb in the Etruscan style was for a long time looked upon as the sepulchre of the Horatii and Curiatii. Here are also the ruins of the villas of Pompey and Domitian. Pop. 8000.—The lake, situated immediately beneath the Alban Hill, is of an oval form, 6 miles in circumference, surrounded by

steep banks of volcanic tufa 300 or 400 feet high, and discharges its superfluous waters by an artificial tunnel at least 2000 years old.

Albans, St. See *St. Albans*.

Al'bany, the original Celtic name probably at first applied to the whole of Britain, but afterwards restricted to the Highlands of Scotland. It gave the title of duke formerly to a prince of the blood-royal of Scotland. The first duke was Robert Stuart (1345-1420), son of Robert II by his mistress Elizabeth Mure, and brother of Robert III. He was virtual ruler of the kingdom during the latter years of his brother's reign, and acted as regent for his nephew James I (kept a prisoner in England) till his own death. Another nephew, David, Duke of Rothesay, is said to have been starved to death in Falkland Castle at his instigation. His son Murdoch, second duke, succeeded him as regent, and was put to death by James for maladministration. The third duke was Alexander, second son of James II and brother of James III. A large part of his life was passed in France. His son John was the fourth who bore the title. He was regent of Scotland during the minority of James V (1515-23).

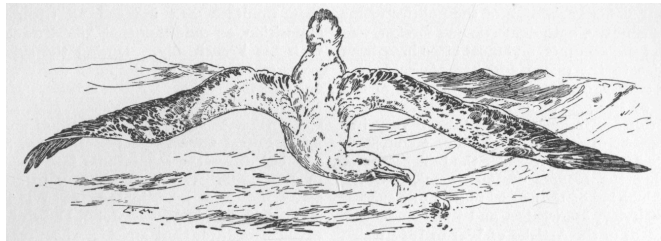
Al'bany, a city of the United States, capital of the State of New York on the west bank of the Hudson, 132 miles north of New York city, from and to which steamboats run daily. The Erie Canal and the numerous railway lines centring here from all directions greatly contribute to the growth and prosperity of the city, which carries on an extensive trade. It is a great mart for timber, and has foundries, breweries, tanneries, &c. Albany was settled by the Dutch between 1610 and 1614, and the older houses are in the Dutch style, with the gable-ends to the streets. There is a university, an observatory, and a State library with 90,000 volumes. The principal public buildings are the capitol or State-house, which cost about £5,000,000, and the State-hall for the public offices, a State arsenal, and numerous churches. Pop. (1920), 113,344.

Al'bany, Louisa Maria Caroline, Countess of, a princess of the Stolberg-Gedern family, was born in 1753, and married, in 1772, the pretender, Charles Edward Stuart, after which event she bore the above title. To escape from the ill-treatment of her husband she retired, in 1780, to the house of her brother-in-law at Rome, where she met the poet Alfieri, whose mistress

she became. After the death of Alfieri in 1793 she opened her famous political and literary salon frequented by the Duchess of Devonshire, the Duchess of Hamilton, Cardinal Consalvi, Samuel Rogers, Thomas Moore, Lamartine, and Chateaubriand. She died at Florence in 1824, where she was buried at the Church of Sta Croce, by the side of Alfieri, whom she is supposed to have married secretly.

Alba'ta, a name sometimes given to German silver.

Al'batross, a large marine swimming bird of several species, of which the wandering albatross (*Diomedea exulans*) is the best known. The bill is straight and strong, the upper mandible hooked at the point and the



Wandering Albatross (*Diomedea exulans*)

lower one truncated; there are three webbed toes on each foot. The upper part of the body is of a greyish brown, and the belly white. It is the largest sea-bird known, some measuring 17½ feet from tip to tip of their expanded wings. They abound at the Cape of Good Hope and in other parts of the southern seas, and in Behring's Straits, and have been known to accompany ships for whole days without ever resting on the waves. From this habit the bird is regarded with feelings of attachment and superstitious awe by sailors, it being reckoned unlucky to kill one. Coleridge has availed himself of this feeling in his *Ancient Mariner*. The albatross is met with at great distances from the land, settling down on the waves at night to sleep. It is exceedingly voracious, whenever food is abundant, gorging to such a degree as to be unable to fly or swim. It feeds on fish, carrion, fish-spawn, oceanic mollusca, and other small marine animals. Its cry is harsh and disagreeable. Its nest is a heap of earth; its eggs are larger than those of a goose.

Albatross, a name applied to a certain type of German aeroplanes, much used for scouting purposes during the European War.

Albay (a'l-bī'), a province, town, bay, and volcano in the south-east part of the Island of Luzon, one of the Philippines. The province is mountainous

but fertile; the town regularly built, with a pop. of 34,000; the bay capacious, secure, and almost landlocked; and the volcano, which is always in activity, forms a conspicuous landmark.

Albemarle, Duke of. See *Monk, George*.

Al'bendorf, a village in Prussia, province of Silesia, 50 miles s.w. of Breslau, remarkable for the pilgrimages made to its church, chapels, statues, &c. Pop. 1800.

Alberoni, Cardinal Giulio (jū'li-o a' l-bā-rō'nē), born in 1664 in North Italy, and educated for the Church. In his youth he laboured as a gardener, but thanks to the protection of the Duc de Vendôme, whose secretary he became, and afterwards of the Duc de Parma, he rose to high position. The latter sent him as his minister to Madrid, where he gained the affection of Philip V. He rose by cunning and intrigue to the position of Prime Minister, became a cardinal, was all-powerful in Spain after the year 1715, and endeavoured to restore it to its ancient splendour. In pursuance of this object he invaded Sardinia and Sicily, and indeed entertained the idea of stirring up a general war in Europe. The alliance of France and England, however, rendered his schemes abortive, and led to his dismissal and exile in 1720. He wandered about a long time under false names, but on the accession of Pope Innocent XIII he was restored to all the rights and honours of a cardinal. He died in 1752, and was buried at Piacenza.

Albert, Prince, Albert Francis Augustus Charles Emmanuel, Prince of Saxe-Coburg-Gotha, and Prince Consort of England, second son of Ernest I, Duke of Saxe-Coburg, was born at the Rosenau, a castle near Coburg, on 26th Aug., 1819. In 1837 he entered the University of Bonn, where he devoted himself to the studies of political and natural science, history, philosophy, &c., as well as to those of music and painting. On leaving the university he made a tour through the chief cities of Italy with Baron Stockmar. On 10th Feb., 1840, he married his cousin, Queen Victoria of England. Leopold I, King of the Belgians and uncle of Queen Victoria, was greatly instrumental in bringing about the marriage. An allowance of £30,000 a year was settled upon the prince, who was naturalized by Act of Parliament, received the title of Royal Highness by patent, was made a field-marshal, a Knight of the Garter, of the Bath, &c. Other honours were

subsequently bestowed upon him, the chief of which was the title of Prince Consort (1857). His foreign birth at first caused him to be regarded with some suspicion, but his unflinching tact and genuine ability were not long in gaining their due recognition. He always carefully abstained from party politics, but his knowledge of the politics of his adopted country, both domestic and foreign, was profound and accurate, and must often have been of service to the queen and her advisers. He always took a deep and active interest in the welfare of the people in general. His services to the cause of science and art were very important; he presided over the commission appointed in 1841 to consider the best means of rebuilding the Houses of Parliament, and the great exhibition of 1851 owed much of its success to his activity, knowledge, and judgment. The amendment of the Articles of War in 1844 which ultimately put an end to duelling was due to his suggestion. Cambridge University conferred upon him the degree of LL.D., and in 1847 he was elected Chancellor. He presided and delivered the inaugural address at the meeting of the British Association at Aberdeen in 1859. He died of typhoid fever on 14th Dec., 1861, after a short illness. A collection of his speeches and addresses was published in 1862. A biography of the prince by Sir Theodore Martin was published in 5 volumes, London, 1875-80.

Albert, first Duke of Prussia, and last grand-master of the Teutonic Order, was born in 1490; died in 1568. In 1511 he was chosen by the Teutonic knights grand-master of their order. Being nephew of Sigismund, King of Poland, the knights hoped by his means to be freed from the feudal superiority of Poland, and placed under the protection of the empire. This superiority, however, Sigismund refused to surrender, and war broke out between uncle and nephew. He subsequently became reconciled to his uncle, and obtained his investiture as hereditary Duke of Prussia under the Polish Crown, the territorial rights of the Teutonic Order being thus set aside. The latter years of his reign were spent in organizing the government and promoting the prosperity of his duchy; he founded schools and churches, established a ducal library, and opened the University of Königsberg in 1543.

Al'bert I, Duke of Austria, and afterwards Emperor of Germany, son of Rudolph of Hapsburg, was born in 1248. On the death of his father in 1292 he claimed the Empire, but his arrogant conduct drove the electors to choose Adolphus of Nassau emperor. Adolphus, after a reign of six years,

having lost the regard of all the princes of the Empire, Albert was elected to succeed him. A battle ensued near Göllheim, in which Adolphus was slain by his adversary, who was elected and crowned. Pope Boniface VIII, however, refused to acknowledge him as emperor, and ordered the electoral princes to renounce their allegiance to him. On the other hand, Albert formed an alliance with Philip le Bel of France, and offered so determined and successful a resistance to the papal authority that Boniface was induced to withdraw his opposition, on condition that Albert would break with his French ally. During the subsequent years of his reign the Emperor was engaged in unsuccessful wars with Holland, Hungary, Bohemia, and other States. His measures still further to strengthen his authority over the Swiss Forest Cantons of Unterwalden, Schwyz, and Uri drove the inhabitants into open revolt in Jan. 1308. While on his way to crush the Swiss he was assassinated, at Windisch in May, 1308, by his nephew John, Duke of Suabia, called afterwards the Parricide, whose inheritance he had seized upon.

Albert I, King of the Belgians, born on 8th April, 1875, at Brussels. He is the son of Prince Philippe, Count of Flanders (died 17th Nov., 1905), and of Princess Marie of Hohenzollern (born 17th Nov., 1845). After the death of his cousin, the Duke of Brabant, and of his father in 1905, Prince Albert became heir apparent. In 1906 he became member of the Belgian Senate and in 1907 was appointed by his uncle, Leopold II, Lieutenant-General. On 2nd Oct., 1900, he married Princess Elizabeth, daughter of Duke Charles Theodor of Bavaria; there are three children. He ascended the Belgian throne in Nov., 1909, after the death of his uncle Leopold II.

Albert Edward, or simply **Edward**, one of the equatorial lakes of Africa, otherwise known as *Muta Nzige* (q.v.).

Albert Hall, an amphitheatre in the Italian Renaissance style in Kensington, London, built during 1867-71 for concerts and assemblies. It can seat 9000 people, and its organ, which has nearly 9000 pipes, is one of the largest in the world.

Albert Memorial, the monument erected in Kensington Gardens, London, in memory of Prince Albert, consort of Queen Victoria. It is the work of Sir Gilbert Scott, and its style is Victorian Gothic.

Albert Nyan'za, a lake of Africa, one of the headwaters of the Nile, lying (approximately) between lat. $2^{\circ} 30'$ and $1^{\circ} 10'$ N., and with its north-east extremity in about lon. 28° E.; general direction from north-east to south-west, surface about 2500 feet above sea-level. It is surrounded by precipitous cliffs, and bounded on the west and south-west by great ranges of mountains. It abounds with fish, and its shores are infested with crocodiles and hippopotami. It receives the Victoria Nile from the Victoria Nyanza, and the White Nile issues from its northern extremity.

Albert-Bapaume. Along the great trunk road from Albert to Bapaume and on either side of it, fierce fighting took place during the Somme offensive of 1916, marked by the stages La Boisselle, Pozières and Le Sars. When, in Feb., 1917, the Germans began the great retreat, the fortified village of Pys on the left of the road was seized at a rush. On the 26th the village of Warlencourt fell, and two days later Thilley village $1\frac{1}{2}$ miles from Bapaume, was taken. The British troops, avoiding direct assaults, gradually encircled the town, forcing the Germans to withdraw. It was entered on 17th March.

Alberta, a province of Canada, established on 1st Sept., 1905, and comprising the former territory of Alberta and the part of the former territory of Athabasca lying west of the meridian 110° , and having the new province of Saskatchewan on the east, British Columbia on the west, the United States on the south, and Mackenzie territory on the north; area, 255,285 sq. miles. A large part of the area on the west is occupied by the Rocky Mountains, which are shared in common with Alberta and British Columbia, and consist mostly of a series of more or less parallel ridges. One or two of the loftier summits are in the province, others on the boundary. There is much valuable timber in this district. The general slope of the surface is from west to east and north-east. The province is intersected by numerous rivers and streams that have their sources in the Rockies, some of them, such as the Peace River and the Athabasca, sending their waters to the Arctic Ocean, while the others, such as the North and South Saskatchewan and their tributaries, belong to the Hudson Bay basin. In the extreme south are one or two small tributaries of the Missouri. There are a number of lakes, the largest being the Lesser Slave Lake and Lake Athabasca (partly in this province). Notwithstanding the number of the streams, there are districts, especially in the south, where agriculture cannot be successfully

carried on without irrigation. Farther to the north there are areas highly suitable for agriculture, and timber is also abundant. Cattle ranching is successfully carried on in the south, but tillage, with and even without irrigation, is also carried on, fine crops of wheat being grown. The most valuable mineral is coal, which is found at various places, but is chiefly mined in the south at Lethbridge, and farther north in the Banff district. Here there are hot springs and grand scenery, and a large tract of land has been set apart as a national park. Near Edmonton, the capital, coal is found on the bank of the North Saskatchewan, and is readily worked. Iron, petroleum, and other minerals are found. The climate is very warm in summer, and in winter less severe and prolonged than might be supposed. The warm *chinook* winds from the Pacific often blow in winter, and speedily melt the snow. The province is crossed in the south by the Canadian Pacific Railway, running by way of Calgary and Banff, and crossing the Rockies. From Calgary one branch runs north to Edmonton, another runs south to M'Leod, where other lines make a connection with the States railroads and British Columbia. Edmonton, being also on the Canadian Northern and the Grand Trunk Pacific, is bound to become a great centre of trade and provincial development. It and Calgary are the chief towns. The population in 1911 was returned at 374,663, the latest estimate being nearly 500,000.

Albertite, an asphaltic hydrocarbon compound, a soft black material, obtained in Canada.

Alber'tus Magnus, or **Albert the Great**, Count of Bollstädt, a distinguished German scholar of the thirteenth century, born in 1193, or 1205, studied at Padua, became a monk of the Dominican order, teaching in the schools of Hildesheim, Ratisbon, and Cologne, where Thomas Aquinas became his pupil. In 1245 he went to Paris and publicly expounded the doctrines of Aristotle, notwithstanding the prohibition of the Church. He is called Doctor Universalis, for he was one of the most proficient scholars of his day, second only to Roger Bacon in his knowledge of nature. He became rector of the school of Cologne in 1249; in 1254 he was made provincial of his order in Germany; and in 1260 he received from Pope Alexander IV the appointment of Bishop of Ratisbon. In 1263 he retired to his convent at Cologne, where he composed many works, especially commentaries on Aristotle. He died in 1280. Owing to his profound knowledge he did not

escape the imputation of using magical arts and trafficking with the Evil One.

Al'bi. See *Alby*.

Albigenses (al-bi-jen'sēz), a neo-Manichæan sect which spread widely in the south of France and elsewhere about the twelfth century, and which differed in doctrine and practice from the Roman Catholic Church, by which they were subjected to severe persecution. They are said to have been so named from Albi, on the banks of the Tarn, a tributary of the Garonne, where, and about Toulouse, Narbonne, &c., they were numerous. They were also known as Catharists (q.v.) and their doctrines were similar to those of several other religious sects such as the Gnostics, Manichæans, and Bogomils. Among the principal doctrines of the Albigenses was the belief in the existence of two principles, good and evil, the creators of the spiritual and material worlds. Since all matter is under the control of the evil principle, maintained the Albigenses, all flesh is evil. The extinction of bodily life, therefore, the deliverance of the soul from the prison-house of the body, should be the aim of man. Suicide by means of starvation was consequently highly meritorious. It is admitted even by Catholic writers (see *Catholic Encyclopædia*, vol. i, p. 268) that the Albigenses were principally antisacerdotal and opposed to the Roman Church on account of the scandalous life led by the Catholic clergy. A crusade was begun against them, and Count Raymond VI of Toulouse for tolerating them, in 1209, the army of the cross being called together by Pope Innocent III. The war was carried on with a cruelty which reflected deep disgrace upon the Catholic Church. Béziers, the capital of Raymond's nephew Roger, was taken by storm, and 20,000 of the inhabitants, without distinction of creed, were put to the sword. Simon de Montfort, the military leader of the crusade, was equally severe towards other places in the territory of Raymond and his allies. After the death of Raymond VI, in 1222, his son, Raymond VII, was obliged, notwithstanding his readiness to do penance, to defend his inheritance against the papal legates and Louis VIII of France. When hundreds of thousands had fallen on both sides, a peace was made in 1229, by which Raymond was obliged to cede Narbonne with other territories to Louis IX, and make his son-in-law, a brother of Louis, his heir. The heretics were now delivered up to the proselytizing zeal of the Dominicans, and to the courts of the Inquisition, by which means it was brought about that the

Albigenses disappeared after the middle of the thirteenth century. Cf. C. Schmidt, *Histoire et doctrine de la Secte des Cathares ou Albigeois* (2 vols.)

Albinos (al-bī'nōz), the name given to those persons from whose skin, hair, and eyes, in consequence of some defect in their organization, the dark colouring matter is absent. The skin of albinos, therefore, whether they belong to the white, Indian, or negro races, is of a uniform pale milky colour, their hair is white, while the iris of their eyes is pale rose colour, and the pupil intensely red, the absence of the dark pigment allowing the multitude of blood-vessels in these parts of the eye to be seen. For the same reason their eyes are not well suited to endure the bright light of day, and they see best in shade or by moonlight. The peculiarity of *albinism* or *leucopathy* is hereditary and not confined to the human race, having been observed also in horses, rabbits, rats, mice, &c., birds (white crows or blackbirds are not particularly uncommon), and fishes. Albinos are not of necessity lacking in mental vigour or capacity. Cf. Karl Pearson, *A Monograph on Albinism in Man*.

Al'bion (Celtic *Albainn*), the earliest name by which the island of Great Britain was known, employed already by writers of the sixth century B.C., who speak not of Britannia but of the land of the Albiones, and in poetry still used for Great Britain. It is connected with Lat. *albus*, white, on account, perhaps, of the chalk cliffs of Dover. The same word as *Albany*, *Albyn*.

Al'bite, or **Soda-felspar**, a mineral, a kind of felspar, usually of a white colour, to which property it owes its name (Lat. *albus*, white), but occasionally bluish, greyish, greenish, or reddish white.

Albizzia (al-bit'si-a), a genus of leguminous trees and shrubs, allied to the genus *Acacia*, with doubly-pinnate leaves and white, yellow, or red flowers often in globular heads, and broad, straight, flat pods. They number over fifty species, and inhabit tropical and subtropical Asia, Africa, and Australia. *A. lophanta*, a native of south-western Australia, has a bark that contains tannin. *A. Lebbek*, a native of Asia and Africa, yields valuable timber, and in Egypt is much cultivated as a shade tree. *A. Julibrissin*, a tree with rose-red flowers, is found in Asia and Africa, and has been introduced into Southern Europe.

Al'boin, King of the Lombards, succeeded his father Audoin in 561, and reigned in Noricum and Pannonia. Narses, the general of Justinian, sought his alliance, and received his aid, in the war against Totila, King of the Ostrogoths. Alboin afterwards (in 568) undertook the conquest of Italy, where Narses, who had subjected this country to Justinian, offended by an ungrateful Court, sought an avenger in Alboin, and offered him his co-operation. After a victorious career in Italy he was slain at Verona, in 573 or 574, by an assassin, instigated by his wife Rosamond, whose hatred he had incurred by sending her, in one of his fits of intoxication, a cup wrought from the skull of her father, and forcing her to drink from it.

Alborak, in Mohammedan mythology, the animal said to have been brought by the angel Gabriel to carry Mohammed to the seventh heaven. It had the face of a man, the body of a horse, the wings of an eagle, and spoke with a human voice.

Albrecht (a'l'breht), the German form of *Albert* (q.v.).

Albrechtsberger (a'l'brehts-ber-gèr), Johann Georg, a German composer and writer on music; a teacher of Beethoven, Moscheles, &c. Born 1736, died 1809.

Albret, Jeanne d' (zha'n da'l-brā), Queen of Navarre, wife of Antoine de Bourbon and mother of Henri IV of France, a zealous supporter of the reformed religion, which she established in her kingdom; born 1528, died (probably poisoned) 1572, shortly before the massacre of St. Bartholomew.

Albuera (a'l-bu"-ā'ra'), a village of Spain, in Estremadura, 12 miles S.S.E. of Badajoz. A battle was fought here, 16th May, 1811, between the army of Marshal Beresford (30,000) and that of Marshal Soult (25,000), when the latter was obliged to retreat to Seville, leaving Badajoz to fall into the hands of the allies.

Albu'go, an affection of the eye, consisting of a white opacity in the cornea; called also *leucoma*.

Al'bum, in ancient Rome a board painted white, on which edicts and public notices were inscribed in black. It is now a name generally given to a blank book for the reception of pieces of poetry, autographs, engravings, photographs, &c. In law it is applied to rent paid in silver (white money).

Albu'men, or **Albumin** (Lat., from *albus*, white), a substance, or rather group of substances, so named from the Latin for the white of an egg, which is one of its most abundant known forms. It may be taken as the type of the protein compounds or the nitrogenous class of food-stuffs. One variety enters largely into the composition of the animal fluids and solids, is coagulable by heat at and above 160°, and is composed of carbon, hydrogen, nitrogen, and oxygen, with a little sulphur. It abounds in the serum of the blood, the vitreous and crystalline humours of the eye, the fluid of dropsy, the substance called coagulable lymph, in nutritive matters, the juice of flesh, &c. The blood contains about 7 per cent of albumen. Another variety, called vegetable albumen, exists in most vegetable juices and many seeds, and has nearly the same composition and properties as egg albumen. When albumen coagulates in any fluid it readily encloses any substances that may be suspended in the fluid. Hence it is used to clarify syrupy liquors. In cookery, white of eggs is employed for clarifying, but in large operations, like sugar-refining, the serum of blood is used. From its being coagulable by various salts, and especially by corrosive sublimate, with which it forms an insoluble compound, white of egg is a convenient antidote in cases of poisoning by that substance. With lime it forms a cement to mend broken ware.

In botany the name albumen is given to the farinaceous matter which surrounds the embryo, the term in this case having no reference to chemical composition. It constitutes the meat of the coco-nut, the flour or meal of cereals, the roasted part of coffee, &c.

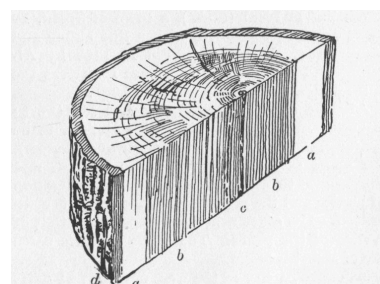
Albuminu'ria, a condition in which the urine contains albumen, evidencing a diseased state of the kidneys.

Albuñol (a'l-bu"-nyol'), a seaport of Southern Spain, province Granada, on the Mediterranean. Pop. 7451.

Albuquerque (a 'l-bu"-kerk'ā), Affonso de, surnamed 'the Great', an eminent Portuguese admiral, born 1453, died in 1515. Portugal having subjected to its power a large part of the western coast of Africa, and begun to extend its sway in the East Indies, Albuquerque was appointed viceroy of the Portuguese acquisitions in this quarter, and arrived in 1503 with a fleet on the coast of Malabar. His career here was extremely successful, he

having extended the Portuguese power over Malabar, Ceylon, the Sunda Islands, and the Peninsula of Malacca, and made the Portuguese name respected by all the nations and princes of India. Notwithstanding his services and his virtues, he was unjustly superseded in his commands by his personal enemy Lopez Soarez, and so severely did he feel the ingratitude of his sovereign, King Emanuel, that he died a few days after receiving the intelligence. His famous letter to the king was discovered and published in 1542 by J. M. de Fonseca. The first volume of his letters was published in 1884 by the Royal Academy of Lisbon.

Albur'num, the soft white substance which, in trees, is found between the liber or inner bark and the wood, and, in progress of time acquiring solidity, becomes itself the wood. A new layer of wood, or rather of alburnum, is added annually to the tree in every part just under the bark.



Alburnum

a a, Alburnum or sapwood. *b*
b, Heart-wood. *c*, Pith. *d*, Bark

Albury (al'ber-i), a rising town of New South Wales on the borders of Victoria, on the right bank of the Murray, 190 miles north-east of Melbourne, in a good agricultural and wine-producing district. Pop. 6750.

Alby, or **Albi** (a'l'bē), an old town of southern France, department of Tarn, 42 miles north-east of Toulouse, on the Tarn, in an extensive plain. It has a cathedral, a Gothic structure, begun in 1282. It manufactures linens, cottons, leather, &c. Alby is said to have given the Albigenses their name. Pop. 18,262.

Alcæ'us, one of the greatest Grecian lyric poets, was born at Mitylene, in Lesbos, and flourished there at the close of the seventh and beginning of the sixth centuries B.C.; but of his life little is known. A strong manly enthusiasm for freedom and justice pervades his lyrics, of which only a few fragments are left. He wrote in the Æolic dialect, and was the inventor of a metre that bears his name (Alcaics), which Horace has employed in many of his odes.

Alcala' de Guadaira (gwa' -dī'ra' ; 'the castle of Guadaira'), a town of southern Spain, on the Guadaira, 7 miles east of Seville, chiefly celebrated

for its manufacture of bread, with which it supplies a large part of the population of Seville. Pop. 8930.

Alcala' de Henares (en-ä'res), a beautiful city of Spain, 16 miles E.N.E. of Madrid, 1 mile from the Henares. It has an imposing appearance when seen from some distance, but on nearer inspection is found to be in a state of decay. There was formerly a university here, at one time attended by 10,000 students; but in 1836 it was removed with its library to Madrid. Cervantes was born here. Pop. 11,728.

Alcala' la Real (rā-a'l'), a town of Spain, 18 miles south-east of Jaen, with a fine abbey and some trade. It was captured in 1340 by Alphonso XI of Leon, from whence it derives the epithet Real ('Royal'). Pop. 15,901.

Alcalde (Sp.; a'l-ka'l-dā), or **Alcaide** (Port.; al-kī'dā; Ar. *alqadi* (Cadi), the judge, not to be confused with *alcaide*, the governor of a fortress), the name of a magistrate in the Spanish and Portuguese towns, to whom the administration of justice and the regulation of the police is committed. His office nearly corresponds to that of justice of the peace. The name and the office are of Moorish origin.

Al'camo, a city in the west of Sicily, 2½ miles south of the Gulf of Castellamare, near the site of the ancient Segesta, the ruins of which, including a well-preserved Doric temple and a theatre, as well as the remains of Moorish occupation, are still to be found here. The district is celebrated for its wine. Pop. 32,200.

Alcañiz (a'l-ka'n-yēth'), a town of north-eastern Spain (Aragon). Pop. 8750.

Alcan'tara (Ar., 'the bridge'), an ancient town and frontier fortress of Spain, on the Tagus, on a rocky acclivity, and enclosed by ancient walls. Pop. 3224.—*Order of Alcantara*, an ancient Spanish order of knighthood instituted for defence against the Moors in 1156, and made a military religious order in 1197.

Alcarraza (a'l-ka'r-rā'tha'), a vessel made of a kind of porous, unglazed pottery, used in Spain to hold drinking-water, which, oozing slightly through the vessel, is kept cool by the evaporation that takes place at the surface. Similar vessels have been long used in Egypt and elsewhere.

Alcazar de San Juan (a´l-kä'tha´r dā sa´n-hwän), a town of Spain, province of Ciudad-Real (New Castile), with manufactures of soap, saltpetre, gunpowder, chocolate, &c. Pop. 13,645.

Alce'do. See *Kingfisher*.

Alces'tis, in Greek mythology, wife of Admetus, King of Thessaly. Her husband was ill, and, according to an oracle, would die unless someone made a vow to meet death in his stead. This was secretly done by Alcestis, and Admetus recovered. After her decease Hercules brought her back from the infernal regions.

Al'chemy, or **Alchymy**, the art which in former times occupied the place of and paved the way for the modern science of chemistry (as astrology did for astronomy), but whose aims were not scientific, being confined solely to the discovery of the means of indefinitely prolonging human life, and of transmuting the baser metals into gold and silver. Among the alchemists it was generally thought necessary to find a substance which, containing the original principle of all matter, should possess the power of dissolving all substances into their elements. This general solvent, or *menstruum universale*, which at the same time was to possess the power of removing all the seeds of disease out of the human body and renewing life, was called the *philosophers' stone*, *lapis philosophorum*, and its pretended possessors were known as *adepts*. Alchemy flourished chiefly in the Middle Ages, though how old such notions might be as those by which the alchemists were inspired it is difficult to say. There are many stories about the mystic origin of alchemy. The art is said to have been taught by the fallen angels, by Isis, or by Miriam, sister of Moses, or by John the Baptist. According to Suidas, Egypt was the home of alchemy, and the mythical Hermes Trismegistus of pre-Christian times was said to have left behind him many books of magical and alchemical learning, and after him alchemy received the name of the *hermetic art*. At a later period chemistry and alchemy were cultivated among the Arabians, and by them the pursuit was introduced into Europe. Many of the monks devoted themselves to alchemy, although they were afterwards prohibited from studying it by the popes. Thus Albertus Magnus is said to have been the author of a work *De Alchimia*, and several treatises on the subject are attributed to Thomas Aquinas. But even Pope John XXII is said to have worked at the science at Avignon. Raymond

Lully, or Lullius, a famous alchemist of the thirteenth and fourteenth centuries, is said to have changed for King Edward I a mass of 50,000 lb. of quicksilver into gold, of which the first rose-nobles were coined. Among other alchemists may be mentioned John Cremer, Abbot of Westminster (1327-77), Nicholas Flamel (1330-80), Basilius Valentinus, Isaac of Holland, and Paracelsus (1493-1541). With the growth of chemistry, the recognition of the chemical elements as forming a large number of distinct substances, and the conception of the fixed unalterable nature of the atoms, attempts to transform the base metals into gold were largely abandoned as being unscientific. But the most modern view of matter, namely, that the atoms of all elements are composed of numerous electrons, favours the idea of the transmutability of elements, and the production of helium from radium (see these articles) by Ramsay shows the possibility of this transmutation.—BIBLIOGRAPHY: Pattison-Muir, *Alchemy, or the Beginnings of Chemistry* (Hodder & Stoughton: Useful Knowledge Series); H. S. Redgrove, *Alchemy, Ancient and Modern*.

Alcibi'ades (-dēz), a famous Athenian statesman and general of high family and of great abilities, but of no principle, was born at Athens in the 82nd Olympiad, 450 B.C., being the son of Cleinias, and a relative of Pericles, who also was his guardian. In youth he was remarkable for the beauty of his person, no less than for the dissoluteness of his manners. He came under the influence of Socrates, but little permanent effect was produced on his character by the precepts of the sage. He acquired great popularity by his liberality in providing for the amusements of the people, and after the death of Cleon attained a political ascendancy which left him no rival but Nicias. Thus he played an important part in the long-continued Peloponnesian war. In 415 he advocated the expedition against Sicily, and was chosen one of the leaders, but before the expedition sailed he was charged with profaning and divulging the Eleusinian mysteries, and mutilating the busts of Hermes, which were set up in public all through Athens. Rather than stand his trial he went over to Sparta, divulged the plans of the Athenians, and assisted the Spartans to defeat them. Sentence of death and confiscation was pronounced against him at Athens, and he was cursed by the ministers of religion. He soon left Sparta and took refuge with the Persian satrap Tissaphernes, ingratiating himself by his affectation of Persian manners, as he had previously done at Sparta by a similar affectation of Spartan

simplicity. He now began to intrigue for his return to Athens, offering to bring Tissaphernes over to the Athenian alliance, and after a while he was recalled and his banishment cancelled. He, however, remained abroad for some years in command of the Athenian forces, gained several victories, and took Chalcedon and Byzantium. In 407 B.C. he returned to Athens, but in 406, the fleet which he commanded having suffered a severe defeat, he was deprived of his command. He once more went over to the Persians, taking refuge with the satrap Pharnabazus of Phrygia, and here he was assassinated in 404 B.C. The authorities for his life are Thucydides, Xenophon, Plutarch, and Cornelius Nepos.

Alcinous (al-sin'o-us), King of the Phæacians. See *Ulysses*.

Alcira (a'l-thē'ra'), a town of Spain, province of Valencia, on the Jucar, founded by the Carthaginians. Fruits, rice, &c., are grown. Pop. 22,050.

Alc'man, the chief lyric poet of Sparta, a Lydian by birth, flourished between 671 B.C. and 631, and wrote (in the Doric dialect) love songs, hymns, pæans, &c., of which only fragments remain.

Alcme'na. See *Amphitryon*.

Alco, a small variety of dog, with a small head and large pendulous ears, found wild in Mexico and Peru, and also domesticated.

Alcobaça (a'l-kō-bä'sa'), a small town of Portugal, 50 miles north of Lisbon, celebrated for a magnificent Cistercian monastery founded in 1148 by Don Alphonso I, and completed in 1222. It contains the tombs of Alphonso II, Alphonso III, Pedro I and his wife Ines de Castro.

Al'cohol, or **Ethyl Alcohol**, C_2H_6O , is a substance obtained by allowing the juice of the grape to undergo a change known as fermentation. It is only in modern times that alcohol has been isolated and its properties examined. Alcohol is now prepared in enormous quantities, both for industrial purposes and for the preparation of alcoholic beverages, from substances rich in sugar or in starch. Potatoes and maize form the main source of alcohol. These are treated with steam under pressure in specially-constructed tanks to extract starchy materials. The starch so liberated is then fermented by means of a substance diastase. This treatment transforms

sugar into alcohol and carbonic acid gas. The solution is then filtered to remove all insoluble matter, proteids, &c., and from this solid residue, cattle-feeding cakes are made. This treatment yields a solution containing 9-10 per cent alcohol. The solution is fractionally distilled, using a special form of distilling column. The most volatile part of the distillate, first runnings, contains acetaldehyde, the second fraction contains the bulk of the alcohol and some water, and the least volatile portion, last runnings, fusel oil and higher alcohols. By this means a liquid containing 80-95 per cent alcohol, rectified spirits, is obtained. For preparation of beverages, fusel oil must be carefully separated from alcohol, as fusel oil has an injurious effect physiologically. The removal of the last traces of water from alcohol is very troublesome. It is repeatedly distilled over quicklime or freshly-ignited potassium carbonate, giving an alcohol containing 98-99 per cent alcohol. The small quantity of water still contained is removed by leaving it in contact with metallic calcium. An alcohol containing more than 96 per cent alcohol is known as *absolute*. Pure alcohol is a colourless poisonous liquid boiling at 78° C., possessing a strong odour and a burning taste. It is inflammable and mixes with water in all proportions and has a specific gravity 0.80625 at 0° C. Very low temperatures convert it into a glassy solid, melting at -117° C., hence it may be used in thermometers for low-temperature measurements. Alcohol burns with a non-luminous flame and gives out great heat; it is used, therefore, in various types of lamps for heating purposes. It is also used as a fuel for motors and is a very valuable solvent for many substances such as resin, oils, colouring-matter, varnishes, and ethereal essences. The so-called 'solid alcohol' can be obtained by dissolving 30 to 40 parts of collodion in 100 parts of alcohol, a solid which separates and burns like alcohol, leaving no residue. Alcohol is the important constituent of all alcoholic beverages and it is due to its presence that wine, whisky, &c., have a stimulating and intoxicating effect on the nervous system. Beverages such as beer, wine, cider, &c., are prepared by direct fermentation of sugars obtained in fruit juices in the case of wine and cider and from barley in the case of beer. These contain varying amounts of alcohol, thus wine may contain from 8 to 10 per cent of alcohol, whilst beer contains 3 to 5 per cent. Whisky, brandy, &c., contain more alcohol, 50-70 per cent, and for the preparation of these the alcohol used must be distilled and purified after fermentation. The alcohol content of an aqueous solution may be deduced from a determination of the specific gravity of the solution

or directly by the Alcoholometer. This gives percentage by volume. The amount of alcohol present in any alcoholic beverage cannot be obtained directly, but if $\frac{1}{3}$ of the liquid be distilled and the distillate made up to the original volume, then the alcohol may be determined by the Alcoholometer. The name alcohol is applied generally in chemistry to a large group of substances, containing carbon, hydrogen, and oxygen, which have chemical properties analogous to those of ethyl alcohol.

Al'coholism, a morbid condition of the body (especially of the nervous system) brought on by the immoderate use of alcoholic liquors.

Alcoholom'eter, an instrument constructed on the principle of the hydrometer, to determine from the specific gravity of spirituous liquors the percentage of alcohol they contain, the scale marking directly the required proportion. If the liquor contain anything besides water and alcohol, previous distillation is necessary.

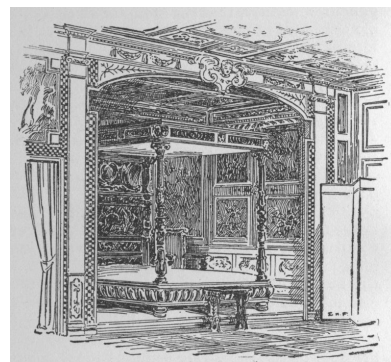
Alco'ran. See *Koran*.

Al'cott, Louisa May, a distinguished American authoress, born in 1833. She wrote a number of books chiefly intended for the young: *Little Women* (1867), *An Old-fashioned Girl* (1869), *Little Men* (1871), *Jack and Jill* (1880), &c. Died in 1888.

Al'cove, a recess in a room, usually separated from the rest of the room by columns, a balustrade, or by curtains, and often containing a bed or seats.

Alcoy', a town of Spain, in Valencia, 24 miles north by west of Alicante, in a richly-cultivated district. There is a Roman bridge over the river, and the town has a very picturesque appearance; its chief manufactures are paper and woollen goods. On the 22nd of April an annual feast is celebrated by the inhabitants of the town commemorating a victory over the Moors in 1257. Pop. 33,896.

Alcudia, Duke of. See *Godoy*.



Alcove. French; late sixteenth century

Alcuin (alk'win; in his native tongue *Ealhwine*), a learned Englishman, the confidant, instructor, and adviser of Charles the Great (Charlemagne). He was born at York in 735, and was educated at York School, of which he subsequently was head master. Alcuin having gone to Rome, Charlemagne became acquainted with him at Parma, invited him in 782 to his Court, and made use of his services in his endeavours to civilize his subjects. To secure the benefit of his instructions, Charlemagne established at his Court a school, called *Schola Palatina*, or the Palace School. In the royal academy Alcuin was called *Flaccus Albinus*. Most of the schools in France were either founded or improved by him; thus he founded the school in the abbey of St. Martin of Tours, in 796, after the plan of the school in York. Alcuin left the Court in 801, and retired to the abbey of St. Martin of Tours, but kept up a constant correspondence with Charles to his death in 804. He left works on theology, philosophy, rhetoric, also poems and letters, all of which have been published. His letters, 232 of which were addressed to Charlemagne, form the most important part of his work. As a philosopher, Alcuin, though lacking in originality, exercised a considerable influence over his contemporaries. The expression of 'scholasticism' is attributed to him.—BIBLIOGRAPHY: C. J. B. Gaskoin, *Alcuin, His Life and his Work*, J. B. Mullinger, *The Schools of Charles the Great*.

Alcyona'ria, cœlenterate animals forming a great division of the class Actinozoa (see *Sea-anemone*). These animals are nearly all composite, and the individual polyps have mostly eight tentacles. They include the organ-pipe corals, sea-pens, fan-corals, &c., as also the red coral of commerce. The polyps resemble those of the genus *Alcyonium* in structure, and in the number and arrangement of the tentacles. See *Alcyonium*.

Alcyo'nium, a genus of cœlenterate animals, one familiar species of which, dredged around the British coasts—*A. digitatum*—is named 'Dead-Men's Fingers', or 'Cow's Paps', from its lobed or digitate appearance. It grows attached to stones, shells, and other objects. It consists of a mass of little polyps, each polyp possessing eight little fringed tentacles disposed around a central mouth. The *Alcyonium* forms the type of the *Alcyonaria*.

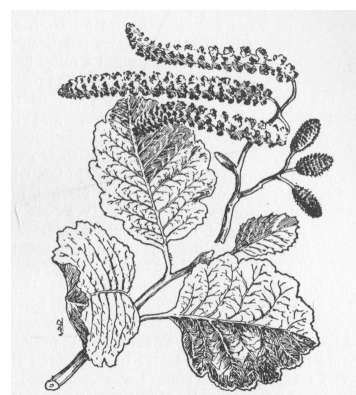
Al'dan, a river of Eastern Siberia, a tributary of the Lena, 1200 miles in length. The Aldan Mountains run along parallel to it on the left for 400 miles.

Aldeb'aran, a star of the first magnitude, forming the eye of the constellation Taurus or the Bull, the brightest of the five stars known to the Greeks as the Hyades. Spectrum analysis has shown it to contain antimony, bismuth, iron, mercury, hydrogen, sodium, calcium, &c.

Aldeburgh (a'ld'bu-ru), a municipal borough of England, on the coast of Suffolk, more important formerly than it is now, having suffered from encroachments of the sea. The poet Crabbe was born there in 1754. Pop. 2892.

Al'dehyde, in chemistry, the generic name given to the compounds of alcohol intermediate between the alcohols and the acids. Common aldehyde (C_2H_4O) is derived from spirit of wine by oxidation, and is a colourless, limpid, volatile, and inflammable liquid, with a peculiar ethereal odour, which is suffocating when strong; specific gravity, 0.79. Atmospheric oxygen converts it into acetic acid. It decomposes oxide of silver, depositing a brilliant film of metallic silver; hence it is used in silvering curved glass surfaces.

Alder (a'l'dër; *Alnus*), a genus of plants of the sub-ord. Betulaceæ (Birch), (nat. ord. Amentaceæ). Fourteen species are known as small trees or shrubs indigenous to temperate and colder regions of the globe; eight of these are found in Central and Western Europe. The only species indigenous to Britain is the common alder (*Alnus glutinōsa*), a tree growing in wet situations in Europe, Asia, and the United States. Its wood, light and soft and of a reddish colour, is used for a variety of purposes, and is well adapted for work which is to be kept constantly in water. Alder is still largely used in gunpowder manufacture, and the roots and knots furnish a beautifully-veined wood well suited for cabinet work; it is used for cigar-boxes in East Prussia and West Russia. The bark is used in tanning and leather-dressing, and by fishermen for staining their nets. This and the young twigs are sometimes employed in dyeing, and yield different shades of yellow and red. With the addition of copperas it yields a black dye.



Common Alder (*Alnus glutinosa*)

Alderley Edge, a town of England, Cheshire, about 8 miles south-west of Stockport. Pop. (1921), 3072.

Al'derman (ä'l'dër-; Anglo-Saxon *ealdorman*, from *ealdor*, older, and *man*), among the Anglo-Saxons a person of a rank equivalent to that of an earl or count, the governor of a shire or county, and member of the *witena-gemót* or great council of the nation. Aldermen played an important rôle already before the Constitution of Egbert, but reached their highest power during the reign of Alfred the Great, who had married the daughter of an alderman. Aldermen, at present, are officers associated with the mayor of a city for the administration of the municipal government in England and the United States.

Al'derney (Fr. *Aurigny*), an island belonging to Britain, off the coast of Normandy, 10 miles due west of Cape La Hogue, and 60 from the nearest point of England, the most northerly of the Channel Islands, between 3 and 4 miles long, and about 1¼ broad. The coast is bold and rocky; the interior is fertile. About a third of the island is occupied by grass lands; and the Alderney cows, a small-sized but handsome breed, are famous for the richness of their milk. The climate is mild and healthy. A judge, with six 'jurats', chosen by the people for life, and twelve 'douzainiers', representatives of the people, form a kind of local legislature. The French language still prevails among the inhabitants, but all understand and many speak English. The *Race of Alderney* is the strait between the coast of France and this island. Pop. 2561.

Aldershot (äl'dër-), a town and military station in England, the latter having given rise to the former. The 'camp' was originated in 1854 by the purchase by Government of a tract of moorland known as Aldershot Heath, on the confines of Surrey, Hampshire, and Berkshire. The object was to accustom both officers and soldiers to act more readily when drawn up in brigades and divisions, their practice having been limited for the most part, since the termination of the French war, to the movements of battalions and companies. It was also deemed advisable to accustom the army to camp life, and to exercise the men in all the evolutions and movements which they might be required to perform when brought into actual contact with the enemy. The accommodation provided for the army, officers as well as men, consisted at first of wooden huts; but these have been superseded by brick

barracks, and altogether the money expended on the camp has amounted to over £3,000,000. The men are exercised in marching, skirmishing, and similar field operations, which are carried on during the summer months with great activity; they are also instructed in the camp in cooking and other duties. The troops at Aldershot in summer include a number of Territorials, Senior and Junior O.T.C., &c. The town is in the neighbourhood of the barracks, immediately beyond the Government ground, and in Hampshire. It contains several churches, and has schools, newspapers, literary institutes, music-halls &c. Aldershot gives its name to a parliamentary division of Hants. Pop. (1921), 28,756.

Ald'helm, an Anglo-Saxon scholar and prelate, Abbot of Malmesbury and Bishop of Sherborne, born 640 (?), died 709. He was a great fosterer of learning and builder of churches, and has left Latin writings on theological subjects.

Al'dine Editions, the name given to the works which proceeded from the press of Aldus Manutius and his family at Venice (1494-1592), Rome (1562-70), and Bologna. (See *Manutius*.) Recommended by their value, as well as by a splendid exterior, they have gained the respect of scholars and the attention of book-collectors. Many of them are the first printed editions (*editiones principes*) of Greek and Latin classics. Others are texts of the modern Italian authors. These editions are of importance in the history of printing. The editions printed by Aldus Manutius the Elder are, however, much more valuable than those issued by his descendants. Among the former are the first edition of the works of Aristotle in 5 vols., and the works of Virgil, Horace, and Petrarch. Aldus had nine kinds of Greek type, and no one before him printed so much and so beautifully in this language. Of the Latin character he procured fourteen kinds of type.

Aldobrandi'ni, the name of a Florentine family, subsequently of princely rank (now extinct), which produced one Pope (Clement VIII) and several cardinals, archbishops, bishops, and men of learning.—*Aldobrandini Marriage*, one of the most beautiful ancient fresco paintings, belonging probably to the time of Augustus, discovered in 1606 on Mount Aquilinus at the very spot where once were the gardens of Mæcenas, and acquired by Cardinal Aldobrandini, nephew of Clement VIII, now in the Vatican. It

represents a marriage scene in which ten persons are portrayed. There is a beautiful copy of this fresco by Poussin in the Galleria Doria at Rome.

Al'dred, or Ealdred, Anglo-Saxon prelate, Bishop of Worcester and Archbishop of York, born 1000(?), died 1069. He improved the discipline of the Church and built several monastic churches. On the death of Edward the Confessor he is said to have crowned Harold. Having submitted to the Conqueror, whose esteem he enjoyed and whose power he made subservient to the views of the Church, he also crowned him as well as Matilda.

Ald'rich, Henry, Dean of Christ Church, Oxford; born in 1647, died in 1710; distinguished as a philosopher, an architect, and as a musician. His *Compendium of Logic* was a textbook till long past the middle of last century. He adapted many of the works of the older musicians, such as Palestrina and Carissimi, to the liturgy of the Church of England, and composed many services and anthems, some of which are still heard in English cathedrals.

