

THE
CAMBRIDGE
ENCYCLOPEDIA

THE
CAMBRIDGE
ENCYCLOPEDIA

EDITED BY
DAVID CRYSTAL



CAMBRIDGE
UNIVERSITY PRESS

à Becket, Thomas » Becket, St Thomas (à)

A-bomb » atomic bomb

à Kempis » Kempis

A level An abbreviation for **Advanced level**, the examination taken by British pupils, usually at the age of 18, which qualifies them for entrance to higher education and the professions. It is a single-subject examination at a level representing two further years of study beyond the GCSE. University matriculation requirements normally specify A levels in at least two subjects. One A level is deemed equivalent to two passes in the Advanced Supplementary (*A/S level*) examination.

Aachen [ahkhuhn] Fr **Aix-la-Chapelle** 50°47'N 6°04'E, pop(1983) 243 700. Manufacturing city in Cologne district. Germany; 64 km, 40 ml WSW of Cologne, near the Dutch and Belgian borders; N capital of Charlemagne's empire; 32 German emperors crowned here; annexed by France, 1801; given to Prussia, 1815; badly bombed in World War 2; railway; technical college; textiles, glass, machinery, chemicals, light engineering, foodstuffs, rubber products; 15th-c cathedral, town hall (1350); Bad Aachen hot springs; international riding, jumping, and driving tournament. » Charlemagne; Germany [1]; Prussia

Aakjaer, Jøppe [awkayr] (1866–1930) Danish novelist and poet, born at Aakjaer. A leader of the 'Jutland movement' in Danish literature, his works include the novel *Vredens Bøn* (1904, Children of Wrath) and the poems *Rugens Sange* (1906, Songs of the Rye). He wrote much in the Jutland dialect, into which he translated some of Burns's poems. He died at Jenle. » Danish literature

Aalto, Alvar [ahltoh] (1898–1976) Finnish architect, born at Kuortane, designer of modern public and industrial buildings in Finland, and also of contemporary furniture. In 1940 he went to the USA and taught architecture at Yale University and the Massachusetts Institute of Technology. He died in Helsinki.

Aaltonen, Wäinö (Valdemar) [ahltonen] (1894–1966) Finnish sculptor, born at St Märten, a versatile artist who worked in many styles. His best-known works are the bust of Sibelius, and the statue of the Olympic runner, Paavo Nurmi. » sculpture

aardvark [ahdvahk] A southern African mammal; length, 1–1.5 m, 3¼–5 ft; long ears, pig-like snout, long sticky tongue, strong claws; digs burrows; inhabits grassland and woodland; eats ants and termites; mainly nocturnal; also known as **ant bear** or **earth pig**. It is the only member of the order *Tubulidentata*. (*Orycteropus afer*. Family: *Orycteropodidae*.) » mammal [1]

aardwolf [ahdwulf] A rare southern African carnivore of the hyena family; slender, yellow with black stripes; inhabits dry plains; eats mainly termites; lives in a den (often an abandoned aardvark burrow); nocturnal; also known as **maned jackal**. (*Proteles cristatus*.) » carnivore [1]; hyena

Aare, River [ahrüh], Fr **Aar** Largest river entirely in Switzerland; emerges from L Grimsel in the Bernese Alps and flows N then W through L Brienz, L Thun, and L Biel to enter the Rhine; length, 295 km, 183 ml; navigable from the Rhine to Thun. » Switzerland [1]

Aarhus » Århus

Aaron, Hank, properly **Henry (Louis)** (1934–) US baseball player, born in Mobile, Alabama. He started his career with the Milwaukee Braves in 1954, and also played for the Atlanta Braves and Milwaukee Brewers. In 1974 he surpassed Babe

Ruth's 39-year-old record of career home runs, and retired in 1976 with a total of 755 home runs. » baseball [1]

Aaron (?c.13th-c BC) Brother of Moses and the first high priest of the Israelites. He was the spokesman for Moses to the Egyptian Pharaoh when attempting to lead their people out of Egypt. He and his sons were ordained as priests after the construction of the Ark of the Covenant and the Tabernacle. » golden calf; Levites; Moses; Zadokites

abaca A fibre obtained from the leaf-stalks of a species of banana, native to the Philippines; the oldest, outermost stalks give the strongest, darkest fibres, 0.9–2.7 m/3–9 ft long; also called **Manila hemp**. Strong and buoyant, it is used for ships' hawsers, cables, and carpets. (*Musa textilis*. Family: *Musaceae*.) » banana; fibre

abacus [abakuhs] A device for performing calculations by sliding bead counters along a set of rods or in grooves. In Japan, the abacus is called *soroban*, and is generally smaller than the Chinese equivalent. It is taught in primary schools as part of arithmetic, and there is a recognized examination and licence system. It is still used by some older people and shopkeepers, but young people prefer calculators.

Abadan [abadahn] 30°20'N 48°16'E, pop(1985e) 294 068. Oil port in Khuzestan province, WC Iran, close to the Iraq border; on Abadan I, in Shatt al-Arab delta, at head of Arabian Gulf; terminus of Iran's major oil pipelines; airport; severely damaged in the Gulf War. » Arabian Gulf; Gulf War; Iran [1]

Abailard » Abelard

abalone [abalohnee] A primitive marine snail which feeds on algae on rocky shores; characterized by a single row of holes extending back from the front margin of its ovoid shell, collected for decoration and for human consumption; also called **ormer**. (Class: *Gastropoda*. Order: *Archaeogastropoda*.) » algae; gastropod; snail

Abarbanel, Isaac Ben Jehudah, also **Abra vanel, Abrabanel** (1437–1508) Jewish writer, born in Lisbon, whose works comprise commentaries on the Bible and philosophical treatises. He died in Venice. His eldest son, **Juda Leon** (Lat **Leo Hebraeus**) (c.1460–1535), a doctor and philosopher, wrote *Dialoghi di Amore* (1535, Philosophy of Love). » Bible; Judaism