Aldrich, Thomas Bailey, the most conspicuous American poet of his generation. Born at Portsmouth, New Hampshire, on 11th Nov., 1836; died at Boston in March, 1907. He edited *Every Saturday* in Boston from 1865 to 1874, and the *Atlantic Monthly* from 1881 to 1890. He was a poet of some skill, the chief characteristic of his lyrics being refinement and finish. Some of his short stories have been rarely surpassed by other American writers. Among his volumes of verse are: *The Ballad of Babie Bell* (1856); *Cloth of Gold* (1874); *Lyrics and Sonnets* (1880); *Friar Jerome's Beautiful Book* (1881); *Unguarded Gates and other Poems* (1895), &c. His prose works include: *Story of a Bad Boy* (1870); *Marjorie Daw and other People* (1873); *The Stillwater Tragedy* (1880); *Two Bites of a Cherry* (1893).

Aldrovan'di, Ulysses, a distinguished Italian naturalist; born 1522, died 1607. He was professor at Bologna, and established botanical gardens and a museum of natural history there; wrote a work on natural history in 14 vols. His *Antidotarii Bononiensis epitome* (1574) has served as a model for all Pharmacopœias published in later years.

Ale and Beer, well-known and extensively-used fermented liquors, the principle of which is extracted from several sorts of grain but most

commonly from barley, after it has undergone the process termed malting. Beer is a more general term than ale, being often used for any kind of fermented malt liquor, including porter, though it is also used in a more special signification. See *Brewing*.

Aleardi (a' -lā-a' r'dē), **Aleardo**, a distinguished Italian lyrical and political poet and patriot, born 1812, died 1878; he was a member of the Italian board of higher education and a senator. His best work is his poem *Il Monte Circello* (1844).

Ale-conner, formerly an officer in England appointed to assay ale and beer, and to take care that they were good and wholesome, and sold at a proper price. The duty of the ale-conners of London was to inspect the measures used in public-houses, to prevent frauds in selling liquors. Four of these were chosen annually by the liverymen, in common hall, on Mid-summer's Day.

Ale-cost. See *Costmary*.

Alec'to, in Greek mythology, one of the Furies (q.v.).

Aleman (a' -le-ma' n'), Mateo, a Spanish novelist, born about the middle of the sixteenth century, died in 1610. His fame rests on his *Life and Adventures of the Rogue Guzman de Alfarache* (translated into French in 1600 and into English in 1623), one of the best of the *picaresque* or rogue novels, which give such a lively picture of the shady classes of society in Spain during the sixteenth and seventeenth centuries. The hero becomes in succession stable-boy, beggar, porter, thief, man of fashion, soldier, valet, merchant, student, robber, galley-slave, and lastly his own biographer.

Aleman'ni, or **Alamanni**, a confederacy of several German tribes which, at the commencement of the third century after Christ, lived near the Roman territory, and came then and subsequently into conflict with the imperial troops. Caracalla first fought with them in 213, but did not conquer them; Severus was likewise unsuccessful. About 250 they began to cross the Rhine westwards, and in 255 they overran Gaul along with the Franks. In 259 a body of them was defeated in Italy at Milan, and in the following year they were driven out of Gaul by Postumus. But the Alemanni did not desist from their incursions, notwithstanding the numerous defeats they suffered at

the hands of the Roman troops. In the fourth century they crossed the Rhine and ravaged Gaul, but were severely defeated by the Emperor Julian and driven back. Subsequently they occupied a considerable territory on both sides of the Rhine; but at last Clovis broke their power in 496 and deprived them of a large portion of their possessions. Part of their territory was formed into a duchy called Alemannia or Swabia, this name being derived from Suevi or Swabians, the name which they gave themselves. It is from the Alemanni that the French have derived their names for Germans and Germany in general, namely, *Allemands* and *Allemagne*, though strictly speaking only the modern Swabians and northern Swiss are the proper descendants of that ancient race.

Alembert (a' -la' n' -bār), Jean le Rond d', a French mathematician and philosopher, born in Paris, 16th Nov., 1717, and died there 29th Oct., 1783. He was the illegitimate son of Madame de Tencin and Chevalier Destouches, and was exposed at the Church of St. Jean le Rond (hence his name) soon after birth. He was brought up by the wife of a poor glazier, and with her he lived for more than forty years. His parents never publicly acknowledged him, but his father settled upon him an income of 1200 livres. He showed much quickness in learning, entered the College Mazarin at the age of twelve, and studied mathematics with enthusiasm and success, but received little encouragement from his teachers. Having left college he studied law and became an advocate, but did not practise, and long continued to occupy himself with mathematics, in which he made immense advances by his own efforts, often arriving at results that other mathematicians had previously arrived at unknown to him. A pamphlet on the motion of solid bodies in a fluid, and another on the integral calculus, which he laid before the Academy of Sciences in 1739 and 1740, showed him in so favourable a light that the Academy received him in 1741 into the number of its members. He soon after published his famous work on dynamics, *Traité de Dynamique* (1743) and another work dealing with fluids, *Traité des Fluides*. His *Réflexion sur la cause générale des vents* was also a work that added to D'Alembert's reputation. He also took a part in the investigations which completed the discoveries of Newton respecting the motion of the heavenly bodies, and published at intervals various important astronomical dissertations—on the perturbations of the planets, for instance, and on the precession of the equinoxes—as well as on other subjects. He

also took part, with Diderot and others, in the celebrated *Encyclopédie* in 33 vols., for which he wrote the *Discours Préliminaire*, as well as many philosophical and almost all the mathematical articles. Literature, history, and philosophy also received attention from him, and his *Éléments de Philosophie* (1759), in which he agrees with the theories of Condillac and Locke, was a work of much value. His great philosophical aim seems to have been the idea of secularizing morality upon a rational basis. Among his miscellaneous works are *Mélanges de Philosophie, d'Histoire, et de Littérature*; *Traduction de quelques Morceaux choisis de Tacite*; *Sur la Destruction des Jésuites*; *Histoire des Membres de l'Académie Française*; *Éléments de Musique théorique et pratique*. He received an invitation from the Russian empress Catherine II to go to St. Petersburg (now Petrograd) as tutor to her son, a very large sum being offered; and Frederick the Great invited him to settle in Berlin, but in vain. From Frederick, however, he accepted a pension, and he also paid a visit to Berlin. There was an intimate friendship between him and Voltaire. He never married, but he was on terms of the closest friendship with Madame L'Espinasse, and they occupied the same house for a number of years. He was held in high esteem by David Hume, who left him a legacy of £200.

Alem'bic, a simple apparatus sometimes used by chemists for distillation, and consisting of three main parts, body, head, and receiver. The *cucurbit*, or body, contains the substance to be distilled, and is usually somewhat like a bottle, bulging below and narrowing towards the top; the *head*, of a globular form, with a flat under-ring, fits on to the neck of the cucurbit, condenses the vapour from the heated liquid, and receives the distilled liquid on the ring enclosing the neck of the lower vessel, and thus causes it to find egress by a discharging-pipe into the third section, called the *receiver*. See *Distillation*.

Alemtejo (a · -lān · -tā'zhō; 'beyond the Tagus'), the largest province of Portugal, and the most southern except Algarve; area, 9219 sq. miles; pop. 478,584. The capital is Evora. It has about 30 miles of coast, but no good harbour and no navigable river. Large areas are devoted to pasturage, and the cultivated portions are comparatively limited, though in the east there are fertile valleys where grain, fruits, &c., are cultivated. There are valuable cork forests in this portion also. Excellent horses are reared. Copper and

iron mines are worked; but on the whole this province is in a backward condition, and is the most thinly inhabited in the country.

Alençon (a'-la'n'-sōn'), a town of France, capital of department Orne, and formerly of the Duchy of Alençon, on the right bank of the Sarthe, 105 miles west by south of Paris; well built; has a fine Gothic church (fifteenth century) and interesting remains of the old castle of the ducs d'Alençon. Alençon was long famed for its point-lace, called 'point d'Alençon', an industry established at the instigation of Colbert in 1673 but now much fallen off; it has cotton and flax spinning and weaving, &c. Fine rock-crystal, yielding the so-called 'diamants d'Alençon', is found in the neighbouring granite quarries. Alençon is mentioned as a city for the first time in 717. Pop. 16,590.—*Alençon*, originally a county, later a dukedom, became united with the crown in 1221, and was given by Louis XI as an appanage to his fifth son, with whom the branch of the Alençon-Valois commenced. The first duke of the name lost his life at the battle of Agincourt in 1415; another, called Charles IV, married the celebrated Margaret of Valois, sister of Francis I. He commanded the left wing of the French army at the battle of Pavia, where, instead of supporting the king at a critical moment, he fled at the head of his troops, the consequence of which was the loss of the battle and the capture of the king.

Alep'po, a city in North Syria, on the River Koik, in a fine plain 60 miles south-east of Alexandretta, which is its port, and 129 miles N.N.E. of Damascus. It has a circumference of about 7 miles, and consists of the old town and numerous suburbs. Its appearance at a distance is striking, and the houses are well built of stone. On a hill stands the citadel, and at its foot the governor's palace. Previous to 1822 Aleppo contained about 100 mosques, but in that year an earthquake laid the greater part of them in ruins, and destroyed nearly the whole city. The aqueduct built by the Romans is the oldest monument of the town. Among the chief attractions of Aleppo are its gardens, in which the pistachio-nut is extensively cultivated. The branch railway to Hamah from the Beyrout-Damascus line has been continued to Aleppo. Formerly the city was a great centre of trade and manufactures, but the earthquake and other causes have combined greatly to lessen its prosperity. It has still a trade, however, in the products of the country, such as wool, cotton, silk, wax, skins, soap, tobacco, &c., and imports a certain quantity of European manufactures.—Aleppo was a place of considerable

importance in very remote times. By the Greeks and Romans it was called *Beræa*. It was conquered by the Arabs in 638, and its original name *Chalybon* was then turned into *Haleb*, whence the Italian form *Aleppo*. The town was occupied by British troops on 27th Oct., 1918. Its population, 200,000 at the beginning of last century, is now estimated at over 250,000. The language generally spoken is Arabic. The vilayet of Aleppo has a pop. of 1,500,000.

Alesh'ki, a town of Southern Russia, government Taurida. Pop. 8915.

Ale'sia, a town and fortress of ancient Gaul, at which in 52 B.C. Julius Cæsar inflicted a crushing defeat on the Gauls under Vercingetorix. It is now represented by the village of Alise, department Côte d'Or, near which Napoleon III erected a colossal statue of Vercingetorix in 1865.

Alessan'dria, a town and fortress in North Italy, capital of the province of the same name, in a marshy country, near the junction of the Bormida and the Tanaro. It was built in 1168 by the Cremonese and Milanese, and was named in honour of Pope Alexander III, who made it a bishop's see. It has a cathedral, important manufactures of linen, woollen, and silk goods, and an active trade. It ranks as one of the first fortresses of Europe, the fortifications including a surrounding wall and bastions, and a strong citadel on the opposite side of the Tanaro, connected by a bridge with the town. Pop. (with suburbs) 78,159.

Ales'si, Galeazzo, a distinguished Italian architect, born at Perugia, 1512, died there in 1572. Many palaces, villas, and churches were erected after his designs, and at the request of Philip II of Spain he drew a plan for the Escorial.

Aletsch'-glacier, the greatest glacier in Switzerland, canton Valais, a prolongation of the immense mass of glaciers connected with the Jungfrau, the Aletschhorn (14,000 feet), and other peaks; about 15 miles long.

Aleurites, a tree belonging to the nat. ord. Euphorbiaceæ, is found in tropical and subtropical parts of the world. *Aleurites triloba*, the 'candleberry tree', is cultivated in the Moluccan Islands for its fruit. The oil extracted from its seeds is valuable both for food and light.

Aleurom'eter, an instrument for indicating the bread-making qualities of wheaten flour. The indications depend upon the expansion of the gluten contained in a given quantity of flour when freed of its starch by pulverization and repeated washings with water.

Aleu'tian Islands, a chain of about eighty small islands belonging to the United States, separating the Sea of Kamchatka from the northern part of the Pacific Ocean, and extending nearly 1000 miles from east to west between lon. 172° E. and 163° W.; total area, 6391 sq. miles; pop. 1220. They are of volcanic formation, and in a number of them there are volcanoes still in activity. Their general appearance is dismal and barren, yet grassy valleys capable of supporting cattle throughout the year are met with, and potatoes, turnips, and other vegetables are successfully cultivated. They afford also an abundance of valuable fur and of fish. The natives belong to the same stock with those of Kamchatka.

Ale'wife (corruption of the Indian name), the *Alōsa tyrannus*, a fish of the same genus as the shad, growing to the length of 12 inches, and caught in great quantities in the mouths of the rivers of New England, New Brunswick, and Nova Scotia, being salted and exported.

Alexander, surnamed **the Great**, was the son of Philip of Macedon and his queen Olympias, and was born at Pella, 356 B.C. In youth he had Aristotle as instructor, and he early displayed uncommon abilities. The victory of Chæronea in 338, which brought Greece entirely under Macedonia, was mainly decided by his efforts. Philip having been assassinated, 336 B.C., Alexander, not yet twenty years of age, ascended the throne. His father had been preparing an expedition against the Persians, and Alexander determined to carry it out; but before doing so he had to chastise the barbarian tribes on the frontiers of Macedon as well as quell a rising in Greece, in which he took and destroyed Thebes, put 6000 of the inhabitants to the sword, and carried 30,000 into captivity. Leaving Antipater to govern in his stead in Europe, and being confirmed as commander-in-chief of the Greek forces in the general assembly of the Greeks, he crossed over the Hellespont into Asia, in the spring of 334, with 30,000 foot and 5000 horse. His first encounter with the Persian forces (assisted by Greek mercenaries) was at the small river



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Granīcus, where he gained a complete victory. Most of the cities of Asia Minor now opened their gates to the victor, and Alexander restored democracy in all the Greek cities. In passing through Gordium he cut the Gordian knot, on which it was believed the fate of Asia depended, and then conquered Lycia, Ionia, Caria, Pamphylia, and Cappadocia. A sickness, caused by bathing in the Cydnus (333 B.C.), checked his progress; but scarcely was he restored to health when he continued his advance, and this same year defeated the Persian emperor Darius and his army of 500,000 or 600,000 men (including 50,000 Greek mercenaries) near Issus (inner angle of the Gulf of Alexandretta). Darius fled towards the interior of his dominions, leaving his family and treasures to fall into the hands of the conqueror. Alexander did not pursue Darius, but proceeded southwards, and secured all the towns along the Mediterranean Sea, though he only got possession of Tyre (taken 332 B.C.) after besieging it for seven months. Palestine and Egypt now fell before him, and in the latter he founded Alexandria, which became one of the first cities of ancient times. Hence he went through the desert of Libya, to consult the oracle of Zeus Ammon, and it was said that the god recognized him as his son. On his return Alexander marched against Darius, who had collected an immense army in Assyria, and rejected the proposals of his rival for peace. A battle was fought at Gaugamela, about 50 miles from Arbela, 331 B.C., and notwithstanding the immense numerical superiority of his enemy, Alexander (who had but 40,000 men and 7000 horse) gained a complete victory. Babylon and Susa opened their gates to the conqueror, who marched towards Persepolis, the capital of Persia, and entered it in triumph. He now seems for a time to have lost his self-command. He gave himself up to arrogance and dissipation, and is said in a fit of intoxication to have set fire to the palace of Persepolis, one of the wonders of the world. Rousing himself up, however, he set out in pursuit of Darius, who, having lost his throne, was kept prisoner by Bessus, satrap of Bactriana. Bessus, on seeing himself closely pursued, caused Darius to be assassinated (330 B.C.). Continuing his progress he subdued Bessus, and advanced to the Jaxartes, the extreme eastern limit of the empire, but did not fully subdue the whole of this region till 328, some fortresses holding out with great tenacity. In one of these he took prisoner the beautiful Roxana, daughter of Oxyartes, a nobleman of Sogdiana, and having fallen in love with her he married her. Meantime disaffection had once or twice manifested itself among his Macedonian followers and had

been cruelly punished; and he had also, to his lasting remorse, killed his faithful friend Cleitus in a fit of drunken rage. Alexander now formed the idea of conquering India, then scarcely known even by name. He passed the Indus (326 B.C.), marched towards the Hydaspes (Jhelum), at the passage of which he conquered a king named Porus in a fierce battle, and advanced victoriously through the north-west of India, and intended to proceed as far as the Ganges, when the murmurs of his army compelled him to return. On the Hydaspes he built a fleet, in which he sent a part of his army down the river, while the rest proceeded along the banks. By the Hydaspes he reached the Acesines (Chenab), and thus the Indus, down which he sailed to the sea. Nearchus, his admiral, sailed hence to the Persian Gulf, while Alexander directed his march by land to Babylon, losing a great part of his troops in the desert through which he had to pass. In Susa he married Statira, the eldest daughter of Darius, and rewarded those of his Macedonians who had married Persian women, because it was his intention to unite the two nations as closely as possible. At Opis, on the Tigris, a mutiny arose among his Macedonians (in 324), who thought he showed too much favour to the Asiatics; by firmness and policy he succeeded in quelling this rising, and sent home 10,000 veterans with rich rewards. Soon after, his favourite, Hephæstion, died at Ecbatana, and Alexander's grief was unbounded. The favourite was royally buried at Babylon, and here Alexander was engaged in extensive plans for the future, when he became suddenly sick, after a banquet, and died in a few days (323 B.C.), in his thirty-third year, after a reign of twelve years and eight months. His body was after a time conveyed to Egypt with great splendour by his general Ptolemy. He left behind him an immense empire, which was divided among his chief generals, and became the scene of continual wars. The reign of Alexander constitutes an important period in the history of humanity. His career was not merely a series of empty conquests, but was attended with the most important results. The language, and much of the civilization of Greece, followed in his track; large additions were made to the sciences of geography, natural history, &c.; a road was opened to India; and the products of the farthest east were introduced into Europe. Greek kingdoms, under his generals and their successors, continued to exist in Asia for centuries.—BIBLIOGRAPHY: B. I. Wheeler, *Alexander the Great* (Heroes of the Nations Series: Putnam); Grote, *History of Greece*; Holm, *History of Greece*; Dodge, *Alexander* (Great Captains Series).

Alexander, the name of eight popes, the earliest of whom, **Alexander I**, is said to have reigned from 108 to 119. **Alexander III**, elected 1159, died 1181, exercised his authority with great vigour against Henry II when the latter was accused of the assassination of Thomas Becket. The most famous (or infamous) is **Alexander VI** (Borgia), who was born at Valencia, in Spain, in 1431, and died in 1503. When he was only twenty-five years of age his uncle, Pope Calixtus III, made him a cardinal, and shortly afterwards appointed him to the dignified and lucrative office of vice-chancellor. By bribery he prepared his way to the papal throne, which he attained in 1492, after the death of Innocent VIII. Both the authority and revenues of the popes being at this time much impaired, he set himself to reduce the power of the Italian princes, and seize upon their possessions for the benefit of his own family. To effect this end he is said not to have scrupled to use the vilest means, including poison and assassination. His policy, foreign as well as domestic, was faithless and base, and his private life was stained by immorality. He understood how to extract immense sums of money from all Christian countries under various pretexts. He sold indulgences, and set aside, in favour of himself, the wills of several cardinals. His excesses roused against him the powerful eloquence of Savonarola, who, by pen and pulpit, urged his deposition, but had to meet his death at the stake in 1498. Not long after his election Alexander had the honour of deciding the dispute between the kings of Portugal and Castile concerning their respective claims to the foreign countries recently discovered. It must, however, be admitted that Pope Alexander, whilst striking the wealthy and powerful, interested himself in the welfare of the people, and that he was a patron of arts and letters. His son, Cesare Borgia, and his daughter, Lucrezia, are equally notorious with himself.

Alexander, the name of three Scottish kings. **Alexander I**, a son of Malcolm III, Canmore, and Margaret of England, succeeded his brother Edgar in 1107, and governed with great ability till his death in 1124. He was a great benefactor of the Church, and a firm vindicator of the national independence.—**Alexander II** was born in 1198, and succeeded his father, William the Lion, in 1214. He was a wise and energetic prince, and Scotland prospered greatly under him, though disturbed by the Norsemen, by the restlessness of some of the Celtic chiefs, and by the attempts of Henry III of England to make Alexander do homage to him. He helped

Robert FitzWilliam to capture London and compel King John to sign Magna Charta. Alexander married Henry's sister, Joan, in 1221, who lived till 1238. In 1244 war with England almost broke out, but was fortunately averted. Alexander died in 1248 at Kerrera, an island opposite Oban, when on an expedition in which he hoped to wrest the Hebrides from Norway. He was succeeded by his son, **Alexander III**, a boy of eight, who in 1251 married Margaret, eldest daughter of Henry III of England. Like his father, he was eager to bring the Hebrides under his sway, and this he was enabled to accomplish in a few years after the defeat of the Norse King Haco at Largs, in 1263. The mainland and islands of Scotland were now under one sovereign, though Orkney and Shetland still belonged to Norway. Alexander was strenuous in asserting the independence both of the Scottish kingdom and the Scottish Church against England. He died in 1285 by the falling of his horse while he was riding in the dark between Burntisland and Kinghorn. He left as his heiress Margaret, the Maid of Norway, daughter of Eric of Norway, and of Alexander's daughter, Margaret. Under him Scotland enjoyed greater prosperity than for generations afterwards.

Alexander I, Emperor of Russia, son of Paul I and Maria, daughter of Prince Eugene of Würtemberg, was born in 1777, and died in 1825. On the assassination of his father, in 1801, Alexander ascended the throne, and one of his first acts was to conclude peace with Britain, against which his predecessor had declared war. In 1803 he offered his services as mediator between England and France, and two years later a convention was entered into between Russia, England, Austria, and Sweden for the purpose of resisting the encroachments of France on the territories of independent States. He was present at the battle of Austerlitz (1805), when the combined armies of Russia and Austria were defeated by Napoleon. In the succeeding campaign the Russians were again beaten at Eylau (8th Feb., 1807) and Friedland (14th June), the result of which was an interview between Alexander and Napoleon, and the treaty at Tilsit. The Russian emperor now for a time identified himself with the Napoleonic schemes, and soon obtained possession of Finland and an extended territory on the Danube. The French alliance, however, he found to be too oppressive, and his having separated himself from Napoleon led to the disastrous French invasion of 1812. In 1813 he published a manifesto which served as the basis of the coalition of the other European powers against France, which was followed

by the capture of Paris (in 1814), the abdication of Napoleon and the restoration of the Bourbons, and the utter overthrow of Napoleon the following year. After Waterloo, Alexander, accompanied by the Emperor of Austria and the King of Prussia, made his second entrance into Paris, where they concluded the treaty known as the Holy Alliance. The remaining part of his reign was chiefly taken up with measures of internal reform, including the gradual abolition of serfdom, and the promotion of education, agriculture, commerce, and manufactures, as well as literature and the fine arts.

Alexander II, Emperor of Russia, was born 29th April, 1818, and succeeded his father Nicholas in 1855, before the end of the Crimean war. After peace was concluded, the new emperor set about effecting reforms in the empire, the greatest of all being the emancipation of the serfs in 1861, a measure which gave freedom, on certain conditions, to 50,000,000 of human beings who were previously in a state little removed from that of slavery. Under him, too, representative assemblies in the provinces were introduced, and he also did much to improve education, and to reorganize the judicial system. During his reign the Russian dominions in Central Asia were extended, a piece of territory south of the Caucasus, formerly belonging to Turkey, was acquired, and a part of Bessarabia restored to Russia. The latter additions resulted from the Russo-Turkish war of 1877-8. He was killed by an explosive missile flung at him by a Nihilist in a street in St. Petersburg (now Petrograd), 13th March, 1881. He was succeeded by his son, Alexander III. His only daughter was married to the Duke of Edinburgh.

Alexander III, Emperor of Russia, son of Alexander II, born in 1845, became heir to the throne on the death of his eldest brother, Nicholas (1865). In 1863 he married Princess Dagmar of Denmark; he succeeded to the throne in 1881, on the assassination of his father, being crowned in Moscow in 1883. He gave up the reforms begun by his father, and ruled in the old autocratic fashion, restricting the liberties of Finland and the Baltic Provinces, and encouraging persecution of the Jews. He spent much time in the closely-guarded castle of Gatchina, to be safe from Nihilistic attempts, several of which he narrowly escaped. He endeavoured to put down corruption and underhand dealing among the bureaucracy, and in his own habits gave an example of simplicity and economy. While showing himself

suspicious of Germany and Austria-Hungary, he entered on friendly relations with France. He began to suffer from disease of the kidneys in 1893, and died at Livadia on 1st Nov., 1894. He was succeeded by his eldest son, Nicholas II.

Alexander I, King of Serbia, born in 1876. He was the son of King Milan, and on the abdication of his father in 1889 was proclaimed king under a regency. He married Madame Draga Mashin, a widow, who was much older than himself. Both were assassinated on 11th June, 1903.

Alexander of Hales. See *Hales, Alexander de*.

Alexander, Boyd, British explorer and naturalist, born in 1873. He led many expeditions for research and exploration to the Cape Verde Islands, the Zambesi River, and various parts of the world. He also discovered many new birds when he ascended the Mount St. Isabel. In 1908 he received the gold medal of the Royal Geographical Society. He was murdered by natives in May, 1910, while exploring the French Congo. He wrote *From the Niger to the Nile* (1907), &c. *Boyd Alexander's Last Journey* was published in 1912.

Alexander Nevskoi, a Russian hero and saint, son of the Grand-Duke Jaroslav, born in 1219, died in 1263. He fought valiantly against assaults of the Mongols, the Danes, Swedes, and Knights of the Teutonic Order. He gained the name of *Nevskoi* in 1240, for a splendid victory, on the Neva, over the Swedes. The gratitude of his countrymen commemorated the hero in popular songs, and raised him to the dignity of a saint. Peter the Great built a splendid monastery at St. Petersburg (Petrograd) in his honour, and in memory of him established the Order of Alexander Nevskoi.

Alexander Seve'rus, a Roman emperor, born in 208, died A.D. 235. He was raised to the imperial dignity in A.D. 222 by the prætorian guards, after they had put his cousin the Emperor Heliogabalus to death. He governed ably both in peace and war; and also occupied himself in poetry, philosophy, and literature. He was very tolerant in religious matters, and although not professing Christianity intended to erect a temple to Christ, but was prevented by the pagan priests from carrying out this plan. In 232 he defeated the Persians under Artaxerxes, who wished to drive the Romans from Asia. When on an expedition into Gaul, to repress an incursion of the

Germans, he was murdered with his mother in an insurrection of his troops, headed by the brutal Maximin, who succeeded him as emperor.

Alexanders (*Smyrniium Olusātrum*), an umbelliferous biennial plant, a native of the Mediterranean region, but found in Great Britain and Ireland. It was formerly cultivated for its leaf-stalks, which, having a pleasant aromatic flavour, were blanched and used instead of celery—a vegetable that has taken its place.

Alexandra, the queen mother, widow of Edward VII, daughter of Christian IX, King of Denmark, was born at Copenhagen on 1st Dec., 1844, and was married on 10th March, 1863, being Princess of Wales up to the death of Queen Victoria and the accession of King Edward in Jan., 1901. She was highly popular from the first in the country of her husband, as she constantly showed an interest in all benevolent causes. She has been the mother of six children, one of whom died in infancy, while the eldest, Edward, Duke of Clarence and Avondale, died in 1892 at the age of twenty-eight. Cf. S. A. Tooley, *Queen Alexandra*.

Alexandret'ta, or **Iskanderoon** (ancient **Alexandria ad Issum**), a small seaport in Asia Minor, on the Gulf of Iskanderoon, the port of Aleppo and Northern Syria. Named after Alexander the Great, and founded in memory of the battle of Issus. In 1832 Mehemet Ali won a victory over the Turks near Alexandretta. There is a large export and import trade. It was occupied by British and French troops in Nov., 1918. Pop. 10,000.

Alexan'dria, an ancient city and seaport in Egypt, at the north-west angle of the Nile delta, on a ridge of land between the sea and Lake Mareotis. Ancient Alexandria was founded by, and named in honour of, Alexander the Great, in 332 B.C., and was long a great and splendid city, the centre of commerce between the east and west, as well as of Greek learning and civilization, with a population at one time of perhaps 1,000,000. It was especially celebrated for its great library, and also for its famous lighthouse, one of the wonders of the world, standing upon the little island of Pharos, which was connected with the city by a mole. Under Roman rule it was the second city of the empire, and when Constantinople became the capital of the East it still remained the chief centre of trade; but it received a blow from which it never recovered when captured by Amru, general of Caliph

Omar, in 641, after a siege of fourteen months. Its ruin was finally completed by the building of Cairo (969) and the discovery of the passage to India by the Cape of Good Hope (1498) which opened up a new route for the Asiatic trade. See *Alexandrian Library, Alexandrian School*.—Modern Alexandria stands partly on what was formerly the island of Pharos, partly on the peninsula which now connects it with the mainland and which was formed by the accumulation of soil, and partly on the mainland. The streets in the Turkish quarter are narrow, dirty, and irregular; in the foreign quarter they are regular and wide, and it is here that the finest houses are situated. Here also are the principal shops and hotels, banks, offices of companies, &c.; this part of the city being supplied with gas, and with water brought by the Mahmudieh Canal from the western branch of the Nile. Alexandria is connected by railway with Cairo, Rosetta, and Suez. A little to the south of the city are the catacombs, which now serve as a quarry. Another relic of antiquity is Pompey's Pillar, 98 feet 9 inches high. Alexandria has two ports, on the east and west respectively of the isthmus of the Pharos peninsula, the latter having a breakwater over 3000 yards in length, with fine quays and suitable railway and other accommodation. The trade of Alexandria is large and varied, the exports being cotton, beans, pease, rice, wheat, &c.; the imports chiefly manufactured goods, machinery, timber, and coal. The origin of its more recent career of prosperity it owes to Mohammed Ali. In 1882 the insurrection of Arabi Pasha and the massacre of Europeans led to the intervention of the British, and the bombardment of the forts by the British fleet in July. The administrative district has an area of 19 sq. miles; pop. 444,617 (or 23,401 per square mile).

Alexandria, a town and port of the United States, in Virginia, on the right bank of the Potomac (which is of sufficient depth for large vessels), 7 miles south of Washington, carries on a considerable trade, chiefly in flour. Pop. (1920), 18,060.

Alexandria, a town of Scotland, in Dumbartonshire, on the Leven, 4 miles north of Dumbarton, with extensive cotton-printing and bleaching works. Pop. 9850.

Alexandria, a town of the Ukraine, in the former Russian government of Kherson, on a tributary of the Dnieper. Pop. 10,521.

Alexandrian Library, the largest and most famous of all the ancient collections of books, founded by Ptolemy Soter (died 283 B.C.), King of Egypt, and greatly enlarged by succeeding Ptolemies. The first librarian was Zenodotus (234 B.C.). At its most flourishing period it is said to have numbered 700,000 volumes, accommodated in two different buildings, one of them being the Serapeion, or temple of Jupiter Serapis. The other collection was burned during Julius Cæsar's siege of the city, but the Serapeion library existed to the time of the Emperor Theodosius the Great, when, at the general destruction of the heathen temples, the splendid temple of Jupiter Serapis was gutted (A.D. 391) by a fanatical crowd of Christians, and its literary treasures destroyed or scattered. A library was again accumulated, but was burned by the Arabs when they captured the city under the caliph Omar in 641. Amru, the captain of the caliph's army, would have been willing to spare the library, but Omar is said to have disposed of the matter in the famous words: "If these writings of the Greeks agree with the Koran they are useless, and need not be preserved; if they disagree they are pernicious, and ought to be destroyed". This story, however, which rests solely on the authority of Abulfaragius, a writer who lived six centuries later, is now generally discredited.

Alexandrian School or Age, the school or period of Greek literature and learning that existed at Alexandria in Egypt during the three hundred years that the rule of the Ptolemies lasted (323-30 B.C.), and continued under the Roman supremacy. Ptolemy Soter founded the famous library of Alexandria (see above) and his son, Philadelphus, established a kind of academy of sciences and arts. Many scholars and men of genius were thus attracted to Alexandria, and a period of literary activity set in, which made Alexandria for long the focus and centre of Greek culture and intellectual effort. It must be admitted, however, that originality was not a characteristic of the Alexandrian age, which was stronger in criticism, grammar, and science than in pure literature. Among the grammarians and critics were Zenodotus, Eratosthenes, Aristophanes, Aristarchus, and Zoilus, proverbial as a captious critic. Their merit is to have collected, edited, and preserved the existing monuments of Greek literature. To the poets belong Apollonius, Lycophron, Aratus, Nicander, Euphorion, Callimachus, Theocritus, Philetas, &c. Among those who pursued mathematics, physics, and astronomy was Euclid, the father of scientific geometry; Archimedes, great in physics and

mechanics; Apollonius of Perga, whose work on conic sections still exists; Nicomachus, the first scientific arithmetician; and (under the Romans) the astronomer and geographer Ptolemy. Alexandria also was distinguished in philosophical speculation, and it was here that the New Platonic school was established by Ammonius of Alexandria (about A.D. 193), whose disciples were Plotinus and Origen. Being for the most part Orientals, formed by the study of Greek learning, the writings of the New Platonists are strikingly characterized—for example, those of Ammonius Saccas, Plotinus, Iamblicus, Porphyrius—by a mixture of Asiatic and European elements. The connection of Neo-Platonism with Alexandria is, however, less than is commonly supposed.—BIBLIOGRAPHY: Mahaffy, *Greek Life and Thought from the Age of Alexander to the Roman Empire*; Kingsley, *Alexandria and her Schools*; Vacherot, *Histoire critique de l'école d'Alexandrie* (3 vols.).

Alexandrian Version. See *Codex Alexandrinus*.

Alexandrine, in prosody, the name given, from an old French poem on Alexander the Great, to a species of verse, which consists of six iambic feet, or twelve syllables, the pause being, in correct Alexandrines, always on the sixth syllable; for example, the second of the following verses:—

A needless Alexandrine ends the song,
That, like a wounded snake, drags its slow length along.

In English Drayton's *Polyolbion* is written in this measure, and the concluding line of the Spenserian stanza is an Alexandrine. In France the verse fell into disuse during the early part of the sixteenth century, but was again revived by Jean Antoine de Baïf, one of the poets of the Pléiade. Jodelle introduced the verse into the drama, and Ronsard made it very popular. French epics and dramas being confined to this verse, it is therefore called the *heroic*.

Alexandro'pol, formerly a Russian town and fortress in the Transcaucasian government of Erivan, near the highway from Erivan to Kars; now belonging to Armenia; it has silk manufactories. Pop. 48,938.

Alexan'drov, a town of Russia, government of Vladimir, with a famous convent, in the church of which are interred two sisters of Peter the Great; manufactures of steel and cotton goods. Pop. 7179.

Alex'isbad, a bathing-place of Germany, Anhalt, in the Harz Mountains, with two mineral springs strongly impregnated with iron.

Alex'is Mikhail'lovitsh (son of Michael), second Russian Tsar of the line of Romanov, born in 1629, succeeded his father Mikhail Feodorovitsh in 1645, and died in 1676. He did much for the internal administration and for the enlargement of the empire; reconquered Little Russia from Poland, and carried his authority to the extreme east of Siberia. He was father of sixteen children, the most famous of them being Peter the Great and his sister Sophia.

Alexis Petro'vitsh, eldest son of Peter the Great and Eudoxia Lopukhina, repudiated in 1698, was born in Moscow, 1690, and died in 1718. He opposed the innovations introduced by his father, who on this account disinherited him by a ukase in 1718, and when he discovered that Alexis was paving the way to succeed to the crown he had his son tried and condemned to death. A few days afterwards Alexis died, after having received twenty-five strokes with the knout, leaving a son, afterwards the Emperor Peter II.

Alex'ius Comne'nus, Byzantine Emperor, was born in 1048, and died in 1118. He was a nephew of Isaac the first emperor of the Comneni, and attained the throne in 1081, at a time when the Empire was menaced from various sides, especially by the Turks and the Normans. From these dangers he managed to extricate himself by policy or warlike measures, and maintained his position till the age of seventy, during a reign of thirty-seven years. His daughter Anna wrote a life of him (*The Alexiad*), which is one continuous eulogy, but all the Latin historians are very severe on him.

Al'fa. See *Esparto*.

Alfal'fa, generally known in Britain as lucerne, a prolific forage plant largely grown in California, &c.

Alfara'bi, an eminent Arabian scholar of the tenth century; died at Damascus in 950; wrote on Aristotelian philosophy, and compiled a kind of encyclopedia.

Al'fenid, an alloy of nickel plated with silver, used for spoons, forks, candlesticks, tea services, &c.

Alfieri (a`l-fē-ā'rē), Vittorio, Count, Italian poet, was born at Asti in 1749, and died in 1803. After extensive European travels he began to write, and his first play, *Cleopatra* (1775), being received with general applause he determined to devote all his efforts to attaining a position among writers of dramatic poetry. At Florence he became intimate with the Countess of Albany, wife of Prince Charles Edward Stuart, and on the death of the prince she lived with him as his mistress. This connection he believed to have served to stimulate and elevate his poetic powers. He died at Florence and was buried in the church of Santa Croce, between Macchiavelli and Michael Angelo, where a beautiful monument by Canova covers his remains. He wrote twenty-one tragedies and six comedies. His theatrical work has been rightly styled a creation of his pride as much as of his genius; he endeavoured to turn the theatre into a platform and was constantly preaching from the stage. Anxious to use his characters as exponents of his theories, and to make them *talk*, he often forgot to make them *act*. Alfieri himself admitted that he was writing with a view to "teaching men how to become free, strong, generous, and passionate for real virtue", but such an attitude is opposed to true art. His tragedies are full of lofty and patriotic sentiments, but the language is stiff and without poetic grace, and the plots poor. Nevertheless he is considered the first tragic writer of Italy, and has served as a model for his successors. Alfieri composed also an epic, lyrics, satires, and poetical translations from the ancient classics. He left an interesting autobiography. The best edition of his works is that published at Pisa (1805-13) in 22 vols.

Alfon'so. See *Alphonso*.

Al'ford, Henry, D.D., Dean of Canterbury, an English poet, scholar, and miscellaneous writer, was born in London in 1810. After attending various schools he entered Trinity College, Cambridge, in 1827, graduated B.A. in 1832, was elected fellow in 1834, and next year became vicar of Wymeswold, Leicestershire. In 1842 he was appointed examiner in logic and moral philosophy to the University of London, and held the appointment till 1857. He early began the great work of his life, his edition of the Greek Testament with commentary, which occupied him for twenty years, the first volumes being published in 1849, the fourth and last in 1861. In 1853 he was transferred to Quebec Chapel, London, and in 1857 was appointed Dean of Canterbury. He was the first editor of the *Contemporary*

Review (1866-70). He died in 1871. Among other works he wrote *Chapters on the Poets of Ancient Greece*, *Sermons*, *Psalms and Hymns*, *Homilies on the Acts of the Apostles*, *Letters from Abroad*, *Poetical Works*, *Plea for the Queen's English*.

Alfred (or **Ælfred**) **the Great**, King of England, was born at Wantage, in Berkshire, A.D. 849, his father being Ethelwulf, son of Egbert, King of the West Saxons. He succeeded his brother Ethelred in 872, at a time when the Danes, or Northmen, had extended their conquests widely over the country, and they had completely overrun the kingdom of the West Saxons by 878. Alfred was obliged to flee in disguise. At length he gathered a small force, and having fortified himself on the Isle of Athelney, formed by the confluence of the Rivers Parret and Tone, amid the marshes of Somerset, he was able to make frequent sallies against the enemy. It was during his abode here that he went, according to legend, disguised as a harper into the camp of King Guthrum (or Guthorm), and, having ascertained that the Danes felt themselves secure, hastened back to his troops, led them against the enemy, and gained such a decided victory that fourteen days afterwards the Danes begged for peace. This battle took place in May, 878, near Edington, in Wiltshire. Alfred allowed the Danes who were already in the country to remain, on condition that they gave hostages, took a solemn oath to quit Wessex, and embraced Christianity. Their king, Guthrum, was baptized, with thirty of his followers, and ever afterward remained faithful to Alfred. They received that portion of the east of England now occupied by the counties of Norfolk, Suffolk, and Cambridge, as a place of residence. The few years of tranquillity (886-93) which followed were employed by Alfred in rebuilding the towns that had suffered most during the war, particularly London; in training his people in arms and no less in agriculture; in improving the navy; in systematizing the laws and internal administration; and in literary labours and the advancement of learning. He caused many manuscripts to be translated from Latin, and himself translated several works into Anglo-Saxon, such as the *Psalms*, *Æsop's Fables*, *Boethius on the Consolation of Philosophy*, the *History of Orosius*, *Bede's Ecclesiastical History*, &c. He also drew up several original works in Anglo-Saxon. These peaceful labours were interrupted, about 894, by an invasion of the Northmen, who, after a struggle of three years, were finally driven out. Alfred died in 901. He had married, in 868, Alswith or Ealhswith, the

daughter of a Mercian nobleman, and left two sons: Edward, who succeeded him, and Ethelwerd, who died in 922.—BIBLIOGRAPHY: Plummer, *Life and Times of Alfred the Great*; A. Bowker, *Alfred the Great, Chapters on his Life and Times*; B. A. Lees, *Alfred the Great*.

Algæ (al'jē), a nat. ord. of cryptogamic or thallogenous plants, found for the most part in the sea and fresh water, or on the surface of damp walls, rocks, the bark of trees, and in similar moist situations. They are either some shade of bluish-green, green, brown, or red colour. The higher forms have stems bearing leaf-like expansions, and they are often attached to the rocks by roots, which, however, do not derive nutriment from the rocks. A stem, however, is most frequently absent. The plants are nourished through their whole surface by the medium in which they live. They vary in size from the microscopic diatoms to forms whose stems resemble those of forest trees, and whose fronds rival the leaves of the palm. They are entirely composed of cellular tissue, and many are edible and nutritious, as carrageen or Irish-moss, dulse, &c. Kelp, iodine, and bromine are products of various species. The Algæ are also valuable as manure. They are often divided into five orders: Diatomaceæ, Confervaceæ, Fucaceæ, Ceramiaceæ, and Characeæ.

Algar'di, Alessandro, one of the chief Italian sculptors of the seventeenth century; born 1602, died 1654. He lived and worked chiefly at Rome; executed the tomb of Leo XI in St. Peter's, a bronze statue of Innocent X, and a marble relief with life-size figures over the altar of St. Leo there.

Algaro'ba-bean. See *Carob Tree*.

Al'garot, a violently purgative and emetic white powder, precipitated from chloride of antimony in water; it was used in medicine by the physician Victor Algarotus in the sixteenth century.

Algarot'ti, Francesco, Count, born in 1712, died in 1764, an Italian writer on science, the fine arts, &c. He lived for some years in France and for a long time in Germany, Frederick the Great of Prussia having made him chamberlain and count. He wrote *Neutonianismo per le donne*; *Saggi sopra le belle arti*, his principal work on art; poems, letters, &c. Algarotti's works published at Venice in 17 vols. (1791-4) and illustrated by Tesi and Novelli are a *chef-d'œuvre* of typography. Frederick the Great erected at Pisa a monument to his memory.

Algarve (al-ga`r`vā, meaning the land situated in the west), a maritime province of Portugal occupying the southern portion of the country, mountainous but with some fertile tracts. The title King of Algarve was held by the Kings of Portugal. Area, 1937 sq. miles; pop. 274,122.

Algau (a`l`gou), a name for the south-western portion of Bavaria and the adjacent parts of Würtemberg and Tyrol, intersected by the Algau Alps. The Algau breed of cattle is one of the best in Germany.

Algazzali (a`l-ga`z-ä`lē), Abu Hamed Mohammed, an Arabian philosopher, Persian by birth; born 1058, died 1111. He was a most prolific author; an opponent of the prevailing Aristotelian philosophy of the day, and wrote against it the *Destruction of the Philosophers*, answered by Averroes in his *Destruction of the Destruction*.

Al'gebra (from the Arabic *al*, definite article, and *jabbara*, to make equal), a kind of generalized arithmetic, in which numbers or quantities and operations, often also the results of operations, are represented by symbols. Thus the expression $xy + cz + dy^2$ denotes that a number represented by x is to be multiplied by a number represented by y , a number c multiplied by a number z , a number d by a number y multiplied by itself (or squared), and the sum taken of these three products. So the *equation* (as it is called) $x^2 - 7x + 12 = 0$ expresses the fact that if a certain number x is multiplied by itself, and this result made less by seven times the number and greater by twelve, the result is 0. In this case x must either be 3 or 4 to produce the given result; but such an equation (or formula) as $(a + b)(a - b) = a^2 - b^2$ is always true whatever values may be assigned to a and b . Algebra is an invaluable instrument in intricate calculations of all kinds, and enables operations to be performed and results obtained that by arithmetic would be impossible, and its scope is still being extended.

The beginnings of algebraic method are to be found in Diophantus, a Greek of the fourth century of our era, but it was the Arabians that introduced algebra to Europe, and from them it received its name. The first Arabian treatise on algebra was published in the reign of the great Caliph Al Mamun (813-33) by Mohammed Ben Musa. Italian merchants were the first algebraists in Europe, and in 1202 Leonardo Fibonacci of Pisa, who had travelled and studied in the East, published a work treating of algebra as

then understood in the Arabian school. From this time to the discovery of printing considerable attention was given to algebra, and the work of Ben Musa and another Arabian treatise, called the *Rule of Algebra*, were translated into Italian. The first printed work treating on algebra (also on arithmetic, &c.) appeared at Venice in 1494, the author being a monk called Luca Pacioli da Bergo, a Minorite friar. Rapid progress now began to be made, and among the names of those to whom advances are to be attributed are Tartaglia and Geronimo Cardano. About the middle of the sixteenth century the German Stifel introduced the signs $+$, $-$, $\sqrt{}$, and Robert Recorde the sign $=$. The last-named wrote the first English work on algebra in 1557. François Vieta, a French mathematician (1540-1603), first adopted the method which has led to so great an extension of modern algebra, by being the first who used general symbols for known quantities as well as for unknown. It was he also who first made the application of algebra to geometry. Albert Girard, a Flemish mathematician in the seventeenth century, extended the theory of equations by the introduction of imaginary quantities. The Englishman Harriot, early in the seventeenth century, discovered negative roots, and established the equality between the number of roots and the units in the degree of the equation. He also invented the signs $<$ $>$, and Oughtred that of $\times$. Descartes, though not the first to apply algebra to geometry, has, by the extent and importance of his applications, commonly acquired the credit of being so. The same discoveries have also been attributed to him as to Harriot, and their respective claims have caused much controversy. He obtained by means of algebra the definition and description of curves. Since his time algebra has been applied so widely in geometry and higher mathematics that we need only mention the names of Fermat, Wallis, Newton, Leibnitz, De Moivre, MacLaurin, Taylor, Euler, D'Alembert, Lagrange, Laplace, Fourier, Poisson, Gauss, Horner, De Morgan, Sylvester, Cayley. Boole, Jevons, and others have applied the algebraic method not only to formal logic but to political economy.—BIBLIOGRAPHY: Chrystal, *Algebra* (2 vols.); Hobson, *Trigonometry*; Hardy, *Pure Mathematics*; Whittaker and Watson, *Modern Analysis*.

Algeciras (a`l-he-thē`ra`s) (perhaps Portus Albus of the Romans), a seaport of Spain, on the west side of the Bay of Gibraltar, a well-built town carrying on a brisk coasting trade. It was the first conquest of the Arabs in Spain (711), and was held by them till 1344, when it was taken by Alphonso XI of

Castile after a long siege. Near it, in 1801, Admiral Sir James Saumarez defeated a Franco-Spanish fleet. Differences between France and Germany regarding Morocco led to a conference of European Powers here from 16th Jan.-7th April, 1906. Pop. 15,800.

Alge'ria, a French dependency in N. Africa, having on the north the Mediterranean, on the east Tunis, on the west Morocco, and on the south the Desert of Sahara; area, 122,878 sq. miles, or including the Algerian Sahara 343,500. The country is divided into three departments—Algiers, Oran, and Constantine. The coastline is about 550 miles in length, steep and rocky, and though the indentations are numerous, the harbours are much exposed to the north wind. The country is traversed by the Atlas Mountains, two chains of which—the Great Atlas, bordering on the Sahara, and the Little, or Maritime Atlas, between it and the sea—run parallel to the coast, the former attaining a height of 7000 feet. The intervals are filled with lower ranges, and numerous transverse ranges connect the principal ones and run from them to the coast, forming elevated tablelands and enclosed valleys. The rivers are numerous, but many of them are mere torrents rising in the mountains near the coast. The Shelif is much the largest. Some of the rivers are largely used for irrigation, and artesian wells have been sunk in some places for the same purpose. There are, both on the coast and in the interior, extensive salt lakes or marshes (*Shotts*), which dry up to a great extent in summer. The country bordering on the coast, called the *Tell*, is generally hilly, with fertile valleys; in some places a flat and fertile plain extends between the hills and the sea. In the east there are *Shotts* that sink below the sea-level, and into these it has been proposed to introduce the waters of the Mediterranean. The climate varies considerably according to elevation and local peculiarities. There are three seasons: winter from November to February, spring from March to June, and summer from July to October. The summer is very hot and dry. In many parts of the coast the temperature is moderate and the climate so healthy that Algeria is now a winter resort for invalids.

The chief products of cultivation are wheat, barley, and oats, tobacco, cotton, wine, silk, and dates. Early vegetables, especially potatoes and pease, are exported to France and England. A fibre called *alfa*, a variety of esparto, which grows wild on the high plateaux, is exported in large quantities. Cork is also exported. There are valuable forests, in which grow

various sorts of pines and oaks, ash, cedar, myrtle, pistachio-nut, mastic, carob, &c. The Australian *Eucalyptus globulus* (a gum tree) has been successfully introduced. Agriculture often suffers much from the ravages of locusts. Among wild animals are the lion, panther, hyena, and jackal; the domestic quadrupeds include the horse, the mule, cattle, sheep, and pigs (introduced by the French). Algeria possesses valuable minerals, including iron, copper, lead, sulphur, zinc, antimony, marble (white and red), phosphate, and lithographic stone.

The trade of Algeria has greatly increased under French rule, France, Spain, and England being the countries with which it is principally carried on, and three-fourths of the whole being with France. The exports (besides those mentioned above) are olive-oil, raw hides, wood, wool, tobacco, oranges, &c.; the imports, manufactured goods, wines, spirits, coffee, &c. The manufacturing industries are unimportant, and include morocco leather, carpets, muslins, and silks. French money, weights, and measures are generally used. The chief towns are Algiers, Oran, Constantine, Bona, and Tlemsen. There are about 2800 miles of railways opened; there is also a considerable network of telegraph lines.

The two principal native races inhabiting Algeria are Arabs and Berbers. The former are mostly nomads, dwelling in tents and wandering from place to place, though a large number of them are settled in the Tell, where they carry on agriculture and have formed numerous villages. The Berbers, here called Kabyles, are the original inhabitants of the territory and still form a considerable part of the population. They speak the Berber language, but use Arabic characters in writing. The Jews form a small but influential part of the population. Various other races also exist. Except the Jews, all the native races are Mahommedans. There are now a considerable number of French and other colonists, provision being made for granting them concessions of land on certain conditions. There are over 260,000 colonists of French origin in Algeria, and over 200,000 colonists natives of other European countries (chiefly Spaniards and Italians). Algeria is governed by a governor-general, who is assisted by a council appointed by the French Government. The settled portion of the country, in the three departments of Algiers, Constantine, and Oran, is treated much as if it were a part of France, and each department sends two deputies and one senator to the French chambers. The rest of the territory is under military rule. The colony

costs France a considerable sum every year. Pop. of Algeria proper in 1911, 5,523,449; of the Algerian Sahara, 40,379.

The country now called Algeria was known to the Romans as Numidia. It flourished greatly under their rule, and early received the Christian religion. It was conquered by the Vandals in A.D. 430-1, and recovered by Belisarius for the Byzantine Empire in 533-4. About the middle of the seventh century it was overrun by the Saracens. The town of Algiers was founded about 935 by Yussef Ibn Zeiri, and the country was subsequently ruled by his successors and the dynasties of the Almoravides and Almohades. After the overthrow of the latter, about 1269, it broke up into a number of small independent territories. The Moors and Jews, who were driven out of Spain by Ferdinand and Isabella at the end of the fifteenth century, settled in large numbers in Algeria, and revenged themselves on their persecutors by the practice of piracy. On this account various expeditions were made by Spain against Algeria, and by 1510 the greater part of the country was made tributary. A few years later the Algerians invited to their assistance the Turkish pirate Horush (or Haruj) Barbarossa, who made himself Sultan of Algiers in 1516, but was not long in being taken by the Spaniards and beheaded. His brother and successor put Algiers under the protection of Turkey (about 1520), and organized the system of piracy which was long the terror of European commerce, and was never wholly suppressed till the French occupation. Henceforth the country belonged to the Turkish Empire, though from 1710 the connection was little more than nominal. The depredations of the Algerian pirates were a continual source of irritation to the Christian Powers, who sent a long series of expeditions against them. For instance, in 1815 a United States fleet defeated an Algerian one and forced the Dey to agree to a peace in which he recognized the American flag as inviolable. In 1816 Lord Exmouth with an English fleet bombarded Algiers, and exacted a treaty by which all the Christian slaves were at once released, and the Dey undertook for the future to treat all his prisoners of war as the European law of nations demanded. But the piratical practices of the Algerians were soon renewed.

At last the French determined on more vigorous measures, and in 1830 sent a force of over 40,000 men against the country. Algiers was speedily occupied, the Dey retired, and the country was without a government, but resistance was organized by Abd-el-Kader, an Arab chief whom the

emergency had raised up. He began his warlike career of fifteen years by an attack on Oran in 1832, and after an obstinate struggle the French, in Feb., 1834, consented to a peace, acknowledging him as ruling over all the Arab tribes west of the Shelif by the title of Emir of Maskara. War was soon again renewed with varying fortune, and in 1837, in order to have their hands free in attacking Constantine, the French made peace with Abd-el-Kader, leaving to him the whole of Western Algeria except some coast towns. Constantine was now taken, and the subjugation of the province of Constantine followed. Meanwhile Abd-el-Kader was preparing for another conflict, and in Nov., 1838, he suddenly broke into French territory with a strong force, and for a time the supremacy of the French was endangered. Matters took a more favourable turn for them when General Bugeaud was appointed governor-general in Feb., 1841. In the autumn of 1841 Saida, the last fortress of Abd-el-Kader, fell into his hands, after which the only region that held out against the French was that bordering on Morocco. Early in the following year this also was conquered, and Abd-el-Kader found himself compelled to seek refuge in the adjoining empire. From Morocco Abd-el-Kader twice made a descent upon Algeria, on the second occasion defeating the French in two battles; and in 1844 he even succeeded in raising an army in Morocco to withstand the French. Bugeaud, however, crossed the frontier, and inflicted a severe defeat on this army, while a French fleet bombarded the towns on the coast. The Emperor of Morocco was at length compelled to agree to a treaty, in which he not only promised to refuse Abd-el-Kader his assistance, but even engaged to lend his assistance against him. Reduced to extremities Abd-el-Kader surrendered on 27th Dec., 1847, and was at first taken to France a prisoner, but was afterwards released on his promise not to return to Algeria. The country was yet far from subdued. The Kabyles, and the Arabs in the south, made protracted resistance, and rose again and again against the yoke which it was attempted to impose upon them. The numerous risings that successively took place thus rendered Algeria a school for French generals, such as Pélissier, Canrobert, St. Arnaud, and MacMahon. In 1864 MacMahon succeeded Pélissier as governor-general, and had as his first work to put down an insurrection. About this time the Emperor Napoleon III, who had visited the colony, introduced considerable modifications into the government, recognizing that the native races had grievances to complain of, and that the French rulers were in various ways astray in the

methods of government adopted. Fresh disturbances broke out in the south nearly every year till 1871, when, owing to the Franco-Prussian war, a great effort was made to throw off the French yoke, the colony being nearly denuded of French soldiers. It was, however, completely suppressed, and in order to remove what was believed to be one principal cause of the frequent insurrections, a civil government was established instead of the military government in the northern parts of the colony. The southern parts, inhabited by nomadic tribes, are still subject to military rule. When the French took in hand the occupation of Tunis, a rising took place (in 1881) in the west of Algeria, under a chieftain who was able to inflict some loss and damage on the French forces and colonists, but with no permanent result. Since then quietness has generally prevailed in the colony, where the French, however, continue to maintain a considerable military force. Owing to this and other expenditure Algeria has always formed a burden on the resources of France. The great aid rendered by Algeria to France during the European War led the French Government to introduce new laws. The law of 4th Feb., 1919, gives French citizenship to all Algerian natives under certain conditions.—BIBLIOGRAPHY: M. D. Stott, *The Real Algeria*; Sir R. Lambert Playfair, *Handbook for Travellers in Algeria* (Murray's Handbooks).

Algesi'ras. See *Algeciras*.

Alghero, or **Algheri** (a' l-gā'rō, a' l-gā'rē), a fortified town and seaport on the north-west coast of the island of Sardinia, 15 miles south-west of Sassari; the seat of a bishop, with a handsome cathedral. One of the remarkable edifices of Alghero is the Casa Arbia, where Charles V was lodged. The necropolis of Anghelu Ruju, situated in the vicinity, was excavated in 1904.

Algiers (al'jērz; Fr., *Alger*), a city and seaport on the Mediterranean, capital of the French colony of Algeria, is situated on the west side of the Bay of Algiers, partly on the slope of a hill facing the sea. The old town, which is the higher, is oriental in appearance, with narrow, crooked streets, and houses that are strong, prison-like edifices. Its crowning point is the Kasbah, or ancient fortress of the Deys, about 500 feet above the sea, now serving as barracks. The modern French town, which occupies the lower slope and spreads along the shore, is handsomely built, with broad streets

and elegant squares. It contains the Government buildings, the central military and civil establishments, the residence of the governor-general and the officials of the general and provincial Government, the superior courts of justice, the archbishop's palace and the cathedral, various other churches, including an English church and library, the great commercial establishments, &c. A fine boulevard built on a series of arches, and bordered on one side by handsome buildings, runs along the sea-front of the town overlooking the bay, harbour, and shipping. Forty feet below are the quay and railway-station, reached by inclined roads leading from the centre of the boulevard. The harbour is good and capacious, enclosed by piers or jetties, and otherwise improved at great expense, and it and the city are defended by a strong series of fortifications. Algiers is well provided with educational institutions, including high schools or colleges for law, medicine, literature, mathematics, and natural science; besides normal schools, an observatory, public library, &c. Algiers is in every way far the most important place in Algeria. There is a large shipping trade carried on, especially with Marseilles, Cette, and some of the Spanish ports. Trade routes from the interior and also railways centre in Algiers, and the exports include grain, wine, cattle, wool, ore, tobacco, fruit, olive-oil, &c. Algiers is now an important coaling station. The city possesses widely-extended suburbs. The climate, though variable, makes it a very desirable winter residence for invalids and others from colder regions. Though warm, it is bracing. There is a considerable rainfall (average 29 inches), but the dry air and absorbent soil prevent it from being disagreeable. The winter months resemble a bright, sunny English autumn, while the heat of summer is not so intense as that of Egypt. The sirocco or desert wind is troublesome, however, during summer, but in the winter it is merely a pleasant, warm, dry breeze. Hailstorms are not infrequent, but frost and snow in Algiers are so rare as to be almost unknown. Pop. 172,397.

Algin, a viscous, gummy substance obtained from certain seaweeds, more especially those of the genus *Laminaria*. It can be utilized for all purposes where starch or gum is now required; may be used in cookery for soups and jellies; and in an insoluble form it can be cut, turned, and polished, like horn or vulcanite.

Algo'a Bay, a bay on the south coast of the Cape Province, 425 miles east of the Cape of Good Hope, the only place of shelter on this coast for vessels

during the prevailing north-west gales. It was the first landing-place of British immigrants in 1820. The usual anchorage is off Port Elizabeth, on its west coast, a place of large and increasing trade, but open on the east and south-east.

Algol', Arabic name of a star in the constellation Perseus (head of Medusa), remarkable as a variable star, changing in brightness from the second to the fifth magnitude.

Algo'ma, a district of Canada, on the north of Lake Superior, forming part of the north-west portion of Ontario, rich in silver, copper, iron, &c.

Algon'kins, or **Algonquins**, a family of North American Indians, formerly spread over a great extent of territory, and still forming a large proportion of the Indians of Canada. They consisted of four groups, namely—(1) the eastern group, comprising the Massachusetts, Narragansets, Mohicans, Delawares, and other tribes; (2) the north-eastern group, consisting of the Abenakis, &c.; (3) the western group, made up of the Shawnees, Miamis, Illinois, &c.; and (4) the north-western group, including the Chippewas or Ojibbewas, the largest of all the tribes.

Algorism, or **Algorithmus**, in arithmetic, a word derived from the name of Algoritmi or Al-Khowarizmi, from whose works European scholars received much of their early information concerning Hindu numerals. The word is now used to designate any particular arrangement of numerical work.

Algraphy. See *Lithography*.

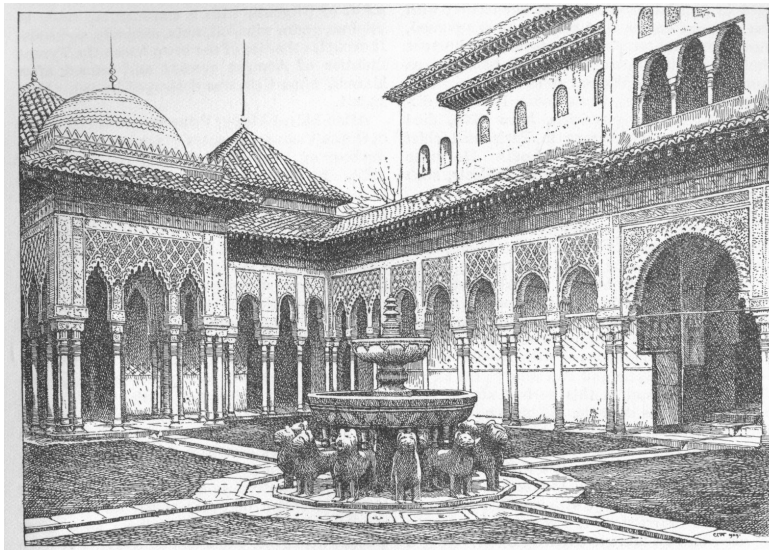
Alguacil, or **Alguazil** (a'l-gwa'-thēl'), in Spain, an officer whose business it is to execute the decrees of a judge; a sort of constable. In ancient times the Alguacil was the great provost of the palace.

Algum. See *Almug*.

Alha'gi. See *Camel's-thorn*.

Alhama (a'-lä'ma'; that is, 'the bath'), a town of Southern Spain, province of Granada, on the Marchan, 25 miles south-west of Granada, celebrated for its warm medicinal (sulphur) baths and drinking waters. It formed a

Moorish fortress, the recovery of which in 1482 by the Spaniards led to the entire conquest of Granada. It was occupied by the French from Feb., 1810-Aug., 1812, and thrown into ruins by an earthquake in Dec., 1884. Pop. 8000.—There is also an *Alhama* in the province of Murcia, with a warm mineral spring. Pop. 6000.



Alhambra—The Court of the Lions

Alham'bra (Ar. *al* and *hamrah*, 'the' and 'red'), a famous group of buildings in Spain, forming the citadel of Granada when that city was one of the principal seats of the empire of the Moors in Spain, situated on a height, surrounded by a wall flanked by many towers, and having a circuit of $2\frac{1}{4}$ miles. Within the circuit of the walls are two churches, a number of mean houses, and some straggling gardens, besides the palace of Charles V and the celebrated Moorish palace which is often distinctively spoken of as the Alhambra. This building, to which the celebrity of the site is entirely due, was the royal palace of the Kings of Granada. The greater part of the present building belongs to the first half of the fourteenth century. In the course of centuries, both through neglect and acts of vandalism, the beauty of the Alhambra has suffered considerably. The work of restoration was, however, undertaken in 1824 by the architect José Contreras, and continued by his son Rafael from 1847-90. It consists mainly of buildings surrounding two oblong courts, the one, called the Court of the Fishpond (or of the Myrtles), 138 by 74 feet, lying north and south; the other, called the Court of the Lions, from a fountain ornamented with twelve lions in marble, 115 by 66 feet, lying east and west, described as being, with the apartments that surround it, "the gem of Arabian art in Spain, its most beautiful and most perfect example". Its design is elaborate, exhibiting a profusion of exquisite detail gorgeous in colouring, but the smallness of its size deprives it of the element of majesty. The peristyle or portico on each side is supported by

128 pillars of white marble, 11 feet high, sometimes placed singly and sometimes in groups. Two pavilions project into the court at each end, the domed roof of one having been restored. Some of the finest chambers of the Alhambra open into this court, and near the entrance a museum of Moorish remains has been formed. On the opposite side of the Court of the Lions is the Hall of the Abencerrages. The prevalence of stucco or plaster ornamentation is one of the features of the Alhambra, which becomes especially remarkable in the beautiful honeycomb 'stalactite vaulting'. Arabesques and geometrical designs with interwoven inscriptions are present in the richest profusion. Cf. Owen Jones's work, *The Alhambra* (2 vols., London, 1842-5).

Alhaurin (a'l-ou-rēn'), a town of Southern Spain, province of Malaga, with sulphureous baths. Pop. 7000.

Ali (a'lē), cousin and son-in-law of Mahomet, the first of his converts, and the bravest and most faithful of his adherents, born A.D. 602. He married Fatima, the daughter of the prophet, but after the death of Mahomet (632) his claims to the caliphate were set aside in favour successively of Abu-Bekr, Omar, and Othman. On the assassination of Othman, in A.D. 656, he became caliph, and after a series of struggles with his opponents, including Ayesha, widow of Mahomet, finally lost his life by assassination at Kufa in 661. A Mahomedan schism arose after his death, and has produced two sects. One sect, called the Shiites, put Ali on a level with Mahomet, and do not acknowledge the three caliphs who preceded Ali. They are regarded as heretics by the other sect, called Sunnites. The Turks hold his memory in abhorrence, whilst the Persians call him the Lion of God, and venerate him as second only to the prophet. The *Maxims* and *Hymns* of Ali are yet extant. See *Caliph*.

Ali, Pasha of Yanina, generally called *Ali Pasha*, a bold and able, but ferocious and unscrupulous Albanian, born in 1741, son of an Albanian chief, who was deprived of his territories by rapacious neighbours. Ali by his enterprise and success, and by his entire want of scruple, got possession of more than his father had lost, and made himself master of a large part of Albania, including Yanina, which the Porte sanctioned his holding, with the title of pasha. Among the travellers who visited his Court at Yanina was Byron, who has left a record of his impressions in *Childe Harold's*

Pilgrimage. Ali Pasha was an apostle of European culture in the East, and the first to feel the necessity for energetic reforms in the old Moslem institutions. He displayed excellent qualities, putting an end to brigandage and anarchy, making roads, and encouraging commerce. He still farther extended his sway by subduing the brave Suliotes of Epirus, whom he conquered in 1803, after a three years' war. Aiming at independent sovereignty, he intrigued alternately with England, France, and Russia, and became almost independent of the Porte, which at length determined, in 1820, to pronounce his deposition. Ali resisted several pashas who were sent to carry out this decision, only surrendering at last in 1822, on receiving assurances that his life and property would be granted him. Faith was not kept with him, however; he was killed, and his head was cut off and conveyed to Constantinople, while his treasures were seized by the Porte.

Al'ias (Lat., 'at another time'), a word often used in judicial proceedings in connection with the different names that persons have assumed, most likely for prudential reasons, at different times, and in order to conceal identity, as Joseph Smith *alias* Thomas Jones.

Alibert (a' -lē-bār), Jean Louis, Baron, a distinguished French physician, born 1766, died 1837. He was a professor in Paris, and chief physician at the Hospital St. Louis. He wrote many valuable works on medical subjects, such as *Description des maladies de la peau*.

Ali Bey, a ruler of Egypt, born in the Caucasus in 1728, was taken to Cairo and sold as a slave, but having entered the force of the Mamelukes, and attained the first dignity among them, he succeeded in making himself virtual governor of Egypt. He then refused the customary tribute to the Porte, and coined money in his own name. In 1769 he took advantage of a war, in which the Porte was then engaged with Russia, to endeavour to add Syria and Palestine to his Egyptian dominion, and in this he had almost succeeded, when the defection of his own adopted son Mohammed Bey drove him from Egypt. Joining his ally Sheikh Daher in Syria, he still pursued his plans of conquest with remarkable success, till in 1773 he was induced to make the attempt to recover Egypt with insufficient means. In a battle near Cairo his army was completely defeated and he himself taken prisoner, dying a few days afterwards either of his wounds or by poison.

Al'ibi (Lat., 'elsewhere'), a defence in criminal procedure, by which the accused endeavours to prove that when the alleged crime was committed he was present in a different place.

Alicante (a' -lē-ka' n'tā), a fortified town and Mediterranean seaport in Spain, capital of the province of the same name, picturesquely situated partly on the slope of a hill, partly on the plain at the foot, about 80 miles south by west of Valencia. The lower town has wide and well-built streets; the upper town is old and irregularly built. The principal manufactures are cotton, linen, and cigars; the chief export is wine, which largely goes to England. Alicante is an ancient town. In 718 it was taken by the Moors, from whom it was wrested about 1240. In modern times it has been several times besieged and bombarded, as by the French in 1709, and in 1812, and by the federalists of Cartagena in 1873. Pop. 58,088.—The province is very fruitful and well cultivated, producing wine, silk, fruits, &c. The wine is of a dark colour (hence called *vino tinto*, deep-coloured wine), and is heavy and sweet. Area, 2185 sq. miles. Pop. 502,607.

Alicata, or **Licata** (a' -lē-kä'ta', lē-kä'ta'), the most important commercial town on the s. coast of Sicily, at the mouth of the Salso, 24 miles E.S.E. of Girgenti, with a considerable trade in sulphur, grain, wine, oil, nuts, almonds, and soda. It occupies the site of the town which the Tyrant Phintias of Acragas erected and named after himself, when Gela was destroyed in 280. Pop. 22,931.

Alice Maud Mary, Princess, second daughter of Queen Victoria, Duchess of Saxony, and Grand-duchess of Hesse-Darmstadt, born 1843, died 1878. In 1862 she married Frederick William Louis of Hesse, nephew of the grand-duke, whom he succeeded in 1877. She showed exemplary devotion to her father Prince Albert during his fatal illness and to the Prince of Wales during his attack of fever in 1871. During the Franco-Prussian war she organized hospitals for the relief of the sick and wounded. She died from diphtheria caught while nursing her husband and children. A selection of her letters to her mother was published in 1883 by Dr. Carl Sell.

A'lien, in relation to any country, a person born out of the jurisdiction of the country, and not having acquired the full rights of a citizen of it. The position of aliens depends upon the laws of the respective countries, but

generally speaking aliens owe a local allegiance, and are bound equally with natives to obey all general rules for the preservation of order which do not relate specially to citizens. Aliens have been often treated with great harshness by the laws of some States. Thus in France there long existed what was known as the *droit d'aubaine*, a law which claimed for the benefit of the State the effects of deceased foreigners leaving no heirs who were natives. Aliens have been repeatedly the objects of legislation in Britain, and the tendency at the present day is to communicate some of the rights of citizenship to aliens, and to widen the definition of subjects. According to the Act of 1870 that now regulates the matter, real and personal property of every description may be acquired, held, and disposed of by an alien, in the same manner in all respects as by a natural-born British subject. No other right or privilege (such as the right to hold any office or any municipal, parliamentary, or other franchise) is by this Act conferred on an alien except such as are expressly given in respect of property. Previously aliens could hold only personal property; they were incompetent to hold landed property, except under certain conditions of residence or business occupancy for a term of years not exceeding twenty-one. The children of aliens born in Britain are natural-born subjects. Formerly the only mode of naturalization was by Act of Parliament; but now an alien who has resided in the United Kingdom for not less than one year immediately preceding his application, and has previously resided in any part of His Majesty's dominions for four years during the last eight years before the application, or who has been in the service of the Crown for not less than five years, and intends to reside in the kingdom, or to serve the British Crown, may apply to the Secretary of State for a certificate of naturalization, and on giving evidence of particulars may obtain it, being thereby entitled to almost all the political and other rights of a natural-born British subject. At present the law is laid down in the British Nationality and Status of Aliens Act, 1914 and 1918. It used to be a principle in English law, that a natural-born subject could not divest himself of his allegiance by becoming naturalized in a foreign State (*nemo potest exuere patriam*); but it is now laid down that a British subject who has voluntarily become naturalized in a foreign State thereby ceases to be a British subject. Any British subject who has become an alien may apply for a certificate of readmission to British nationality on the same terms as those provided for aliens in general. In the United States the position of aliens as regards acquisition and holding of real property differs

somewhat in the different States, though in recent times the disabilities of aliens have been removed in most of them. Personal property they can take, hold, and dispose of like native citizens. Individual States have no jurisdiction on the subject of naturalization, though they may pass laws admitting aliens to any privilege short of citizenship. A naturalized citizen is not eligible for election as president or vice-president of the United States, and cannot serve as senator until after nine years' citizenship, nor as a member of the House of Representatives until after seven years' citizenship. Five years' residence in the United States and one year's permanent residence in the particular State are necessary for the attainment of citizenship.

Alien Immigration. In various countries certain classes of aliens have long been prohibited from gaining admission. In the United States, for instance, admission is refused to such persons as idiots, epileptics, persons suffering from loathsome or dangerous contagious diseases, paupers, criminals (except political criminals), illiterate persons, &c. Chinese labourers as a whole are excluded, and even any persons coming to America under a definite agreement to engage in any kind of labour or service. Similar laws are in force in Australia, where there is a test that a person proposing to settle in the country must be able to write fifty words of a European language. Towards the end of last century the great influx of foreigners into Britain, and into London in particular, drew public attention to the matter. A select committee appointed in 1888 reported in favour of the exclusion of destitute aliens, in 1894 a bill was introduced into the House of Lords, while in 1898 a bill to regulate the immigration of aliens was passed in the Lords, but made no further progress. In 1902 a royal commission was appointed, and drew up a report, published in 1903, containing valuable information and various recommendations. Among these were the establishment of an immigration department, and the granting of powers to deport criminals, prostitutes, and other undesirable aliens, and to prevent the landing of persons mentally unfit or suffering from infectious or loathsome diseases. In 1904 an Aliens Immigration Bill was introduced and read a second time in the House of Commons. It was based on the recommendations of the commission, and in its favour it was argued that a large amount of British labour had been displaced by aliens, in London especially, that the prevalence of crime among aliens was out of proportion

to their numbers, that many of them were paupers, criminals convicted in their own country, or other undesirables. In 1905 another bill on the subject was introduced by the Government, which succeeded in passing it, so that the matter can now be dealt with, and undesirable aliens kept out. Since the European War (1914-8) and the new passport regulations it is easy to ascertain the number of aliens that enter the country and settle. At the census of 1901 the whole alien population was set down at 286,925, as against 219,523 in 1891, but there has been a very large influx from 1901 to 1914, by far the largest number consisting of Russian and Polish Jews. The restrictions imposed upon aliens during the European War are still in force, so far as they prohibit landing by any alien, except at specified ports by leave of an immigration officer, and, in case of former enemy aliens, by special permission of the Home Secretary. Cf. J. M. Landa, *The Alien Problem*.

Aliganj (*a-lē-ganj'*), a town of Bengal, 54 miles from Dinapur, noted for its pottery. It has a trade in grain, indigo-seed, and cotton, and contains two mosques, and a large mud fort. Pop. 7436.

Aligarh (*a-lē-gar'*), a fort and town in India, in the United Provinces, on the East Indian railway, 84 miles south-east of Delhi. The town, properly called Koel or Coel, is distant about 2 miles from the fort, and is connected with it by a beautiful avenue. It is handsome and well situated, and has a trade in cotton, &c. The fort, which had been skilfully strengthened by French engineers in the service of the Mahrattas, was taken by storm after a desperate resistance in 1803 by the British forces under Lord Lake, when the whole district was added to the British possessions. Pop. 64,825. The district has an area of 1946 sq. miles. Pop. 1,165,680.

Align'ment (*a-līn'ment*), a military term, signifying the act of adjusting to a straight line or in regular straight lines, or the state of being so adjusted.

Al'iment, food, a term which includes everything, solid or liquid, serving as nutriment for the bodily system. Aliments are of the most diverse character, but all of them must contain nutritious matter of some kind, which, being extracted by the act of digestion, enters the blood, and effects by assimilation the repair of the body. Alimentary matter, therefore, must be similar to animal substance, or transmutable into such. All alimentary

substances must, therefore, be composed in a greater or less degree of soluble parts, which easily lose their peculiar qualities in the process of digestion, and correspond to the elements of the body. The food of animals consists for the most part of substances containing little oxygen and exhibiting a high degree of chemical combination, in which respects they differ from most substances that serve as sustenance for plants, which are generally highly oxidized and exhibit little chemical combination. According to the nature of their constituents most of the aliments of animals are divided into nitrogenous (consisting of carbon, hydrogen, and oxygen along with nitrogen, and also of sulphur and phosphorus) and non-nitrogenous (consisting of carbon, hydrogen, and oxygen without nitrogen). Water and salts are usually considered as forming a third group, and, in the widest sense of the word aliment, oxygen alone, which enters the blood in the lungs, forms the fourth. The articles used as food by man do not consist entirely of nutritious substances, but with few exceptions are compounds of various nutritious with indigestible and accordingly innutritious substances. The only nitrogenous aliments are albuminous substances, and these are contained largely in animal food (flesh, eggs, milk, cheese). The principal non-nitrogenous substance obtained as food from animals is fat. Sugar is so obtained in smaller quantities (in milk). While some vegetable substances also contain much albumen, very many of them are rich in starch. Among vegetable substances the richest in albumen are the legumes (peas, beans, and lentils), and following them come the cereals (wheat, oats, &c.). Sugar, water, and salts may pass without any change into the circulatory system; but albuminous substances cannot do so without being first rendered soluble and capable of absorption (in the stomach and intestines); starch must be converted into sugar and fat emulsified (chiefly by the action of the pancreatic juice). One of the objects of cooking is to make our food more susceptible of the operation of the digestive fluids.

The relative importance of the various nutritious substances that are taken into the system and enter the blood depends upon their chemical constitution. The albuminous substances are the most indispensable, inasmuch as they form the material by which the constant waste of the body is repaired, whence they are called by Liebig the substance-formers. But a part of the operation of albuminous nutriment may be performed equally well, and at less cost, by non-nitrogenous substances, that part being the

maintenance of the temperature of the body. As is well known, the temperature of warm-blooded animals is considerably higher than the ordinary temperature of the surrounding air, in man about 98° F., and the uniformity of this temperature is maintained by the heat which is set free by the chemical processes (of oxidation) which go on within the body. Now these processes take place as well with non-nitrogenous as with nitrogenous substances. The former are even preferable to the latter for the keeping up of these processes; by oxidation they yield larger quantities of heat with less labour to the body, and they are hence called the heat-givers. The best heat-giver is fat. Albuminous matters are not only the tissue-formers of the body; they also supply the vehicle for the oxygen, inasmuch as it is of such matters that the blood corpuscles are formed. The more red blood corpuscles an animal possesses, the more oxygen can it take into its system, and the more easily and rapidly can it carry on the process of oxidation and develop heat. Now only a part of the heat so developed passes away into the environment of the animal; another part is transformed within the body (in the muscles) into mechanical work. Hence it follows that the non-nitrogenous articles of food produce not merely heat but also work, but only with the assistance of albuminous matters, which, on the one hand, compose the working machine, and, on the other hand, convey the oxygen necessary for oxidation.

The wholesome or unwholesome character of any aliment depends, in a great measure, on the state of the digestive organs in any given case, as also on the method in which it is cooked. Very often a simple aliment is made indigestible by artificial cookery. In any given case the digestive power of the individual is to be considered in order to determine whether a particular aliment is wholesome or not. In general, therefore, we can only say that that aliment is healthy which is easily soluble, and is suited to the power of digestion of the individual. Man is fitted to derive nourishment both from animal and vegetable aliment, but can live exclusively on either. The nations of the North incline generally more to animal aliments; those of the South, and the Orientals, more to vegetable. The inhabitants of the most northerly regions live almost entirely upon animal food, and very largely on fat on account of its heat-giving property. See *Dietetics, Digestion, Adulteration, &c.*

Alimentary Canal, a common name given to the œsophagus, stomach, and intestines of animals. See *Æsophagus*, *Intestine*, *Stomach*.

Ali-Mirza, Shah of Persia, son of Muzaffar-ed-Din, born in 1872. He succeeded his father on 8th Jan., 1907. Although his European education had given him sympathies for Western civilization, he showed himself despotic, and became very unpopular. He was deposed by the National Assembly or Mejliss in July, 1909, and his son proclaimed Shah in his place.

Al'imony (Lat. *alere*, to nourish), in law, the allowance to which a woman is entitled while a matrimonial suit is pending between her and her husband, or after a legal separation from her husband, not occasioned by adultery or elopement on her part. It is either temporary or permanent, the former being the provision made by the husband pending the suit, the latter after the decree.

Al'iquot Part is such part of a number as will divide and measure it exactly without any remainder. For instance, 2 is an aliquot part of 4, 3 of 12, and 4 of 20.

Alisma'ceæ, the water-plantain family, a natural order of endogenous plants, the members of which are herbaceous, annual or perennial; with petiolate leaves sheathing at the base, hermaphrodite (rarely unisexual) flowers, disposed in spikes, panicles, or racemes. They are floating or marsh plants, and many have edible fleshy rhizomes. They are found in all countries, but especially in Europe and North America, where their rather brilliant flowers adorn the pools and streams. The principal genera are *Alisma* (water-plantain) *Sagittaria* (arrow-head), *Damasonium* (star-fruit), and *Butomus* (flowering-rush).

Al'ison, Rev. Archibald, a theologian and writer on æsthetics, born at Edinburgh in 1757; died there in 1839. He studied at Glasgow and at Balliol College, Oxford, entered the English Church, and finally (1800) settled as the minister of an Episcopal chapel at Edinburgh. He published 2 volumes of sermons, and a work entitled *Essays on the Nature and Principles of Taste* (1790), in which he maintains that all the beauty of material objects depends upon the associations connected with them.

Al'ison, Sir Archibald, lawyer and writer of history, son of the above, was born in Shropshire in 1792, and died in 1867, near Glasgow. He was educated at the University of Edinburgh, and in 1814 was admitted to the Scottish bar. He spent the next eight years in Continental travel. On his return he was appointed advocate depute, which post he held till 1830. In 1832 he published *Principles of the Criminal Law of Scotland*, and in 1833 *The Practice of the Criminal Law*. He was appointed sheriff of Lanarkshire in 1834, and retained this post till his death. He was made a baronet in 1852. His chief work—*The History of Europe, from 1789 to 1815*—was first issued in 10 vols., 1833-42, the narrative being subsequently brought down to 1852, the beginning of the second French Empire. This work displays industry and research, and is generally accurate, but not very readable. It has been translated into French, German, Arabic, Hindustani, &c. Among Sir Archibald's other productions are *Principles of Population*; *Free-trade and Protection*; *England in 1815 and 1845*; *Life of the Duke of Marlborough*, &c.

Al'ison, General Sir Archibald, G.C.B., son of the above, was born 1826, entered the army in 1846, and served in the Crimea, in India during the mutiny, and in the Ashantee expedition of 1873-4. In Egypt, in 1882, he led the Highland Brigade at the battle of Tel-el-Kebir, and in 1882-3 remained in command of the army of occupation (of 12,000 men). He retired from the army in 1893, and died in 1907.

Aliwal', a village of Hindustan in the Punjab, on the left bank of the Sutlej, celebrated from the battle fought in its vicinity, 28th Jan., 1846, between the Sikhs and a British army commanded by Sir Harry Smith, resulting in the total defeat of the Sikhs.

Aliwal North, a town in the eastern part of Cape Province, on the Orange River, which here forms the boundary with the Orange Free State, and is crossed by a fine bridge—the Frere Bridge. It stands at the height of 4350 feet, in a locality said to be highly suitable for consumptives, and the warm sulphur springs in the neighbourhood also attract many invalids. It is a well-built place, with churches, hotels, golf links, race-course, &c.; and has railway connection with East London, Port Elizabeth, &c. Pop. 5557.—*Aliwal South* was a name formerly given to Mossel Bay, the small seaport midway between Cape Town and Port Elizabeth.

Aliz'arine, a substance contained in the madder root (*Rubia tinctorum*), and largely used in dyeing reds of various shades, as Turkey red, &c. Until 1868 it was obtained entirely from madder root, but the use of the root has been almost superseded by the employment of alizarine itself, prepared artificially from one of the constituents of coal-tar. It forms yellowish-red prismatic crystals, nearly insoluble in cold, but dissolved to a small extent by boiling water, and readily soluble in alcohol and ether. It possesses exceedingly strong tinctorial powers.

Al'kahest, the so-called universal solvent or menstruum of the alchemists. The word is believed to have been invented by Paracelsus.

Al'kali (from Ar. *al-qali*, the ashes of the plant from which soda was first obtained, or the plant itself), a term first used to designate the soluble parts of the ashes of plants, especially of seaweed, and designated *fixed alkali*, as marking a distinction from ammonia, which was termed *volatile alkali*. Now the term is applied to various classes of bodies having the following properties in common: (1) solubility in water; (2) the power of neutralizing acids, and forming salts with them; (3) the property of corroding animal and vegetable substances; (4) the property of altering the tint of many colouring matters—thus, they turn litmus, reddened by an acid, into blue; turmeric, brown; and syrup of violets and infusion of red cabbages, green. The alkalies may be regarded as water in which part of the hydrogen is replaced by a metallic radicle. The caustic alkalies are strong alkalies which have a powerful corrosive action on the skin, and the common ones are potassic hydroxide or caustic potash, sodic hydroxide or caustic soda, and lithic hydroxide. *Volatile Alkali*, or ammoniac hydroxide, is a much feebler alkali than the others, and when the solution is heated all the ammonia is driven off. Other alkalies are calcic hydroxide or slaked lime, a solution of which in water is known as *lime-water*; baric hydroxide and strontic hydroxide, derived from the metals barium and strontium. Quicklime is the only alkali extensively used in agriculture.

Alkalim'eter, an instrument for ascertaining the quantity of free alkali in any impure specimen, as in the potashes of commerce. These, besides the carbonate of potash, of which they principally consist, usually contain a portion of foreign salts, as sulphate and chloride of potassium, and as the true worth of the substance, or price for which it ought to sell, depends

entirely on the quantity of carbonate, it is of importance to be able to measure it accurately by some easy process. This process depends on the neutralization of the alkali by an acid of known strength, the point of neutralization being determined by the fact that neutral liquids are without action on either red or blue litmus solution. The alkalimeter is merely a graduated tube—a burette—with a stopcock at the lower extremity, from which the standard acid is dropped into water in which a known weight of the substance is dissolved. The quantity required to produce neutralization being noted, the strength of the liquid tested is easily arrived at. A process of neutralization, exactly the same in principle, may be employed to test the strength of acids by alkalies, the one process being called *alkalimetry* the other *acidimetry*.

Al'kaloid, a term applied to a class of nitrogenous compounds having basic properties, found in living plants, usually in combination with organic acids. They are usually given names ending in *-ine*, as *morphine*, *quinine*, *aconitine*, *nicotine*, *caffeine*, &c. Most alkaloids occur in plants, but some are formed by decomposition. Most natural alkaloids contain carbon, hydrogen, nitrogen, and oxygen, but a few contain no oxygen. The nitrogen they contain imparts to them basic properties—they are organic bases—and hence they all form salts with acids. They all possess a pronounced bitter taste, and the poisonous nature of many plants, e.g. hemlock, yew, deadly nightshade, &c., are due to the alkaloids they contain. Although formed originally within the plant, it has been found possible to prepare several of these alkaloids by artificial means.

Al'kanet, a dyeing drug, the bark of the root of the *Anchūsa* or *Alkanna tinctoria*, a plant of the order Boraginaceæ, with downy and spear-shaped leaves, and clusters of small purple or reddish flowers. The plant is sometimes cultivated in Britain, chiefly on the east coast of England, but most of the alkanet of commerce is imported from the Levant or from southern France. It imparts a fine deep-red colour to all unctuous substances and is used for colouring oils, plasters, lip-salve, confections, &c.; also in compositions for rubbing and giving colour to mahogany furniture, and to colour spurious port-wine.

Alkan'na, a name of henna. See also *Alkanet*.

Alkar'sin, an extremely poisonous liquid containing kakodyle, together with oxidation products of this substance, and formerly known as *Cadet's fuming liquor*, characterized by its insupportable smell and high degree of spontaneous combustibility when exposed to air.

Al-katif, a town of Arabia, on the Persian Gulf, carrying on a considerable trade. Pop. 6000.

Alkmaar (a'lk'mär), a town of the Netherlands, province of North Holland, on the North Holland Canal, and 20 miles N.N.W. of Amsterdam; regularly built, with a fine church (St. Lawrence) and a richly decorated Gothic town-house; manufactures of salt, sail-cloth, vinegar, leather, &c., and an extensive trade in cattle, corn, butter, and cheese. Pop. 22,685.

Al-Ko'ran, or **Qu'ran**. See *Koran*.

Alla breve (brā'vā), a musical direction expressing that a breve is to be played as fast as a semibreve, a semibreve as fast as a minim, and so on. It is also called a capella, as it is employed in church music.

Al'lah, in Arabic, the name of God, a word of kindred origin with the Hebrew word *Elohim*. *Alla Akbar* (God is great) is a Mahommedan war-cry.

Allahabād' ('city of Allah'), an ancient city of India, capital of the United Provinces, on the wedge of land formed by the Jumna and the Ganges, largely built of mud houses, though the English quarter has more of a European aspect. Among the remarkable buildings are the fort, occupying the angle between the rivers, and containing the remains of an ancient palace, and now also the barracks, &c.; the mausoleum and garden of Khosru, the tomb being a handsome domed building; the Government offices and courts; Government house; the Roman Catholic cathedral; the Central College for the United Provinces; the Mayo Memorial and town hall. Allahabad is one of the chief resorts of Hindu pilgrims, who have their sins washed away by bathing in the waters of the sacred rivers Ganges and Jumna at their junction; and is also the scene of a great fair in December and January. There are no manufactures of importance, but a large general and transit trade is carried on. The town is as old as the third century B.C. In the mutiny of 1857 it was the scene of a serious outbreak and massacre. Pop. 171,697.—The division of *Allahabad* contains the districts of

Cawnpur, Futtehpur, Hamirpur, Banda, Jaunpur, and Allahabad; area, 17,265 sq. miles. Pop. 5,535,803.—The district contains an area of 2852 sq. miles, about five-sixths being under cultivation. Pop. 1,487,904.

Allaman'da, a genus of American tropical plants, ord. Apocynaceæ, with large yellow or violet flowers; some of them are grown in European greenhouses. *A. cathartica* has strong emetic and purgative properties.

Allan, David, a Scottish painter, born 1744, died 1796. He studied in Foulis's academy of painting and engraving in Glasgow, and for sixteen years in Italy; finally establishing himself at Edinburgh, where he succeeded Runciman as master of the Trustees' Academy. His illustrations of the *Gentle Shepherd*, *The Cotter's Saturday Night*, and other sketches of rustic life and manners in Scotland are his best-known works.

Allan, Sir William, a distinguished Scottish artist, born in 1782, died in 1850. He was a fellow student with Wilkie in Edinburgh, afterwards a student of the Royal Academy, London. After residing in Russia for ten years, he returned to Scotland, and publicly exhibited his pictures, one of which (*Circassian Captives*) made his reputation. He now turned his attention to historical painting, and produced *Knox admonishing Mary Queen of Scots*, *Murder of Rizzio*, *Exiles on their way to Siberia*, *The Slave Market at Constantinople*, &c.; and afterwards also battle scenes, as the *Battle of Prestonpans*, *Nelson boarding the San Nicolas*, and two pictures of *The Battle of Waterloo*, the one from the British, the other from the French position, and delineating the actual scene and the incidents therein taking place at the moment chosen for the representation. One of these Waterloo pictures was purchased by the Duke of Wellington. He travelled extensively, visiting Italy, Greece, Asia Minor, Spain, and Barbary. In 1835 he became a Royal Academician, in 1838 president of the Scottish Academy, and in 1842 he was knighted.

Allan'tois, a structure appearing during the early development of vertebrate animals—Reptiles, Birds, and Mammalia. It is largely made up of blood-vessels, and, especially in Birds, attains a large size. It forms the inner lining to the shell, and may thus be viewed as the surface by means of which the respiration of the embryo is carried on. In Mammalia the allantois

is not so largely developed as in Birds, and it enters largely into the formation of the placenta.

Alleghany (al-le-gā'ni), a river of Pennsylvania and New York, which unites with the Monongahela at Pittsburg to form the Ohio; navigable nearly 200 miles above Pittsburg.

Alleghany Mountains, or the **Alleghanies**, a name sometimes used as synonymous with Appalachians, but also often restricted to the portion of those mountains that traverses the states of Virginia, Maryland, and Pennsylvania from south-west to north-east, and consists of a series of parallel ridges for the most part wooded to the summit, and with some fertile valleys between. Their mean elevation is about 2500 feet; but in Virginia they rise to 4473.

Allegheny (al-le-gen'i), a city of the United States, in Pennsylvania, on the River Allegheny, opposite Pittsburg, of which it may be considered virtually to be a suburb, and with which it is connected by six bridges. The principal industries are connected with iron and machinery. Pop. 132,283. Also called Allegheny City.

Alle'giance (from mid-Eng. *ligeaunce*, formed from *liege*), according to Blackstone, is "the tie or *ligamen* which binds the subject to the sovereign in return for that protection which the sovereign affords the subject", or, generally, the obedience which every subject or citizen owes to the Government of his country. It used to be the doctrine of the English law that natural-born subjects owe an allegiance which is intrinsic and perpetual, and which cannot be divested by any act of their own (*Nemo potest exuere patriam*); but this is no longer the case since the Naturalization Act passed in 1870, A British subject, however, or a child who has acquired a British domicile by the naturalization of an alien parent, cannot in time of war divest himself of British nationality for the purpose of becoming an enemy alien. Aliens owe a temporary or local allegiance to the Government under which they for the time reside. Usurpers in undisturbed possession of the Crown are entitled to allegiance; and thus treasons against Henry VI were punished in the reign of Edward IV, though the former had, by Act of Parliament, been declared a usurper.

Al'legory, a figurative representation in which the signs (words or forms) signify something besides their literal or direct meaning. In rhetoric, allegory is often but a continued simile. Parables and fables are a species of allegory. Sometimes long works are throughout allegorical, as Spenser's *Faerie Queene* and Bunyan's *Pilgrim's Progress*. When an allegory is thus continued it is indispensable to its success that not only the allegorical meaning should be appropriate, but that the story should have an interest of its own in the direct meaning apart from the allegorical significance. Allegories are frequent in the Old Testament, whilst in the New they take the form of parables. One of the best-known allegories in classical literature is the story of the stomach and the members of the body in the speech attributed to Menenius Agrippa by Plutarch and Livy. (Cf. Shakespeare, *Coriolanus*, i, 1.) Allegory is often made use of in painting and sculpture as well as in literature.