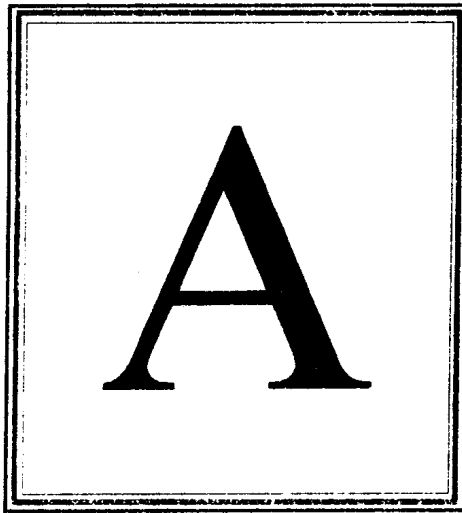
Abbas (566–652) Uncle of Mohammed, at first hostile to him, but ultimately the chief promoter of his religion. He was the founder of the Abbasid dynasty of rulers. » Abbasids; Mohammed

Abbas the Great (1557–1628) Shah of Persia (1585–1628), who won back lost territory from the Uzbeks, Turks, and the Great Mughal. His reign marked a peak of Persian artistic achievement, especially in such fields as painting, weaving, and manuscript illumination.

Abbasids [abasidz] A dynasty of caliphs, which replaced that of the Umayyads in 749, establishing itself in Baghdad until its sack by the Mongols in 1258. Early Abbasid power reached its peak under Harun al-Rashid (786–809). The Abbasids came from the family of the Prophet Mohammed's uncle al-Abbas, and were thus able to claim legitimacy in the eyes of the pious. » Abbas; Mohammed; Mongols

Abbe, Cleveland [abuh] (1838–1916) US meteorologist, born in New York City. He wrote on the atmosphere and on climate, inaugurated a national weather service (1870), and introduced the system of Standard Time. He died at Chevy Chase, Maryland. » meteorology; standard time

Abbe, Ernst [abuh] (1840–1905) German professor of optics, born at Eisenach, who partnered Carl Zeiss in the famous optical company. He deduced the mathematics of the optics of



the microscope, and this enabled him to design microscopic objectives scientifically, working with Otto Schott (1851-1935) to perfect optical glass, and (1886) producing lenses of the highest possible quality for scientific research. He died at Jena. >> aberrations [1]; microscope, optics [1]; Zeiss

abbey A building or group of buildings used by a religious order for worship and living. It houses a community under the direction of an abbot or abbess as head, who is elected for a term of years or for life. Abbeys were centres of learning in the Middle Ages. >> Belém Monastery; Chartreuse, La Grande; Clairvaux; Escorial, El; Fountains Abbey; monasticism

Abbey Theatre A theatre situated in Dublin's Abbey Street, the centre of the Irish dramatic movement initiated by Lady Gregory and WB Yeats. Best known for its championship of Synge and of the early plays of O'Casey, the Abbey was a major theatrical venue throughout the first 30 years of the 20th-c. The present theatre was opened in 1966, after the earlier building had burnt down in 1951. >> O'Casey; Synge

ABC Islands An abbreviated name often applied to the three main islands of Aruba, Bonaire, and Curaçao in the S Netherlands Antilles, off the N coast of S America. >> Netherlands Antilles [1]

Abd-El-Kader [abdelkahder] (1807-83) Algerian hero, born at Mascara. After the French conquest of Algiers, the Arab tribes of Oran elected him as their emir. He waged a long struggle against the French (1832-47), defeating them at Makta (1835). Eventually crushed by overpowering force, he took refuge in Morocco and began a crusade against the enemies of Islam. He finally surrendered in 1847 and was sent to France. He later lived in Brusa and in Damascus, where he died. >> Islam

Abd-El-Krim, Mohammed (1882-1963) Berber chief, born at Ajdir, Morocco, who led revolts in 1921 and 1924 against Spain and France. He surrendered before their combined forces in 1926, was exiled to Réunion, and later amnestied (1947). He then went to Egypt, where he formed the North African Liberation Committee. He died in Cairo.

Abdias, Book of >> **Obadiah, Book of**

Abdim's stork A small stork native to Africa and the SW Arabian Peninsula; feeds in drier habitats than other storks. eats insects, especially locusts. (*Ciconia abdimii*). >> stork

abdomen The lower part of the trunk, extending from within the pelvis to under the cover of the chest wall. Except for the vertebral column and ribs, it is bounded entirely by muscles. It contains most of the alimentary canal (from stomach to rectum), the liver, pancreas, spleen, kidneys and bladder, and the uterus in females. The cavity has a lining (the *peritoneum*) which covers or completely surrounds and suspends the majority of the various contents. Major blood vessels and nerves pass into it from the chest and out of it to the legs. >> alimentary canal; peritoneum; peritonitis; Plate XII

abdominal thrust >> **Heimlich manoeuvre** [1]

Abdul-Jabbar, Kareem, originally **Lewis Ferdinand Alcinder Jr** (1947-) US basketball player, born in New York City; his change of name came with his conversion to Islam in 1969. He turned professional with Milwaukee in 1970, and during his career played more National Basketball League games (1 560) than any other player, and scored more points, 38 387. He retired in 1989. >> basketball

Abel Biblical character, the brother of Cain and second son of Adam and Eve. He is described as a shepherd, whose offering God accepts; but he was then murdered by his brother, Cain (*Gen* 4.2-16). >> Adam and Eve; Cain; Old Testament