Allegrì (a'l-lā'grē), Gregorio, an Italian composer, born at Rome in 1560 or 1585, died there about 1650; celebrated for his *Miserere*, a setting of the fifty-first psalm (the fiftieth in the *Vulgate*), which in the Latin version begins with that word. Allegrì's *Miserere* is annually performed in the Sistine Chapel at Rome.

Allegro (It., a'l-lā'grō), a musical term expressing a more or less quick rate of movement, or a piece of music or movement in lively time. *Allegro moderato*, moderately quick; *allegro maestoso*, quick but with dignity; *allegro assai* and *allegro molto*, very quick; *allegro con brio* or *con fuoco*, with fire and energy; *allegroissimo*, with the utmost rapidity.

Allein (al'en), Joseph, English Nonconformist divine; born 1633, died 1668; the author of a popular religious book entitled, *An Alarm to Unconverted Sinners, or The Sure Guide to Heaven* (1672).

Allein (al'en), Richard, English Nonconformist divine; born in 1611, died 1681; rector for twenty years of Batcombe (Somerset); deprived of his living at the Restoration, and imprisoned for preaching. He wrote, among other things, *Vindiciæ Pietatis* ('A Vindication of Godliness'), published in 1660, which was condemned to be burned in the royal kitchen.

Alleluia. See *Halleluia*.

Allemande (a'l-ma'n'd), a kind of slow, graceful dance, invented in France in the time of Louis XIV, and again in vogue in the time of the First Empire. The name is also given to pieces of music based on the dance movement. Bach and Handel have composed a great number of Allemandes, and Beethoven has written twelve for orchestra.

Allen, Bog of, the name applied to a series of bogs in Ireland (not to one continuous morass), dispersed, often widely apart, with extensive tracts of dry cultivated soil between, over a broad belt of land stretching across the centre of the country, the bogs being, however, all on the east side of the Shannon.

Allen, Ethan, an American revolutionary partisan and general; born 1737, died 1789. He surprised and captured Ticonderoga Fort (1775); attacked Montreal, and was captured and sent to England, being exchanged in 1778; wrote against Christianity, *Reason, the only Oracle of Man* (1784).—His younger brother, Ira (1751-1814), was also prominent in the revolutionary era.

Allen, Grant, writer on scientific subjects and novelist, was born at Kingston, Canada, 1848, died in 1899. His earlier education he received in America, but he also studied in France and graduated at Oxford with honours in 1870. From 1873 to 1879 he was connected with Queen's College, Jamaica, but afterwards resided chiefly in England, and became well known as an exponent of evolutionary science, and as a novelist. His first important work, *Physiological Æsthetics*, appeared in 1877; his other scientific or semi-scientific works include *The Colour Sense*; *The Evolutionist at Large*; *Colin Clouts Calendar (the record of a summer)*; *Vignettes from Nature*; *The Colours of Flowers*; *Flowers and their Pedigrees*; and *Force and Energy, a Theory of Dynamics*. Other works by him are: *Anglo-Saxon Britain*; *Charles Darwin*; and *The Evolution of the Idea of God*. His novels, about thirty in number, include: *The Devil's Die*; *The Woman Who Did*, &c.

Allen, John, a Scottish political and historical writer; born in 1771, died in 1843. He studied medicine, and became M.D. of Edinburgh University. In 1801 he went abroad with Lord Holland and family, and henceforth he maintained this connection, being long an inmate of Holland House

(London) and a member of the brilliant society that assembled there. He contributed many articles to the *Edinburgh Review*; and wrote *An Inquiry into the Rise and Growth of the Royal Prerogative in England*; *Vindication of the Ancient Independence of Scotland*; &c.

Allen, Ralph, celebrated as a philanthropist, and as the friend of Pope, Fielding, and the elder Pitt, was born in 1694, died in 1764. He lived mostly at Bath, where he made a large income as farmer of a system of posts and as owner of quarries. He is the prototype of Squire Allworthy in Fielding's *Tom Jones*; and after the novelist's death he took charge of his family. Pope, who received many kindnesses at his hands, referred to him in the lines:

Let humble Allen, with an awkward shame,
Do good by stealth, and blush to find it fame.

With Pitt he was on intimate terms, and left him £1000 in his will. Hurd, Sherlock, and Warburton were also his friends.

Allen, Thomas, an English mathematician, philosopher, antiquarian, and astrologer, born in 1542, died in 1632. He studied at Oxford, and lived the greater part of his life in learned retirement, corresponding with many of the famous men of his time. In his own day he was generally reputed a dealer in the black art.

Allen, William, cardinal, an English Roman Catholic of the time of Queen Elizabeth. Influenced by the Jesuit Robert Parsons, he became a strenuous opponent of Protestantism and supporter of the claims of Philip II to the English throne; born 1532, died 1594. It was by his efforts that the English college for Catholics at Douai was established. He was made cardinal in 1587. His numerous writings include: *The Declaration of the Sentence of Sixtus V*, and *An Admonition to the Nobility and People of England*.

Allen, William, D.D., American clergyman and author; born 1784, died 1868. He was president of Bowdoin College, 1820-39; author of *American Biographical and Historical Dictionary*; *Junius Unmasked*; &c.

Allenby, Viscount, Edmund Henry Hynman, British soldier, born on 23rd April, 1861, and educated at Haileybury. He joined the Inniskilling Dragoons, and in 1884 served with that regiment in the Bechuanaland

Expedition. He was with the British forces in Zululand in 1888, took part in the South African war, and commanded the 4th Cavalry Brigade, 1905-10. In the European War he at first commanded the British Third Army, contributing largely to the victories of the Somme and the Aisne. After a reverse, south of Gaza, suffered on 26th March, 1917, by the British troops under the command of Sir Archibald Murray, the latter was relieved, and General Allenby was placed in command of the operations. He made thorough preparations for the next offensive, and his progress was very rapid. Beersheba and Gaza were captured, and on 9th Dec., 1917 Jerusalem, the Holy City, was surrendered to the general by the mayor. His formal entry took place on the 11th. He was awarded the G.C.M.G. on 16th Dec., 1917, and is a Grand Officer of the Legion of Honour. In Aug., 1919, he was voted a sum of £50,000 and created a viscount, adopting the title of Viscount Allenby of Megiddo and of Felixstowe in Suffolk. In Oct., 1919, he was appointed High Commissioner for Egypt.

Allenstein (a · l'en-stīn), a town in East Prussia, 65 miles south of Königsberg, on the Alle, with breweries and manufactures of iron and lucifer matches. Pop. 24,295.

Allentown, a town in the United States, Pennsylvania, on Lehigh River, 18 miles above its junction with the Delaware. It has an important trade in coal and iron ore, with large blast-furnaces, rolling-mills, &c. Pop. (1920), 73,502.

Allep'pi. See *Aulapolay*.

Alleyn (al'len), Edward, an actor and theatre proprietor in the reigns of Elizabeth and James I, friend of Ben Jonson and Shakespeare; born 1566, died 1626. Nashe called him "the famous Ned". Having become wealthy, he built Dulwich College, under the name of "The College of God's Gift", between 1613-17, at a cost of £10,000. See *Dulwich*.

All-fours, a game at cards, which derives its name from the four chances of which it consists, for each of which a point is scored. These chances are *high*, or the ace of trumps, or next best trump out; *low*, or the deuce of trumps, or next lowest trump out; *jack*, or the knave of trumps; *game*, the majority of pips collected from the tricks taken by the respective players. The player who has all these is said to have *all-fours*. It is played by two or

four persons with the full pack. The ace counts four, the king three, queen two, knave one, ten ten. The game is known in America as *Seven-up*, *Old-sledge*, or *High-low Jack*.

All-hallows, or **All-hallowmas**, a name for All-saints' Day.

Al'lia, a small affluent of the Tiber, joining it about 12 miles from Rome, famous for the victory won by the Gauls, under Brennus, over the Roman army. This battle resulted in the capture and sack of Rome in 390 B.C.

Allia'ceous Plants, plants belonging to the genus *Allium* (ord. Liliaceæ), that to which the onion, leek, garlic, shallot, &c., belong, or to other allied genera, and distinguished by a certain peculiar pungent smell and taste characterized as *alliaceous*. This flavour is also found in a few plants having no botanical affinities with the above, as in the *Alliaria officinālis*, or Jack-by-the-hedge, a plant of the order Cruciferae.

Alli'ance, a league between two or more Powers. Alliances are divided into offensive and defensive. The former are for the purpose of attacking a common enemy, and the latter for mutual defence. An alliance often unites both of these conditions. Offensive alliances, of course, are usually directed against some particular enemy; defensive alliances against anyone from whom an attack may come. Among the more famous alliances in history are: The Triple Alliance of 1688 between Great Britain, Sweden, and the Netherlands; The Grand Alliance of 1689 between the Emperor, Holland, England, Spain, and Saxony; The Quadruple Alliance of 1814 between Great Britain, Austria, Russia, and Prussia; The Triple Alliance of 1882 between Germany, Austria, and Italy; and The Dual Alliance between Russia and France.

Alliance, Holy. See *Holy Alliance*.

Alliance Israélite Universelle, an association founded in Paris in 1860 for the protection of the Jews all over the world, but particularly with a view to advocating by various means the emancipation of the Jews in those countries where they did not enjoy equal civil and political rights with the other inhabitants. It was established by six Jews of Paris: Aristide Astruc, Isidore Cahen, Jules Carvallo, Narcisse Leven, Eugène Manuel, and Charles Netter. Adolphe Crémieux and Salomon Munk were among the first

presidents of the association. It is managed by a central committee resident in Paris, and consisting of 62 members, 23 of whom live in Paris. The Alliance has done a great deal towards raising the status of the Jews in the East by establishing educational institutions and industrial and agricultural schools, especially in Turkey, Egypt, Morocco, Persia, Bulgaria, Tunis, and Abyssinia. The chief sources of its income are the subscriptions and donations of the members. Its annual income amounts to about 200,000 francs. It also manages a fund of about £400,000 founded by Baron and Baroness de Hirsch for the establishment of Jewish Schools in Turkey. The Alliance Israélite works in unison with the Anglo-Jewish Association and the Board of Deputies in London, two organizations pursuing the same aims.

Allia'ria, a genus of plants, ord. Cruciferae, containing two species, one of which (*A. officinālis*), commonly called Jack-by-the-hedge, is widely spread in Europe, and often used as a pot-herb. See *Alliaceous Plants*.

Al'libone, Samuel Austin, LL.D., American author, born 1816, died 1889. He compiled a most useful *Critical Dictionary of English Literature and British and American Authors* (3 vols., 1859, 1870, 1871, containing 50,000 biographies, 2 vols. of supplement by J. F. Kirk, 1891).

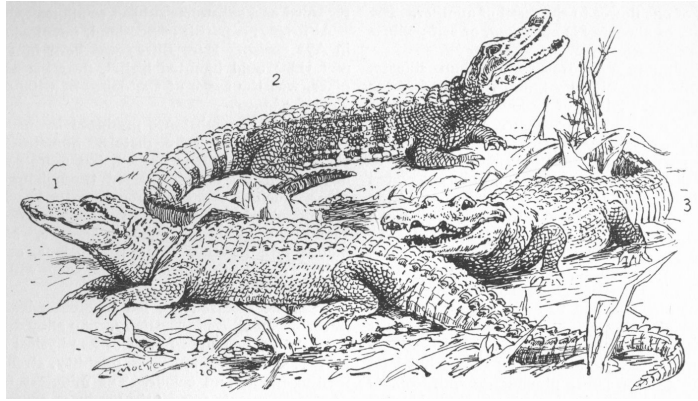
Allice, a name of the common shad.

Allier (a' l-lē-ā), a central department of France, intersected by the River Allier, and partly bounded by the Loire; its surface is diversified by offsets of the Cevennes and other ranges, rising in the south to over 4000 feet, and in general richly wooded. It has extensive beds of coal as well as other minerals, which are actively worked, there being several flourishing centres of mining and manufacturing enterprise; mineral waters at Vichy, Bourbon, L'Archambault, &c. Large numbers of sheep and cattle are bred. Area, 2848 sq. miles. Capital, Moulins. Pop. (1921), 370,950.—The River Allier flows northward for 200 miles through Lozère, Upper Loire, Puy de Dôme, and Allier, and enters the Loire, of which it is the chief tributary.

Alliga'tion, a rule of arithmetic, chiefly found in the older books, relating to the solution of questions concerning the compounding or mixing together of different ingredients, or ingredients of different qualities or values. Thus if a quantity of tea worth 10*d.* the pound and another quantity worth 18*d.* are

mixed, the question to be solved by alligation is, what is the value of the mixture by the pound?

Alliga'tor (a corruption of Sp. *el lagarto*, lit. the lizard —Lat. *lacertus*), a genus of reptiles of the family Crocodilidæ, differing from the true crocodiles in having a shorter and flatter head, in having cavities or pits in the upper jaw, into which the long canine teeth of the under jaw fit, and in having the feet much less webbed.



Alligators—1, Mississippi Alligator; 2, Banded Cayman; 3, Chinese Alligator

Their habits are less perfectly aquatic. They are confined to the warmer parts of America, where they frequent swamps and marshes, and may be seen basking on the dry ground during the day in the heat of the sun. They are most active during the night, when they make a loud bellowing. The largest of these animals grow to the length of 18 or 20 feet. They are covered by a dense armour of horny scales, impenetrable to a bullet, and have a large mouth, armed with strong, conical teeth. They swim with wonderful celerity, impelled by their long, laterally-compressed, and powerful tails. On land their motions are proportionally slow and embarrassed because of the length and unwieldiness of their bodies and the shortness of their limbs. They live on fish, and any small animals or carrion, and sometimes catch pigs on the shore, or dogs which are swimming. They even sometimes make man their prey. In winter they burrow in the mud of swamps and marshes, lying torpid till the warm weather. The female lays a great number of eggs, which are deposited in the sand or mud, and left to be hatched by the heat of the sun, but after this has taken place the mother alligator is very attentive to her young. The most fierce and dangerous species is that found in the southern parts of the United States (*Alligator Lucius*), having the snout a little turned up, slightly resembling that of the pike. The alligators of South America are there very often called *Caymans*. *A. sclerops* is known also as the *Spectacled Cayman*, from the prominent bony rim surrounding the orbit of each eye. The flesh of the alligator is

sometimes eaten, the tail being considered a great delicacy by the negroes. Among the fossils of the south of England are remains of a true alligator (*A. Hantoniensis*) in the Eocene beds of the Hampshire basin.

Alligator-apple (*Anōna palustris*), a fruit allied to the custard-apple, growing in marshy districts in Jamaica, little eaten on account of its narcotic properties.

Alligator-pear (*Persēa gratissima*), an evergreen tree of the nat. ord. Lauraceæ, with a fruit resembling a large pear, 1 to 2 lb. in weight, with a firm marrow-like pulp of a delicate flavour; called also avocado-pear, or subaltern's butter. It is a native of tropical America and the West Indies.

Al'lingham, William, an Irish poet, born in Ireland in 1824 or 1828, died in 1889. He published his first volume (*Poems*) in 1850; *Day and Night Songs* in 1855; *Lawrence Bloomfield in Ireland*, narrative poem, in 1864; *Songs, Poems, and Ballads* in 1877 (including a number of new poems). He was a frequent contributor to periodicals, and for some time edited *Fraser's Magazine*.

Allitera'tion, the repetition of the same letter at the beginning of two or more words immediately succeeding each other, or at short intervals; as "*many men many minds*"; "*death defies the doctor*". "*Apt alliteration's artful aid*" (*Churchill*). "*Puffs, powders, patches, bibles, billet-doux*" (*Pope*). "*Weave the warp and weave the woof*" (*Gray*). In the ancient German and Scandinavian and in early English poetry alliteration took the place of terminal rhymes, the alliterative syllables being made to recur with a certain regularity in the same position in successive verses. In the *Vision of William Concerning Piers the Ploughman*, for instance, it is regularly employed as in the following lines:—

Hire robe was ful riche . of red scarlet engreyned,
With ribanes of red gold . and of riche stones;
Hire arraye me ravysshed . such ricchesse saw I nevere;
I had wondre what she was . and whas wyf she were.

Alliteration was known to the Latin authors: "*O Tite tute, Tati, tibi tanta, tyranne tulisti*" (*Ennius*). In the hands of some English poets and prose writers of later times alliteration became a mere conceit. It is still employed

in Icelandic and Finnish poetry. So far has alliteration sometimes been carried that long compositions have been written every word of which commenced with the same letter. It may also be employed in the middle of words: "Un frais parfum sortait des touffes d'asfodile" (*Victor Hugo*).

Al'lium, a genus of plants, ord. Liliaceæ; containing numerous well-known species of pot-herbs. They are umbelliferous, and mostly perennial, herbaceous plants, but a few are biennial. Among them are garlic (*A. sativum*), onion (*A. Cepa*), leek (*A. Porrum*), chives (*A. Schænopräsum*), shallot (*A. ascalonicum*). The peculiar alliaceous flavour that belongs to them is well known.

Al'loa, a river port of Scotland, on the north bank of the Forth (where there is now a bridge), 7 miles from Stirling, county of Clackmannan. It carries on brewing, distilling, and shipbuilding; has manufactures of woollens, bottles, &c., and a shipping trade. Pop. (1921), 12,421.

Allocu'tion, an address, a term particularly applied to certain addresses on important occasions made by the Pope to the cardinals, and through them to the Church in general.

Allo'dium (probably derived from *all* and *odh*, property), land held in one's own right, without any feudal obligation to a superior or lord. In England, according to the theory of the British constitution, all land is held of the crown (by *feudal* tenure); the word *allodial* is, therefore, never applied to landed property there.

Allogamy (from the Gr. *allos*, other, and *gamos*, wedding), meaning the transfer of the pollen of one flower to the pistil of another. The opposite of allogamy is *autogamy*, or self-pollination.

Allophane, a hydrous aluminium silicate, with the composition $\text{Al}_2\text{SiO}_5 + 5\text{H}_2\text{O}$, forming crusts in the cavities of various rocks and commonly of a delicate blue colour.

Allot'ment System, the system of allotting small portions of land (an acre or less) to farm-labourers or other workers, to be cultivated after their regular work by themselves and their families, a system believed by many to be calculated greatly to improve their condition. An Allotment Act for

England, passed in 1887, authorizes the sanitary authorities in any locality to determine if there is a sufficient demand for allotments there, and to acquire land to be let to the labouring population resident in their district. Such land may be compulsorily acquired, due compensation being given; but land belonging to a park, pleasure-ground, &c., is not to be so acquired. No person is to hold more than 1 acre as an allotment; and the rents are to be fixed at such amount as may reasonably be deemed sufficient to guarantee the sanitary authority from loss. No building is to be erected on any allotment other than a tool-house, pig-sty, shed, or the like. In the Allotment Acts of 1887 and 1892 (Scotland) the definition is applied to a plot of land not exceeding 1 acre, but the Local Government Act of 1894 authorized the letting of an allotment up to the area of 4 acres to one person, while the Small Holdings and Allotments Act of 1907 definitely extends the limit of an allotment to 5 acres. The distinction between allotments and small holdings has therefore been obliterated, at least as far as England and Wales are concerned. County councils will let plots of 1 to 5 acres as small holdings, and parish councils as allotments. During the European War 183,000 allotments were registered under the Cultivation of Lands Order, and the number of allotments in Great Britain not exceeding 1 acre now amounts to over 1,000,000. In proportion to the total agricultural area or population it is much smaller in Scotland than in England. The rents of allotments vary greatly, and near towns, or even villages, they are very high, often from £4 to £8 per acre. A measure corresponding to the English Small Holdings and Allotments Act of 1907 was passed for Scotland in 1911, and came into operation in 1912. In recent years a large number of co-operative allotment associations have come into existence.

Allot'ropy (Gr. *allos*, other, *tropos*, manner), a term used by Berzelius to express the fact that one and the same element may exist in different forms, differing widely in external physical properties. Thus carbon occurs as the diamond, and as charcoal and plumbago, and is therefore regarded as a substance subject to allotropy.

Al'loway, a parish of Scotland, now included in Ayr parish. Here Burns was born in 1759, and the "auld haunted kirk", near his birthplace, was the scene of the dance of witches in *Tam o' Shanter*.

Alloy' is the substance produced by melting together two or more metals. Sometimes a chemical compound is formed, but more generally one metal is interspersed throughout the other, much as sugar is through water in which it is dissolved. In this case the alloy is called a 'solid solution' of one metal in another. Many metals mix together in all proportions, others only in certain proportions, while some will not mix in any proportion.

Scientific research has led to great advances in the use of alloys industrially. An alloy differs from its components in most of its physical properties, such as its hardness, ductility, strength, melting-point, and colour. The minutest trace of certain metals frequently produces an extraordinary change in the property of the body with which it is mixed. For instance, if bismuth is present in copper to the extent of more than 0.5 per cent, the copper cannot be used successfully in the construction of electrical machinery. Frequently the addition of a small proportion of a metal produces highly-desirable effects in one direction, but is deleterious in other directions. For instance, the presence of a small amount of manganese in cast-iron gives clean castings, but the magnetic qualities of the material are impaired.

Alloys are classified as ferrous and non-ferrous alloys.

Ferrous Alloys.—These alloys are of great industrial importance, as they include cast irons and steels. Pure iron is very little used in industry. Ordinary *cast iron* contains iron and about 3 per cent of carbon. The ordinary wrought iron of the blacksmith contains less than 0.25 per cent of carbon. Cast iron is brittle, and unreliable when used to sustain tensile stresses, and it cannot be forged; but wrought iron can be safely used in tension, is not brittle, and can be forged. The raw material from which steel is made is cast iron or wrought iron. (For manufacture of steel see *Steel*.) The properties of steel can be varied within very wide limits by adding to it traces of certain metals. For instance, the addition of nickel up to 5 per cent makes the steel much stronger and tougher; the addition of tungsten up to about 19 per cent makes it hard (tool-steel, magnet steel), while molybdenum has a similar effect. Chromium and vanadium have a 'stabilizing' effect, i.e. tend to make large masses of the alloy homogeneous, and to make the alloy retain its hardness over wide ranges of temperature. Cobalt has a similar stabilizing effect. Molybdenum high-speed steel is more expensive than tungsten high-speed steel, but is said to wear better.

Non-ferrous Alloys.—Of the non-ferrous alloys the most important have copper as the basic metal. They do not become rusty on exposure. Copper, when used for electrical purposes, must be nearly pure. It is deposited electrolytically (see *Electrolysis*) and then made into bars (electrolytic copper).

Brass is an alloy of copper and zinc and varies much in composition. The best-known varieties are:—

Best brass	Copper 70%,	Zinc 30%.
Admiralty brass	Copper 70%,	Zinc 29%, Tin 1%.
Ordinary brass	Copper 67%,	Zinc 30%, Lead 3%.

Gun-metal is a mixture of copper, tin, and zinc. The standard Admiralty mixture is copper 88, tin 10, zinc 2. It possesses a tensile strength of 14 tons per sq. inch.

Bronzes.—The bronzes are alloys of copper, with zinc or tin mainly. They can be cast easily, and when heated to a dull red the metal can be forged, stamped, rolled, pressed, or extruded. They are largely free from corrosion.

Phosphor Bronze.—This is a specially strong bronze. A typical composition is copper 89.5, tin 10, phosphorus 0.5. The tensile strength is higher than that of pure copper or brass (about 15 tons per sq. inch), and it has about one-half the electrical conductivity of pure copper. It is used for small castings, and it can be drawn into wire, which is used in alternating-current electric-railway construction for the overhead conductor.

Delta metals are bronzes of specially high tensile strength (30-50 tons per sq. inch).

Manganese bronzes are bronzes of high tensile strength and ductility, and are largely used for marine propellers. Manganese bronze is not affected by sea-water. It usually contains copper, zinc, and manganese, with a little aluminium and tin.

A recently-discovered copper alloy is known as *monel metal*. It is a naturally-occurring alloy of copper, nickel, iron, and manganese (copper 27-29 per cent, nickel 68-70 per cent, iron and manganese 4-5 per cent), and possesses, roughly, the qualities of a mild steel and copper. It has a high

tensile strength, which it retains over a wide range of temperature change. It is ductile, is not affected by immersion in sea-water, and can be machined. It is used for pump-valves, pump-pistons, turbine blading, &c.

In the British silver coinage silver is alloyed with 7.5 per cent copper, which renders it harder and more durable. British gold coinage contains 8.3 per cent of copper.—BIBLIOGRAPHY: Law, *Alloys*; Osmond and Stead, *Microscopic Analysis of Metals*; Mellor, *Crystallization of Iron and Steel*; Desch, *Metallography*.

All Saints' Day, a festival of the Christian Church, instituted in 835, and celebrated on 1st Nov. in honour of the saints in general.

All Souls' College, a college of Oxford University, founded in 1437 by Henry Chichele, Archbishop of Canterbury. Attached to it are the Chichele Professorship of International Law and the Chichele Professorship of Modern History.

All Souls' Day, a festival of the Roman Catholic Church, instituted in 998, and observed on 2nd Nov. for the relief of souls in purgatory.

Allspice (a'l'spīs), or **Pimenta**, is the dried and ground berry of a West Indian species of myrtle (*Myrtus Pimenta*), a beautiful tree with white and fragrant aromatic flowers and leaves of a deep shining green. The tree is often 30 feet high, and may yield 150 lb. of raw berries, equivalent to 100 lb. of dried spice. Pimenta is thought to resemble in flavour a mixture of cinnamon, nutmegs, and cloves, whence the popular name of *allspice*; it is also called Jamaica pepper, the trees being cultivated there extensively. It is employed in cookery, also in medicine as an agreeable aromatic, and forms the basis of a distilled water, a spirit, and an essential oil.



Allspice (*Myrtus Pimenta*)

All'ston (äl'stun), Washington, an American painter, born 1779, died 1843. He studied in London and Rome, and is most celebrated for his pictures on scriptural subjects. Among his pictures *The Angel Uriel* is at Stafford

House; *The Prophet Jeremiah* at Yale College, Newport. A portrait of Coleridge by Allston is in the National Gallery. He also wrote poems and a tragical romance (*Monaldi*).

Allu'vium (Lat. *alluvium*—*ad*, to, and *luo*, to wash), deposits of soil collected by the action of water, such as are found in valleys and plains, consisting of loam, clay, gravel, &c., washed down from the higher grounds. Great alterations are often produced by alluvium—deltas and whole islands being often formed by this cause. Much of the rich land along the banks of rivers is alluvial in its origin. There are great tracts of alluviums lying along the banks of the Derwent, the Ouse, and the Trent, and the Romney Marsh of Kent along the banks of the Thames.

Allygurh. See *Aligarh*.

Alma, a small river of Russia, in the Crimea, celebrated from the victory gained by the allied British and French over the Russians, 20th Sept., 1854.

Al'mack's, the name formerly given to certain assembly-rooms in King Street, St. James's, London, derived from Almack, a tavern-keeper, by whom they were built, and whose real name is said to have been M'Call, of which Almack is an anagram; afterwards called *Willis's Rooms*. They were first opened about 1770, and became famous for the extreme exclusiveness displayed by the lady patronesses in regard to the admission of applicants for tickets to the balls held here—only those of the most assured social standing being admitted. They were turned into a restaurant in 1890.

Alma'da, a town of Portugal, on the Tagus, opposite Lisbon. Pop. 7913.

Al'maden, a place in California, United States, about 60 miles S.E. of San Francisco, with rich quicksilver-mines, the product of which has been largely employed in gold and silver mining.

Almaden', a town of Spain, province of Ciudad-Real, celebrated both in ancient and modern times for its mines of quicksilver (in the form of cinnabar). Pop. 7410.

Almaden Process. See *Mercury*.

Al'magest (Ar. *al*, the, and Gr. *megistē*, greatest, *sc.* 'treatise') the name of a celebrated astronomical work composed by Claudius Ptolemy.

Alma'gro, an old town of Spain, province of Ciudad-Real (New Castile), with important lace manufactures. Pop. 7700.

Alma'gro, Diego de, Spanish 'Conquistador', a foundling, born in 1475, killed 1538. He took part with Pizarro in the conquest of Peru, and after frequent disputes with Pizarro about their respective shares in their conquests led an expedition against Chile, which he failed to conquer. On his return a struggle took place between him and Pizarro, in which Almagro was finally overcome, taken prisoner, strangled, and afterwards beheaded. He was avenged by his son, born in 1520, who raised an insurrection, in which Pizarro was assassinated, in 1541. The younger Almagro was put to death at Cuzco in 1542 by De Castro, the new Viceroy of Peru.

Almalee', a town of Asia Minor, 50 miles from Adalia, with thriving manufactures and a considerable trade. Pop. 3500.

Al'ma Ma'ter (Lat., fostering or bounteous mother), a term familiarly applied to their own university by those who have had a university education.

Al-Mamun (ma'-mön'), a caliph of the Abasside dynasty, son of Harun-al-Rashid, born 786, died 833. Under him Bagdad became a great centre of art and science.

Al'manac, a calendar, in which are set down the rising and setting of the sun, the phases of the moon, the most remarkable positions and phenomena of the heavenly bodies, for every month and day of the year; also the several fasts and feasts to be observed in the Church and State, &c., and often much miscellaneous information likely to be useful to the public. The term is of Arabic origin, but the Arabs were not the first to use almanacs, which indeed existed from remote ages. In England they are known from the fourteenth century, there being several English almanacs of this century existing in MS. They became generally used in Europe within a short time after the invention of printing; and they were very early remarkable, as some are still, for the mixture of truth and falsehood which they contained. Their effects in France were found so mischievous, from the pretended

prophecies which they published, that an edict was promulgated by Henry III in 1579 forbidding any predictions to be inserted in them relating to civil affairs, whether those of the State or of private persons. In the reign of James I of England letters-patent were granted to the two universities and the Stationers' Company for an exclusive right of printing almanacs, but in 1775 this monopoly was abolished. During the civil war of Charles I, and thence onward, English almanacs were conspicuous for the unblushing boldness of their astrological predictions, and their determined perpetuation of popular errors. The most famous English almanac was *Poor Robin's Almanack*, which was published from 1663 to 1775. Gradually, however, a better taste began to prevail, and in 1828 the Society for the Diffusion of Useful Knowledge, by publishing the *British Almanac*, had the merit of taking the lead in the production of an unexceptionable almanac in Great Britain. The example thus set has been almost universally adopted. The circulation of almanacs continued to be much cramped by the very heavy duty of one shilling and threepence per copy till 1834, when this duty was abolished. About 200 new almanacs were started immediately on the repeal. Almanacs, from their periodical character, and the frequency with which they are referred to, are now more and more used as vehicles for conveying statistical and other useful information, some being intended for the inhabitants of a particular country or district, others for a particular class or party. Some of the almanacs that are regularly published every year are extremely useful, and are indeed almost indispensable to men engaged in official, mercantile, literary, or professional business. Such in Great Britain are *Thom's Official Directory of the United Kingdom*, *The British Almanac*, *Oliver and Boyd's New Edinburgh Almanac*, and *Whitaker's Almanac*, started in 1868. In the United States is published *The American Almanac*, a useful compilation. The *Almanach de Gotha*, which has appeared at Gotha since 1764, contains in small bulk a wonderful quantity of information regarding the reigning families and Governments, the finances, commerce, population, &c., of the different States throughout the world. Since 1871 it is published both in a French and in a German edition. Among French almanacs the most famous was the *Almanach Liégeois*, whilst the *Almanach National*, first published in 1679 as *Almanach Royal*, is the most important of modern almanacs in France. Almanacs that pretend to foretell the weather and occurrences of various kinds are still popular in Britain, France, and elsewhere.—*The Nautical Almanac* is an important work

published annually by the British Government, two or three years in advance, in which is contained much useful astronomical matter, more especially the distances of the moon from the sun, and from certain fixed stars, for every three hours of apparent time, adapted to the meridian of the Royal Observatory, Greenwich. By comparing these with the distances carefully observed at sea the mariner may, with comparative ease, infer his longitude to a degree of accuracy unattainable in any other way, and sufficient for most nautical purposes. This almanac was commenced in 1767 by Dr. Maskelyne, Astronomer Royal. The French *Connaissance des Temps* is published for the same purpose as the English *Nautical Almanac*, and nearly on the same plan. It commenced in 1679. Of a similar character is the *Astronomisches Jahrbuch* published at Berlin.

Alman'dine, a mineral of a reddish or violet colour, a variety of precious or noble garnet.

Alman'sa, a town of south-eastern Spain (Murcia), near which was fought (25th April, 1707) a decisive battle in the War of the Spanish Succession, when the French, under the Duke of Berwick, defeated the Anglo-Spanish army under the Earl of Galway. Pop. 11,887.

Alman'zur, or **Almansur**, a caliph of the Abasside dynasty, reigned 754-75. He was cruel and treacherous and a persecutor of the Christians, but a patron of learning.

Alma-Tad'ema, Sir Lawrence, Dutch painter, born in 1836, resided since 1870 in England, where he became a naturalized subject. He was made A.R.A. in 1876, R.A. in 1879, knighted in 1899, and awarded the Order of Merit in 1905. He died at Wiesbaden, 25th June, 1912. He is especially celebrated for his pictures of ancient Roman, Greek, and Egyptian life, which are painted with great realism and archæological correctness.

Al'meh, the name given in Egypt to a class of girls whose profession is to sing for the amusement of the upper classes, as distinguished from the *gawasi*, who perform before the lower classes. They perform at feasts and other entertainments (including funerals), and many of them are skilful improvisatrici. One of their most famous dances is called 'The Bee'.

Almeida (a`l-mā`i-da`), one of the strongest fortresses in Portugal, in the province of Beira, near the Spanish border, on the Coa. Pop. 2350. Taken by Masséna from the English in 1810, retaken by Wellington in 1811.

Almeida (da`l-mā`i-da`), Francisco d', first Portuguese viceroy of India, son of the Conde de Abrantes, born about the middle of the fifteenth century. He fought with renown against the Moors, and being appointed governor of the new Portuguese settlements on the African and Indian coasts, he sailed for India in 1505, accompanied by his son Lorenzo and other eminent men. In Africa he took possession of Quiloa and Mombas, and in the East he conquered Cananor, Cochin, Calicut, &c., and established forts and factories. His son Lorenzo discovered the Maldives and Madagascar, but perished in an attack made on him by a fleet sent by the Sultan of Egypt, with the aid of the Porte and the Republic of Venice. Having signally defeated the Mussulmans (1508), and avenged his son, and being superseded by Albuquerque, he sailed for Portugal, but was killed in a skirmish on the African coast in 1510.

Almelo', a town of Holland, province of Overijssel, on the Vechte; with manufactures of linen. Pop. 7360.

Almendralejo (-ā`hō), a town of Spain, province of Badajoz, in a district rich in grain, wine, and fruits, with many brandy distilleries. Pop. 12,587.

Almeria (a`l-mā-rē'a`), a fortified seaport of Southern Spain, capital of province of Almeria, near the mouth of a river and on the gulf of same name, with no building of consequence except a Gothic cathedral, but with a large trade, exporting grapes, iron ore, lead, esparto, &c. The province, which has an area of 3360 sq. miles, is generally mountainous, and rich in minerals. Pop. of town, 48,614; of province, 393,689.

Almodo'var, a town of Spain, province of Ciudad-Real (New Castile), near the Sierra Morena. Pop. 12,640.

Almohades (al'mo-hādz), a Moorish dynasty that ruled in Africa and Spain in the twelfth and thirteenth centuries, founded by Mohammed Ibn Tumart, a religious enthusiast, who assumed the title of *Mahdi*. They overthrew the Almoravides in Spain, but themselves received a defeat in 1212 from which

they did not recover, and in 1269 were overthrown in Africa, when Idris El-Wathik, their last emir, was murdered by a slave.

Al-mokanna. See *Mokanna*.

Almond (a · 'mund), the fruit of the almond tree (*Amygdālus commūnis*), a tree which grows usually to the height of 20 feet, and is akin to the peach, nectarine, &c. (ord. Rosaceæ). It has beautiful pinkish flowers that appear before the leaves, which are oval, pointed, and delicately serrated. It is a native of Africa and Asia, naturalized in Southern Europe, and cultivated in England for its beauty, as it seldom produces edible fruit even in the warmer portions of Southern England. The fruit is a drupe, ovoid, and with downy outer surface; the fleshy covering is tough and fibrous; it covers the compressed wrinkled stone enclosing the seed or almond within it. There are two varieties, one sweet and the other bitter; both are produced from *A. communis*, though from different varieties. Most of the sweet almonds imported into Britain come from Southern Europe, the Levant, and California, the finest being the Valencian, Jordan, and Malaga. They contain a bland fixed oil, consisting chiefly of olein. Bitter almonds come from Mogador, and besides a fixed oil they contain a substance called *emulsin*, and also a bitter crystalline substance called *amygdalin*, which, acting on the emulsin, produces prussic acid, whence the aroma of bitter almonds when mixed with water. *Almond-oil*, a bland fixed oil, is expressed from the kernels of either sweet or bitter almonds, and is used by perfumers and in medicine. A poisonous essential oil is obtained from bitter almonds, which is used for flavouring by cooks and confectioners, also by perfumers and in medicine. The name *almond*, with a qualifying word prefixed, is also given to the seeds of other species of plants; thus *Java almonds* are the kernels of *Canarium commune*.

Almondbury (a · 'mund-be-ri), a town of England, West Riding of Yorkshire, S.E. of Huddersfield, in which it is now included, with manufactures of woollens, cotton and silk goods.

Al'moner, an officer of a religious establishment to whom belonged the distribution of alms. The grand almoner (*grand aumonier*) of France was the highest ecclesiastical dignitary in that kingdom before the revolution. The lord almoner, or lord high almoner of England, is generally a bishop,

whose office is well-nigh a sinecure. He distributes the sovereign's doles to the poor on Maundy Thursday.

Almo'ra, a town and fortress of India, in the United Provinces, capital of Kumaon, 170 miles E.N.E. of Delhi, a thriving little place. Pop. about 10,560.

Almo'ravides (-vīdz), a Moorish dynasty which arose in North-Western Africa in the eleventh century, and reigned from 1055-1147. The town of Marrakesh, built in 1062, became the capital of this dynasty. Having crossed the Straits of Gibraltar, the family gained possession of all Arabic Spain, but was overthrown by the Almohades in the following century.

Al'mug (or **Al'gum**) **tree**, names which occur in *1 Kings*, x, 11, 12, and *2 Chron.*, ii, 8, and ix, 10, 11, as the names of trees of which the wood was used for pillars in the temple and the king's house, for harps and psalteries, &c. They are said in one passage to be hewn in Lebanon, in another to be brought from Ophir. They have been identified by critics with the red sandalwood of India. Some of them may possibly have been transplanted to Lebanon by the Phoenicians.

Almuñecar (a · l-mu'n-ye-kär'), a seaport of Spain, Granada, on the Mediterranean. Pop. 8000.

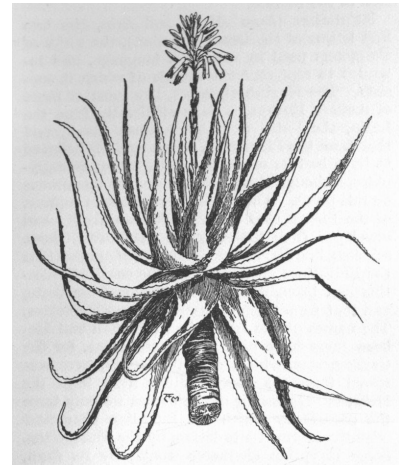
Al'nager, formerly, in England, an official whose duty it was to inspect, measure, and stamp woollen cloth.

Al'nus. See *Alder*.

Alnwick (an'ik), a town of England, county town of Northumberland, 34 miles north of Newcastle, near the Aln. It is well built, and carries on tanning, brewing, and a general trade. The town is famous for the curious ceremonies which take place there annually during the election of the common council (25th March). Alnwick Castle, residence of the Dukes of Northumberland, for many centuries a fortress of great strength, stands close to the town. Pop. (1921), 6991.

Aloe (al'ō), the name of a number of plants belonging to the genus *Aloë* (ord. *Liliaceæ*), some of which are not more than a few inches, whilst others are 30 feet and upwards in height; natives of South Africa and Socotra; leaves fleshy, thick, and more or less spinous at the edges or extremity;

flowers with a tubular corolla. Some of the larger kinds are of great use, the fibrous parts of the leaves being made into cordage, fishing nets and lines, cloth, &c. The inspissated juice of several species is used in medicine, under the name of *aloes*, forming a bitter purgative. The medicinal value of bitter aloes was known to the Greeks in the fourth century B.C. According to the Arabian historian Edrisi, the occupation of Socotra by the Macedonians was due to Aristotle's persuading Alexander the Great to secure the monopoly of the supplies of the drug. The drug is said to have been commended



Socotrine Aloe (*Aloe socotrīna*)

to Alfred the Great by the Patriarch of Jerusalem, but a direct trade in it between Socotra and Britain was opened only in the seventeenth century. The principal drug-producing species are the Socotrine aloe (*A. Socotrīna*); the Barbados aloe (*A. vulgāris*), first imported into Britain in 1693; the Cape aloe (*A. spicāta*), 1780; and Natal aloes, 1870; &c. A beautiful violet colour is yielded by the leaves of the Socotrine aloe. The American aloe (see *Agave*) is a different plant altogether; as are also the aloes or lign-aloes of Scripture, which are supposed to be the *Aquilaria Agallōchum*, or aloes-wood (q. v.). *Aloe fibre* is obtained from species of Aloë, Agave, Yucca, &c., and is made into coarse fabrics, ropes, &c.

Aloes-wood, Eagle-wood, or Agilawood, the inner portion of the trunk of *Aquilāria ovāta* and *A. Agallōchum*, forest trees belonging to the ord. Aquilariaceæ, found in tropical Asia, and yielding a fragrant resinous substance, which, as well as the wood, is burned for its perfume. Another tree, the *Aloexylon Agallōchum* (ord. Leguminosæ), also produces aloes-wood. This wood is supposed to be the lign-aloes (a corruption of the Lat. *lignum aloë*) of the Bible.

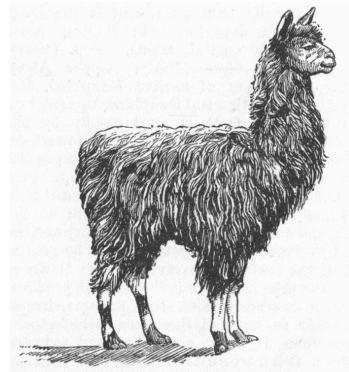
Alope'cia, a variety of baldness in which the hair falls off from the beard and eyebrows, as well as the scalp.

Alopecu'rus, a genus of grasses. See *Foxtail-grass*.

Alo'ra, a town of Southern Spain, province of Malaga. Pop. 6200.

Alost, or **Aalst** (ä'lost, älst), a town of Belgium, 15 miles W.N.W. of Brussels, on the Dender (here navigable), with a beautiful, though unfinished, church, and an ancient town hall (thirteenth century); manufactures of lace, thread, linen and cotton goods, &c., and a considerable trade. In the market-place stands a statue of Thierry Maartens, who introduced the art of typography into the Netherlands in 1473. The town was occupied by the Germans in 1914. Pop. 35,603.

Alpac'a, a ruminant mammal of the camel tribe, and genus *Auchēnia* (*A. Paco*), a native of the Andes, especially of the mountains of Chile and Peru, and closely allied to the llama. Llamas and alpacas are mutually fertile when crossed, and this explains the existence of intermediate forms between the two breeds. It has been domesticated, and remains also in a wild state. In form and size it approaches the sheep, but has a longer neck. It is valued chiefly for its long, soft, and silky wool,



Alpaca (*Auchēnia Paco*)

which is straighter than that of the sheep, and very strong, and is woven into fabrics of great beauty, used for shawls, clothing for warm climates, coat-linings, and umbrellas, and known by the same name. Cloth made from imported alpaca wool is manufactured in England, principally in Yorkshire. Attempts have been made to introduce and acclimatize the alpaca in Europe and in Australia, but no measure of success has attended the experiments. Its flesh is pleasant and wholesome.

Alpe'na, a town of the United States, Michigan, at the entrance of the Thunder into Lake Huron, with saw-mills, woollen factories, &c. Pop. 12,706.

Alpen-horn, or **Alp-horn** (Ger.), a long, nearly-straight horn, curving slightly, and widening towards its extremity, used in the Alps to convey signals, or notice of something.

Alpen-stock (Ger.), a strong, tall stick shod with iron, pointed at the end so as to take hold in, and give support on, ice and other dangerous places in climbing the Alps and other high mountains.

Alpes (a'lp), the name of three departments in the south-east of France, all more or less covered by the Alps or their offshoots:—*Basses-Alpes* (bäs-a'lp; Lower Alps) has mountains rising to a height of 8000 to 10,000 feet, is drained by the Durance and its tributaries, and is the most thinly-peopled department in France; area, 2697 sq. miles; capital, Digne. Pop. (1921), 91,882.—*Hautes-Alpes* (ōt-a'lp; Upper Alps), mostly formed out of ancient Dauphiné, traversed by the Cottian and Dauphiné Alps (highest summits 12,000 feet), drained chiefly by the Durance and its tributaries. It is the lowest department in France in point of absolute population; area, 2178 sq. miles; capital, Gap. Pop. (1921), 89,275.—*Alpes-Maritimes* (a'lp-ma'-ri-tēm; Maritime Alps) has the Mediterranean on the south, and mainly consists of the territory of Nice, ceded to France by Italy in 1860. The greater part of the surface is covered by the Maritime Alps; the principal river is the Var. It produces in the south, cereals, vines, olives, oranges, citrons, and other fruits; and there are manufactories of perfumes, liqueurs, soap, &c., and valuable fisheries. It is a favourite resort for invalids; area, 1443 sq. miles; capital, Nice. Pop. 357,759.

Al'pha and **O'mega**, the first and last letters of the Greek alphabet, sometimes used to signify the beginning and the end, or the first and the last of anything; also as a symbol of the Divine Being (*Rev.* i, 8; xxi, 6; xxii, 13). They were also formerly the symbol of Christianity, and engraved accordingly on the tombs of the ancient Christians. Some of these engravings are to be seen in the Louvre.

Al'phabet (from *Alpha* and *Beta*, the two first letters of the Greek alphabet), the series of characters used in writing a language, and intended to represent the sounds of which it consists. The English alphabet, like most of those of modern Europe, is derived directly from the Latin, the Latin from the ancient Greek, and that from the Phœnician, which again is believed to have had its origin in the Egyptian hieroglyphics, although Egyptologists are not unanimous on this point. There is little evidence in support of the theory that the Phœnician alphabet had developed from the Assyrian cuneiform. Some scholars, like Sir Arthur Evans, are of opinion that the Philistines established on the coast of Palestine had brought the alphabet over from Crete, and that from them it passed to the Phœnicians. The names of the letters in Phœnician and Hebrew must have been almost the same, for the Greek names, which, with the letters, were borrowed from

the former, differ little from the Hebrew. By means of the names we may trace the process by which the Egyptian characters were transformed into letters by the Phœnicians. Some Egyptian character would, by its form, recall the idea of a house, for example, in Phœnician or Hebrew *beth*. This character would subsequently come to be used wherever the sound *b* occurred. Its form might be afterwards simplified, or even completely modified, but the name would still remain, as *beth* still continues the Hebrew name for *b*, and *beta* the Greek. Our letter *m*, which in Hebrew was called *mim*, water, has still a considerable resemblance to the zig-zag wavy line which had been chosen to represent water, as in the zodiacal symbol for *Aquarius*. The letter *o*, of which the Hebrew name means eye, no doubt was originally intended to represent that organ. While the ancient Greek alphabet gave rise to the ordinary Greek alphabet and the Latin, the Greek alphabet of later times furnished elements for the Coptic, the Gothic, and the old Slavic alphabets. The Latin characters are now employed by a great many nations, such as the Italian, the French, the Spanish, the Portuguese, the English, the Dutch, the German, the Hungarian, the Polish, &c., each nation having introduced such modifications or additions as are necessary to express the sound of the language peculiar to it. The Greek alphabet originally possessed only sixteen letters, though the Phœnician had twenty-two. The original Latin alphabet, as it is found in the oldest inscriptions, consisted of twenty-one letters; namely, the vowels *a*, *e*, *i*, *o*, and *u* (*v*), and the consonants *b*, *c*, *d*, *f*, *h*, *k*, *l*, *m*, *n*, *p*, *q*, *r*, *s*, *t*, *x*, *z*. The Anglo-Saxon alphabet had two characters for the digraph *th*, which were unfortunately not retained in later English; it had also the character *æ*. It wanted *j*, *v*, *y* (consonant), and *z*. The German alphabet consists of the same letters as the English, but the sounds of some of them are different. Anciently certain characters called *Runic* were made use of by the Teutonic nations, to which some would attribute an origin independent of the Greek and Latin alphabets. Wimmer, the Danish scholar, is, however, of opinion that the *runes* were developed from the Latin alphabet. While the alphabets of the west of Europe are derived from the Latin, the Russian, which is very complete, is based on the Greek, with some characters borrowed from the Armenian, &c; it is called *azbouka*, from the first two letters *az*, *a*, and *bouki*, *b*. Among Asiatic alphabets, the Arabian (ultimately of Phœnician origin) has played a part analogous to that of the Latin in Europe, the conquests of Mohammedanism having imposed it on the Persian, the

Turkish, the Hindustani, &c. The Sanskrit or Devanāgarī alphabet is one of the most remarkable alphabets of the world. As now used it has fourteen characters for the vowels and diphthongs, and thirty-three for the consonants, besides two other symbols. Our alphabet is a very imperfect instrument for what it has to perform, being both defective and redundant. An alphabet is not essential to the writing of a language, since ideograms or symbols may be used instead, as in Chinese. See *Writing*.—BIBLIOGRAPHY: E. Clodd, *The Alphabet* (Useful Knowledge Series, Hodder & Stoughton); Canon J. Taylor, *The Alphabet*; Philippe Berger, *Histoire de l'Écriture dans l'Antiquité*.

Alphē'us (now **Rufia**), the largest river of Peloponnesus, flowing westwards into the Ionian Sea. In Greek mythology Alphēus is supposed to have been the son of Oceanus and Tethys.

Alphon'so, the name of a number of Portuguese and Spanish kings. Among the former may be mentioned **Alphonso I**, the Conqueror, first King of Portugal, son of Henry of Burgundy, the Conqueror and first Count of Portugal; born 1110, fought successfully against the Spaniards and the Moors, named himself King of Portugal, and was as such recognized by the Pope; died 1185.—**Alphonso V**, the African, born in 1432; succeeded his father, Edward I, 1438; conquered Tangiers in 1471; died 1481. During his reign Prince Henry the Navigator continued the important voyages of discovery already begun by the Portuguese. Under him was drawn up an important code of laws.—Among kings of Spain may be mentioned **Alphonso X**, King of Castile and Leon, surnamed the *Astronomer*, the *Philosopher*, or the *Wise* (El Sabio); born in 1226; succeeded in 1252. Being grandson of Philip of Hohenstaufen, son of Frederick Barbarossa, he endeavoured to have himself elected Emperor of Germany, and in 1257 succeeded in dividing the election with Richard, Earl of Cornwall. On Richard's death in 1272 he again unsuccessfully contested the imperial crown. Meantime his throne was endangered by conspiracies of the nobles and the attacks of the Moors. The Moors he conquered, but his domestic troubles were less easily overcome, and he was finally dethroned by his son Sancho, and died two years after, 1284. Alphonso was the most learned prince of his age. Under his direction or superintendence were drawn up a celebrated code of laws, valuable astronomical tables which go under his name (*Alphonsine Tables*), the first general history of Spain in the Castilian

tongue, and a Spanish translation of the Bible.—**Alphonso V** of Aragon, I of Naples and Sicily, born in 1385, was the son of Ferdinand I of Aragon, the throne of which he ascended in 1416, ruling also over Sicily and the Island of Sardinia. Queen Joanna of Naples made him her heir, but after her death in 1435 her will was disputed by René of Anjou. Alphonso now proceeded to take possession of Naples by force, which he succeeded in doing in 1442, and reigned till his death in 1458. He was an enlightened patron of literary men, by whom, in the latter part of his reign, his Court was thronged.—**Alphonso XII**, King of Spain, the only son of Queen Isabella II and her cousin Francis of Assisi, was born in 1857 and died in 1885. He left Spain with his mother when she was driven from the throne by the revolution of 1868, and till 1874 resided partly in France, partly in Austria. In the latter year he studied for a time at the Royal Military College, Sandhurst, being then known as Prince of the Asturias. His mother had given up her claims to the throne in 1870 in his favour, and in 1874 Alphonso came forward himself as claimant, and in the end of the year was proclaimed by General Martinez Campos as king. He now passed over into Spain and was enthusiastically received, most of the Spaniards being by this time tired of the republican Government, which had failed to put down the Carlist party. Alphonso was successful in bringing the Carlist struggle to an end (1876), and henceforth he reigned with little disturbance. His minister Canovas del Castillo ruined, however, Alphonso's popularity when he advised the king to conclude an alliance with Bismarck and Germany. He married first his cousin Maria de las Mercedes, daughter of the Duc de Montpensier; second, Maria Christina, Archduchess of Austria, whom he left a widow with two daughters and a son.—**Alphonso XIII**, King of Spain, born in 1886, the posthumous son of Alphonso XII. His mother was appointed regent during his minority, and acted as such until 1902. On attaining his sixteenth year, the king assumed personal charge of the Government. In 1906 (31st May) he married Princess Ena, daughter of Princess Henry of Battenberg, a daughter of Queen Victoria.

Alpine Club, an association of English gentlemen, originating in 1856 or 1857, having as their common bond of union a delight in making the ascent of mountains, in the Alps or elsewhere, difficult to ascend, and in investigating everything connected with mountains. Similar associations now exist in Germany, Austria, Switzerland, and France.

Alpine Crow, or Alpine Chough (*Pyrrhocorax alpinus*), a European bird closely akin to the chough of England.

Alpine Museum, a museum established at Munich in 1911 by the German and Austrian Alpine Club. Its purpose is to spread knowledge about the Alps, and to disseminate the results of scientific research by means of exhibits and literary publications. Not only alpine geology, botany, and zoology, but also industry, custom, and costumes are well demonstrated in the exhibits.

Alpine Plants, the name given to those plants whose habitat is in the neighbourhood of the snow, on mountains partly covered with it all the year round. As the height of the snow-line varies according to the latitude and local conditions, so also does the height at which these plants grow. The mean height for the alpine plants of Central Europe is about 6000 feet; but it rises in parts of the Alps and in the Pyrenees to 9000 feet, or even more. The high grounds clear of snow among these mountains present a very well marked flora, the general characters of the plants being a low dwarfish habit, a tendency to form thick turfs, stems partly or wholly woody, and large brilliantly-coloured and often very sweet-smelling flowers. They are also often closely covered with woolly hairs. In the Alps of Middle Europe the eye is at once attracted by gentians, saxifrages, rhododendrons, primroses of different kinds, &c. Ferns and mosses of many kinds also characterize these regions. Some alpine plants are found only in one locality. Considerable success has attended the attempt to grow alpine plants in gardens, the first necessity being a situation where there is plenty of sunlight, and which is free from the shade of trees.

Alpine Warbler (*Accentor alpinus*), a European bird of the same genus as the hedge-sparrow.

Alpin'ia, a genus of plants. See *Galanga*.

Alps, the highest and most extensive system of mountains in Europe, included between lat. 44° and 48° N., and long. 5° and 18° E., covering great part of Northern Italy, several departments of France, nearly the whole of Switzerland, and a large part of Austria, while its extensive ramifications connect it with nearly all the mountain systems of Europe. The culminating peak is Mont Blanc, 15,781 feet high, though the true centre is the St.

Gothard, or the mountain mass to which it belongs, and from whose slopes flow, either directly or by affluents, the great rivers of Central Europe—the Danube, Rhine, Rhone, and Po. Round the northern frontier of Italy the Alps form a remarkable barrier, shutting it off from the mainland of Europe, so that formerly it could hardly be approached from France, Germany, or Switzerland, except through high and difficult passes. In the west this barrier approaches close to the Mediterranean coast, and near Nice there is left a free passage into the Italian peninsula between the mountains and the sea. From this point eastward the chain proceeds along the coast till it forms a junction with the Apennines. In the opposite direction it proceeds north-west, and afterwards north to Mont Blanc, on the boundaries of France and Italy; it then turns north-east and runs generally in this direction to the Gross Glockner, in Central Tyrol, between the Rivers Drave and the Salza, where it divides into two branches, the northern proceeding north-east towards Vienna, the southern towards the Balkan Peninsula. The principal valleys of the Alps run mostly in a direction nearly parallel with the principal ranges, and therefore east and west. The transverse valleys are commonly shorter, and frequently lead up through a narrow gorge to a depression in the main ridge between two adjacent peaks. These are the passes or *cols*, which may usually be found by tracing a stream which descends from the mountains up to its source.

The Alps in their various great divisions receive different names. The *Maritime Alps*, so called from their proximity to the Mediterranean, extend westward from their junction with the Apennines for a distance of about 100 miles; culminating points Aiguille de Chambeyron, 11,155 feet, and Grand Rioburent, 11,142 feet; principal pass, the Col di Tende (6158 feet), which was made practicable for carriages by Napoleon I. Proceeding northward the next group consists of the *Cottian Alps*, length about 60 miles; principal peaks: Monte Viso, 12,605 feet; Pic des Écrins, 13,462; Pelvoux, 12,973. Next come the *Graian Alps*, 50 miles long, with extensive ramifications in Savoy and Piedmont; principal peaks: Aiguille de la Sassièrre, 12,326 feet; Grand Paradis, 13,300; Grande Casse, 12,780. To this group belongs Mont Cenis (6765 feet), over which a carriage road was constructed by Napoleon I, while a railway now passes through the mountain by a tunnel nearly 8 miles long. These three divisions of the Alps are often classed together as the *Western Alps*, while the portion of the

system immediately east of this forms the *Central Alps*. The *Pennine Alps* form the loftiest portion of the whole system, having Mont Blanc (in France) at one extremity and Monte Rosa at the other (60 miles), and including the Alps of Savoy and the Valais. In the east the valley of the Upper Rhone separates the Pennine Alps from the great chain of the *Bernese Alps* running nearly parallel, the great peaks of the two ranges being about 20 miles apart. The principal heights of the Pennine Alps are Mont Blanc, 15,781 feet; Monte Rosa, 15,217; Mischabelhörner (Dom), 14,935; Weisshorn, 14,804; Matterhorn, 14,780. In the Bernese Alps, the Finsteraarhorn, 14,026; Aletschhorn, 13,803; Jungfrau, 13,671. The pass of Great St. Bernard is celebrated for its hospice. The most easterly pass is the Simplon, 6595 feet, with a carriage road made by Napoleon I, and a tunnel leading into Italy, fully 12 miles long. Farther east are the *Lepontine Alps*, which give off a number of streams that feed the Italian lakes—Maggiore, Como, &c. The principal pass is the St. Gothard (6936 feet), over which a carriage road leads to Italy, while through this mountain mass a railway tunnel more than 9 miles long has been opened. Highest peaks: Tödi, 11,887 feet; Monte Leone, 11,696. The *Rhaetian Alps*, extending east to about lat. $12^{\circ} 30'$, are the most easterly of the Central Alps, and are divided into two portions by the Engadine, or valley of the Inn, and also broken by the valley of the Adige; principal peaks: Piz Bernina, 13,294 feet; Ortlerspitze, 12,814; Monte Adamello, 11,832. The Brenner Pass (4588 feet), from Verona to Innsbruck, and between the Central and the Eastern Alps, is crossed by a railway. On the railway from Innsbruck to the Lake of Constance is the Arlberg Tunnel, over 6 miles long. The *Eastern Alps* form the broadest and lowest portion of the system, and embrace the *Noric Alps*, the *Carnic Alps*, the *Julian Alps*, &c.; highest peak, the Gross Glockner, 12,405 feet. The height of the south-eastern continuations of the Alps rapidly diminishes, and they lose themselves in ranges having nothing in common with the great mountain masses which distinguish the centre of the system.

The Alps are very rich in lakes and streams. Among the chief of the former are the Lakes of Geneva, Constance, Zürich, Thun, Brienz, on the north side; on the south Maggiore, Como, Lugano, Garda, &c. The drainage is carried to the North Sea by the Rhine, to the Mediterranean by the Rhone, to the Adriatic by the Po, to the Black Sea by the Danube.

In the lower valleys of the Alps the mean temperature ranges from 50° to 60°. Half-way up the Alps it averages about 32°—a height which in the snowy regions it never reaches. But even where the temperature is lowest the solar radiation produced by the rocks and snow is often so great as to raise the photometer to 120° and even higher. The exhilarating and invigorating nature of the climate in the upper regions during summer has been acknowledged by all.

In respect to vegetation the Alps have been divided into six zones, depending on height modified by exposure and local circumstances. The first is the olive region. This tree flourishes better on sheltered slopes of the mountains than on the plains of Northern Italy. The vine, which bears greater winter cold, distinguishes the second zone. On slopes exposed to the sun it flourishes to a considerable extent. The third is called the mountainous region. Cereals and deciduous trees form the distinguishing features of its vegetation. The mean temperature about equals that of Great Britain, but the extremes are greater. The fourth region is the sub-Alpine or coniferous. Here are vast forests of pines of various species. Most of the Alpine villages are in the two last regions. On the northern slopes pines grow to 6000, and on the southern slopes to 7000 feet above the level of the sea. This is also the region of the lower or permanent pastures where the flocks are fed in winter. The fifth is the pasture region, the term *alp* being used in the local sense of high pasture grounds. It extends from the uppermost limit of trees to the region of perpetual snow. Here there are shrubs, rhododendrons, junipers, bilberries, and dwarf willows, &c. The sixth zone is the region of perpetual snow. The line of snow varies, according to seasons and localities, from 8000 to 9500 feet, but the line is not continuous, being often broken in upon. Few flowering plants extend above 10,000 feet, but they have been found as high as 12,000 feet.

At this great elevation are found the wild goat and the chamois. In summer the high mountain pastures are covered with large flocks of cattle, sheep, and goats, which are in winter removed to a lower and warmer level. The marmot, and white or Alpine hare, inhabit both the snowy and the woody regions. Lower down are found the wild-cat, fox, lynx, bear, and wolf; the last two are now extremely rare. The vulture, eagle, and other birds of prey frequent the highest elevations, the ptarmigan seeks its food and shelter among the diminutive plants that border upon the snow-line. Excellent trout

and other fish are found; but the most elevated lakes are, from their low temperature, entirely destitute of fish.

The geological structure of the Alps is highly involved, and is far, as yet, from being thoroughly investigated or understood. In general three zones can be distinguished, a central, in which crystalline rocks prevail, and two exterior zones, in which sedimentary rocks predominate. The rocks of the central zone consist of granite, gneiss, hornblende, mica slate, and other slates and schists. In the western Alps there are also considerable elevations in the central zone that belong to the Jurassic (Oolite) and Cretaceous formations. From the disposition of the beds, which are broken, tilted, and distorted on a gigantic scale, the Alps appear to have been formed by a succession of disruptions and elevations extending over a very protracted period. Among the minerals that are obtained are iron and lead, gold, silver, copper, zinc, alum, and coal.

Extensive views of alpine scenery are now commanded by means of special railways climbing to the summit of Mont Blanc, the Jungfrau, and other mountains. The Rigi railway was one of the earliest constructed of these. Here there are hotels at the top, 5905 feet above the level of the sea, and 4468 above the Lake of Lucerne. A favourite view from hence is to watch the sun rise over the Bernese Alps. The Becca di Nona (8415 feet), south of Aosta, gives, according to some authorities, the finest panoramic view to be obtained from any summit of the Alps. The most accessible glaciers are those of Aletsch, Chamonix, and Zermatt.

Alpujarras (a'l-pö-ha'r'ra's), a district of Spain, in Andalusia, between the Sierra Nevada and the Mediterranean, mountainous, but with rich and well-cultivated valleys, yielding grain, vines, olives, and other fruits. The inhabitants are Christianized descendants of the Moors.

Alquifou (al'ki-fö), a sort of lead ore used by potters as a green varnish or glaze.

Alsace (a'l-sa's; Ger. *Elsass*), before the French revolution a province of France, on the Rhine, afterwards constituting the French departments of Haut- and Bas-Rhin, and subsequently to the Franco-Prussian war of 1870-1 annexed by Germany, and incorporated in the province of Elsass-Lothringen (Alsace-Lorraine). Alsace is generally a level country, though

there are several ranges of low hills richly wooded. The principal river is the Ill. Corn, flax, tobacco, grapes, and other fruits are grown. Area, 3202 sq. miles. Pop. 1,218,803. Alsace was originally a part of ancient Gaul. It afterwards became a dukedom of the German Empire. In 1268, the line of its dukes becoming extinct, it was parcelled out to several members of the empire. By the peace of Westphalia, in 1648, a great part of it was ceded to France, which afterwards seized the rest of it, this seizure being recognized by the peace of Ryswick, in 1697.

Alsace-Lorraine, the imperial territory, or Reichsland of Elsass-Lothringen, taken by Germany from France in 1871, and restored to France in 1919. The province is partly bounded by the Rhine; area, 5605 sq. miles. Pop. 1,874,014. Under the German system the province was divided into three districts, namely, Lorraine, Upper Alsace, and Lower Alsace, and governed by a Statthalter, having his seat at Strassburg. By the law of 31st May, 1911, a constitution was granted to Alsace-Lorraine, by which it received three votes in the Federal Council. After the signing of the armistice, French troops occupied Alsace-Lorraine, and the French Government, by a decree of 26th Nov., 1918, took over the administration of the restored territories, and French officials were installed. The three chief towns are Strassburg, Mulhausen, and Metz. About 76 per cent of the inhabitants are Roman Catholics, 22 per cent Evangelical, and between 1 and 2 per cent Jews. The chief crops are wheat, rye, barley, oats, potatoes, and hay; the potash deposits of Alsace are superior to and more extensive than those of Strassfurt, Germany. *See France; Moselle.*—BIBLIOGRAPHY: M. Harrison, *The Stolen Lands: a Study on Alsace-Lorraine*; G. W. Edwards, *Alsace-Lorraine*.

Alsa'tia, formerly a cant name for Whitefriars, a district in London between the Thames and Fleet Street, and adjoining the Temple, which, possessing certain privileges of sanctuary, became for that reason a nest of mischievous characters who were liable to be arrested. These privileges were abolished in 1697. The name Alsatia is a Latinized form of Alsace, which, being on the frontiers of France and Germany, was a harbour for necessitous or troublesome characters from both countries.

Al'sen, an island on the east coast of Schleswig-Holstein; length, 20 miles, breadth, from 5 to 7 miles, diversified with forests, lakes, well-cultivated

fields, orchards, and towns. Pop. 25,000.

Al Sirat (sē'rat), in Mahommedan belief the bridge extending over the abyss of hell, which must be crossed by everyone on his journey to heaven. It is finer than a hair, as sharp as the edge of a sword, and beset with thorns on either side. The righteous will pass over with ease and swiftness, but the wicked will fall into hell below.

Alstrœme'ria, a genus of South American plants, ord. Amaryllidaceæ, some of them cultivated in European greenhouses and gardens. *A. Salsilla* and *A. ovāta* are cultivated for their edible tubers.

Altaic Languages (also called **Ural-Altaic** and **Turanian**), a family of languages occupying a portion of Northern and Eastern Europe, and nearly the whole of Northern and Central Asia, together with some other regions, and divided into five branches, the Ugrian or Finno-Hungarian, Samoyedic, Mongolic, Turkic, and Tungusic.

Altai Mountains (a' l'tī), an important Asiatic system on the borders of Siberia and Mongolia, partly in Russian and partly in Chinese territory, between lat. 46° and 53° N., long. 83° and 91° E., but having great eastern extensions. The Russian portion is comprised in the governments of Tomsk and Semipalatinsk, the Chinese in Dsungaria. The rivers of this region, which are large and numerous, are mostly headwaters of the Obi and Irtysh. The mountain scenery is generally grand and interesting. The highest summit is Byeluka ('white mountain', from its snowy top), height 11,000 feet. The area covered by perpetual snow is very considerable, and glaciers occupy a large area. In the high lands the winter is very severe, but on the whole the climate is comparatively mild and is also healthy. The flora of the Altai Mountains greatly resembles that of the Alps, about five-sixths of the latter being found here. The mountain forests are composed of birch, alder, aspen, fir, larch, stone-pine, &c. The wild sheep has here its native home, and several kinds of deer are found. The Altai is exceedingly rich in minerals, including gold, silver, copper, and iron. The name Altai means 'gold mountain'. The inhabitants are chiefly Russians and Kalmuks. The chief town is Barnaul.

Altamu'ra, a town of South Italy, province of Bari, at the foot of the Apennines, walled, well built, and containing a magnificent cathedral. Pop.

25,616.

Altar (a"l'tar), any pile or structure raised above the ground for receiving sacrifices to some divinity. Amongst the Semites the altar was primarily the place where the victim was slaughtered, and amongst the Indo-Germanic peoples the place where it was burnt. The Greek and Roman altars were various in form, and often highly ornamental; in temples they were usually placed before the statue of the god. In the Jewish ceremonial the altar held an important place, and was associated with many of the most significant rites of religion. Two altars were erected in the tabernacle in the wilderness, and the same number in the temple. In most sections of the Christian Church the communion-table, or table on which the eucharist is placed, is called an altar. In the primitive Church it was a table of wood, but subsequently stone and metal were introduced with rich ornaments, sculpture, and painting. After the introduction of Gothic art the altar frequently became a lofty and most elaborate structure. Originally there was but one altar in a church, but later on there might be several in a large church, the chief or *high altar* standing at the east end. Over an altar there is often a painting (an *altar-piece*), and behind it there may be an ornamental *altar-screen* separating the choir from the east end of the church.

Altaz'imuth (also called **Universal Instrument**), an astronomical instrument similar to a theodolite, having a telescope so mounted that it can be turned round in a plane perpendicular to the horizon, while it and the graduated vertical circle connected can also be turned horizontally to any point of the compass above a graduated horizontal circle. The altazimuth can thus determine the altitude and azimuth of objects, hence the name.

Altdorf. See *Altorf*.

Al'tena, a town of Prussia, Westphalia, 40 miles N.N.E. of Cologne; it has wire-works, rolling-mills, chain-works, manufactories of needles, pins, thimbles, &c. Pop. 14,579.

Al'tenburg, a town of Germany, capital of Saxe-Altenburg, 23 miles south of Leipzig. It has some fine streets and many handsome buildings, including a splendid palace; it manufactures cigars, woollen yarn, gloves, hats, musical instruments, glass, brushes, &c. Pop. 39,976.

Alteratives (a'l-), medicines, as mercury, iodine, &c., which, administered in small doses, gradually induce a change in the habit or constitution, and imperceptibly alter disordered secretions and actions, and restore healthy functions without producing any sensible evacuation by perspiration, purging, or vomiting.

Alter ego (Lat., 'another I'), a second self, one who represents another in every respect. This term was formerly given, in the official style of the Kingdom of the Two Sicilies, to a substitute appointed by the king to manage the affairs of the kingdom, with full royal power.

Alter'nate, in botany, placed on opposite sides of an axis at a different level, as leaves.—*Alternate generation*, the reproduction of young not resembling their parents, but their grandparents, continuously, as in the jelly-fishes, &c. See *Generations*, *Alternation of*.



Alternate leaves

Alternator. See *Electricity*.

Althæ'a, a genus of plants. See *Hollyhock* and *Marsh-mallow*.

Althorn, one of the instruments of the sax-horn family, the tenor sax-horn. See *Sax-horn*.

Al'tiscope, an instrument consisting of an arrangement of mirrors in a vertical framework, by means of which a person is enabled to overlook an object (a parapet, for instance) intervening between himself and any view that he desires to see, the picture of the latter being reflected from a higher to a lower mirror, where it is seen by the observer.

Al'titude, in mathematics, the perpendicular height of the vertex or apex of a plane figure or solid above the base. In astronomy it is the vertical height of any point or body above the horizon. It is measured or estimated by the angle subtended between the object and the plane of the horizon, and may be either *true* or *apparent*. The *apparent* altitude is that which is obtained immediately from observation; the *true* altitude, that which results from correcting the apparent altitude, by making allowance for parallax, refraction, &c. Altitude is one of the main determining influences of local

climate. Its increase has the same effect on temperature as an increase of distance north or south of the equator.

Altitude-and-azimuth Instrument. See *Altazimuth*.

Alto, in music, the highest singing voice of a male adult, the lowest of a boy or a woman, being in the latter the same as *contralto*. The alto, or *counter-tenor*, is not a natural voice, but a development of the *falsetto*. It is almost entirely confined to English singers, and the only music written for it is by English composers. It is especially used in cathedral compositions and glees.

Altofts, a town of England, West Riding of Yorkshire, on the south of the Calder, 3 miles north-east of Wakefield, with a fourteenth-century Gothic church, and extensive collieries adjoining. Pop. (1921), 5050 (urban district).

Al'ton, a town of England, in Hampshire, 16 miles north-east of Winchester, famous for its ale. Pop. (1921), 5580.

Al'ton, a town of the United States, in Illinois, on the Mississippi near the mouth of the Missouri, with a state penitentiary, several mills and manufactories, and in the neighbourhood limestone and coal. Pop. 23,783.

Al'tona, an important commercial city of Schleswig-Holstein, on the right bank of the Elbe, adjoining Hamburg, with which it virtually forms one city. It is a free port, and its commerce, both inland and foreign, is large, being quite identified with that of Hamburg. Pop. (1919), 168,729.

Altoo'na, a town of the United States, in Pennsylvania, at the eastern base of the Alleghanies, 244 miles west of Philadelphia, with large machine-shops and locomotive factories. Pop. (1920), 60,331.

Al'torf, a small town of Switzerland, capital of the canton of Uri beautifully situated, near the Lake of Lucerne, amid gardens and orchards, and memorable as the place where, according to legend, Tell shot the apple from his son's head. A colossal statue of Tell now stands here. The town possesses a beautiful church containing a remarkable organ and a picture by Van Dyck. Pop. 3837.

Alto-rilievo (a · l'tō-rē-lē-ā"vo), high relief, a term applied in regard to sculptured figures to express that they stand out boldly from the background, projecting more than half their thickness, without being entirely detached. In mezzo-rilievo, or middle relief, the projection is one-half, and in basso-rilievo, or bas-relief, less than one-half. Alto-rilievo is further distinguished from mezzo-rilievo by some portion of the figures standing usually quite free from the surface on which they are carved, while in the latter the figures, though rounded, are not detached in any part.



Alto-rilievo.—Soldiers of the Prætorian Guard, the personal body-guard of the Emperor Augustus (in the Louvre, Paris).

Altötting (a · lt-eut'ing), a famous place of pilgrimage, in Bavaria, 52 miles E.N.E. of Munich, near the Inn, with an ancient image of the Madonna (the Black Virgin) in a chapel dating from 696, and containing a rich treasure in gold and precious stones; and another chapel in which Tilly was buried. Pop. 5408.

Altranstädt (a · lt'-ra · n-stet), a village of Saxony, where a treaty was concluded between Charles XII, King of Sweden, and Augustus, Elector of Saxony and King of Poland, 24th Sept., 1706, by which the latter resigned the crown of Poland.

Alt'ringham, or **Altrincham**, a town of England, in Cheshire, 8 miles south-west of Manchester, resorted to by invalids; large quantities of fruit and vegetables are raised; and there are several industrial works. Pop. 20,461. Also a parliamentary division of the county.

Al'truism, a term first employed by the French philosopher Comte, to signify devotion to others or to humanity: the opposite of *selfishness* or *egoism*. It was adopted by the English positivists and applied to sociological problems of the physical theory of organic evolution. Herbert Spencer gives considerable space to the discussion of altruism and egoism in his *Data of Ethics*.

Altstätten (a · lt'stet-n), a town of Switzerland, canton St. Gall, in the valley of the Rhine, 10 miles south of the Lake of Constance, with manufactures of cotton and woollen goods. Pop. 8743.

Altwasser (a'lt'va's-ër), a town of Prussia, in Silesia, 35 miles south-west of Breslau; here are made porcelain, machinery, iron, yarn, mirrors, &c. Pop. 17,321.

Al'um, a well-known crystalline, astringent substance with a sweetish taste, a double sulphate of potassium and aluminium with water of crystallization; formula, $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24 H_2O$. It crystallizes in colourless regular octahedra. Its solution reddens vegetable blues. When heated, its water of crystallization is driven off, and it becomes light and spongy with slightly corrosive properties, and is used as a caustic under the name of *burnt alum*. Alum is prepared in Great Britain at Whitby from alum-slate—where it forms the cliffs for miles—and was once manufactured near Glasgow from bituminous alum-shale and slate-clay, obtained from old coal-pits. It is also prepared near Rome from alum-stone. Common alum is strictly *potash alum*; other two varieties are *soda alum* and *ammonia alum*, both similar in properties. *Iron alum* (pale mauve) and *chrome alum* (deep purple) are compounds containing iron and chromium in place of aluminium. Alum is employed to harden tallow, to remove grease from printers' cushions and blocks in calico manufactories, and in dyeing as a mordant. It is also largely used in the composition of crayons, in tannery, and in medicine (as an astringent and styptic). Wood and paper are dipped in a solution of alum to render them less combustible.

Alumbagh (a-lam-bäg'), a palace and connected buildings in Hindustan, about 4 miles south of Lucknow. On the outbreak of the Indian Mutiny it was occupied by the revolted sepoys, and converted into a fort. On the 23rd Sept., 1857, it was captured by the British, and during the following winter a British garrison, under Sir James Outram, held out there, though repeatedly attacked by overwhelming numbers of the rebels, till in March, 1858, it was finally relieved. Sir Henry Havelock was buried within the grounds.

Alu'mina (Al_2O_3), the single oxide of the metal aluminium. As found native it is called corundum, when crystallized ruby or sapphire, when amorphous emery. It is next to the diamond in hardness. In combination with silica it is one of the most widely distributed of substances, as it enters in large quantity into the composition of granite, traps, slates, schists, clays, loams, and other rocks. The porcelain clays and kaolins contain about half

their weight of this earth, to which they owe their most valuable properties. It forms compounds with certain colouring matters, which causes it to be employed in the preparation of the colours called *lakes* in dyeing and calico-printing. It combines with the acids and forms numerous salts, the most important of which are the sulphate (see *Alum*) and acetate, the latter of extensive use as a mordant.

Alumin'ium (symbol Al, atomic weight 27.1), a metal discovered in 1827, but nowhere found native, although its oxide, alumina (which see), is abundantly distributed. The minerals *bauxite* and *cryolite* are sources of aluminium, but the chief source is the pure oxide, from which the metal is obtained by means of a strong electric current. It is a shining white metal, of a colour between that of silver and platinum, very light (specific gravity, 2.56 cast, 2.67 hammered), not liable to tarnish nor undergo oxidation in the air, very ductile and malleable, and remarkably sonorous. It forms several useful alloys with iron and copper; one of the latter (*aluminium gold*) much resembles gold, and is made into cheap trinkets. Another, known as *aluminium bronze*, possesses great hardness and tenacity. Spoons, tea and coffee pots, dish-covers, musical and mathematical instruments, trinkets, &c., are made of aluminium.

Alum-root, the name given in America to two plants from the remarkable astringency of their roots, which are used for medical purposes: *Geranium maculatum* and *Heuchera americana* (nat. ord. Saxifragaceæ).

Alum-slate, or **Alum-schist**, a slaty rock from which much alum is prepared; colour greyish, bluish, or iron-black; often possessed of a glossy or shining lustre; chiefly composed of clay (silicate of alumina), with variable proportions of sulphide of iron (iron-pyrites), lime, bitumen, and magnesia.

Alum-stone. See *Alunite*.

Alunite, a mineral sulphate of aluminium and potassium, greyish or yellowish white, from which alum is prepared in Sicily by roasting and lixiviation. It is regarded as a possible source of potassium for agriculture and also of aluminium. A considerable vein occurs in Utah.

Alun'no, Niccolo (real name **Niccolo de Liberatore**), an Italian painter of the fifteenth century, the founder of the Umbrian School, born in Foligno about 1430, died 1502. Vasari, interpreting wrongly the passage "Nicholaus alumnus Fulginiae", gave him the name of Alunno.

Al'va, a town of Scotland, in Clackmannanshire, 2½ miles north of Alloa, near the River Devon, at the foot of the Ochils. It manufactures woollen shawls, tweeds, yarn, &c. Pop. (1921), 4107.

Al'va, or **Al'ba**, Ferdinand Alvarez, Duke of, Spanish statesman and general under Charles V and Philip II, was born in 1508; early embraced a military career, and fought in the wars of Charles V in France, Italy, Africa, Hungary, and Germany. He is more especially remembered for his bloody and tyrannical government of the Netherlands (1567-73), which had revolted, and which he was commissioned by Philip II to reduce to entire subjection to Spain. Among his first proceedings was to establish the 'Council of Blood', a tribunal which condemned, without discrimination, all whose opinions were suspected, and whose riches were coveted. The present and absent, the living and the dead, were subjected to trial and their property confiscated. Many merchants and mechanics emigrated to England; people by hundreds of thousands abandoned their country. The Counts of Egmont and Horn, and other men of rank, were executed, and William and Louis of Orange had to save themselves in Germany. The most oppressive taxes were imposed, and trade was brought completely to a standstill. As a reward for his services to the faith the Pope presented him with a consecrated hat and sword, a distinction previously conferred only on princes. Resistance was only quelled for a time, and soon the provinces of Holland and Zealand revolted against his tyranny. A fleet which was fitted out at his command was annihilated, and he was everywhere met with insuperable courage. Hopeless of finally subduing the country he asked to be recalled, and accordingly, in Dec., 1573, Alva left the country, in which, as he himself boasted, he had executed 18,000 men. He was received with distinction in Madrid, but did not long enjoy his former credit. He had the honour, however, before his death (which took place in 1582) of reducing all Portugal to subjection to his sovereign. It is said of him that during sixty years of warfare he never lost a battle and was never taken by surprise.

Alvarado (a'l-va'-ră'dō), Pedro de, one of the Spanish 'conquistadores', was born towards the end of the fifteenth century, and died in 1541. Having crossed the Atlantic, he was associated (1519) with Cortez in his expedition to conquer Mexico; and was entrusted with important operations. In July, 1520, during the disastrous retreat from the capital after the death of Montezuma, the perilous command of the rear-guard was assigned to Alvarado. On his return to Spain he was received with honour by Charles V, who made him governor of Guatemala, which he had himself conquered. To this was subsequently added Honduras. He continued to add to the Spanish dominions in America till his death.

Alvarez (a'l-va'-reth'), Don José, a Spanish sculptor, born 1768, died 1827. His works are characterized by truth to nature, dignity, and feeling, one of the chief representing a scene in the defence of Saragossa. The Museo del Prado, in Madrid, contains some of his finest work.

Alve'olus, one of the sockets in which the teeth of mammals are fixed. Hence *alveolar arches*, the parts of the jaws containing these sockets.

Alverstoke. See *Gosport*.

Alverstone, Richard Everard Webster, first Viscount, eminent English lawyer, born in 1842, died in 1915. Educated at King's College School, the Charterhouse, and Trinity College, Cambridge, he was called to the bar in 1868, and made Q.C. in 1878. He was Member of Parliament for Launceston for a short time in 1885, and from that year to 1900 represented the Isle of Wight. He was Attorney-General from 1885-6, 1886-92, and 1895-1900, being then made Lord Chief Justice and elevated to the peerage: he had been created a baronet in 1899. He represented Britain in the arbitration with the United States regarding the Behring Sea (1893), in the affair of the Venezuelan and Guiana boundary (1898-9), and was one of three British commissioners who, with three from the United States, settled the Canada and Alaska boundary in 1903. Upon retiring in 1913 he was created viscount. His book *Recollections of Bar and Bench* was published in 1914.

Alwar (al-war'), a State of north-western Hindustan, in Rajputana; area, 3141 sq. miles; surface generally elevated and rugged, and much of it of an arid description, though water is generally found on the plains by digging a

little beneath the surface, and the means of irrigation being thus provided, the soil, though sandy, is highly productive. This semi-independent State has as its ruler a rajah with a revenue of £232,000; military force, about 5000 infantry and 2000 cavalry. Pop. 791,688.—*Alwar*, the capital, is situated at the base of a rocky hill crowned by a fort, 80 miles s.s.w. of Delhi. It is surrounded by a moat and rampart, and is poorly built, but has fine surroundings; it contains the rajah's palace and a few other good buildings. Pop. 41,305.

Alys'sum (*A. saxatile*, L.), a native of Crete, a genus of cruciferous plants, several species of which are cultivated on account of their white or yellow coloured flowers; madwort.

Alyth (ā'lith), a town of Scotland, Perthshire, near the eastern boundary, with linen and jute manufactures. Pop. (1921), 1710.

Amad'avat (*Estrilda amandāva*), a small Indian singing bird allied to the finches and buntings; the female is olive-brown, and the male, in summer, largely crimson.

Amade'us, the name of several counts of Savoy. The first was the son of Humbert I, and succeeded him in 1048, dying about 1078; others who have occupied an important place in history are the following:—**Amadeus V**, 'the Great', succeeded in 1285; gained great honour in defending Rhodes against the Turks; increased his possessions by marriage and war; was made a prince of the empire; died in 1323.—**Amadeus VIII** succeeded his father, Amadeus VII, in 1391, and had his title raised to that of duke by the Emperor Sigismund. He was chosen regent of Piedmont; but after this elevation retired from his throne and family into a religious house. He now aspired to the papacy, and was chosen by the Council of Basel (1439), becoming Pope, or rather anti-Pope, under the name of Felix V, though he had never taken holy orders. He was recognized as Pope by only a few princes, and resigned in 1449, being the last of the anti-Popes. He died in 1451.

Amade'us, Duke of Aosta, for a short time King of Spain, second son of Victor Emanuel of Italy, and brother of Humbert I, King of Italy. He was born in 1845, and, thanks to the influence of Marshals Prim and Serrano, was chosen by the Cortes King of Spain in 1870, Queen Isabella having had

to leave the country in 1868. He made his entrance into Madrid as king on 2nd Jan., 1871, and took the oath to the constitution. His position was far from comfortable, however, and, having little hope of becoming acceptable to all parties, he abdicated in 1873 (11th Feb.). He died in 1890.

Amade'us, Lake, a large salt lake or salt swamp in South Australia, and nearly in the centre of Australia. It was discovered by Giles in 1872, and is seldom visited, being in a dreary, arid region.

Am'adis, a name belonging to a number of heroes in the romances of chivalry, Amadis de Gaul being the greatest among them, and represented as the progenitor of the whole. The Spanish series of Amadis romances is the oldest. It is comprised in fourteen books, of which the first four narrate the adventures of Amadis de Gaul, this portion of the series having originated about the end of the thirteenth or beginning of the fourteenth century, and the subsequent books being added by various hands. An abridged English translation of *Amadis of Gaul* was published by Southey in 1803.

Amadou (am'a-dö), a name of several fungi, genus *Polyporus*, of a leathery appearance, growing on trees. See *German Tinder*.

Amager (a ' m'a-ger), a small Danish island in the Sound, opposite Copenhagen, part of which is situated on it. Rural pop. 25,000.

Amako'sa, one of the Kaffir tribes of S. Africa.

Amalasun'tha, daughter of Theodoric, king of the Ostrogoths, and after his death regent of Italy for her son Athalarich. Athalarich died in 534, after which Amalasuntha married her cousin Theodahad, but retained the power in her own hands. Mainly on this account she was imprisoned and strangled in her bath by order of her second husband, A.D. 535.

Amal'ekites, an ancient tribe occupying the peninsula between Egypt and Palestine, named after a grandson of Esau. They were denounced by Moses for their hostility to the Israelites during their journey through the wilderness, and they seem to have been all but exterminated by Saul and David. The Kenites seem to have been a branch of the Amalekites.

Amal'fi, a seaport in Southern Italy, on the Gulf of Salerno, 23 miles from Naples, the seat of an archbishop. In the early part of the Middle Ages it was a place of great commercial importance, and it long enjoyed a republican constitution of its own. Quarrels with its neighbours, encroachments of the sea, and other causes led to its downfall, but it is still much visited by tourists. The road from Salerno to Amalfi is a magnificent carriage-way, partly hewn in the cliffs, and affords charming views. Amalfi is surrounded by rocky heights, and its harbour was choked up by a landslip in 1900. Here arose the *Amalfian Code* of maritime law, composed in 1010 and containing 66 articles, which once had great influence in the maritime affairs of the Mediterranean trading peoples. The MS. was discovered by the Prince of Andorra, in 1844, in the imperial library at Vienna. Pop. 7472.

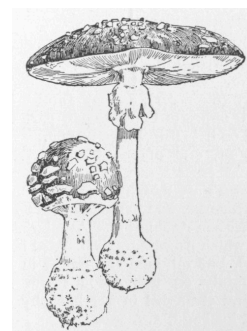
Amal'gam, a name applied to the alloys of mercury with the other metals. One of them is the amalgam of mercury with tin, which is used to silver looking-glasses. Mercury unites very readily with gold and silver at ordinary temperatures, and advantage is taken of this to separate them from their ores, the process being called *amalgamation*. The mercury dissolves and combines with the precious metal and separates it from the waste matters, and is itself easily driven off by heat. An amalgam made of cadmium and copper is frequently used in dentistry, and an amalgam of zinc and tin is used for the rubbers of frictional electric machines.

Amani'ta, a genus of fungi, one species of which, *A. muscāria*, or fly-agaric, is extremely poisonous.

Ama'nus, a branch of the Taurus Mountains in Asia Minor.

Amapala (a'-ma'-pä'la'), a seaport of Central America, State of Honduras, on a small island.

Amarantha'ceæ, the amaranths, a nat. ord. of apetalous plants, chiefly found in tropical countries, where they are often troublesome weeds. They are remarkable for the white or sometimes reddish scales of which their flowers are composed. *Amaranthus*, the typical genus, comprises *A. caudātus*, or love-lies-bleeding, a common plant in gardens, with pendulous racemes of crimson flowers; and *A. hypochondriacus*, or prince's feather. The blossoms keep their bloom after being plucked and dried (hence the name: Gr. *a*, not, and *marainō*, to wither).



Amanita.—Two forms of fly-agaric

Amarapura (a-ma-ra-pö'ra), a deserted city, once the capital of the Burmese Empire, on the left bank of the Irawadi, quite close to Mandalay. In 1810, when the city had about 175,000 inhabitants, it was completely destroyed by fire; in 1839 it was visited by a destructive earthquake. In 1857 the seat of government was removed to Mandalay. Pop. 6500.

Amaryllida'ceæ, an order of monocotyledonous plants, generally bulbous, occasionally with a tall, cylindrical, woody stem (as in *Agave*); with a highly-coloured flower, six stamens, and an inferior three-celled ovary; natives of Europe and most of the warmer parts of the world. The order includes the snowdrop, the snow-flake, the daffodil, the belladonna-lily (belonging to the typical genus *Amaryllis*), the so-called Guernsey-lily (probably a native of Japan), the *Brunsvigias*, the blood-flowers (*Hæmanthus*) of the Cape of Good Hope, different species of *Narcissus*, *Agave* (American aloe), &c. Many are highly prized in gardens and hot-houses; the bulbs of some are extremely poisonous.

Amasia (a'-ma'-sē'a'), a town in the north of Asia Minor, on the Irmak, 60 miles from the Black Sea, surmounted by a rocky height in which is a ruined fortress; has numerous mosques, richly-endowed Mahommedan

schools, and a trade in wine, silk, &c. Amasia was a residence of the ancient kings of Pontus. A few miles from Amasia, on the road leading to Zilleh, is the famous battle-field where Cæsar defeated Pharnaces, King of Pontus, and whence he sent his famous message to Rome: *Veni, vidi, vici*. Pop. 30,000.

Ama'sis, King of Egypt from 569 to 526 B.C., obtained the throne by rebelling against his predecessor and benefactor Apries, and is chiefly known from his friendship for the Greeks, and his wise government of the kingdom, which, under him, was in the most prosperous condition. He was succeeded by his son Psammetik.

Amati (a · -mä'tē), a family, almost a dynasty, of Cremona who manufactured violins in the sixteenth and seventeenth centuries. Andrea (about 1540-1600) was the founder of the business, which was carried on by his sons Geronimo and Antonio, and by Niccolo the son of Geronimo. The first instrument signed Amati bears the date 1546. Most of the violins made by them are of comparatively small size and flat model, and the tone produced by the fourth or G string is somewhat thin and sharp. Many of Niccolo Amati's violins are, however, of a larger size and have all the fulness and intensity of tone characteristic of those manufactured by Stradivario and Guarnerio.

Amatit'lan, a town in Central America, State of Guatemala, about 15 miles south of the city of Guatemala, a busy modern town, the inhabitants of which are actively engaged in the cochineal trade. There is a small lake of the same name close to the town. Pop. 12,000.

Amauro'sis (Gr. *amauros*, dark), a species of blindness, formerly called *gutta serena* (the 'drop serene', as Milton, whose blindness was of this sort, called it), caused by disease of the nerves of vision. The most frequent causes are a long-continued direction of the eye on minute objects, long exposure to a bright light, to the fire of a forge, to snow, or irritating gases, overfulness of blood, disease of the brain, &c. If taken in time it may be cured or mitigated; but, unless caused by loss of blood, by lead-poisoning, or debility, it is usually incurable.

Amaxichi (a · -ma · ks'ē-hē), the chief town and seaport of Santa Maura (Leukadia), one of the Ionian Isles, the seat of a Greek bishop;

manufactures cotton and leather. Pop. 5500.

Am'azon, or **Am'azons**, a river of South America, the largest in the world, formed by a great number of sources which rise in the Andes, the two head branches being the Tunguragua or Marañon and the Ucayali, both rising in Peru, the former from Lake Lauricocha, in lat. $10^{\circ} 29' \text{ s.}$, the latter formed by the Apurimac and Urubamba, the headwaters of which are between lat. 14° and 16° s. ; general course north of east; length, including windings, between 3000 and 4000 miles; area of drainage basin, 2,500,000 sq. miles. It enters the Atlantic under the equator by a mouth 200 miles wide, divided into two principal and several smaller arms by the large island Marajo and a number of smaller islands. In its upper course navigation is interrupted by rapids, but from its mouth upwards for a distance of 3300 miles (mostly in Brazil) there is no obstruction. It receives the waters of about 200 tributaries, 100 of which are navigable and seventeen of these 1000 to 2300 miles in length; northern tributaries: Santiago, Morona, Pastaça, Tigre, Napo, Putumayo, Japura, Rio Negro (the Cassiquiare connects this stream with the Orinoco), &c.; southern: Huallaga, Ucayali, Javari, Jutay, Jurua, Coary, Purus, Madeira, Tapajos, Xingu, &c. At Tabatinga, where it enters Brazilian territory, the breadth is $1\frac{1}{2}$ miles; below the mouth of the Madeira it is 3 miles wide, and where there are islands often as much as 7; from the sea to the Rio Negro, 750 miles in a straight line, the depth is nowhere less than 30 fathoms; up to the junction of the Ucayale there is depth sufficient for the largest vessels. The Amazonian water system affords some 50,000 miles of river suitable for navigation. The rapidity of the river is considerable, especially during the rainy season (Jan. to June), when it is subject to floods; but there is no great fall in its course. The tides reach up as far as 400 miles from its mouth. The singular phenomenon of the *bore*, or as it is called on the Amazon the *pororoca*, occurs at the mouth of the river at spring-tides on a grand scale. The river swarms with alligators, turtles, and a great variety of fish. The country through which it flows is extremely fertile, and is mostly covered with immense forests; it must at some future time support a numerous population, and be the theatre of a busy commerce. Steamers and other craft ply on the river, the chief centre of trade being Para, at its mouth. The Amazon was discovered by Vicente Yañez Pinzon in 1500, but the stream was not navigated by any European till 1541, when Francis Orellana descended it. Orellana stated that he found

on its banks a nation of armed women, and this circumstance gave the name to the river.