Abelard or **Abailard, Peter** (1079-1142) Boldest theologian of the 12th c, born near Nantes, France. While a lecturer at Notre-Dame, he fell in love with Héloïse, the 17-year-old niece of the canon Fulbert. The lovers fled together to Brittany, and were privately married. Soon after, Héloïse denied the marriage, lest it should stand in Abelard's way, and left her uncle's house for the convent of Argenteuil. Abelard then entered the abbey of St Denis as a monk. After his teaching on the Trinity was condemned as heretical, he retired to a hermitage, which later became a monastic school known as Paraclete. He then became abbot of St Gildas-de-Rhuys, Paraclete being given to Héloïse and a sisterhood. Later, at Cluny, he lived a model of asceticism and theological labour, and recanted some of

the doctrines that had given most offence. Again, however, his adversaries, headed by Bernard of Clairvaux, accused him of heresies, and he was found guilty by a council at Sens. On his way to Rome to defend himself, he died at the priory of St Marcel, near Chalon. His remains were buried by Héloïse at Paraclete, and hers were laid beside them in 1154 >> Bernard of Clairvaux; St; monasticism; theology; Trinity

Aberdeen, George Hamilton Gordon, 4th Earl (1784-1860) British statesman and Prime Minister (1852-5), born in Edinburgh, Scotland. Educated at Harrow and Cambridge, he succeeded to his earldom in 1801, and became a Scottish representative peer (1806), Ambassador to Vienna (1813-14), and Foreign Secretary (1828-30, 1841-6). In 1852, he headed a coalition ministry, which for some time was extremely popular. However, vacillating policy and mismanagement during the Crimean War led to his resignation. He died in London. >> Crimean War

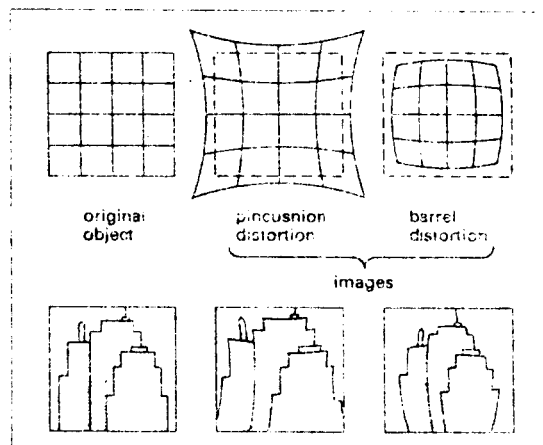
Aberdeen, ancient Devana 57 10N 2 04W, pop(1981) 190 465. Seaport capital of Grampian region, NE Scotland; on the North Sea, between Rivers Dee (S) and Don (N), 92 km/57 mi NE of Dundee; royal burgh since 1179; airport; helicopter port; ferries to Orkney and Shetland; railway; university (1494); port trade and fishing, finance, oil supply service, granite ('Granite City'), tourism; Art Gallery; Gordon Highlanders Regimental Museum; maritime museum; St Machar's Cathedral (1131); Bridge of Dee (1560); Bng o' Balgownie (c.1320), Aberdeen festival (Jul-Aug). >> Grampian; Scotland [1]

Aberdeen terrier >> **Scottish terrier**

Aberfan [abervan] 51 42N 3 21W. Village in coal-mining region, Mid Glamorgan, S Wales, UK; scene of major disaster in 1966, when a landslip of mining waste engulfed several houses and the school, killing 144, including 116 children >> Mid Glamorgan

aberrations 1 In optics, deviations in lenses from perfect images, as predicted by simple lens theory. They are consequences of the laws of refraction. *Chromatic* aberrations result from the dependence of the bending power of a lens on light colour, and may produce images having coloured haloes. Colour-independent aberrations (*monochromatic*) include some which deform an image (*distortion, field curvature*) and others which blur it (*spherical aberration, coma, astigmatism*). Aberrations in cameras, binoculars, and other optical instruments can be minimized using lens combinations. Mirrors have similar monochromatic aberrations to lenses, but no chromatic aberrations. >> astigmatism, lens, optics [1] 2 in astronomy, apparent changes in the observed position of a star, because of changes in relative velocity as the Earth orbits the Sun. >> orbit, star

Aberystwyth [aberistwith] 52 25N 4 05W, pop(1981) 11 170.



Distortion - An aberration caused by variation in the lens magnifying power with an object's distance from the lens axis.

University and resort town in Ceredigion district, Dyfed, SW Wales, UK; at the mouth of the Ystwyth and Rheidol Rivers, on Cardigan Bay; built around a castle of Edward I, 1227; college of University of Wales (1872); National Library of Wales (1955); railway, boatbuilding, brewing, agricultural trade; university theatre summer season. » **Dyfed**

Abidjan [abɛdʒɑ̃] 5°19'N 4°01'W, pop.(1980) 1 690 000. Industrial seaport and former capital (to 1983) of Côte d'Ivoire, W Africa; on N shore of Ebrié lagoon; capital, 1935; port facilities added in early 1950s; airport; railway; university (1958); farm machinery, metallurgy, car assembly, electrical appliances, plastics, soap, coffee and cocoa trade, timber products, tobacco, food processing, beer, chemicals; ifan museum. » Côte d'Ivoire [1]; Yamoussoukro

abiogenesis [ajbɛkɔʒjənəsɪs] » **spontaneous generation**
ablaut [ablɔʊt] Vowel changes in related forms of a word, found in Indo-European languages. Ablaut can be seen in English in several sets of verb forms, such as *drive/drove/driven*. » Indo-European languages; vowel

ABM » **antiballistic missile**

Abney level » **clinometer**

abnormal psychology The scientific study of the nature and origins of psychologically abnormal states. In contrast to clinical psychology and psychiatry, where the emphasis is on the assessment and treatment of individuals, abnormal psychology seeks more general theories about disorders, in such areas as personality, intelligence, and social behaviour. » behaviour therapy; clinical psychology; neurosis; psychoanalysis; psychosis; psychotherapy

Abø » **Turku**

abolitionism A 19th-c movement to end slavery in the US South; distinguished from earlier anti-slavery movements by its uncompromising attitude. Blacks as well as Whites, and women as well as men took active parts. Abolitionism crystallized around the American Anti-Slavery Society, founded in 1833. Its great achievement was to make slavery an issue that could not be ignored. » American Colonization Society; civil rights