Amaz'onas, the largest state of Brazil, traversed by the Amazon and its tributaries; area, 731,000 sq. miles. Pop. 459,309.

Am'azons, according to an ancient Greek tradition, the name of a community of women, who permitted no men to reside among them, fought under the conduct of a queen, and long constituted a formidable State. They were said to burn off the right breast that it might not impede them in the use of the bow—a legend that arose from the Greeks supposing the name was from *a*, not, *mazos*, breast. It is probably from *a*, together, and *mazos*, breast, the name meaning therefore sisters. Several nations of Amazons are mentioned, the most famous being those who dwelt in Pontus, who built Ephesus and other cities. Their queen, Hippolyta, was vanquished by Hercules, who took from her the girdle of Mars. They attacked Attica in the time of Theseus. They came to the assistance of Troy under their queen, Penthesilēa, who was slain by Achilles.

Amazu'lu, a branch of the Zulu Kaffir race. See *Zulus*.

Amba'la, or **Umball'a**, a town of India, in the Punjab, in an open plain 3 miles from the Ghaggar, consisting of an old and a new portion, with a flourishing trade in grain and other commodities. The military cantonment is several miles distant. Total pop. 80,131.

Ambale'ma, a town of S. America, Colombia, on the Magdalena; the centre of an important tobacco district. Pop. 6285.

Am'baree, a fibre similar to jute largely used in India, obtained from *Hibiscus cannabīnus*.

Ambarvalia, an ancient Roman festival held annually in May, and celebrated by the Arval Brothers (Fratres Arvales). Its object was to preserve the growing crops from harm of any kind.

Ambas'sador, a minister of the highest rank, employed by one prince or State at the Court of another to manage the public concerns, or support the interests of his own prince or State, and representing the power and dignity of his sovereign or State. Ambassadors are *ordinary* when they reside

permanently at a foreign Court, or *extraordinary* when they are sent on a special occasion. When *ambassadors extraordinary* have full powers, as of concluding peace, making treaties, and the like, they are called *plenipotentiaries*. Ambassadors are often called simply *ministers*. *Envoys* are ministers employed on special occasions, and are of less dignity than ambassadors. The term *ambassador*, however, is also used in a more general sense for any diplomatic agent or minister. An ambassador and his suite are not amenable to the laws of the country in which they are residing. See *Diplomacy*.

Am'batch (*Herminiëra elaphroxylon*), a thorny leguminous shrub with yellow flowers growing in the shallows of the Upper Nile and other rivers of tropical Africa, 15 to 20 feet high. Its wood is extremely light and spongy, and hence is made into floats or rafts. A raft capable of bearing eight persons can easily be carried by one.

Amba'to, a town of Ecuador, on the side of Chimborazo, 70 miles south of Quito. Pop. 12,000.

Am'ber, a semi-mineral substance of resinous composition, a sort of fossil resin, the produce of extinct Coniferæ, used for the manufacture of ornamental objects. It is usually of yellow or reddish-brown colour; brittle; yields easily to the knife; is translucent, and possessed of a resinous lustre. Specific gravity, 1.065. It burns with a yellow flame, emitting a pungent aromatic smoke, and leaving a light carbonaceous residue, which is employed as the basis of the finest black varnishes. By friction it becomes strongly electric. It is found in masses from the size of coarse sand to that of a man's head, and occurs in beds of bituminous wood situated upon the shores of the Baltic and Adriatic Seas; also in Poland, France, Italy, and Denmark. It is often washed up on the Prussian shores of the Baltic, and is also obtained by fishing for it with nets. Sometimes it is found on the east coast of Britain, in gravel pits round London, also in the United States.

Am'berg, a town of South Germany, in Bavaria, on the Vils, well built, with a Gothic church of the fifteenth century, royal palace, town house, &c.; it manufactures iron-wares, stone-ware, tobacco, beer, vinegar, and arms. Pop. 25,242.

Am'bergris, a substance derived from the intestines of the sperm-whale, and found floating or on the shore; yellowish or blackish white; very light; melts at 140°, and is entirely dissipated on red-hot coals; is soluble in ether, volatile oils, and partially in alcohol, and is chiefly composed of a peculiar fatty, substance. Its odour is very agreeable, and hence it is used as a perfume.

Amble, a town (urban district) of England, Northumberland, near the mouth of the River Coquet, with a harbour at which coal is exported, fishing also being carried on. Pop. 4851.

Ambleside, an old market-town of England, Westmorland, near the head of Windermere, a great tourist centre. Pop. (1921), 2878.

Ambleteuse (a · n · -bl-teuz), a small seaport of France, 6 miles from Boulogne. After the capture of Boulogne in 1544 the English began to construct a military harbour here under the name of New Haven, but had to abandon the enterprise in 1554. Here James II landed on Christmas Day, 1688, after his flight from England; and from its harbour Napoleon I prepared to dispatch a flotilla of flat-bottomed boats for the invasion of Britain.

Amblyop'sis, a genus of blind fishes, containing only one species, *A. spelæus*, found in the Mammoth Cave of Kentucky.

Am'blyopy, dullness or obscurity of eyesight without any apparent defect in the organs; the first stage of amaurosis.

Am'bo, or **Am'bon**, in early Christian churches a kind of raised desk or pulpit, sometimes richly ornamented, from which certain parts of the service were read, or discourses delivered, there being sometimes two in one church. Some of the most ancient of these pulpits (fourth century) are at Salonica and at Ravenna (fifth and sixth centuries). The ambo constructed by Justinian in the Church of St. Sophia was destroyed by an earthquake.

Amboina. See *Amboyna*.

Amboise (a · n · -bwäz), a town of France, department Indre-et-Loire, 12 miles east of Tours, on the Loire, with an antique castle, the residence of several French kings, and manufactures of files and rasps. Near the Château

d'Amboise is that of Cloux, which was given by Francis I to Leonardo da Vinci, and where the artist died in 1519. Pop. 4660.

Amboy'na, Amboina, or Apon, one of the Molucca Islands in the Indian Archipelago, close to the large island of Ceram; area, about 360 sq. miles. Here is the seat of government of the Dutch residency or province of Amboyna, which includes also Ceram, Buru, &c. Its surface is generally hilly or mountainous, its general aspect beautiful, and its climate on the whole salubrious, but frequently visited by earthquakes. It affords a variety of useful trees, including the coco-nut and sago palms. Cloves and nutmegs are the staple productions. The soil in the valleys and along the shores is very fertile, but a large portion remains uncultivated. The natives are mostly of Malayan race. The capital, also called *Amboyna*, is situated on the Bay of Amboyna, and is well built and defended by a citadel. The streets are planted on each side with rows of fruit-trees. It is a free port. Pop. 10,000. In 1607 Amboyna and the other Moluccas were taken by the Dutch from the Portuguese, and it was for some years the seat of government of the Dutch East Indies. Trade with the Moluccas was secured to the British by treaty in 1619, but the British establishment was destroyed and several persons massacred in 1623, an outrage for which no satisfaction was obtained till Cromwell obtained it in 1654. Amboyna was taken by the British in 1796 and 1810, but each time restored to the Dutch. Pop. about 40,000. The Dutch residency of Amboyna, including the Banda group, Ceram, Buru, and other islands, has an area of 19,870 sq. miles and a population of about 300,000.

Amboyna Wood, a beautiful curled orange or brownish coloured wood brought from the Moluccas, yielded by *Pterospermum indicum*.

Ambra'cia. See *Arta*.

Ambrine, a preparation of paraffin, resin, and wax, used as a remedy in the treatment of burns and scalds and in rheumatic disorders. It was discovered by Barthe de Sandford, a French doctor, in 1904.

Am'brose, Saint, a celebrated father of the Church; born in A.D. 333 or 334, probably at Trèves, where his father was prefect; died in 397. He was educated at Rome, studied law, practised as a pleader at Milan, and in 369 was appointed governor of Liguria and Æmilia (North Italy). His kindness

and wisdom gained him the esteem and love of the people, and in 374 he was unanimously called to the bishopric of Milan, though not yet baptized. For a time he refused to accept this dignity, but he had to give way, and at once ranged himself against the Arians. In his struggles against the Arian heresy he was opposed by Justina, mother of Valentinian II, and for a time by the young emperor himself, together with the courtiers and the Gothic troops. Backed by the people of Milan, however, he felt strong enough to deny the Arians the use of a single church in the city, although Justina, in her son's name, demanded that two should be given up. He had also to carry on a war with paganism, Symmachus, the prefect of the city, an eloquent orator, having endeavoured to restore the worship of heathen deities. In 390, on account of the ruthless massacres at Thessalonica ordered by the emperor Theodosius, he refused him entrance into the church of Milan for eight months. The later years of his life were devoted to the more immediate care of his see. His writings, which are numerous, show that his theological knowledge extended little beyond an acquaintance with the works of the Greek fathers. He wrote Latin hymns, but the *Te Deum Laudamus*, which has been ascribed to him, was written a century later. He introduced the *Ambrosian Chant*, a mode of singing more monotonous than the Gregorian, which superseded it. He also compiled a form of ritual known by his name. The best edition of his works is that published in Paris, 1686-90, in 2 vols. fol., and reissued at Lyons in 1853.

Ambro'sia, in Greek mythology the food of the gods, as nectar was their drink.

Ambrosian Chant. See *Ambrose*.

Ambrosian Library, a public library in Milan founded by the cardinal archbishop Federigo Borromeo, a relation of St. Charles Borromeo, who sent scholars, among them Antonio Olgiati, all over Europe to acquire books. The library was opened in 1609, now containing 230,000 printed books and many MSS., among the latter being the famous collection of Pinelli. It was named in honour of St. Ambrose, the patron saint of Milan.

Am'bry, a niche or recess in the wall of ancient churches near the altar, fitted with a door and used for keeping the sacred utensils, &c.

Ambula'cral System, the locomotive apparatus of the Echinodermata (sea-urchins, star-fishes, &c.), the most important feature of which is the protrusible tube-feet that the animal can at will dilate with water and thus move forward.

Am'bulance (Field), a military medical unit attached to an army in the field for the purpose of providing medical and surgical first-aid to sick and wounded immediately behind the fighting-line. The term field-ambulance was adopted in the British service in 1905-6. The chief and most important duty of a field-ambulance is to relieve fighting troops of their sick and wounded and transfer them to the rear to the collecting-hospitals, known as Casualty Clearing Stations, situated at the head of the line of communications to the army's base. Three field-ambulances are attached to each division in the field, one to each brigade, and their officers and men are divided into bearer and nursing sections and equipped with horse or mule and motor transport for wounded and sick. In the East sick and wounded are often carried in litters on camel-back, two of the cacolets being balanced against each other. A medical ambulance is theoretically able to undertake any hospital work, but in practice it confines itself when in action with its division to clearing the front line, and when at rest to treating the minor maladies such as lice, scabies, and slight illnesses which do not require much time or equipment. The medical and surgical outfit of an ambulance is carried in panniers and is usually in excess of its requirements. The word ambulance is often used to designate the motors or other vehicles employed by military or civil authorities in carrying the sick and wounded.—BIBLIOGRAPHY: M. M. Bird, *The Errand of Mercy: a History of Ambulance Work upon the Battle-field*; G. H. Painton, *The Field Ambulance Guide*.

Amelan'chier (-kē-ēr), a genus of small trees natives of Europe and N. America, allied to the medlar. *A. vulgāris*, long cultivated in English gardens, has showy white flowers; *A. Botryāpium* (grape-pear) and *A. ovālis*, American species, yield pleasant fruits.

Ameland (ä'me-la'nt), an island off the north coast of Holland, 13 miles long and 3 broad; flat; inhabitants (about 2000 in number) chiefly engaged in fishing and agriculture.

Amélie-les-Bains (a ´ -mā-lē-lā-ban ´), a village of France, department Pyrénées-Orientales, frequented as a winter residence for invalids, and for its warm sulphureous springs. The place was known to the Romans, as it has been proved by the discovery of Roman medals there.

Amen (ā-men'), a Hebrew word, signifying 'verily', 'truly', transferred from the religious language of the Jews to that of the Christians, and used at the end of prayers as equivalent to 'so be it', 'may this be granted'.

Amend'ment, a proposal brought forward in a meeting of some public or other body, either in order to get an alteration introduced into some proposal already before the meeting, or entirely to overturn such proposal. In Parliament an amendment denotes an alteration made in the original draft of a Bill whilst it is passing through the houses. Amendments may be made so as totally to alter the nature of the proposition; and this is a way of getting rid of a proposition, by making it bear a sense different from what was intended by the movers, who are thus compelled to abandon it.

Ameno'phis (or **Amenhotep**) **III**, a king of ancient Egypt about 1500 B.C.; warred successfully against Syrians and Ethiopians; built magnificent temples and palaces at Thebes, where the so-called Memnon statue is a statue of this king. He was the only Egyptian king deified during his lifetime.

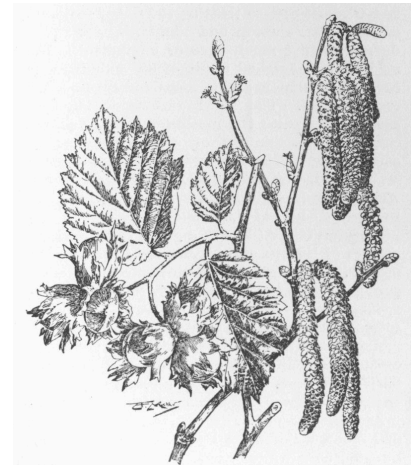
Amenorrhœ'a, absence or suspension of menstruation. The former may arise from general debility or from defective development, the latter from exposure to cold, from attacks of fever or other ailment, violent excitement, &c.

Amenta'ceæ, an order of plants having their flowers arranged in amenta or catkins; now broken up into several orders, the chief of which are Betulaceæ (the birch), Salicaceæ (the willow), Fagaceæ (the beech), Juglandaceæ (the walnut), and Myricaceæ (bog-myrtle).

Amen'tia, imbecility from birth, especially when extreme; idiocy.

Amen'tum, in botany, that kind of inflorescence which is commonly known as a catkin (as in the birch or willow), consisting of unisexual apetalous flowers in the axil of scales or bracts.

Amer'ica, or the **New World**, the largest of the great divisions of the globe except Asia, is washed on the west by the Pacific, on the east by the Atlantic, on the north by the Arctic Ocean, while on the south it tapers to a point. On the north-west it approaches within about 50 miles of Asia, while on the north-east the island of Greenland approaches within 370 miles of the European island Iceland; but in the south the distance between the American mainland and Europe or Africa is very great. Extreme points of the continent—north, Boothia Felix, at the Strait of Bellot, lat. 72° N.; south, Cape Horn, lat. 56° S.; west, Cape Prince of Wales, long. 168° W.; east, Point de Guia, long. 35° W. America as a whole forms the two triangular continents of North and South America, united by the narrow Isthmus of Panama, and having an entire length of about 10,000 miles; a maximum breadth (in North America) of 3500 miles; a coast-line of 44,000 miles; and a total area, including the islands, of over 16,000,000, of which N. America contains about 8,300,000 sq. miles. South America is more compact in form than N. America, in this respect resembling Africa, while N. America more resembles Europe. Between the two on the east side is the great basin which comprises the Gulf of Mexico, the Caribbean Sea, and the West India Islands. Like Europe also N. America possesses numerous islands, while those of S. America are less important and confined almost to the southern extremity.



Amentum
Hazel (*Corylus Avellana*)
showing Catkins and Nuts.

Three-fourths of the area of America is comparatively flat, and this portion of the surface is bounded on the west by lofty mountain systems which stretch continuously from north to south between the extremities of the continent, generally at no great distance from the west shore. In North America the Rocky Mountains, a broad series of masses partly consisting of plateaux, form the most important portion of the elevated surface, being continued southward in the mountains and tableland of Mexico and the ranges of Central America. Separated by depressions from the Rocky Mountains proper, and running close to and parallel with the western coast, are several lofty ranges (Sierra Nevada, Cascade Mountains, &c.). Near the

eastern coast, and forming an isolated mass, are the Appalachians, a system of much inferior magnitude. The loftiest mountains in N. America are M'Kinley (20,470 feet), in Alaska; Logan (19,514 feet), in N. W. Canada; and Popocatepetl (18,000 feet). The depression of the Isthmus of Panama (about 260 feet) forms a natural separation between the systems of the north and the south. In S. America the Andes form a system of greater elevation but less breadth than the Rocky Mountains, and consist of a series of ranges (*cordilleras*) closely following the line of the west coast from the Isthmus of Panama to Cape Horn. The highest summits are Aconcagua (23,080 feet), Sorata or Illampu (21,484), and Sahama (21,054). Volcanoes are numerous. Isolated mountain groups of minor importance are the highlands of Venezuela and of Brazil, the latter near the eastern coast, reaching a height of 10,000 feet.

The fertile lowlands which lie to the east of the Rocky Mountains and the Andes form a depression extending through both continents from the northern to the southern oceans. They have somewhat different features and different names in different portions; in N. America are *prairies* and *savannahs*, in S. America *llanos*, *selvas*, and *pampas*.

Through these low grounds flow the numerous great rivers which form so characteristic a feature of America. The principal are the Mackenzie, Coppermine, and Great Fish Rivers, entering the Northern Ocean; the Churchill, Nelson, Severn, and Albany, entering Hudson's Bay; the St. Lawrence, entering the Atlantic; Mississippi and Rio del Norte, entering the Gulf of Mexico (all these being in N. America); the Magdalena, Orinoco, Amazon, Paranaíba, Rio de la Plata, Colorado, and Rio Negro, entering the Atlantic (all in S. America); and the Yukon, Fraser, Colombia, San Joaquin, Sacramento, and Colorado, entering the Pacific. The rivers which flow into the Pacific, however, owing to the fact that the great backbone of the continent, the Rocky Mountains and the Andes, lies so near the west coast, are of comparatively little importance, in S. America being all quite small. Sometimes rivers traversing the same plains, and nearly on the same levels, open communications with each other, a remarkable instance being the Cassiquiare in S. America, which, branching off from the Rio Negro and joining the Orinoco, forms a kind of natural canal, uniting the basins of the Orinoco and the Amazon. The Amazon or Marañon in S. America, the largest river in the world, has a course of about 3500 miles, and a basin of

2,300,000 sq. miles; the Mississippi-Missouri, the largest river of North America, runs a longer course than the Amazon, but the area of its basin is not nearly so great. North America has the most extensive group of lakes in the world—Lakes Superior, Michigan, Huron, Erie, and Ontario, which through the St. Lawrence send their drainage to the Atlantic. Thus by means of lakes and rivers the interior of both N. and S. America is opened up and made accessible.

In regard to climate N. America naturally differs very much from S. America, and has more resemblance to the continents of Europe and Asia (regarded as a whole). In N. America, as in the older continent, the eastern parts are colder than the western, and hence the towns on the Atlantic coast have a winter temperature about 10° lower than those in corresponding latitudes of Europe. The winter temperature of the greater part of N. America is indeed severe, though the intense cold is less felt on account of the dryness of the air. There is no regular season of rainfall unless in the south. Although two-thirds of S. America lies within the tropics the heat is not so great as might be expected, owing to the prevailing winds, the influences of the Andes, and other causes. The highest temperature experienced is probably not more than 100° in the shade; at Rio de Janeiro the mean is about 74° , at Lima 72° . Over a great part of S. America there is a wet and a dry season, varying in different regions; on the upper Amazon the rains last for ten months, being caused by the prevailing easterly winds bringing moisture from the Atlantic, which is condensed on the eastern slopes of the Andes. In each of the Americas there is a region in which little or no rain falls; in N. America it extends over a part of the United States and Northern Mexico, in S. America over a part of the coast region of Peru and Chile.

America is rich in valuable minerals. It has supplied the world with immense quantities of gold and silver, which it still yields in no small amount, especially in the United States. It possesses inexhaustible stores of coal (United States), with iron, copper, lead, tin, mercury, &c. Petroleum may be called one of its specialities, its petroleum wells having caused whole towns to spring into existence. Diamonds and other precious stones are found.

As regards vegetation America may be called a region of forests and verdure, vast tracts being covered by the grassy prairies, llanos, and pampas where the forests fail. In N. America the forests have been largely made use of by man; in S. America vast areas are covered with forests, which as yet are traversed only by the uncivilized Indian. In the north is the region of pines and firs; farther south come the deciduous trees, as the oak, beech, maple, elm, chestnut, &c. Then follow the evergreen forests of the tropical regions. The useful timber trees are very numerous; among the most characteristic of America are mahogany and other ornamental woods, and various dyewoods. In the tropical parts are numerous palms, cacti in great variety, and various species of the agave or American aloe. In the virgin forests of S. America the trees are often bound together into an impenetrable mass of vegetation by various kinds of climbing and twining plants. Among useful plants belonging to the American continent are maize, the potato, cacao, tobacco, cinchona, vanilla, Paraguay tea, &c. The most important plants introduced are wheat, rice, and other grains, sugar-cane, coffee, and cotton, with various fruits and vegetables. The vine is native to the continent, and both the American and introduced varieties are now largely cultivated.

The animals of America include, among carnivora, the jaguar or American tiger, found only in S. America; the puma or American lion, found mostly in S. America; the grizzly bear of N. America, fully as powerful an animal as either; the black bear, the skunk, the racoon, the American or prairie wolf, several species of foxes, &c. The rodents are represented by the beaver, the porcupine, and squirrels of several species; the marsupials by the opossum. Among ruminants are the bison, or, as it is commonly called, the buffalo, the moose or elk, the Virginian stag, the musk-ox; and in S. America the llama (which takes the place of the camel of the Old World), the alpaca, and the vicuña. Other animals most distinctive of S. America are sloths, fitted to live only in its dense and boundless forests; ant-eaters and armadillos; monkeys with prehensile tails, in this and other respects differing from those of the Old World; the condor among the heights of the Andes, the nandu, rhea or three-toed ostrich, beautiful parrots and humming-birds. Among American reptiles are the boa-constrictor, the rattlesnake, the alligator or cayman, the iguana and other large lizards, large frogs and

toads. The domestic animals of America, horses, cattle, and sheep, are of foreign origin. The electrical eel exists in the tropical waters.

The population of America consists partly of an aboriginal race or races, partly of immigrants or their descendants. The aboriginal inhabitants are the American Indians or red men, being generally of a brownish-red colour, and now forming a very small portion of the total population, especially in N. America, where the white population has almost exterminated them. These people are divided into branches, some of which have displayed a considerable aptitude for civilization. When the Europeans became acquainted with the New World, Mexico, Central America, and part of S. America were inhabited by populations which had made great advances in many things that pertain to civilized life, dwelling in large and well-built cities under a settled form of government, and practising agriculture and the mechanical arts. Ever since the discovery of America at the close of the fifteenth century Europeans of all nations have crowded into it; and the comparatively feeble native races have rapidly diminished, or lost their distinctive features by intermixtures with whites, and also with negroes brought from Africa to work as slaves. These mixed races are distinguished by a variety of names, as Mestizos, Mulattoes, Zambos, &c. In North America the white population is mainly of British origin, though to a considerable extent it also consists of Germans, Scandinavians, &c., and the descendants of such. In Central and South America the prevailing white nationality is the Spanish and Portuguese. In the extreme north are the Eskimos—a scattered and stunted race closely allied to some of the peoples of Northern Asia. That the aboriginal inhabitants of America passed over from Asia is tolerably certain, but when and from what part we do not know. The total population of the New World is estimated at 180,000,000, of which perhaps 124,000,000 are whites, 28,000,000 mixed races, 15,000,000 negroes, and 13,000,000 Indians. As regards religion, the bulk of the population of N. America is Protestant; of Central and S. America the religion is almost exclusively Roman Catholic. Several millions of the Indians are heathens.—The independent States of America are all republican in form of government, Brazil having become a republic in 1889. See *North America*, *Central America*, *South America*, *West Indies*, &c.

The merit of first opening up the American continent to modern Europe belongs to the Genoese navigator Christopher Columbus, who discovered, in Oct., 1492, one of the Bahamas, and named it San Salvador. Europeans, however, had on different former occasions discovered the American coasts, and the coasts of Massachusetts and Rhode Island were visited by Northmen and named Vinland in the year 1000. Still these discoveries had no influence on the enterprise of Columbus, and cannot detract in the least from his merit; they were forgotten, and had never been made known to the inhabitants of the rest of Europe. Though Columbus was the first of his time who set foot in the New World, it has taken its name not from him, but from Amerigo Vespucci. The mainland was first seen in 1497 by Sebastian Cabot, who sailed under the patronage of Henry VII of England. For further particulars of discovery see *North America* and *South America*.

The known history of America hardly goes beyond the period of its discovery by Columbus; but it possesses many monuments of antiquity that might take us many centuries backward, could we learn anything of their origin or of those by whom they were produced. Among such antiquities are great earthworks in the form of mounds, or of raised enclosures, crowning the tops of hills, river peninsulas, &c., and no doubt serving for defence. They enclose considerable areas, are surrounded by an exterior ditch, and by ramparts which are composed of mingled earth and stones, and are often of great extent in proportion to the area enclosed. They are always supplied either naturally or artificially with water, and give other indications of having been provided for a siege. Barrows and tumuli containing human bones, and bearing indications of having been used both as places of sepulture and as temples, are also numerous. They are in geometrical forms—circles, squares, parallelograms, &c. A mound on the plain of Cahokia in Illinois, opposite the city of St. Louis, is 700 feet long, 500 feet broad, and 90 feet high. Earth mounds of another class represent gigantic animal forms in bas-relief on the ground. One is a man with two heads, the body 50 feet long and 25 feet broad across the breast; another represents a serpent 1000 feet in length, with graceful curves. The monuments of Mexico, Central America, and Peru are of a more advanced state of civilization, approach nearer to the historical period, and make the loss of authentic information more keenly felt. Here there are numerous ruined towns with most elaborate sculptures, lofty pyramidal structures serving as temples or forts, statues,

picture writing, hieroglyphics, roads, aqueducts, bridges, &c. Some remarkable prehistoric remains discovered in recent years are what are known as the abodes of the 'cliff-dwellers'. These consist of habitations constructed on terraces and in caves high up and steep sides of cañons in Colorado and other parts of the western states of N. America. Some of these buildings are several stories high. See also *Mexico, Peru, &c.*—BIBLIOGRAPHY: L. Farrand, *The American Nation*; Prescott, *The Conquest of Mexico* and *The Conquest of Peru*; Winsor, *Narrative and Critical History of America*; F. W. Halsey, *Great Epochs in American History* (11 vols.).

American Indians. See *Indians*.

Americanism, a term, phrase, or idiom peculiar to the English language as spoken in America, and not forming part of the language as spoken in England. The following is a list of a few of the more noteworthy Americanisms, some of them being rather slangy or vulgar.

Approbate, to approve.

Around or *round*, about or near. To *hang around* is to loiter about a place.

Backwoods, the partially-cleared forest regions in the western States.

Bee, an assemblage of persons to unite their labours for the benefit of an individual or family, or to carry out a joint scheme.

Boss, an employer or superintendent of labourers, a leader.

Bug, a coleopterous insect, or what in England is called a *beetle*.

Buggy, a four-wheeled vehicle.

Bulldose, to; to intimidate voters.

Bunkum or *buncombe*, a speech made solely to please a constituency; talk for talking's sake, and in an inflated style.

Bureau, a chest of drawers, a dressing-table surmounted by a mirror.

Calculate, to suppose, to believe, to think.

Camp-meeting, a meeting held in the fields or woods for religious purposes, and where the assemblage encamps and remains several days.

Cane-brake, a thicket of canes.

Car, a carriage or wagon of a railway train. The Englishman 'travels by rail' or 'takes the train'; the American takes or goes by the *cars*.

Carpet-bagger, a needy political adventurer who carries all his worldly goods in a carpet-bag.

Caucus, a private meeting of the leading politicians of a party to agree upon the plans to be pursued in an approaching election.

Chalk: a *long chalk* means a great distance, a good deal.

Clever, good-natured, obliging.

Cocktail, a stimulating drink made of brandy or gin mixed with bitters, sugar, and water.

Corn, maize (in England it means wheat, or grain in general).

Corn-husking, or *corn-shucking*, an occasion on which a farmer invites his neighbours to assist him in stripping the husks from his Indian corn.

Cow-hide, a whip made of twisted strips of raw hide.

Creek, a small river or brook; not, as in England, a small arm of the sea.

Cunning, small and pretty, nice, e.g. 'It was such a *cunning* baby'.

Dander; to get one's *dander raised*, to have one's *dander up*, is to have been worked into a passion.

Dead-heads, people who have free admission to entertainments, or who have the use of public conveyances, or the like, free of charge.

Depot, a railway station.

Down east, in or into the New England States. A *down-easter* is a New Englander.

Drummer, a bagman or commercial traveller.

Dry goods, a general term for such articles as are sold by linen-draper, haberdashers, hosiers, &c.

Dutch, the German language.—*Dutchman*, a German.

Fix, to; to put in order, to prepare, to adjust. To fix the hair, the table, the fire, is to dress the hair, lay the table, make up the fire.

Fixings, arrangements, dress, embellishments, luggage, furniture, garnishings of any kind.

Gerrymander, to arrange political divisions so that in an election one party may obtain an advantage over its opponent, even though the latter may possess a majority of votes in the State; from the deviser of such a scheme, named *Gerry*, governor of Massachusetts.

Given name, a Christian name.

Guess, to; to believe, to suppose, to think, to fancy; also used emphatically, as 'Joe, will you liquor up?' 'I guess I will.'

Gulch, a deep abrupt ravine, caused by the action of water.

Happen in, to; to happen to come in or call.

Help, a servant.

High-falutin, inflated speech, bombast.

Hoe-cake, a cake of Indian meal baked on a hoe or before the fire.

Indian summer, the short season of pleasant weather usually occurring about the middle of November.

Johnny Cake, a cake made of Indian corn meal mixed with milk or water and sometimes a little stewed pumpkin; the term is also applied to a New Englander.

Julep, a drink composed of brandy or whisky with sugar, pounded ice, and some sprigs of mint.

Log-rolling, the assembly of several parties of wood-cutters to help one of them in rolling their logs to the river after they are felled and trimmed; also employed in politics to signify a like system of mutual co-operation.

Lot, a piece or division of land, an allotment.

Lumber, timber sawed and split for use; as beams, joists, planks, staves, hoops, &c.

Lynch law, an irregular species of justice executed by the populace or a mob, without legal authority or trial.

Mail letters, to; to post letters.

Make tracks, to; to run away.

Mitten; to *get the mitten* is to meet with a refusal.

Mizzle, to; to abscond, or run away.

Mush, a kind of hasty-pudding.

Muss, a state of confusion.

Notions, a term applied to every variety of small-wares.

One-horse: a one-horse thing is a thing of no value or importance, a mean and trifling thing.

Picaninny, a negro child.

Pile, a quantity of money.

Planks, in a political sense, are the several principles which appertain to a party; *platform* is the collection of such principles.

Reckon, to; to suppose, to think.

Rock, a stone of any size; a pebble; as to throw *rocks* at a dog.

Scalawag, a scamp, a scapegrace.

Shanty, a mean structure such as squatters erect; a temporary hut.

Skedaddle, to; to run away; a word introduced during the civil war.

Smart, often used in the sense of considerable, a good deal, as a *smart chance*.

Soft sawder, flattering, coaxing talk.

Span of horses, two horses as nearly as possible alike, harnessed side by side.

Spread-eagle style, a compound of exaggeration, bombast, mixed metaphor, &c.

Store, a shop, as a book *store*, a grocery *store*.

Strike oil, to; to come upon petroleum: hence to make a lucky hit, especially financially.

Stump speech, a bombastic speech calculated to please the popular ear, such speeches in newly-settled districts being often delivered from stumps of trees.

Sun-up, sunrise.

Tall, great, fine (used by Shakespeare much in the same sense); *tall talk* is extravagant talk.

Ticket: to vote the *straight ticket* is to vote for all the men or measures your party wishes.

Truck, the small produce of gardens; *truck patch*, a plot in which the smaller fruits and vegetables are raised.

Ugly, ill-tempered, vicious.

Vamose, to; to run off (from the Sp. *vamos*, let us go).

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American Jute. See *Abutilon*.

American Organ. See *Organ*.

Amer'icus, a town of the United States, Georgia, in a good cotton and corn district. Pop. 11,000.

Amerigo Vespucci (a' -mer-ē'go vespu't'chē), a maritime discoverer, after whom America has been named, born, 1451, at Florence; died, 1512, at Seville. In 1499 he coasted along the continent of America for several hundred leagues, and the publication of his narrative, while the prior discovery of Columbus was yet comparatively a secret, led to the giving of his name to the new continent.

Amerongen, a village in Holland. Here, at the château belonging to Count Goddard Bentinck, the ex-Kaiser Wilhelm II took up his residence after signing his letters of abdication at Spa on 9th Nov., 1918.

Amersfoort (ä'merz-fōrt), a town in Holland, province of Utrecht, communicating by the Eem with the Zuider-Zee; manufactures woollen goods, tobacco, glass, and silk yarn. Pop. 28,777.

Ames, Fisher, American statesman, born 1758, died 1808; studied law, and became prominent in his profession—distinguished as a political orator and essayist.

Ames, Joseph, English antiquary, born at Yarmouth, 1689, died 1759. He became a ship-chandler at Wapping, devoted himself to antiquarian pursuits, and was for many years secretary to the Society of Antiquaries. His chief publication is, *Typographical Antiquities: being an historical account of Printing in England* (1749).

Ametab'ola (Gr. *ametabolos*, unchangeable), a division of insects, including only the apterous or wingless insects, as lice, spring-tails, &c., which do not undergo any metamorphosis, but which escape from the egg nearly under the same form which they preserve through life.

Am'ethyst, a violet-blue or purple variety of quartz, generally occurring crystallized in hexahedral prisms or pyramids, also in rolled fragments, composed of imperfect prismatic crystals. It is wrought into various articles of jewellery. The *oriental amethyst* is a rare violet-coloured gem, a variety of alumina or corundum, of much brilliance and beauty. The name is generally said to be of Greek origin, and expresses some supposed quality in the stone of preventing or curing intoxication. The gem was one of the twelve stones in the breastplate of the Jewish high-priest.

Amhara (a' m-hä'ra'), a district of Abyssinia, lying between the Tacazzé and the Blue Nile, but of which the limits are not well defined. The Amharic language, developed from the ancient Gheez, and written since the sixteenth century, has gradually gained ground in Southern and Central Abyssinia, and has also become the Court language.

Amherst (am'erst), a seaport of Canada, in Nova Scotia, on an arm of Chignecto Bay, with flourishing industries, and trade by railway and sea. Pop. 10,320. Also a port of Burmah, 31 miles south of Moulmein, a health resort of Europeans. Pop. 3750.

Amherst, Jeffrey, Lord, born 1717, died 1797; distinguished British general, who fought at Dettingen and Fontenoy, and commanded in America, where he took Louisburg, Ticonderoga, and Quebec, and restored the British prestige in Canada. He was raised to the peerage, became commander-in-chief, and ultimately field-marshal.

Amherst, William Pitt, first earl, nephew of the above; Governor-General of India, 1823; prosecuted the first Burmese war, and suppressed the Barrackpore mutiny. Born 1773, died 1857.

Amian'thus, a kind of flexible asbestos. See *Asbestos*.

Amice (am'is), an oblong piece of linen with an embroidered apparel sewed upon it, worn under the alb by priests of the Roman Catholic Church when engaged in the sacrifice of the mass.

Amide, or **Amine** (am'id, am'in), names used in chemistry. The amines are compounds formed by the introduction of alcohol radicles into ammonia, e.g. $C_2H_5NH_2$, which is known as ethylamine. They closely resemble

ammonia in properties. The amides are formed by replacing one of the hydrogen atoms of ammonia by an acid radicle, e.g. $\text{C}_2\text{H}_3\text{ONH}_2$, which is called acetamide. They are not strongly basic, and are usually crystalline, and have high boiling-points.

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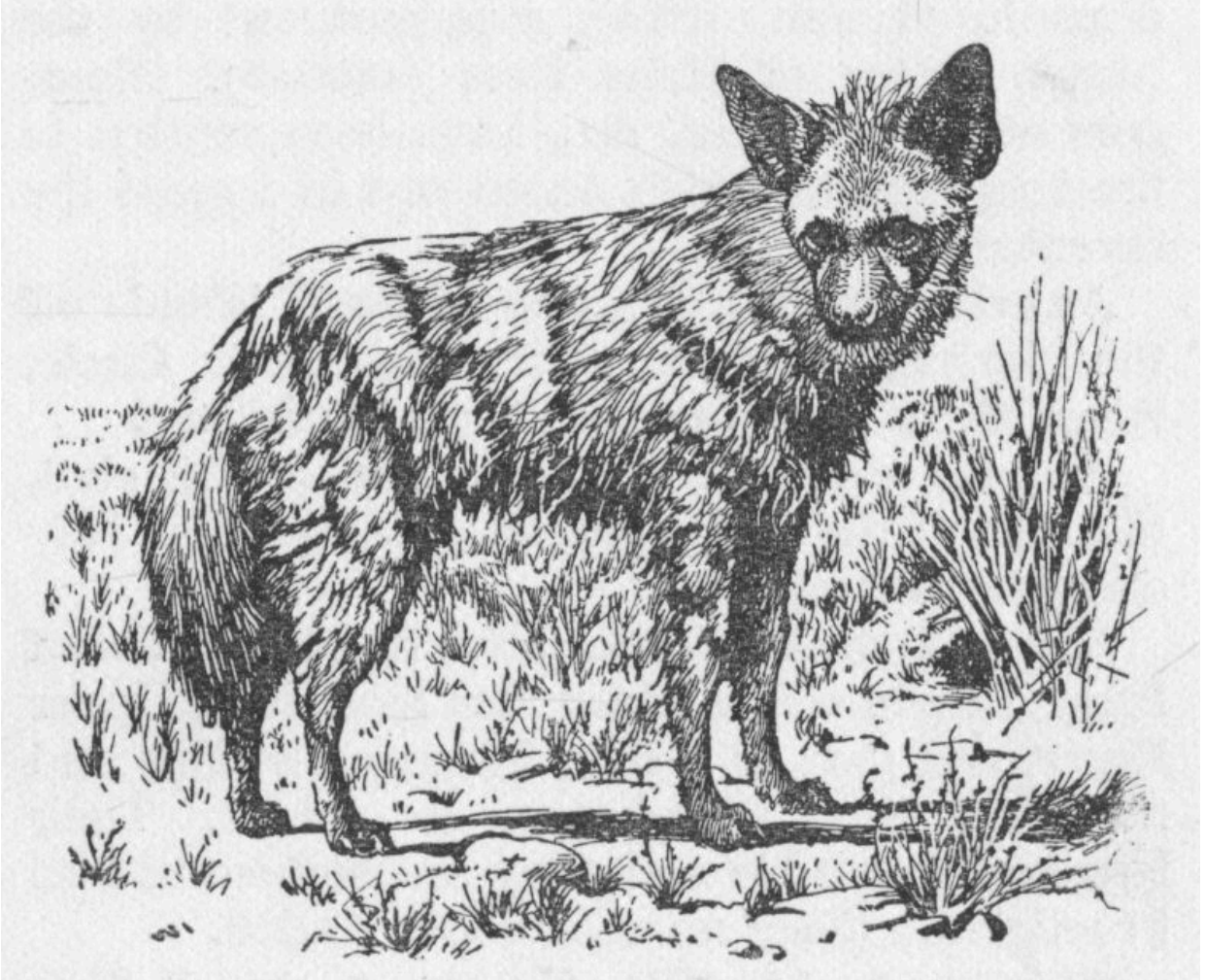
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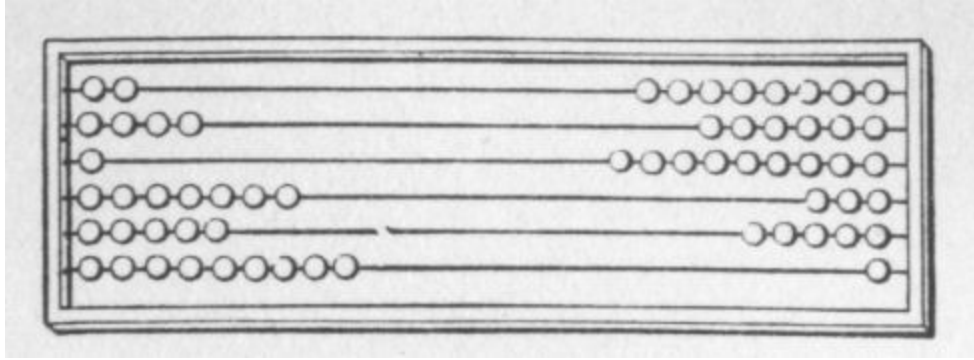
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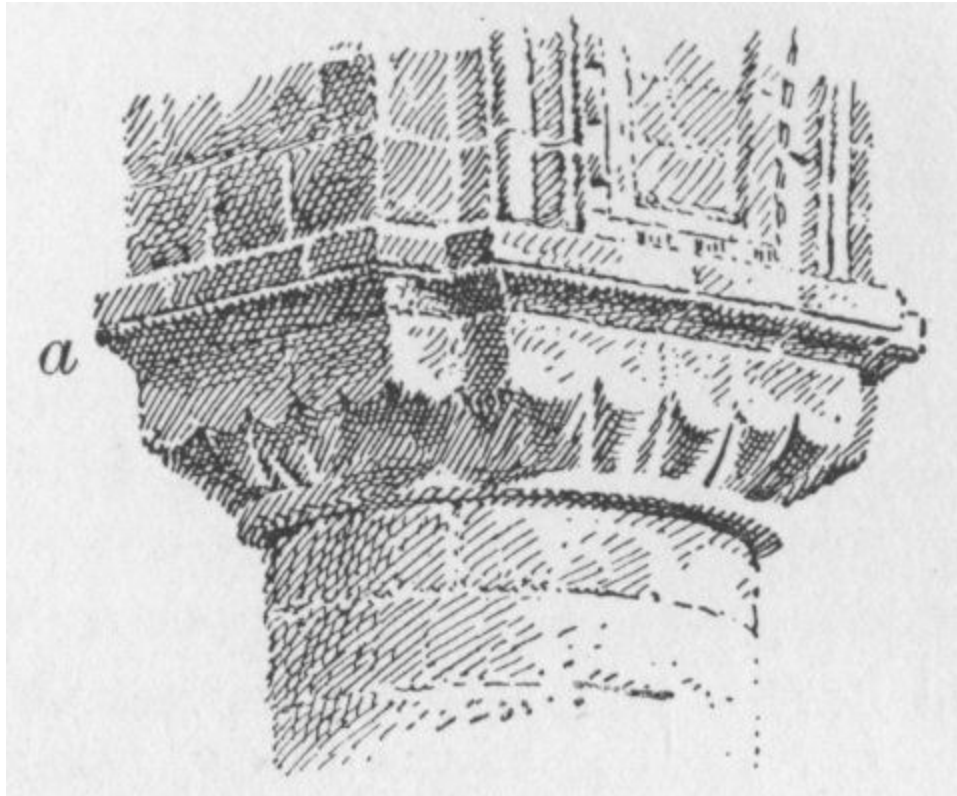
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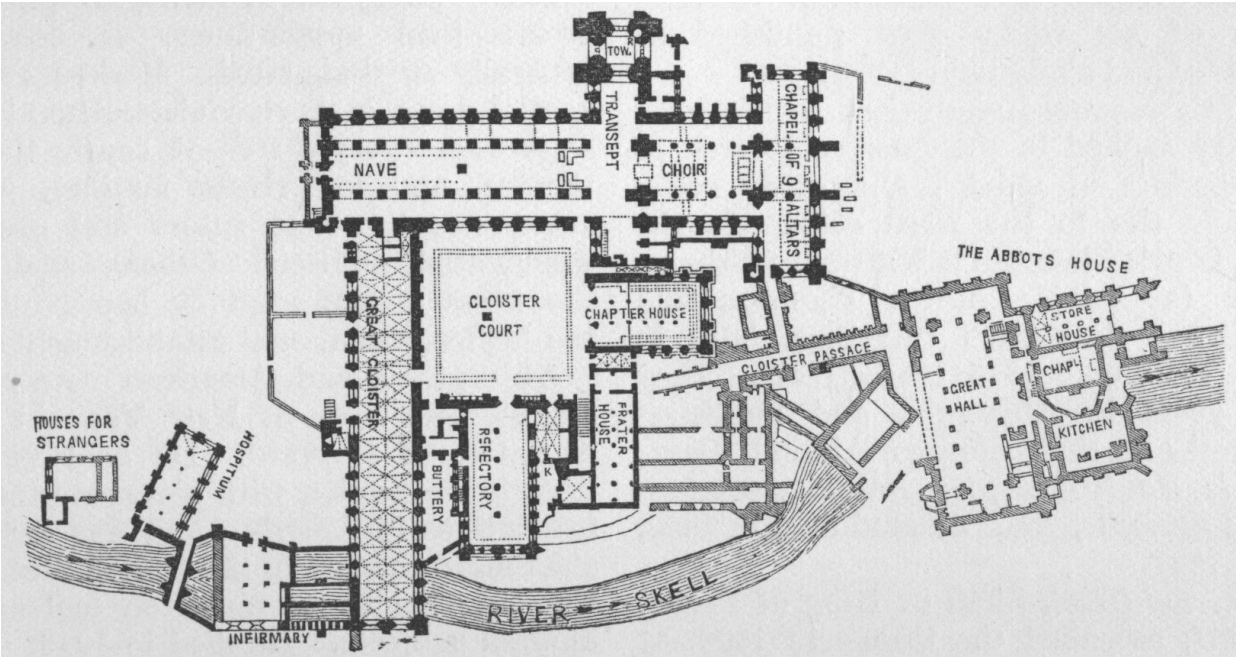
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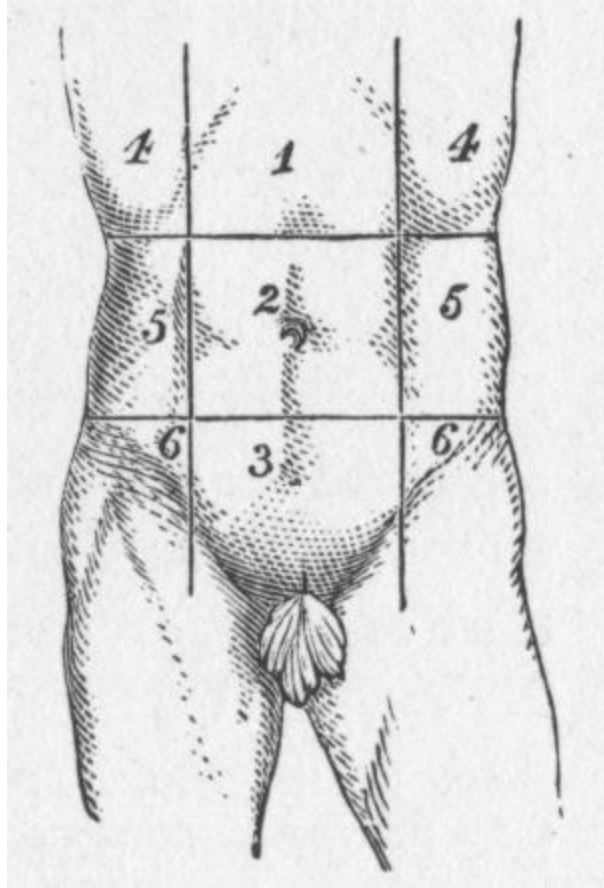
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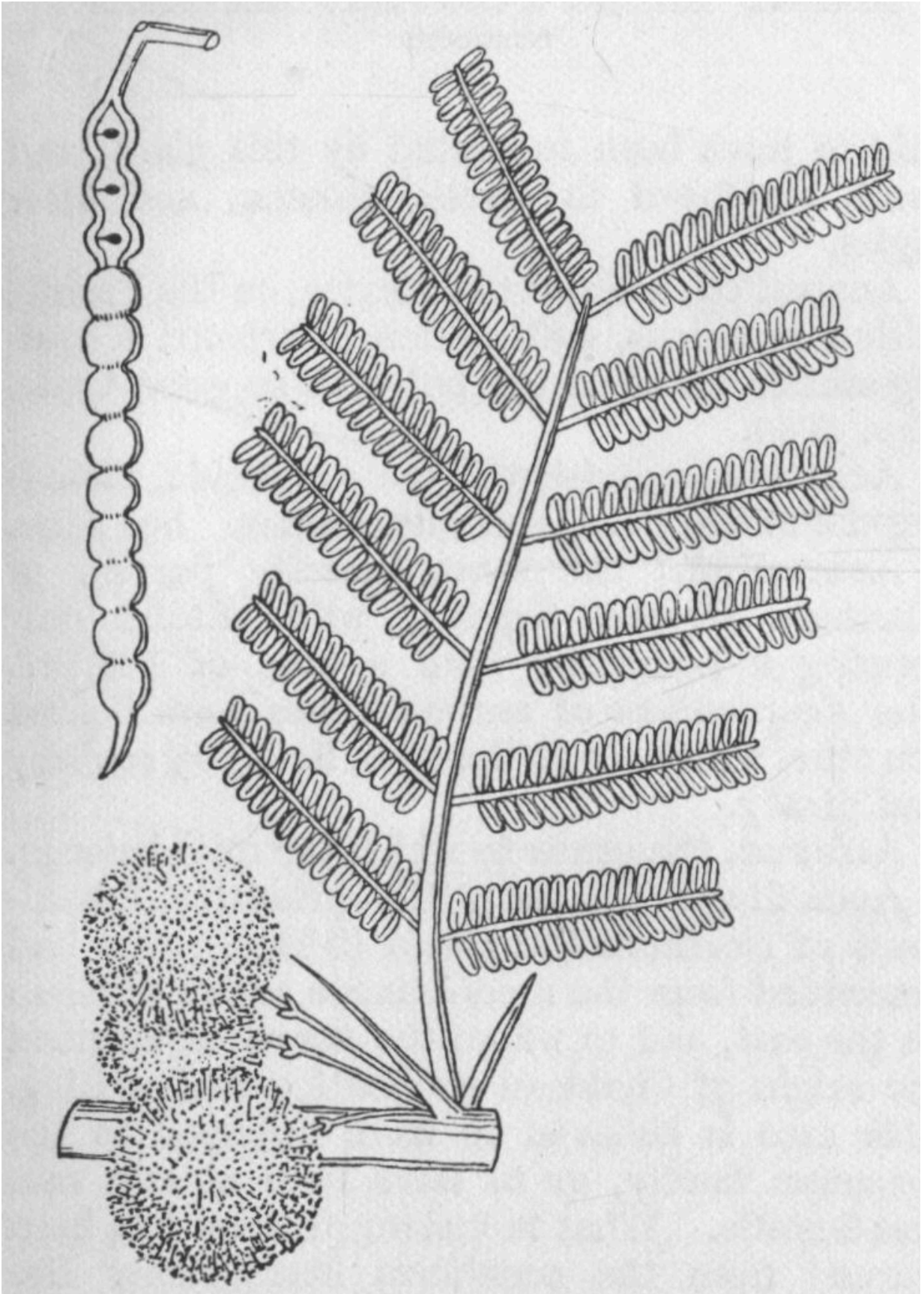
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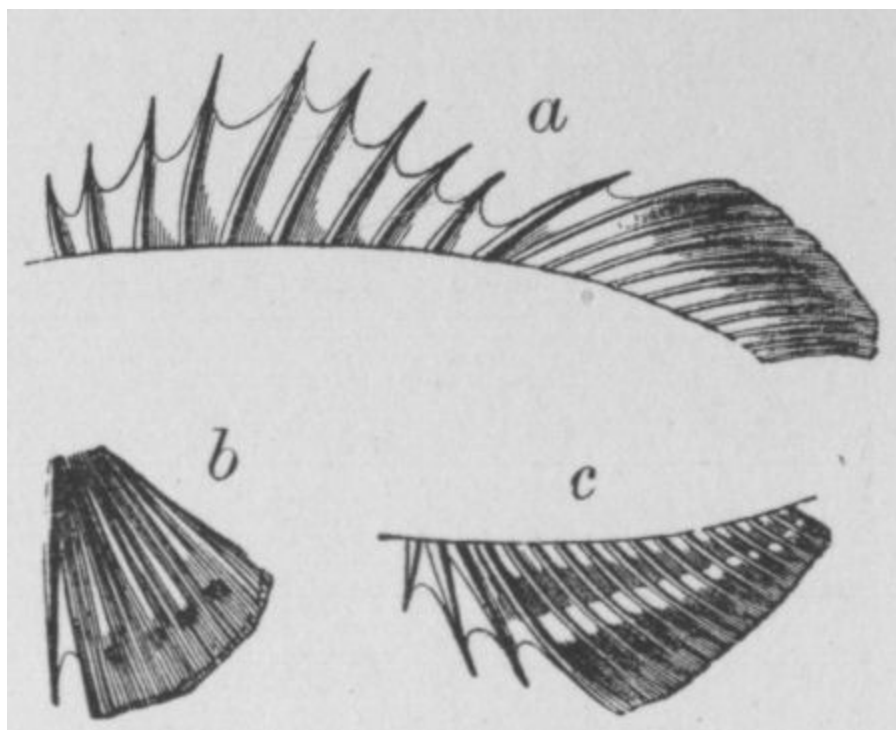
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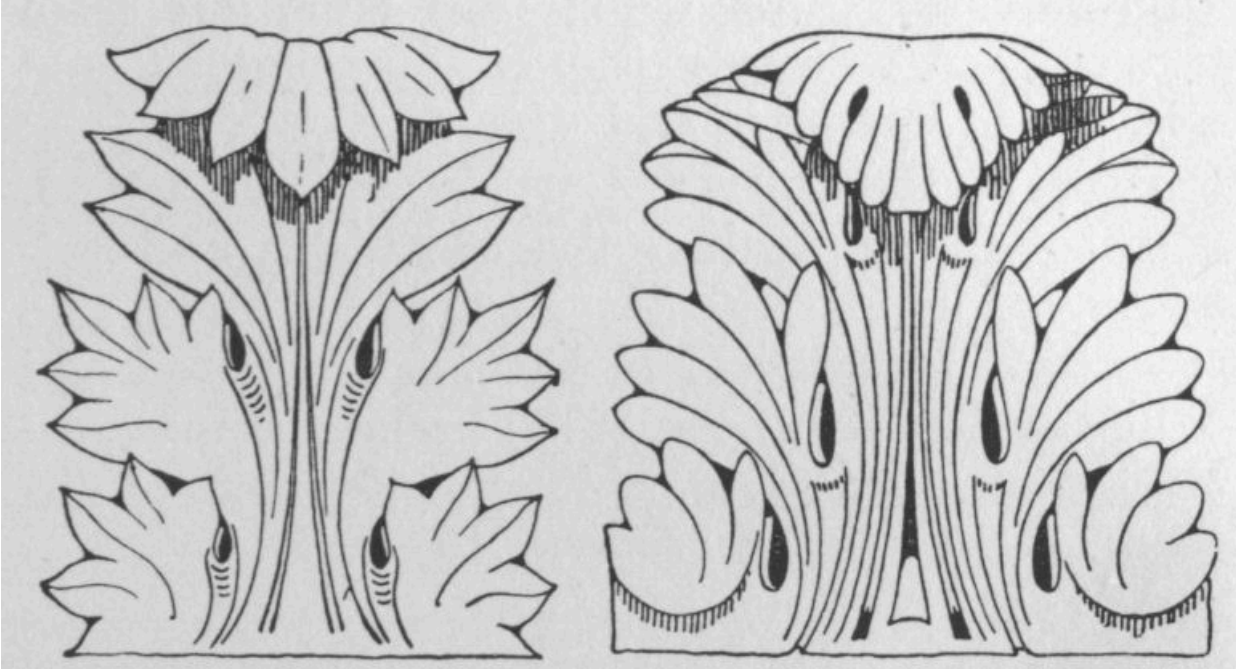
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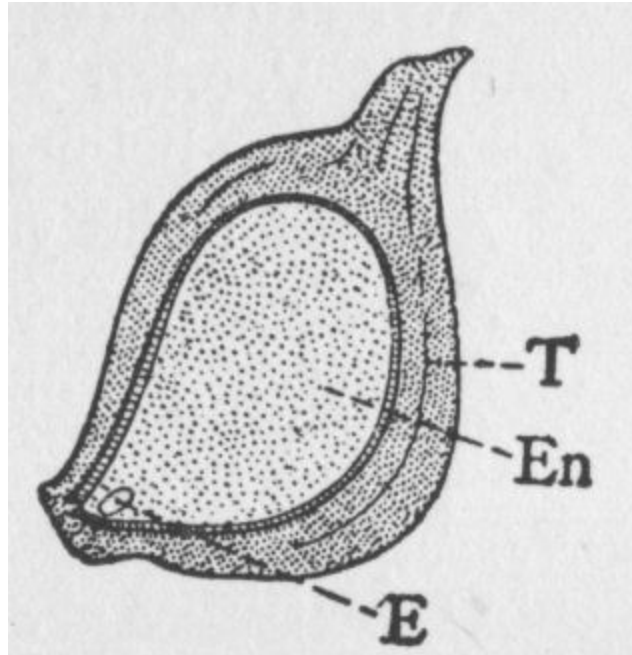
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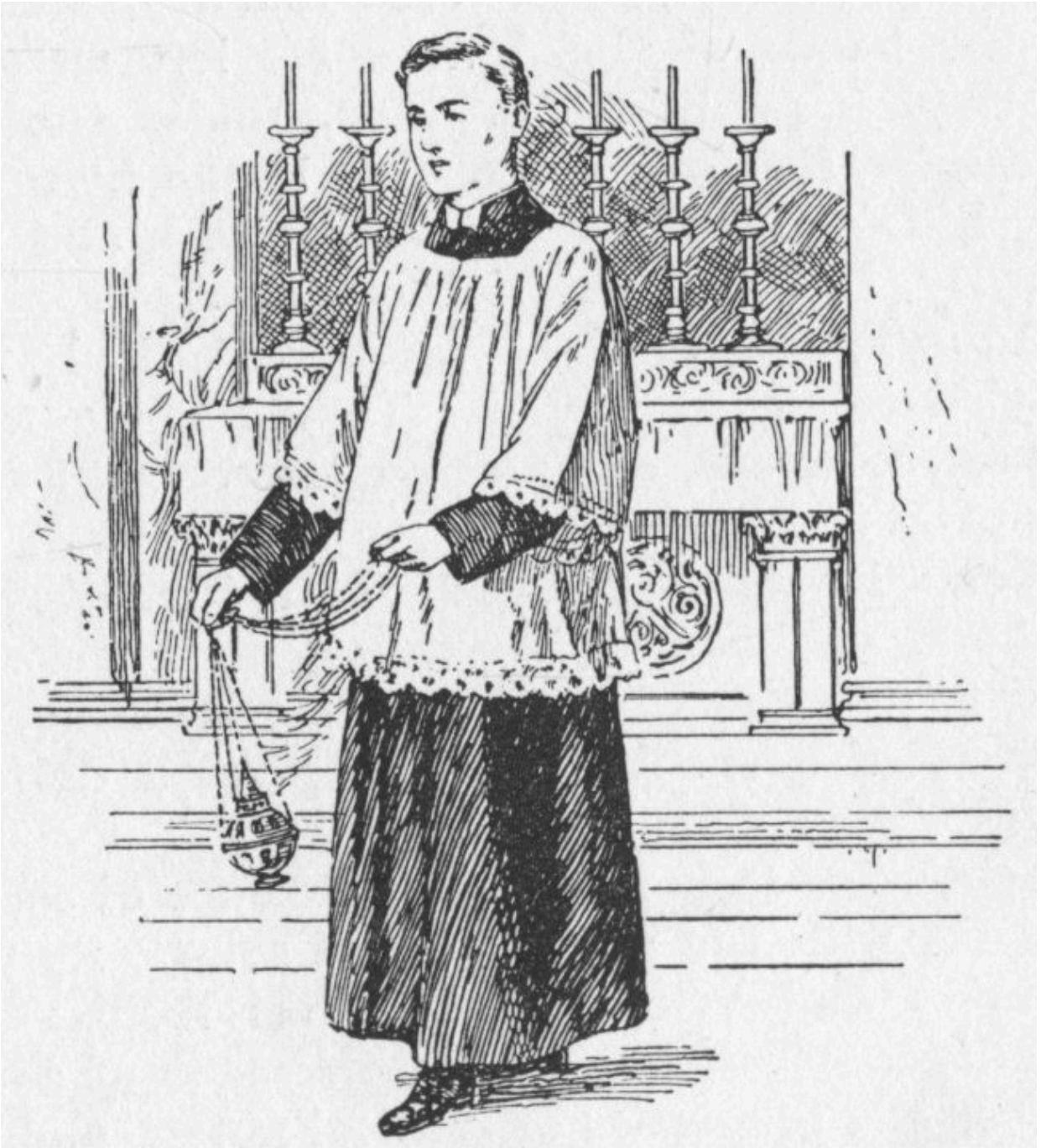
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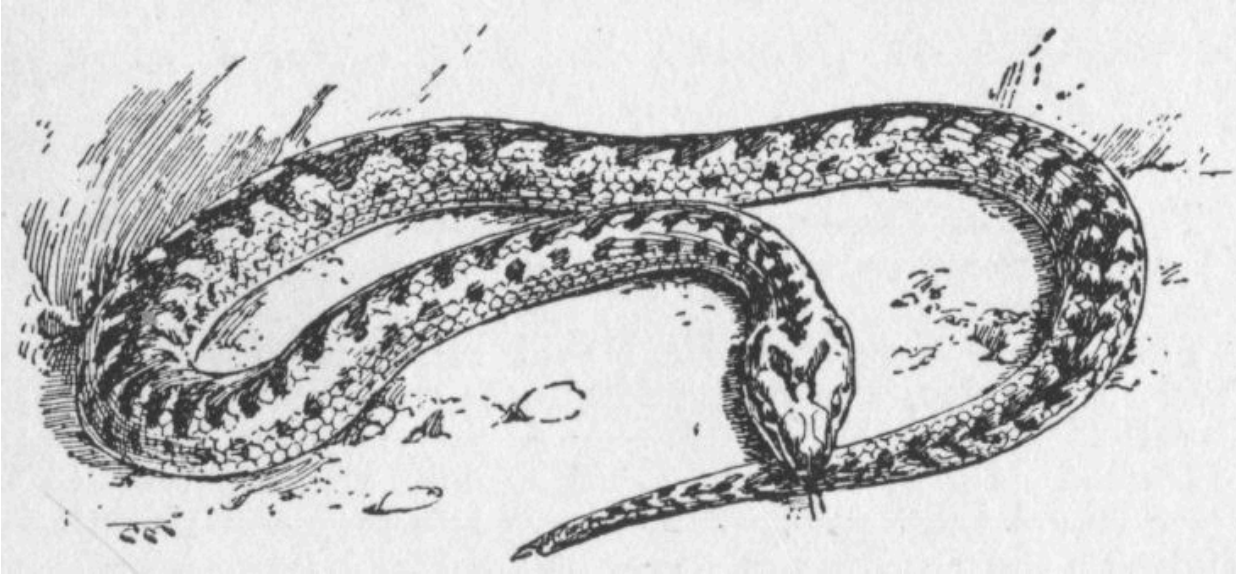
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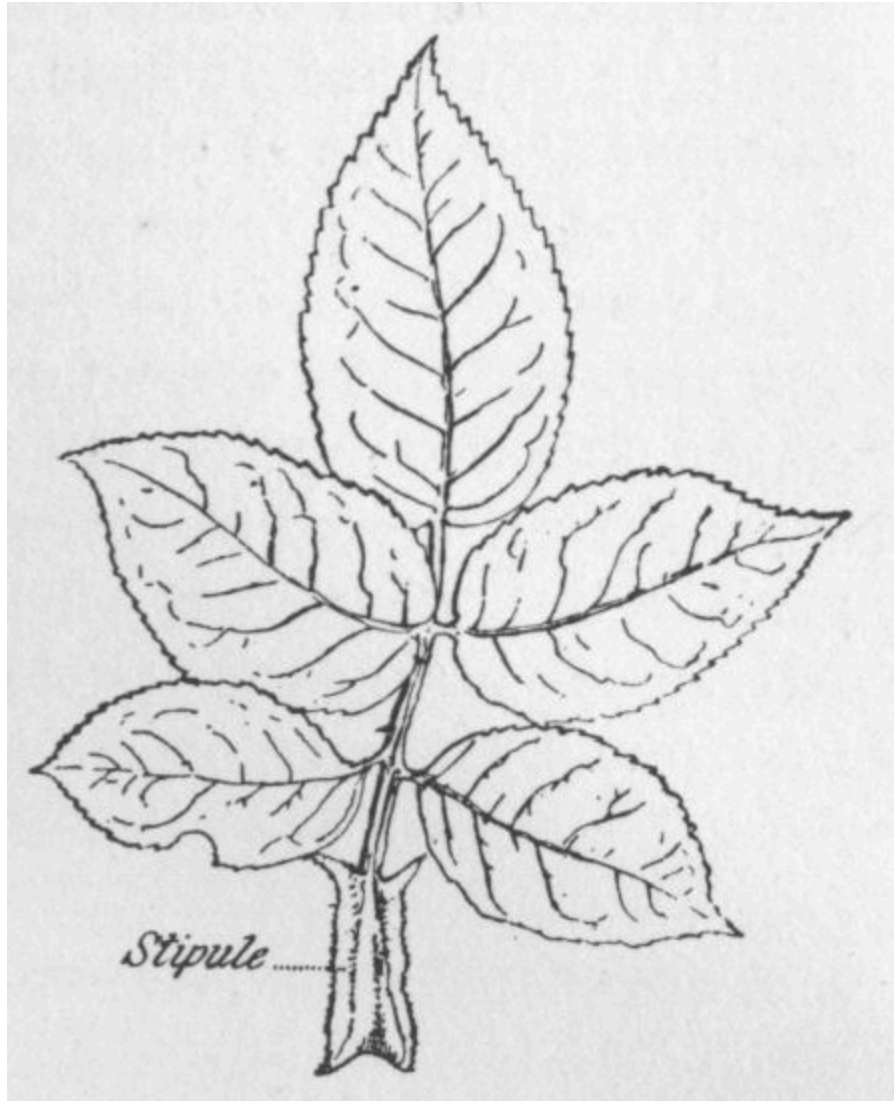
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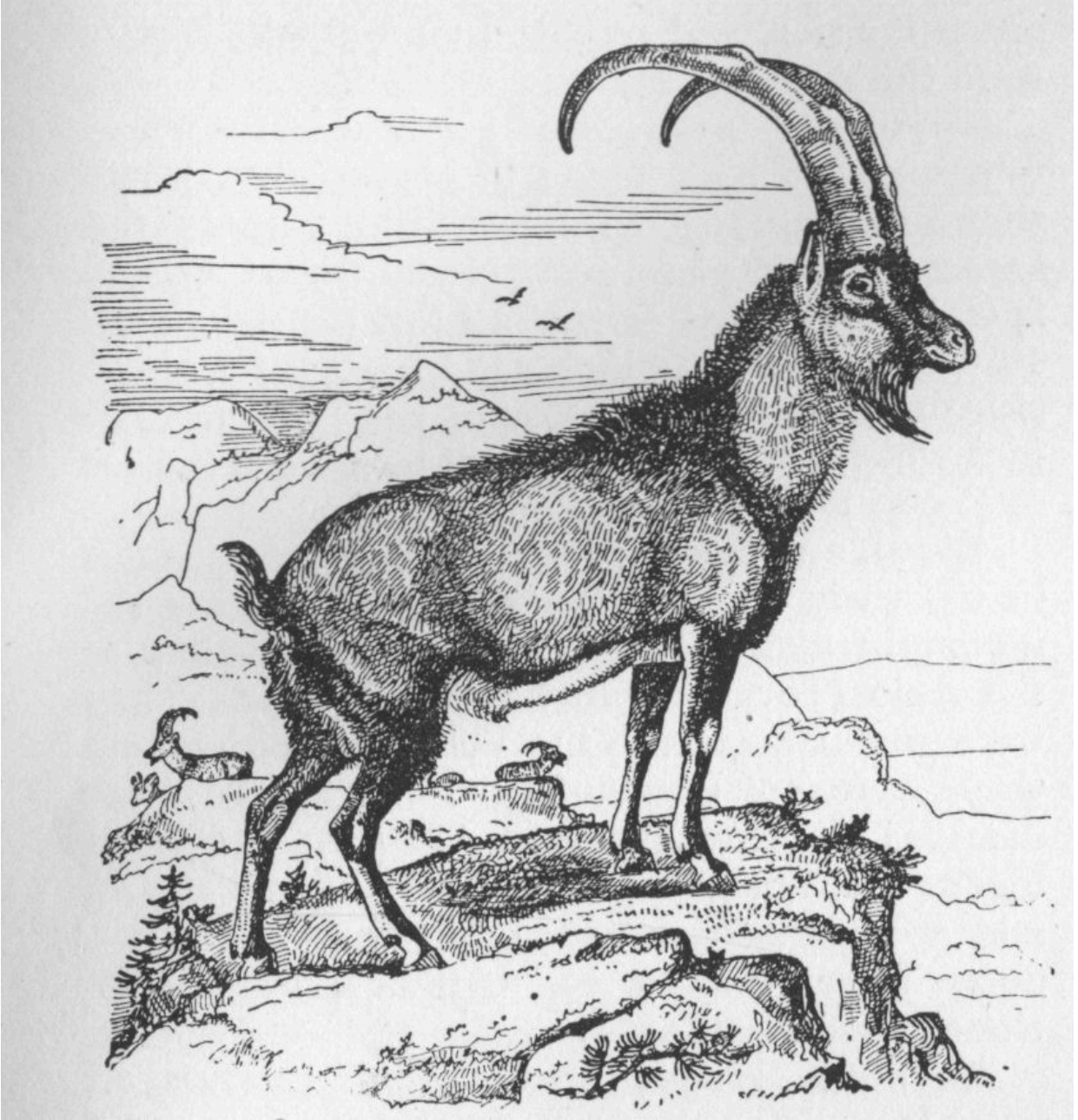
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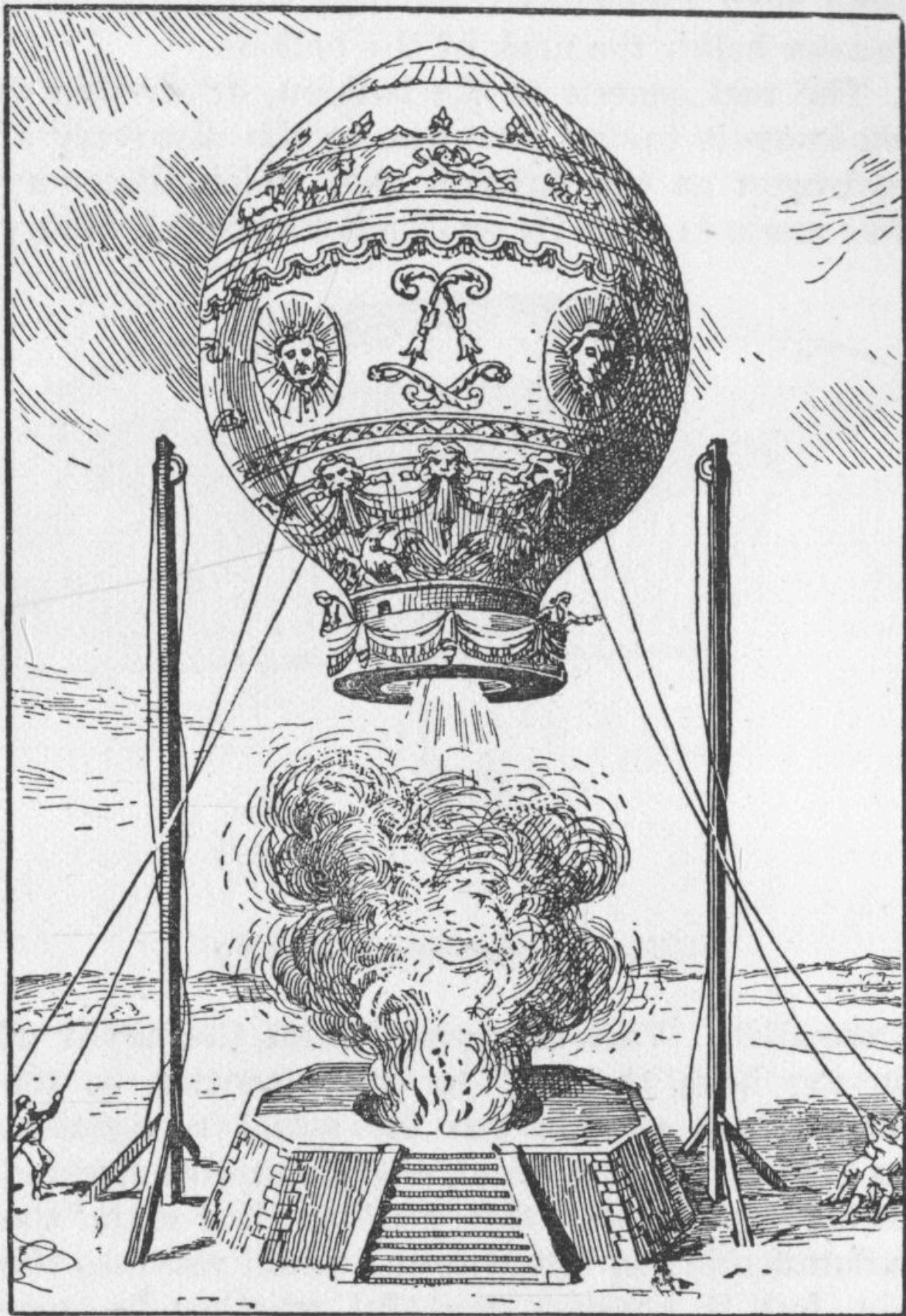
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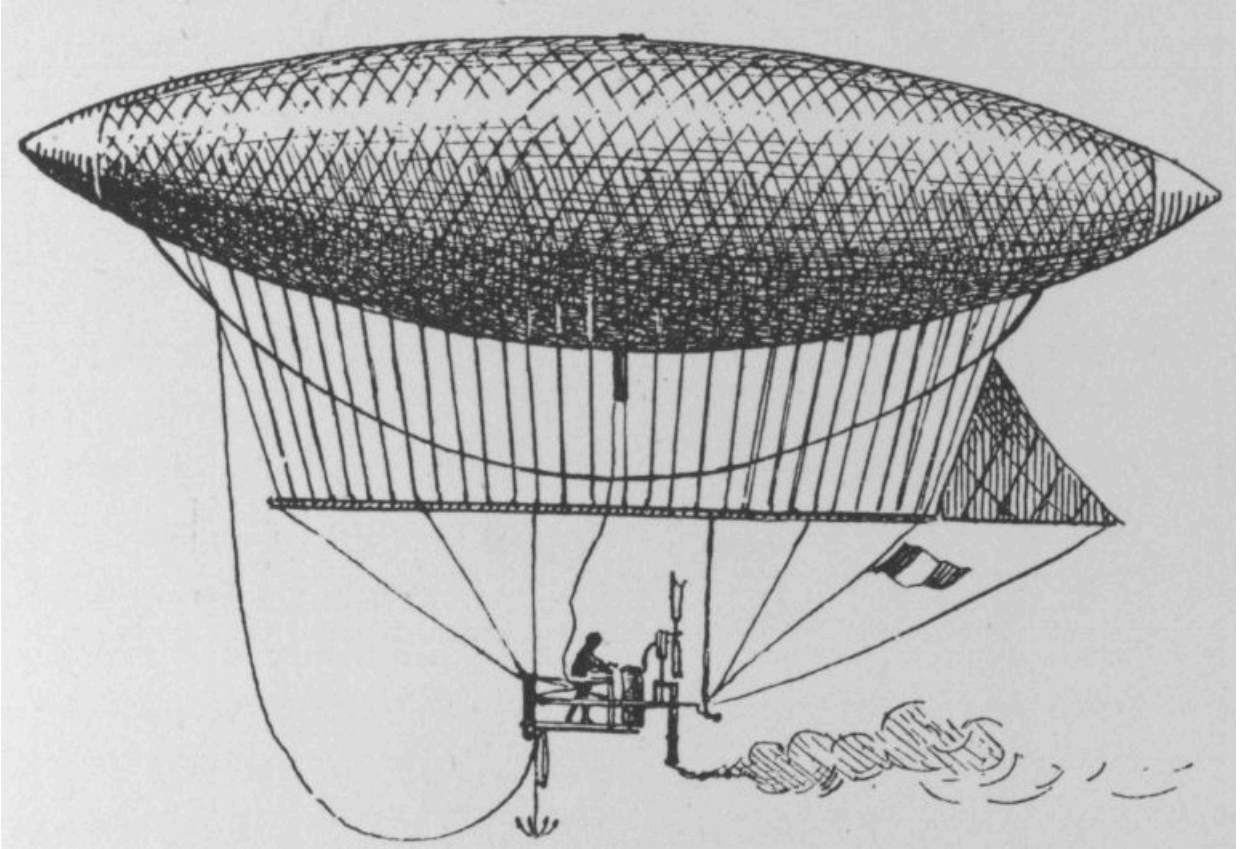
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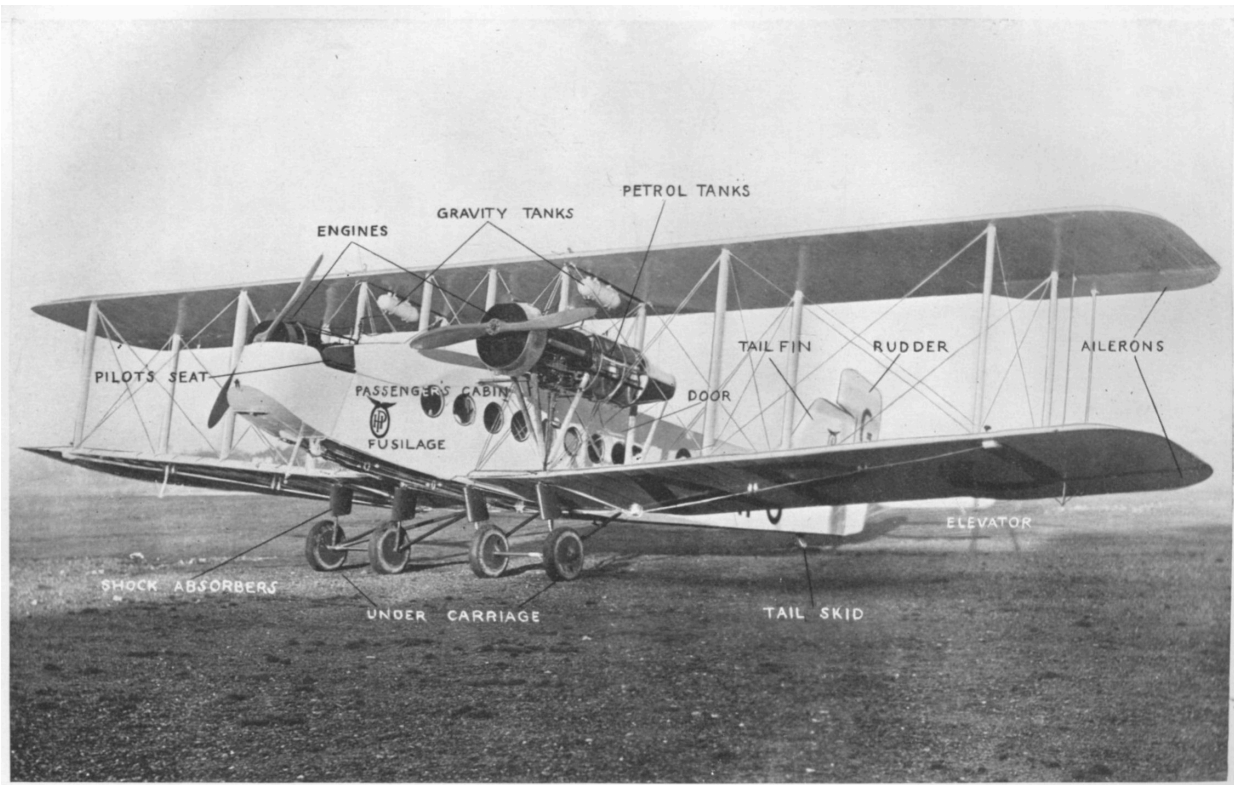
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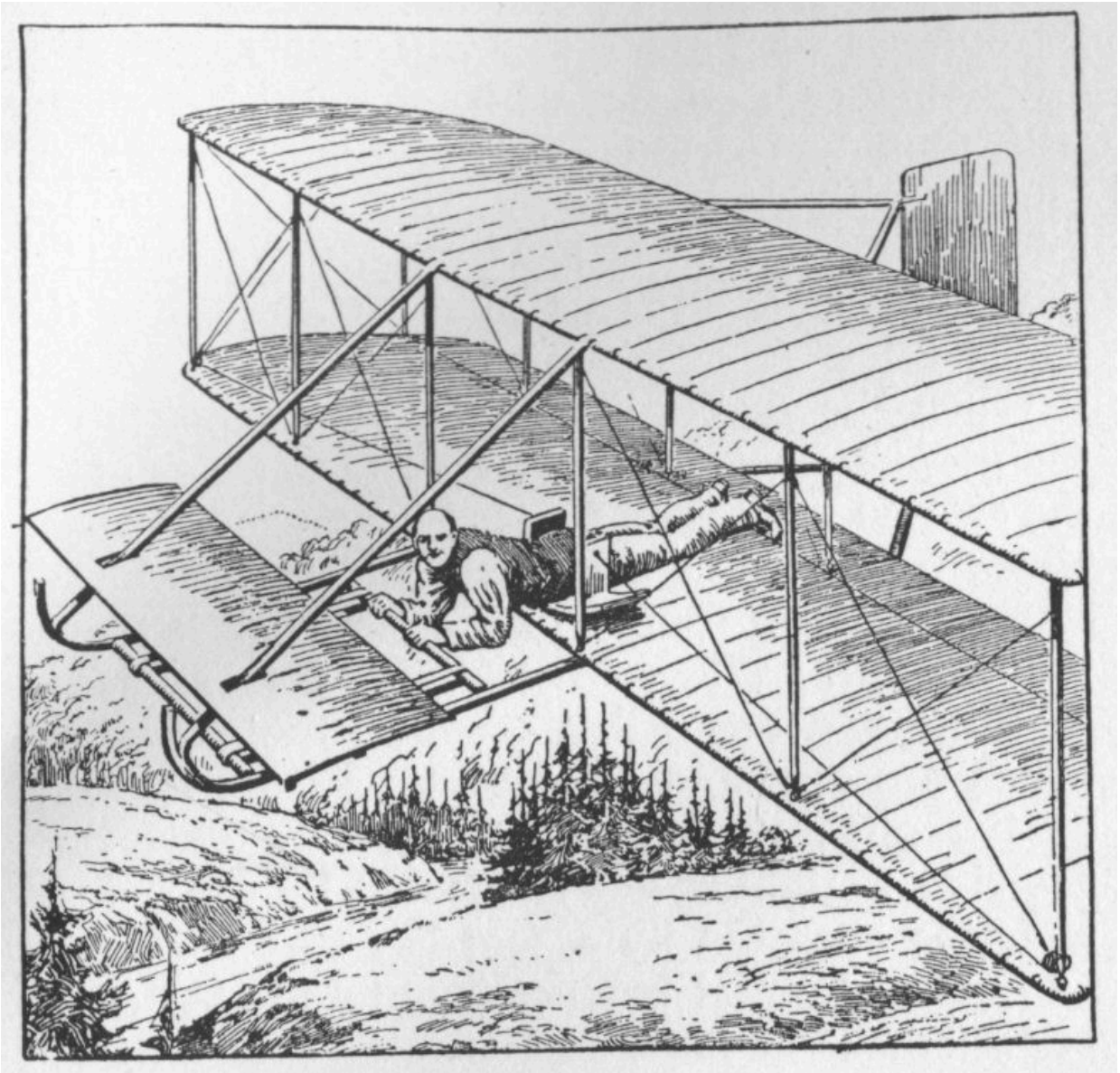
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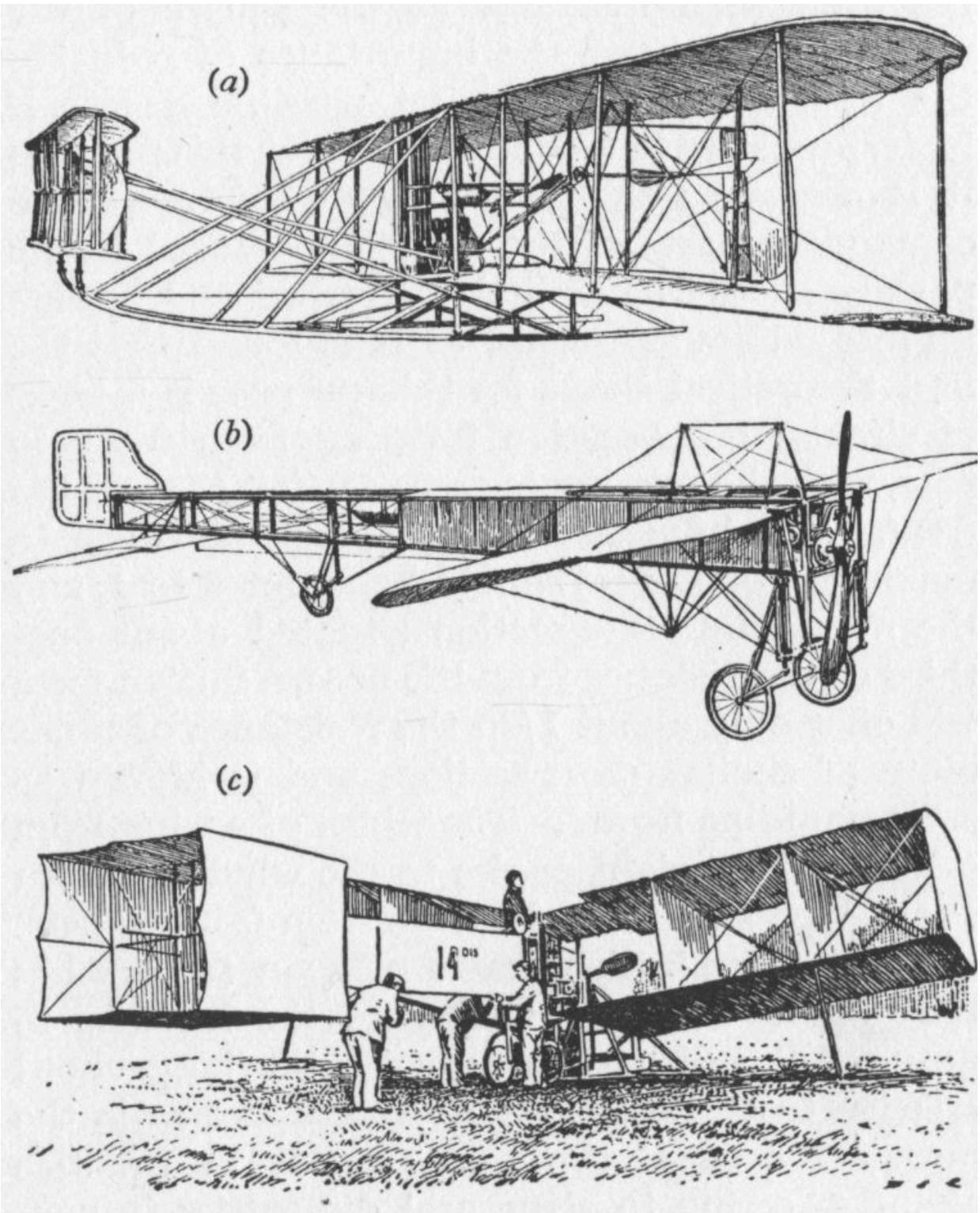
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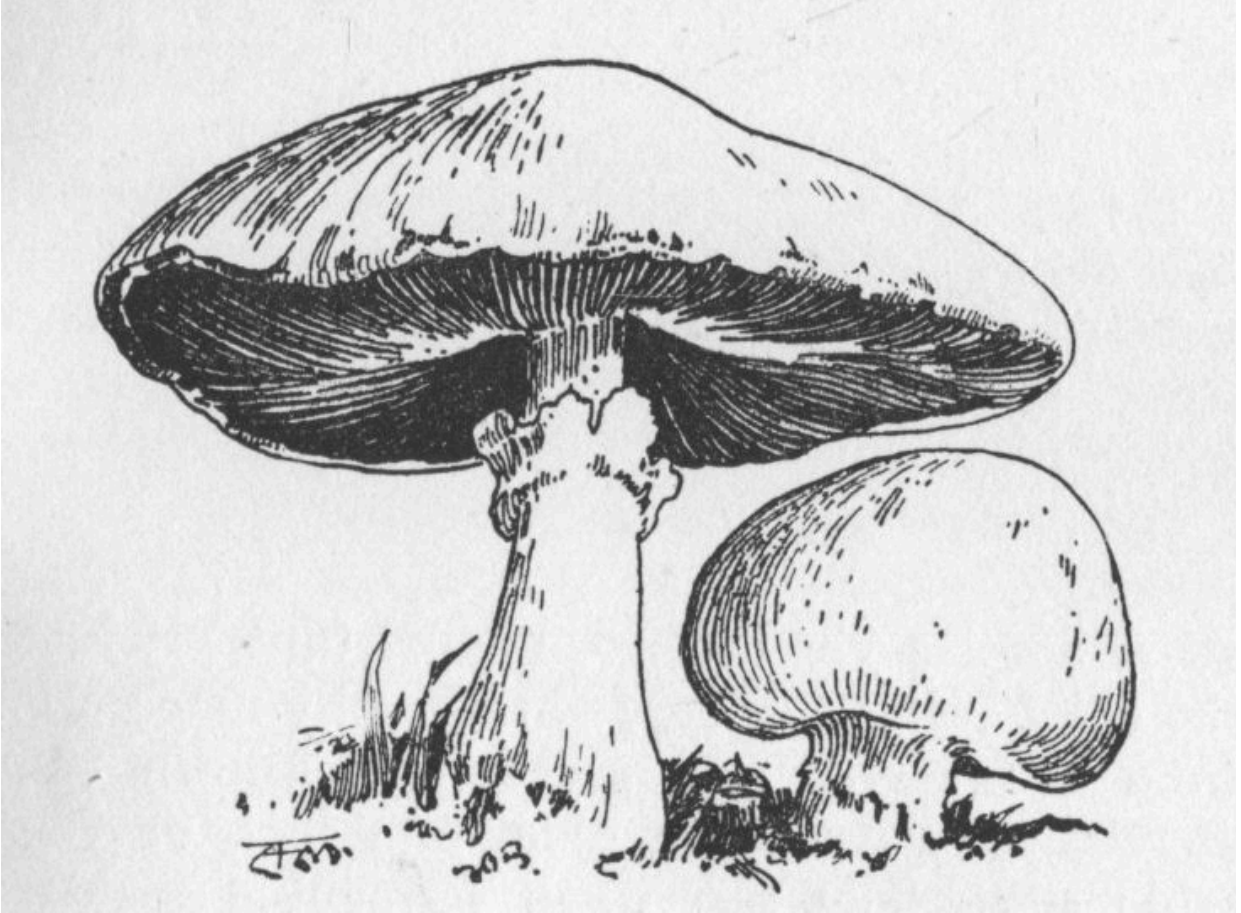
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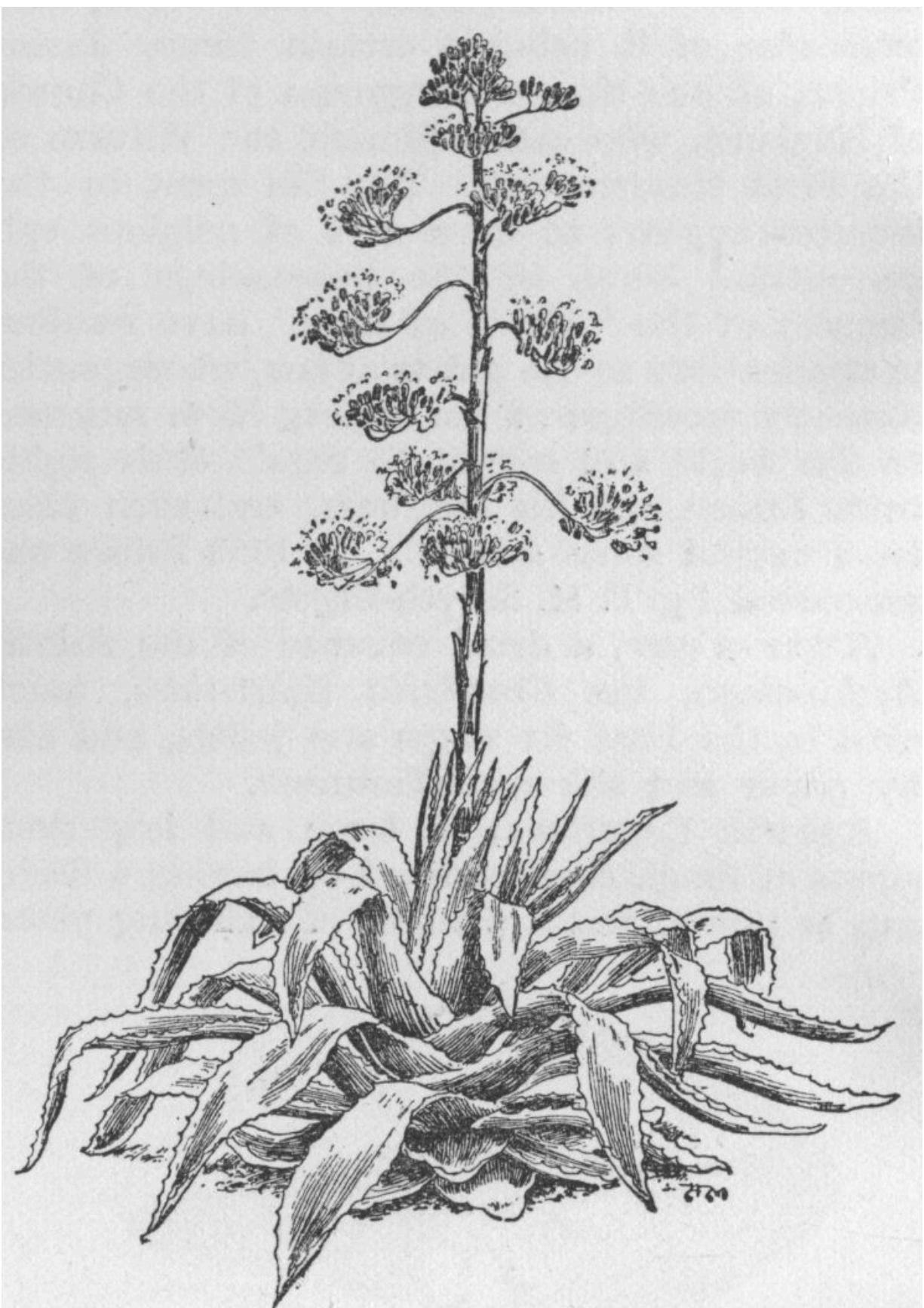
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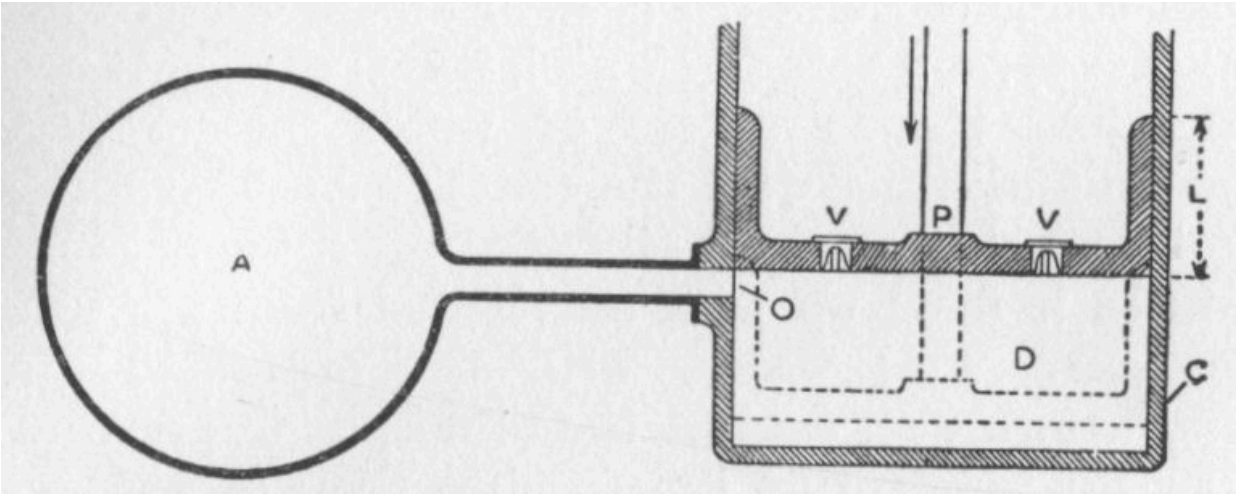
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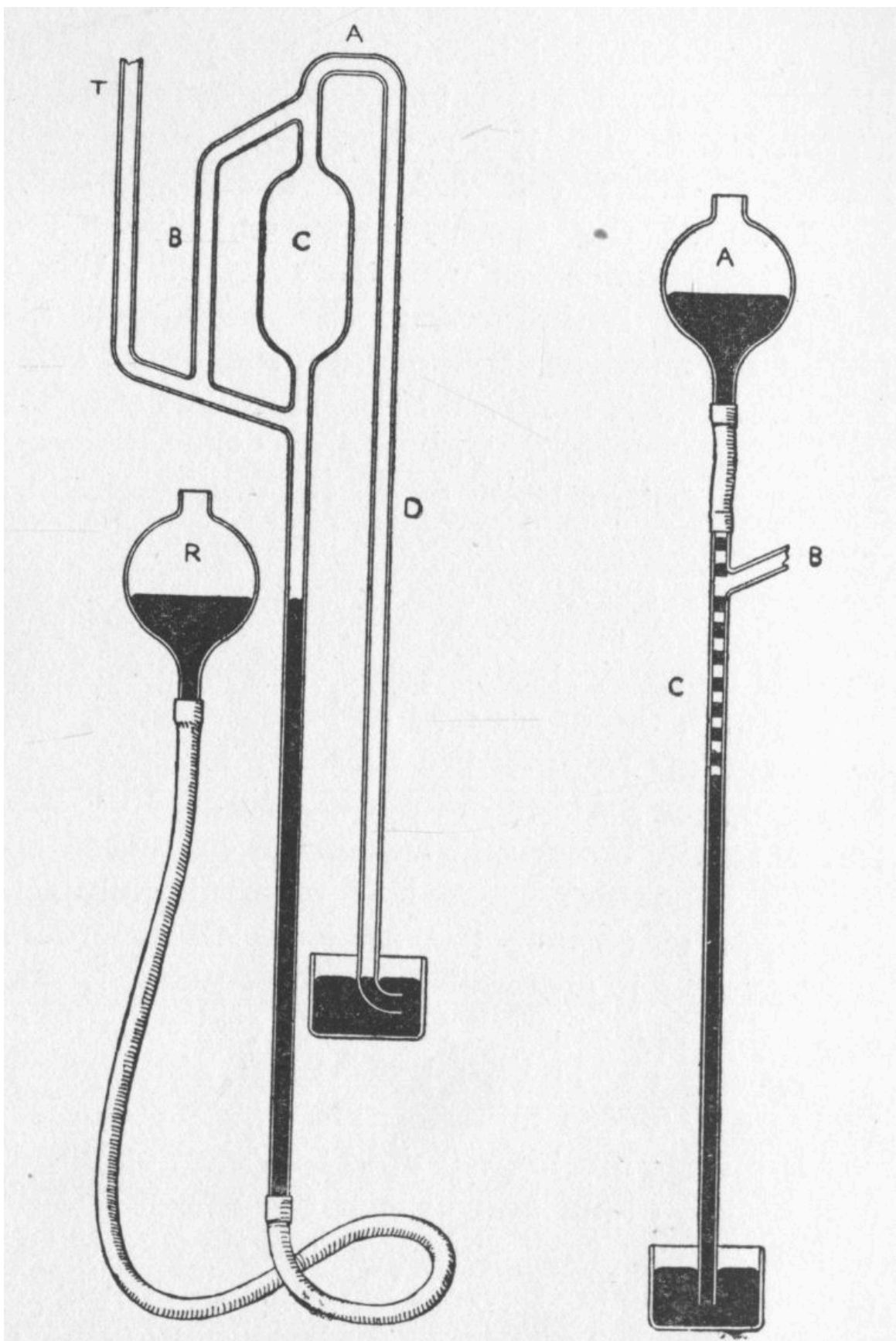
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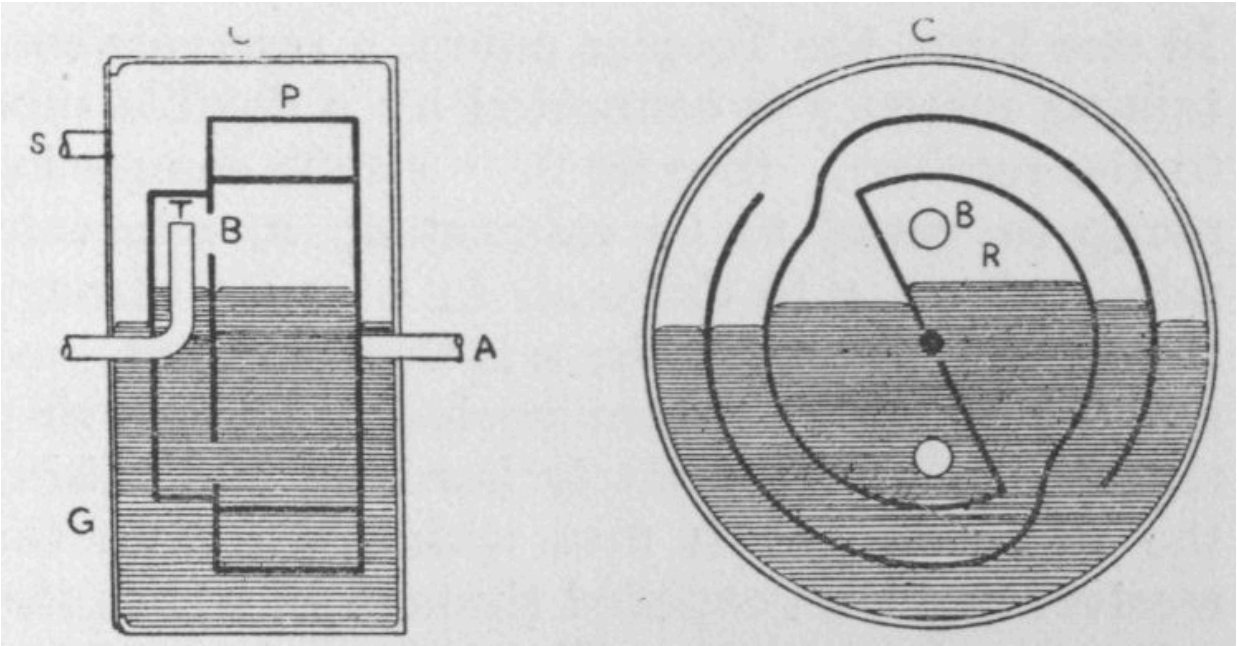
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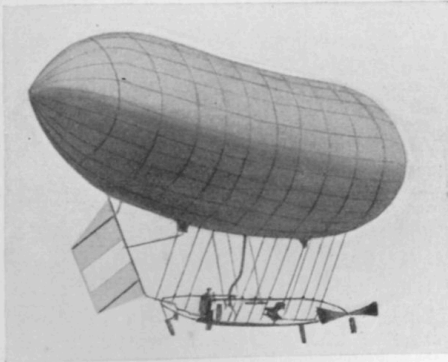
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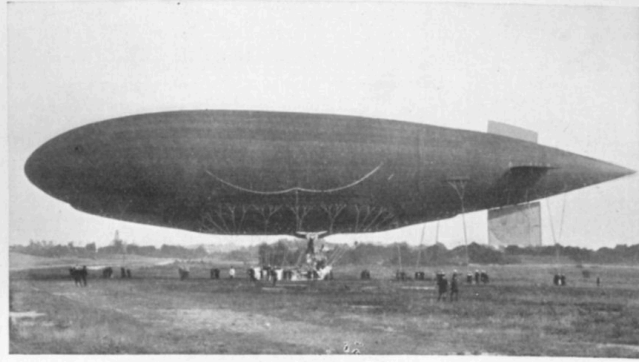
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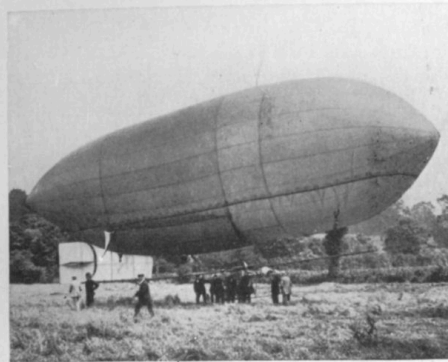
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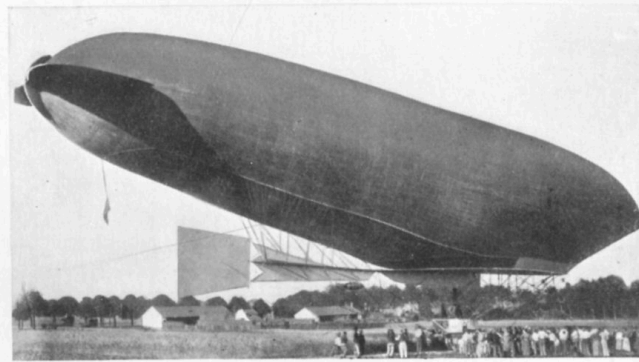
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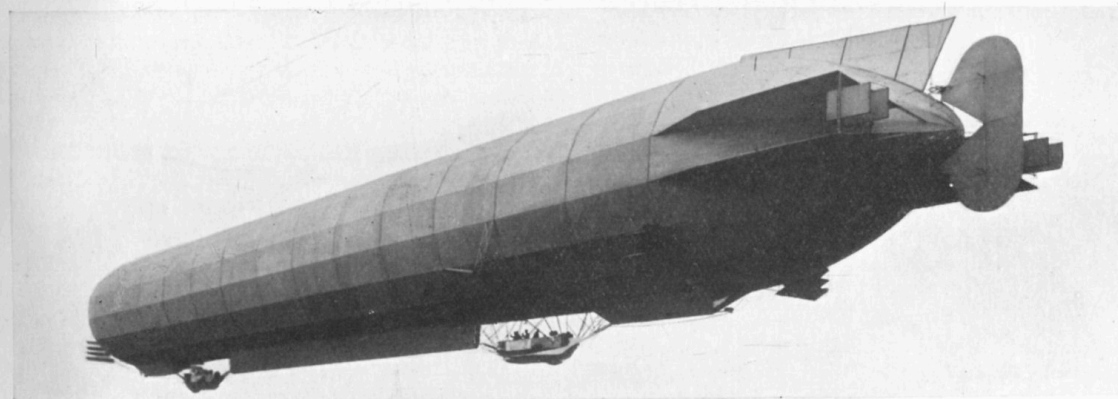
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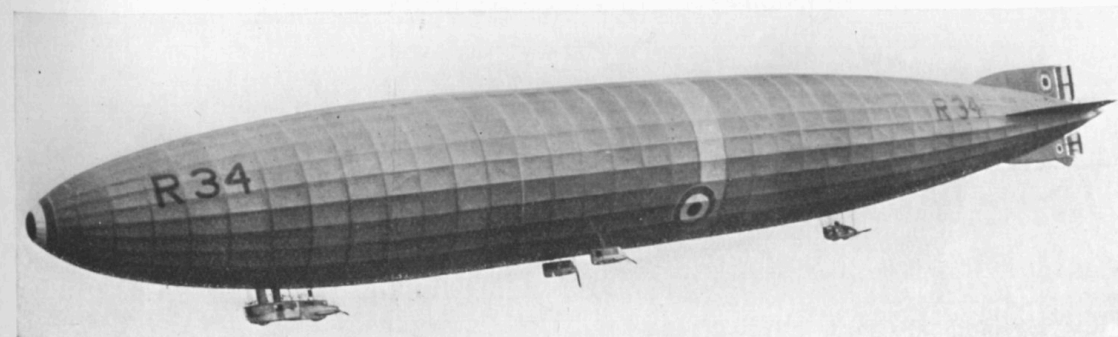
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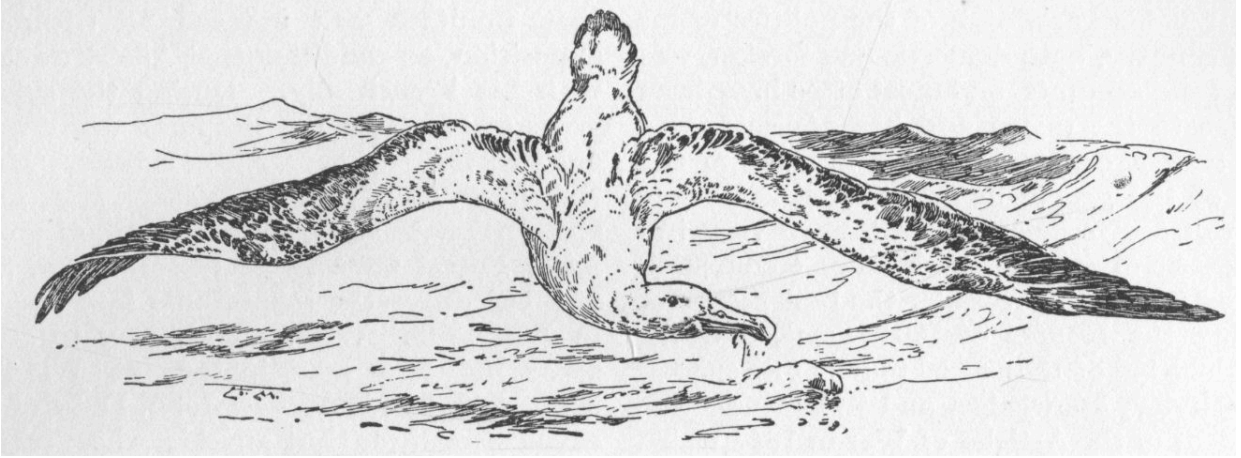