Abomey [abomɛj] 7°14'N 2°00'E, pop.(1979) 41 000. Town in Zou province, S Benin, W Africa; 105 km/65 mi NNW of Porto Novo; capital of old Yoruba kingdom of Dahomey; burned by the Portuguese and abandoned to the French, 1892; Royal Palace of Djema, including the tomb of King Gbehanzin (still guarded by women), a world heritage site. » Benin (country) [1]; Dahomey; Yoruba

abominable snowman » **yeti**; **Bigfoot**

Aboriginal art The art of the Australian Aborigines, which has its roots in prehistory. Wooden sculptures occur, as in Arnhem Land, but most aboriginal art consists of painting with simple earth colours, plus charcoal and kaolin, on rock surfaces, bark, shells, trees, everyday utensils, and the human body. Much of this is purely decorative rather than functional, but some forms are associated with magic rituals. Rock art, both painted and scratched, occurs throughout the continent with local variations of style, sometimes figurative and sometimes geometric. » Aborigines; art; bark painting; Palaeolithic art

Aborigines The native inhabitants of Australia, belonging to the Australoid geographical race, who reached the country between 25 000 and 40 000 years ago. By 1788, when European occupation began, there were c.600 territorially defined groups, subsisting on hunting and gathering, with a population of 300 000-1 million. Numbers then fell dramatically, partly through conflict with the Europeans, but mainly through European diseases, especially the smallpox epidemics of 1789 and 1829. By 1933 the population had fallen to c.66 000; it then steadily increased, and reached 145 000 by 1981.

At first Europeans portrayed Aborigines as 'noble savages', but this image quickly gave way to contempt, and policies were designed to turn them into Christians with European lifestyles. In the late 19th-c, Social Darwinist ideas were influential, maintaining that Aborigines were an inferior race incapable of self-management and destined to die out. In Van Diemen's Land (Tasmania) the government removed the remaining Aborigines to Flinders I in the late 1820s; the last full-blooded Aborigine, Truganini, died there in 1876. Elsewhere in Australia,

they were confined to government reserves or Christian missions.

Aborigines have not accepted their lot passively. In the 1950s they began moving into the cities of SE Australia and formed advancement groups; but it was not until the mid-1960s that activism became prominent. In 1965 Charles Perkins (1936-) became the first Aboriginal university graduate, and helped organize 'freedom rides' in New South Wales to protest against discrimination. In 1967 90.8% of Australian voters approved a referendum which granted the federal government the power to count Aborigines in the census and to make laws on their behalf, thus enabling them to be provided with official assistance. Although their condition has since improved significantly, they remain the most disadvantaged group in Australian society. Their disadvantages were the basis for a campaign, begun in 1972, for 'land rights'. Opposition to their claims has come from mining and pastoral interests, and from conservative governments, particularly in Queensland. Nevertheless by the mid-1980s Aborigines had gained freehold title to about 6% of Australia (mostly in the centre), and were in the process of being granted further areas. » Australia [1]; Australian languages; Myall Creek massacre

abortion The spontaneous or induced termination of pregnancy before the foetus is viable. In the UK and for legal purposes, this is taken to be the 24th week, although some foetuses expelled before then may survive. In the USA and in some European countries, the time limit is set some weeks earlier. Spontaneous abortion (*miscarriage*) occurs in about 20% of apparently normal pregnancies, and may not be recognized. It may arise from defects in the products of conception, in the uterus and placenta, or in the maternal environment, such as maternal illness. Abortion can be induced by the use of drugs and by surgical procedures. Unless permitted by the Abortion Acts, induced abortion is a criminal offence. » pregnancy [1]

Aboukir Bay, Battle of I (Aug 1798) A naval battle during the War of the Second Coalition, in which Nelson destroyed the French fleet under Brueys off the coast of Egypt; also known as the **Battle of the Nile**. This victory forced Napoleon to abandon his Egyptian campaign, aimed at threatening British territory in India, and return to France. 2 (Jul 1799) The last French victory of the Egyptian campaign, in which Napoleon's Army of Egypt captured Aboukir citadel, NE of Alexandria, defeating an Ottoman Turkish force over twice the size, led by Mustafa Pasha. » Napoleon I; Nelson, Horatio

Abrahanel » **Abarbanel**

Abraham or Abram (after 2000 bc) Biblical character revered as the ancestor of Israel and of several other nations; also an important figure in Islam. He is portrayed as called by God to travel with his wife Sarah and nephew Lot from the Chaldean town of Ur to Haran in NW Mesopotamia and finally to Canaan, having been promised a land and descendants which would become a great nation (*Gen* 12, 15). He had a son Ishmael by his wife's maid Hagar, but finally at 100 years of age is said to have had a son Isaac by his own previously barren wife, Sarah (*Gen* 21). In Judaism, Isaac was seen as the fulfilment of the divine promises, although Abraham was nearly ordered by God to sacrifice his heir at Moriah as a test of faith (*Gen* 22). » Bible; Hagar; Isaac; Ishmael; Islam; Judaism; Sarah

Abraham, Plains/Heights of The site of a battle (1759), Quebec City, Canada, in which British forces under Wolfe defeated a French/Canadian force under Montcalm and Vaudreuil, and gained control over Quebec. Wolfe and Montcalm were both killed in the battle. » Montcalm; Wolfe, James

Abram » **Abraham**

abrasives Hard, rough, or sharp textured materials used to wear down, rub, or polish materials which are less hard, as in the traditional grindstone or whetstone. Naturally occurring abrasive substances include various forms of silica (sand, quartz, or flint), pumice, and emery (an aluminium oxide mineral). Artificial abrasives include silicon carbide, synthetic diamond, and boron carbide. They can be used as powders or incorporated in hand or machine tools. » emery; pumice; silica

Abrahanel » **Abarbanel**

Abruzzi or Abruzzo [abruotsee] area 400 sq km/154 sq mi.

- National park in the S of Abruzzi region, EC Italy, between the Apennines and the Adriatic Sea, in the valley of the upper Sangro; established in 1922; cereals, fishing, tourism; resort village of Pescasseroli. > Italy [1]
- abscess** A localized collection of pus in an organ or tissue, surrounded by an inflammatory reaction which forms a well-defined wall (an abscess cavity). It is commonly due to infection with pus-forming (*pyogenic*) bacteria, but occasionally a foreign body may be responsible. > boil; carbuncle; pus
- absolute zero** The temperature of a system for which a reversible isothermal process involves no heat transfer. It represents the state of lowest possible total energy of a system, and is denoted by 0K (-273.15°C). It is unattainable, according to the third law of thermodynamics. > energy; heat; isotherm; kelvin; thermodynamics
- absolution** A declaration of forgiveness of sins. In Christian worship, it is understood as God's gracious work in Jesus Christ, pronounced by a priest or minister either in private after confession or as part of the liturgy in public worship. > Christianity; confession; liturgy; priest; sin
- absolutism** A theory of kingship elaborated and practised in early modern Europe, associated notably with Louis XIV of France; sometimes equated loosely with systems of government in which one person exercises unlimited power. Absolute power was justified by the belief that monarchs were God's representatives on Earth. Armed with this notion of Divine Right, kings were owed unquestioning obedience by their subjects; as a corollary, the powers of hereditary monarchs were tempered by concepts of fundamental law and responsibility to their subjects and to God. > Divine Right of Kings; Louis XIV
- absorbed dose** > radioactivity units [1]
- abstract art** A form of art in which there is no attempt to represent objects or persons, but which relies instead on lines, colours, and shapes alone for its aesthetic appeal. It seems to have emerged c.1910, and was partly a reaction against 19th-c Realism and Impressionism. Early abstract artists include Kandinsky, Miró, Pevsner, and Brancusi. Stylistically, abstract art ranges from the 'geometrical' (Mondrian, de Stijl, Constructivism) to the 'organic' (Arp, Moore). More recent developments include action painting and Op Art. Historically, abstract tendencies have been present in one form or another in most cultures. Two trends should be distinguished: (a) the simplification, distortion, or reduction of natural appearances, characteristic not only of Cubism, Expressionism, and many other kinds of modern art, but present too in much figurative art in earlier periods (such as Mannerism), which always has its starting-point in objective reality; and (b) the total rejection - in theory, at least - of any dependence on natural appearances. Such works establish their own 'reality' and are intended to appeal in their own right. Only the latter should, strictly speaking, be called 'abstract', but the term is often used imprecisely to cover a wide range of 20th-c art. > action painting; art; biomorphic art; concrete art; Constructivism; Cubism; De Stijl; figurative art; Op Art; Arp; Brancusi; Kandinsky; Miró; Mondrian; Moore, Henry; Pevsner, Antoine; Plate XV
- abstract expressionism** > action painting
- absurdism** The expression in art of the meaninglessness of human existence. It is explored in Camus' *Le Mythe de Sisyphe* (1942, *The Myth of Sisyphus*), where human efforts are seen as pointless but compulsory. The potential for comedy and terror has been exploited especially in the theatre (*Theatre of the Absurd*), as in the plays of Ionesco, Beckett, and Pinter. > Beckett; Camus; comedy; drama; Ionesco; Pinter; tragic-comedy
- Abu-Bakr** or **Abu-Bakr** (573-634) Father of Mohammed's wife, Ayesha, born at Mecca. He became the Prophet's most trusted follower, succeeded him as the first caliph (632), and began the compilation of the Koran. He died at Medina and was buried near Mohammed. > Koran; Mohammed
- Abu Dhabi** or **Abu Zabi** [aboo dabec] pop (1980) 449 000; area c.67 600 sq km/26 000 sq ml. Largest of the seven member states of the United Arab Emirates; bounded NW by Qatar, S and W by Saudi Arabia, and N by the Arabian Gulf; vast areas of desert and salt flats; coastline 400 km/250 ml; capital Abu Dhabi, pop (1980) 242 985; main oasis settlement, Al Ayn; a major oil region; petrochemical and gas liquefaction industry at Das I; power and desalination complex at Taweelah. > Ayn, Al; United Arab Emirates [1]
- Abu Mena** [aboo mena] A site in NW Egypt sacred to the 3rd-c AD martyr Abu Mena (St Menas). Many miracles were associated with his burial place, which was a centre of pilgrimage for 400 years. The ruins of the early 5th-c basilica erected here by Emperor Arcadius are a world heritage site. > Egypt [1]
- Abu Simbel** 22°22'N 31°38'E. The site of two huge sandstone temples carved by Pharaoh Rameses II (c.1304-1273 BC) out of the Nile bank near Aswan; now a world heritage site. They were dismantled and re-located in the 1960s when the rising waters of the newly-constructed Aswan High Dam threatened their safety. > Rameses II
- Abuja** [abooja] 9°05'N 7°30'E. New capital (from 1982) of Nigeria, in Federal Capital Territory, C Nigeria; planned in 1976, to relieve pressure on the infrastructure of Lagos; under construction at the geographical centre of the country; government offices began moving from Lagos in the 1980s. > Nigeria [1]
- abulia** A lack of drive or inability to make decisions or to translate decisions into action. The term was considered a cardinal feature of schizophrenia by early psychiatrists, and can be paraphrased as 'the spirit is willing but the energy for action is lacking'. > schizophrenia
- abysal hills** Low hills which occur on the deep sea floor. Large areas of the Atlantic and Indian Ocean floors are covered by these hills, no higher than about 1 000 m/3 000 ft. They tend to occur as series of parallel ridges 1-10 km/½-6 ml across, and represent the rugged topography of mid-ocean ridges subdued by burial beneath thick layers of sediments. > abyssal plains; oceanic ridges
- abyssal plains** Extremely flat areas of the deep ocean floor which may extend for more than 1 000 km/600 ml. They typically have slopes less than 1:1 000, and are found off continental margins where sediments can enter the deep sea unobstructed. They are common in the Atlantic and Indian oceans, but rare in the Pacific, where deep trenches and island arcs serve as barriers to the transport of sediment from the continents. Abyssal plains represent thick deposits of primarily land-derived sediments smoothing over more rugged topographic features of the sea floor. > continental margin; island arc
- Abyssinia** > Ethiopia [1]
- Abyssinian cat** A breed of domestic cat, popular in the USA (known as the 'foreign short-haired'); reddish-brown, each hair with several dark bands; orange-red nose; two types: **Abyssinian** (standard Abyssinian or ruddy Abyssinian) and the redder **red Abyssinian**. > cat
- acacia** > wattle [1]
- Academy** 1 A place of learning or association formed for scientific, literary, artistic, or musical purposes, the word deriving from the Greek hero *Academus*, who gave his name to the olive grove where Plato taught (387 BC). From the Renaissance the term was applied to institutions of higher learning (eg the *Accademia della Crusca*, 1587) and advanced teaching (until the term 'university' became widespread in the 18th-c). It was also used to describe societies of distinguished figures and experts in the arts and sciences (eg the *Académie Française*, 1634). Since the 19th-c, the term has been used in many countries for national centres to promote science, literature, and the arts. 2 The American Academy of Motion Picture Arts and Sciences, widely known since 1927 for its annual awards for creative merit and craftsmanship in film production. It has been influential in establishing technical standards. > Oscar, RR101
- Acadia** Part of France's American empire; what is today Prince Edward Island, Nova Scotia, and New Brunswick. The first settlement was established at Port Royal in 1605 by Champlain, and the area was exchanged between France and England until the Treaty of Utrecht (1713) handed most of Acadia to Britain. In 1755 10 000 Acadians were evicted from the territory for refusing to pursue a policy of neutrality in the