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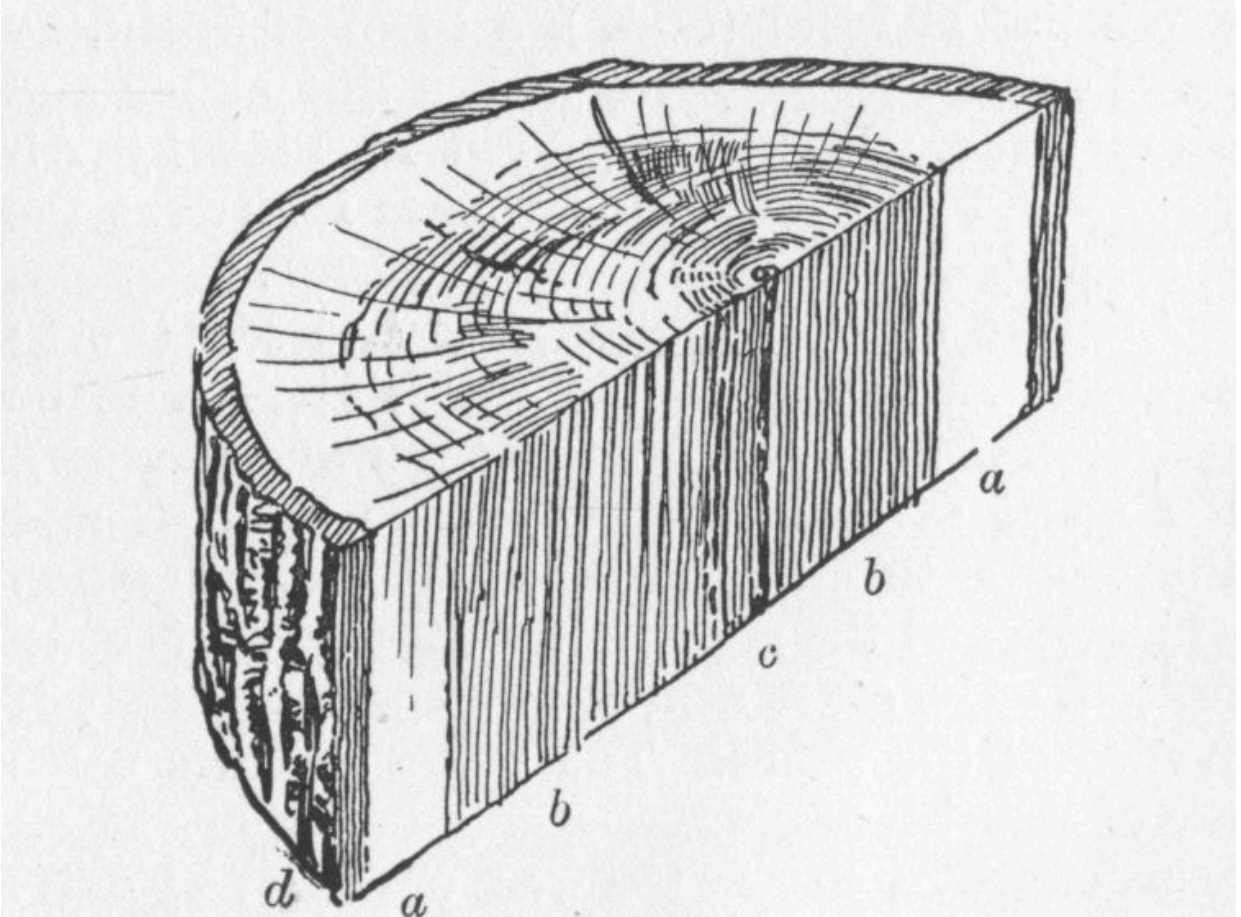
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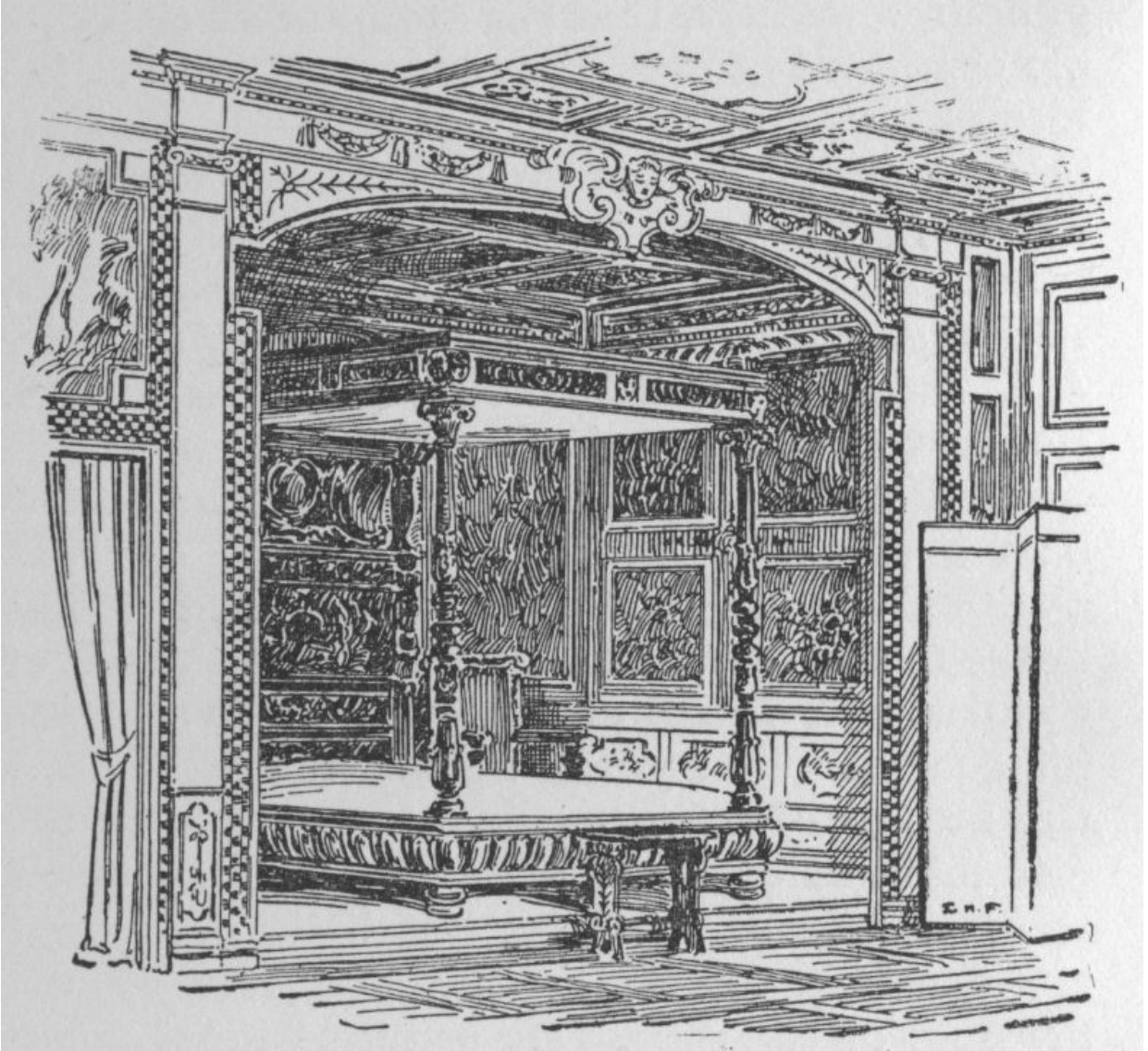
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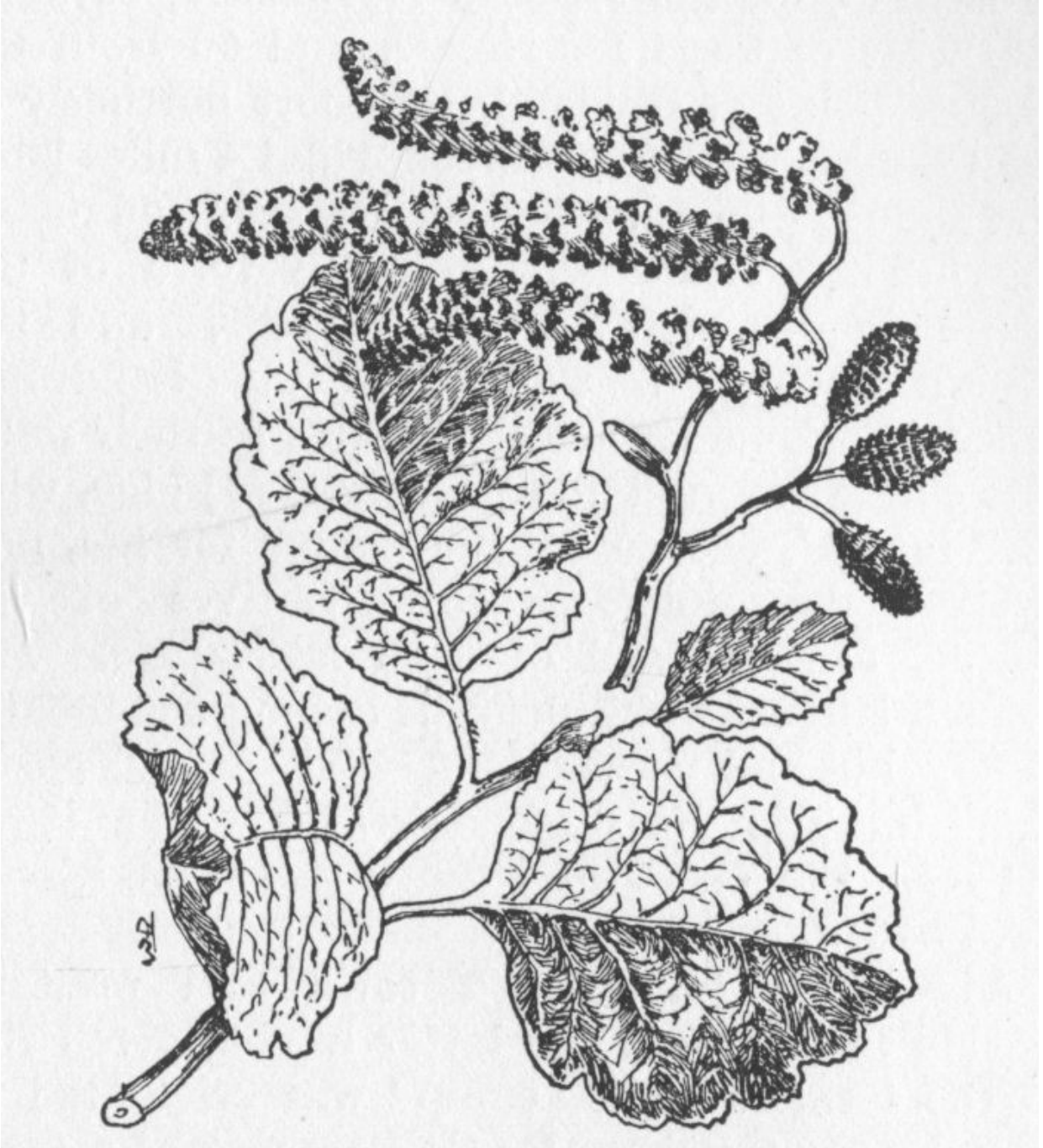
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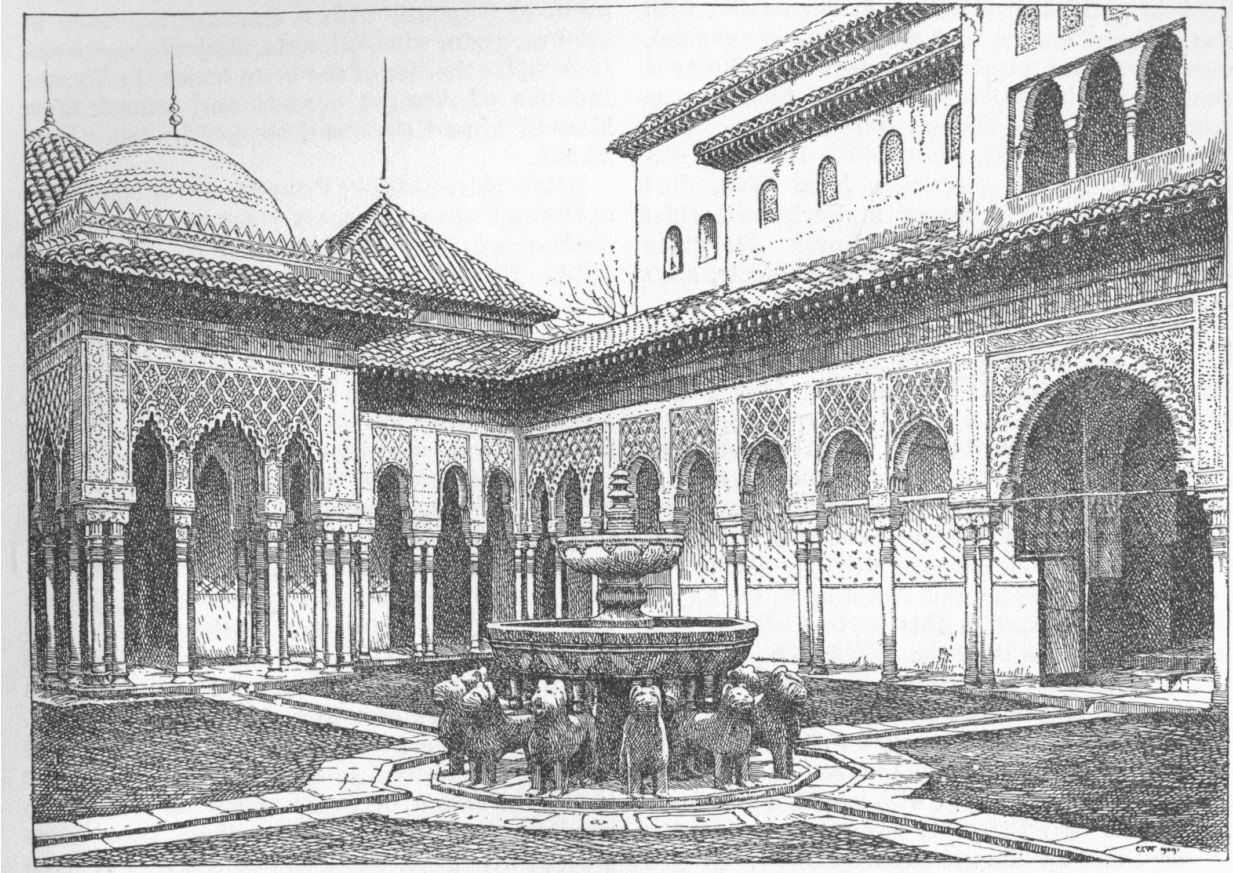
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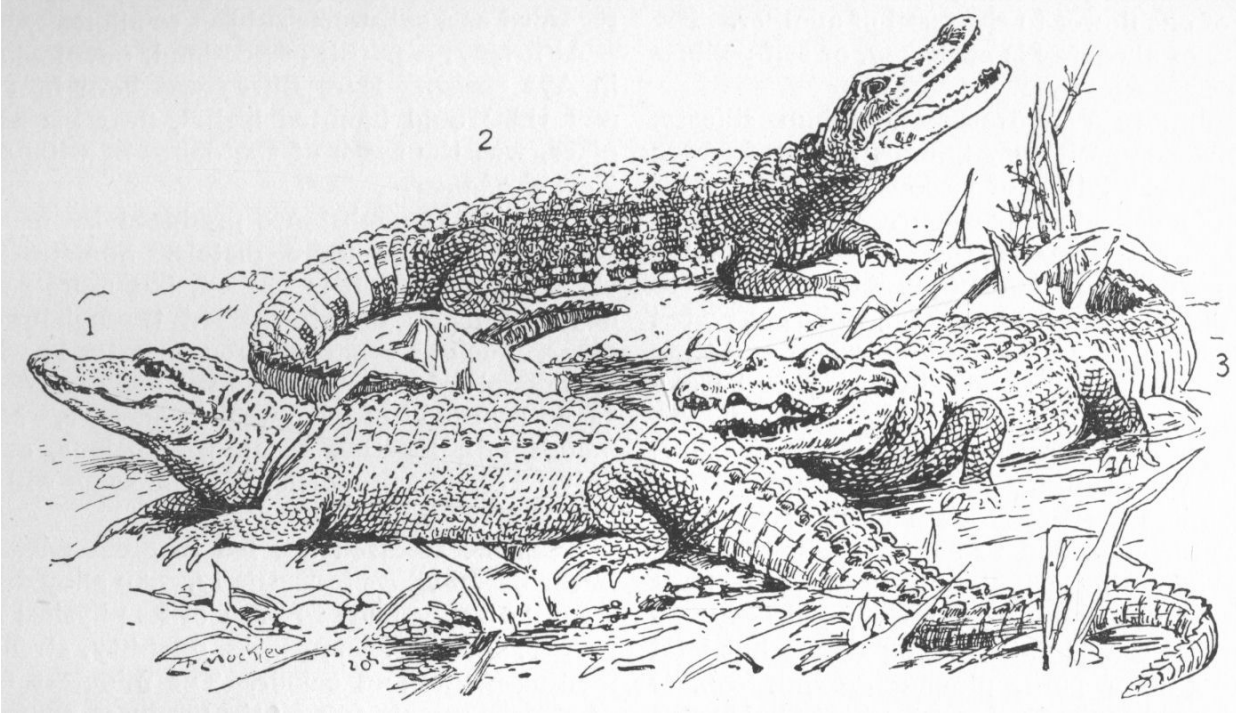
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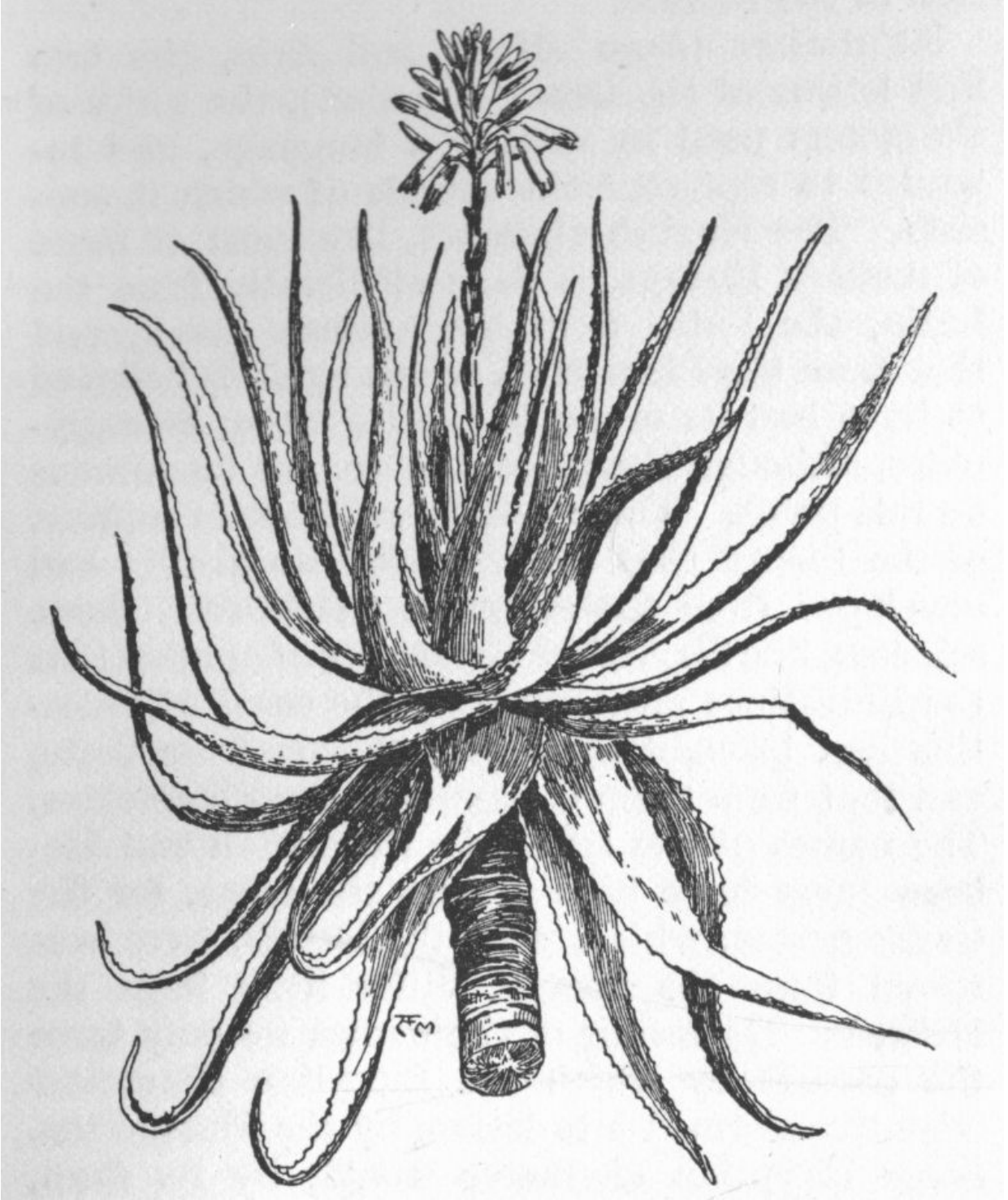
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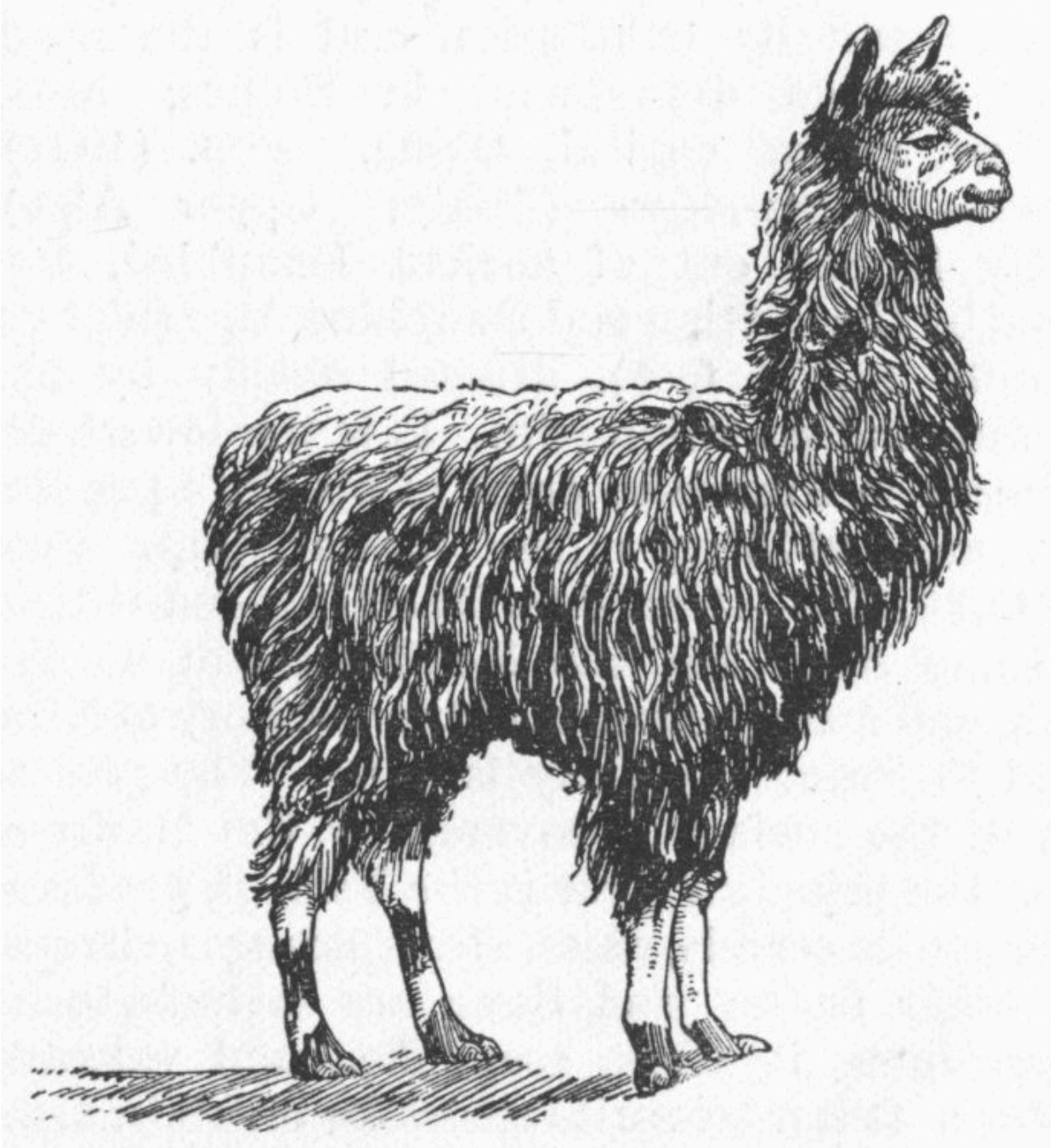
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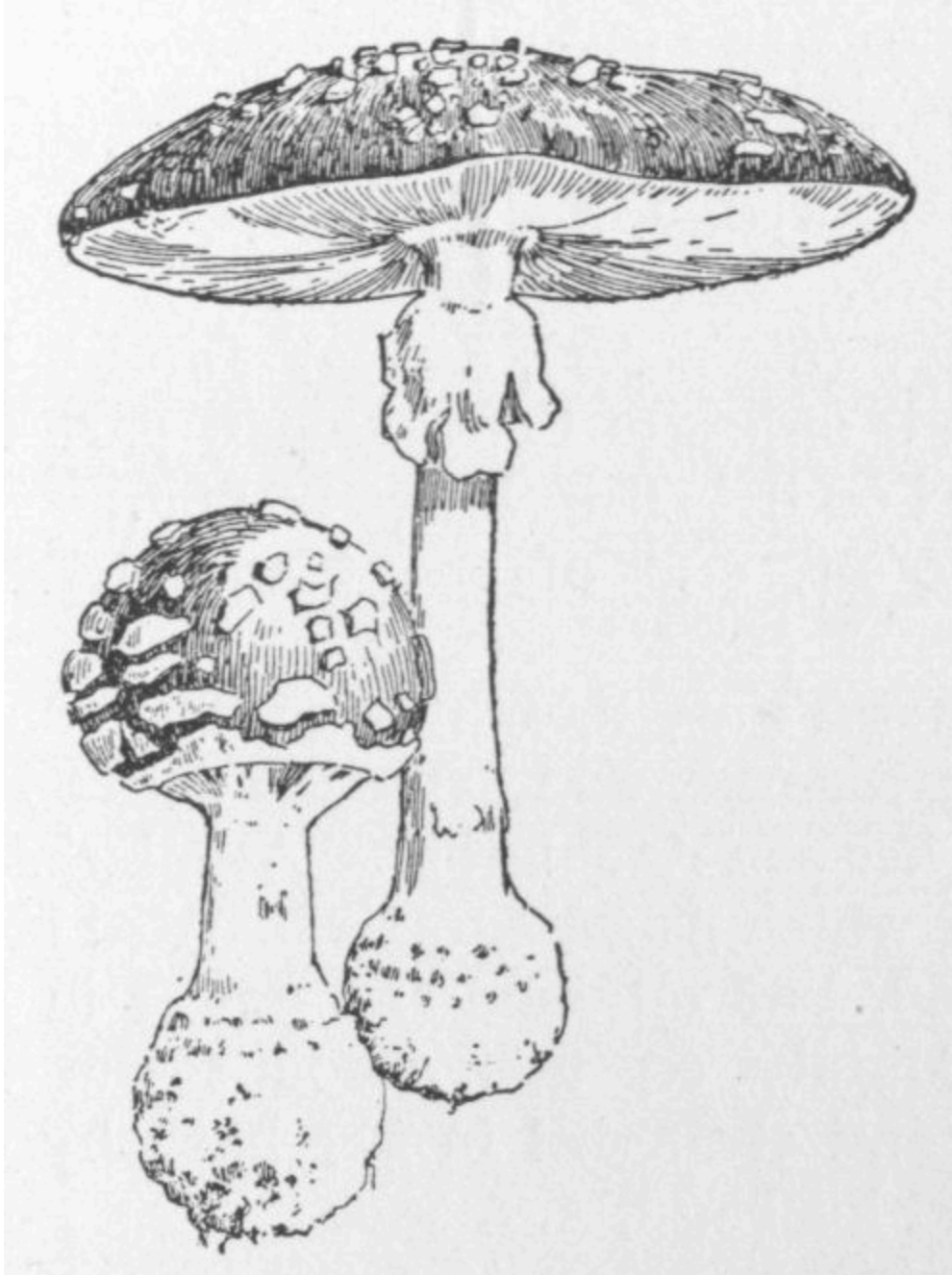
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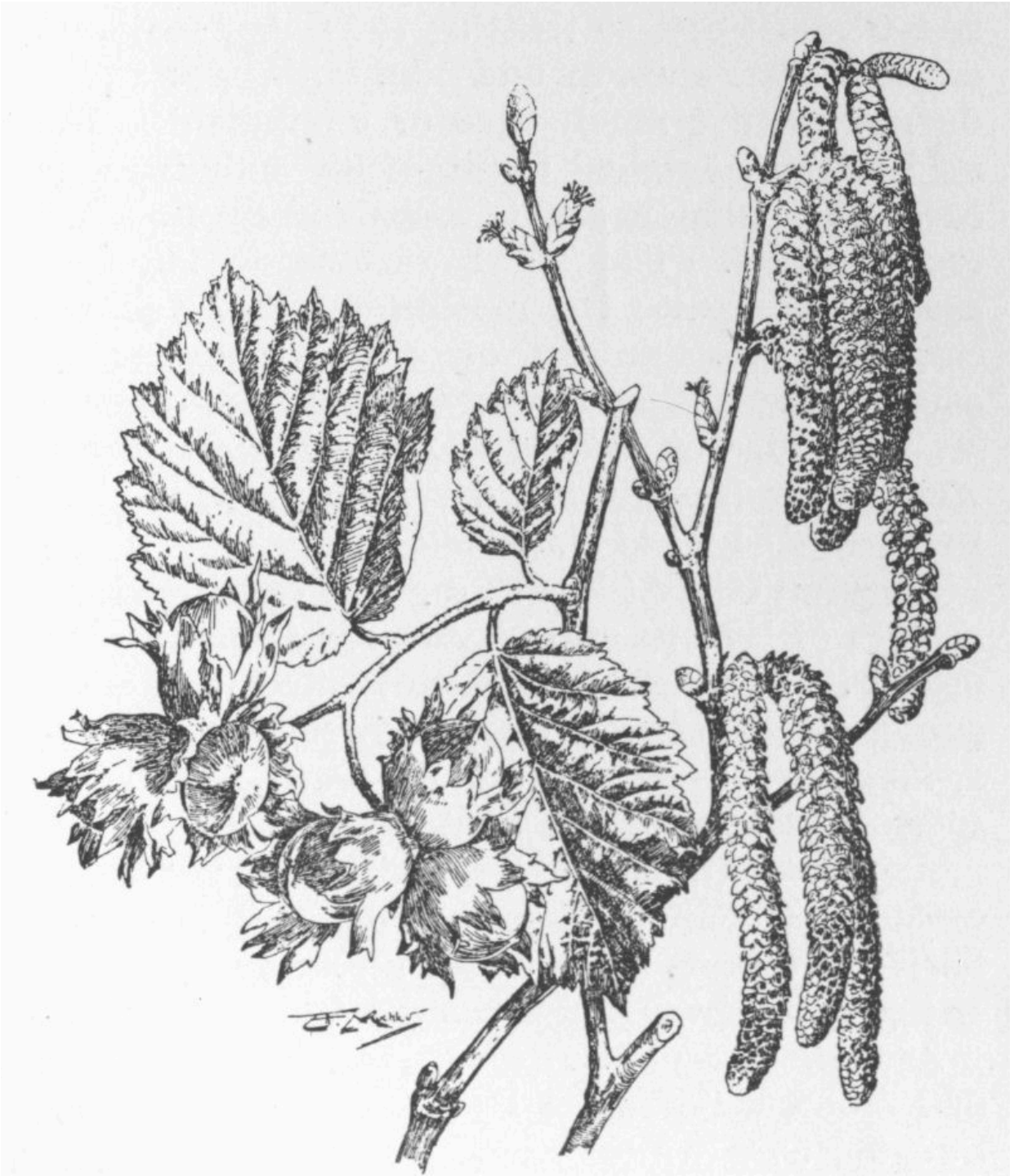
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