conflicts between France and Britain. The last French stronghold, Louisbourg, fell in 1758. >> Champlain

acanthus [akanthuhs] A plant with thick, prickly leaves, representations of which are often used to decorate mouldings or carved parts of a building; in particular, the capitals of Corinthian columns. >> capital (architecture); Corinthian order

Acapulco [akapulkoh] or **Acapulco de Juarez** 6°51N 99°56W, pop(1980) 409 335. Port and resort town in Guerrero state, S Mexico; on the Pacific Ocean, 310 km/193 ml SSW of Mexico City; airfield; leading Mexican tourist resort ('the Mexican Riviera'); Fort San Diego. >> Mexico [1]

Acari [akariy] >> mite

ACAS [aykas] An acronym for **Advisory, Conciliation and Arbitration Service**, a UK body set up under the Employment Protection Act (1975) under the management of a Council appointed by the Secretary of State for Employment. Its function is to provide facilities for conciliation, arbitration, and mediation in industrial disputes.

acceleration For linear motion, the rate of change of velocity with time; equals force divided by mass; symbol a , units m/s^2 ; a vector quantity. For rotational motion, the rate of change of angular velocity with time; equals torque divided by moment of inertia; angular acceleration symbol α , units $radians/s^2$; a vector quantity. >> acceleration due to gravity; force; torque [1]; vector (mathematics); velocity

acceleration due to gravity The acceleration on an object close to the Earth, due to the Earth's gravitational field; symbol g . Its value is usually taken as $9.81 m/s^2$, but it varies between 9.76 and 9.83 over the Earth's surface because of geological variations, and decreases with height above sea level. >> acceleration; free fall; gravitation

accent 1 The features of pronunciation which mark a speaker's regional background or social class. Accent is to be distinguished from dialect, which involves the study of other linguistic features, such as grammar and vocabulary. >> dialectology

2 The emphasis on a syllable in speech, resulting from a combination of loudness, pitch, and duration. It can be clearly heard in the contrast between the two forms of *present* (noun), *present* (verb). >> phonetics

accentor A sparrow-like bird native to N Africa, Europe, and Asia; brownish-grey to chestnut above, often streaked; grey beneath; feeds on ground; eats insects in summer, seeds in winter. (Genus: *Prunella*, 12 species. Family: *Prunellidae*.) >> dunno

accepting house A merchant bank which buys ('accepts') three-month bills of exchange issued by companies. In the UK, the top accepting houses in London form the Accepting Houses Committee. >> bill of exchange

access course A bridging course offered to would-be students not in possession of normal entry requirements which, on successful completion, will permit them to start the course of their choice. It is often provided specifically for students who have been prevented from obtaining formal qualifications, or who have been otherwise disadvantaged. >> vocational education

access time The length of time required to retrieve information from computer memory or other computer storage media, such as magnetic disks or tapes. Access times from integrated circuit memory are much shorter than those from magnetic disks. >> magnetic disk; magnetic tape 2; memory, computer

accessory >> accomplice

accomplice A person who participates with at least one other in committing a crime. The accomplice may be a *perpetrator* or an *accessory*, ie someone who either incites the crime or assists the perpetrator after it has been committed.

accordion A portable musical instrument of the reed organ type, fed with air from bellows activated by the player. In the most advanced models a treble keyboard is played with the right hand, while the left operates (usually) six rows of buttons, producing bass notes and chords. The earliest type was patented in Vienna in 1829, since when, despite continuous improvements to its tone and mechanism, it has remained primarily an instrument for popular music, though several major 20th-c composers, including Berg and Prokofiev, have

written for it. >> aerophone; Berg; keyboard instrument; Prokofiev; reed organ

accountancy The profession which deals with matters relating to money within an organization. Traditionally its role was that of recording the organization's economic transactions; but it now handles a wide range of activities, including financial planning, management accounting, taxation, and treasury management (managing money), as well as recording and presenting accounts for management and owners. The content and form of published information is set by company law and the Stock Exchange (for a public company). >> amortization; audit; cost-accounting; depreciation

Accra 5°33N 0°15W, pop(1970) 636 067. Seaport capital of Ghana, on the Gulf of Guinea coast, 415 km/258 ml WSW of Lagos; founded as three forts and trading posts, 17th-c; capital of Gold Coast, 1877; capital of Ghana, 1957; airport; railway; university (1948) at Legon 13 km/8 ml W; food processing, fishing, brewing, engineering, scrap metal trade, cacao, gold, timber, fruit, export of zoo animals. >> Ghana [1]

accretion In astronomy, a process in which a celestial body, particularly an evolved dwarf star in a binary star system, or a planet, is enlarged by the accumulation of extraneous matter falling in under gravity. In binary stars this can cause intense X-ray emission. >> binary star; dwarf star; X-rays

acculturation A process involving the adoption and acceptance of the ideas, beliefs, and symbols of another society. This may occur by *immigration*, when incoming members of a society adopt its culture, or by *emulation*, when one society takes on cultural features from another, such as happened in colonial contexts. >> migration 1

acetaldehyde [asitaldihyd] CH_3CHO , IUPAC **ethanal**, boiling point $21^\circ C$. The product of gentle oxidation of ethanol, intermediate in the formation of acetic acid; a colourless liquid with a sharp odour. A reducing agent, the compound is actually the one detected in the 'breathalyzer' test. >> acetic acid; aldehyde; IUPAC; paraldehyde [1]

acetals [asiltz] Substances of the general structure $R_2C(OR)_2$, formed by the reaction of an alcohol with an aldehyde, water also being formed. Internal acetal formation gives most sugars ring structures. >> alcohols; aldehyde; glucose [1]; ring

acetate film >> safety film

acetic acid [asetik] CH_3COOH , IUPAC **ethanoic acid**, boiling point $118^\circ C$. The product of oxidation of ethanol. The pure substance is a viscous liquid with a strong odour. Its aqueous solutions are weakly acidic; partially neutralized solutions have a pH of about 5. Vinegar is essentially a 5% solution of acetic acid. >> acid; buffer (chemistry); ethanol; IUPAC; pH

acetone [asitohn] CH_3COCH_3 , IUPAC **propanone**, boiling point $56^\circ C$. A volatile liquid with an odour resembling ethers. It is a very widely used solvent, especially for plastics and lacquers. >> ether; IUPAC; ketone

acetyl [asitiyl] CH_3CO- , IUPAC **ethanoyl**. A functional group in chemistry, whose addition to a name usually indicates its substitution for hydrogen in a compound. >> functional group; hydrogen; IUPAC

acetylcholine [asitiylkohleen] An acetyl ester of choline ($C_7H_{16}NO_2^+$) which functions as a neurotransmitter in most animals with nervous systems. In mammals it is present in the brain, spinal cord, and ganglia of the autonomic nervous system, as well as the terminals of motor neurones (which control skeletal muscle fibres) and the post-ganglionic fibres of the parasympathetic nervous system. >> acetyl; choline; ester [1]; ganglion 1; nervous system; neurotransmitter

acetylene [asetilcen] $HC\equiv CH$, IUPAC **ethyne**, boiling point $-84^\circ C$. The simplest alkyne, a colourless gas formed by the action of water on calcium carbide. It is an important starting material in organic synthesis, and is used as a fuel, especially (mixed with oxygen) in the oxyacetylene torch. >> alkynes; IUPAC; oxyacetylene welding

Achaean [akeeanz] 1 The archaic name for the Greeks, found frequently in Homer. 2 In classical Greece, the inhabitants of Achaia, the territory to the south of the Corinthian Gulf. >> Greek history

Achaemenids [akiyemenidz] The first royal house of Persia, founded by the early 7th-c ruler, Achaemenes. Its capitals

included Parsagadae and Persepolis.
 » Cyrus II; Darius I; Persian Empire; Xerxes I

Achebe, Chinua [achaybay] (1930–) Nigerian novelist, born at Ogidi, and educated at Umuchia and Ibadan. Four novels written between 1958 (*Things Fall Apart*) and 1966 (*A Man of the People*) describe inter-tribal and inter-racial tensions in pre- and post-colonial Nigerian society. In 1966 he became involved in the war between Biafra and the rest of Nigeria, and devoted most of his time thereafter to politics and education, producing no more fiction until *Anthills of the Savannah* (1987). » African literature; novel

Achelous, River, Gr Akhelóds [akiloɦuhs] Second longest river of Greece; rises in the Pindhos Mts, flows S through mountain gorges to the fertile Agrinion plain and enters the Ionian Sea opposite Cephalonia I; length 220 km/137 ml.
 » Greece [1]

Achenbach, Andreas [akhenbakh] (1815–1910) German landscape and marine painter, born at Kassel. His paintings of the North Sea coasts of Europe had considerable influence in Germany, and he was regarded as the father of 19th-c German landscape painting. He died at Düsseldorf. » German art; landscape painting

achene [uhkeens] A dry fruit, not splitting to release the single seed. It is usually small, often bearing hooks, spines, or other structures which aid in dispersal. » fruit

Achernar [akernuh] » Eridanus

Acheron [akeron] In Greek mythology, the chasm or abyss of the Underworld, and the name of one of the rivers there. It is also the name of a river in Epirus, which disappeared underground, and was thought to be an entrance to Hades. » Charon (mythology); Hades

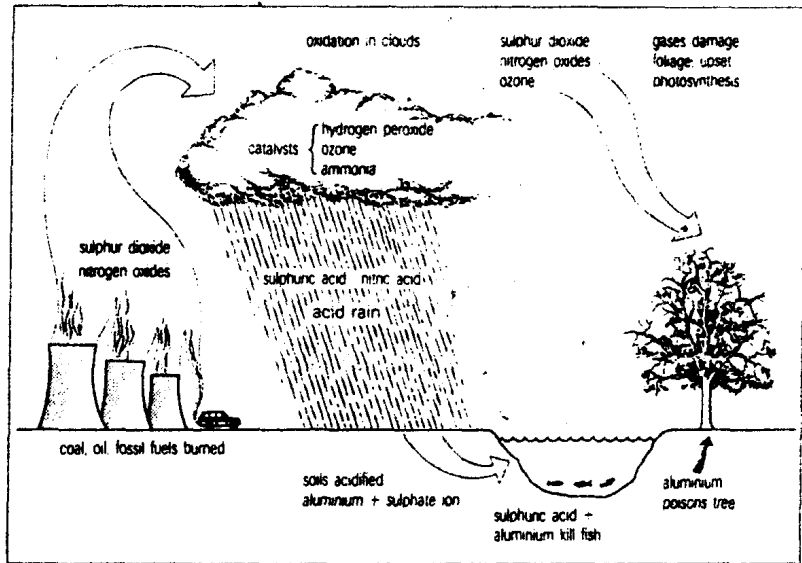
Acheson, Dean (Gooderham) [aychesuhn] (1893–1971) US lawyer and politician, born at Middletown, Connecticut. Educated at Yale and Harvard, he was under-secretary (1945–7) and then Secretary of State (1949–53) in the Truman administration. He helped to establish the Marshall Plan (1947) and also the North Atlantic Treaty Organization (1949). He died at Sandy Spring, Maryland. » Marshall Plan; NATO; Truman

Acheulian [ashoolceuhn] In Europe, Africa, and Asia, a broad term for early prehistoric cultures using symmetrically-flaked stone handaxes. These first appear in E Africa (eg at Koobi Fora, Kenya) c.1.5 million years ago, but were still being made c.100 000 bc. In Europe they are characteristic of N France/England during the Lower Palaeolithic Age, c.300 000–200 000 bc. The name derives from finds made c.1850 at Saint-Acheul, a suburb of Amiens in the Somme Valley, N France. » Three Age System

achievement test A test used to measure educational attainment in different fields. It may involve assessment of knowledge, skills, and understanding through written papers, oral, or practical examinations. » continuous assessment

Achilles [akileez] A legendary Greek hero, son of Peleus and Thetis, who dipped him in the R Styx so that he was invulnerable, except for the heel where she had held him. When the Trojan War began, his mother hid him among girls on Scyros, but he was detected by Odysseus and so went to Troy. The whole story of the *Iliad* turns on his excessive pride; in his anger he sulks in his tent. When his friend Patroclus is killed, he rejoins the battle, kills Hector, brutally mistreats his body, but finally allows Priam to recover it. He was killed by Paris, who shot him in the heel with a poisoned arrow.

achondroplasia [aykondruplayzhuh] An inherited form of dwarfism, in which growth of the limb bones is disproportionately shortened. There is a characteristic bulging of the fore-



Acid rain – The chain from pollutants to acidified lakes and dying trees

head, and saddle nose. Circus dwarfs are commonly achondroplastic. » congenital abnormality; dwarfism

acid Usually, a substance reacting with metals to liberate hydrogen gas, or dissolving in water with dissociation and the formation of hydrogen ions. Acids are classed as strong or weak depending on the extent to which this dissociation occurs. More general concepts of acidity are that an acid is a proton donor or an electron acceptor. Strong acids are corrosive. » base (chemistry); corrosion; dissociation; pH

acid rain A term first used in the 19th-c to describe polluted rain in Manchester, UK. Colloquially it is used for polluted rainfall associated with the burning of fossil fuels. Acid pollution can be wet (rain, snow, mist) or dry (gases, particles). A number of gases are involved, particularly sulphur dioxide (SO₂) and oxides of nitrogen (NO). Reactions in the atmosphere lead to the production of sulphuric acid (H₂SO₄) and nitric acid (HNO₃). In Europe c.85% of SO₂ in the air comes from the burning of fossil fuels; chemical plants which remove the sulphurous emissions are being fitted to some power stations. The main emissions of oxides of nitrogen, including (NO) and (NO₂), are from fossil-fuel power generation and the internal combustion engine. Acid rain is implicated in damage to forests and the acidification of soils and lakes. In 1985, 19 countries formed the 'Thirty Percent Club', agreeing to lower their emissions of SO₂ by 30% by 1993, using 1980 emissions as the baseline. » fossil fuel; greenhouse effect; nitric acid; sulphuric acid

acidic oxide » oxide

acne A chronic inflammation of the sweat glands in the skin, notably affecting the face, upper chest, and back. It is particularly found in adolescents. » chloracne; gland

Aconcagua, Cerro [akonkagwa] 32°39S 70°01W. Mountain rising to 6960 m/22834 ft in Mendoza province, W Argentina; in the Andes, E of the Chilean border; 112 km/70 mi WNW of Mendoza; the highest peak in the W hemisphere; Uspallata Pass at its S foot; first climbed in 1897 by the Fitzgerald expedition. » Andes

aconite » monkshood; winter aconite

acorn The fruit of the oak tree, actually a specialized nut borne in a cup-shaped structure, the cupule. » fruit; nut; oak

acornworm A worm-like, marine invertebrate, length up to 2.5 m/8½ ft; body soft, divided into a proboscis, collar, and trunk; gill slits supported by skeletal rods; c.70 species, found in soft inter-tidal and sub-tidal sediments. (Phylum: *Hemichordata*. Class: *Enteropneusta*.) » worm

acouchi [akooshee] A cavy-like rodent; inhabits Amazonian forests; eats plants; resembles a small agouti, but with a longer

- tail (white, used for signalling). (Genus: *Myoprocta*, 2 species. Family: *Dasyproctidae*.) » agouti; cavy; rodent
- acoustic coupler** A device which allows a computer to communicate with other computers over the telephone network by using a standard telephone handset. Digital data is transmitted as coded audio signals. » local area network; modem; viewdata
- acoustics** The study of sound: the production, detection, and propagation of sound waves, and the absorption and reflection of sound. It includes the study of how electrical signals are converted into mechanical signals, as in loudspeakers, and the converse, as in microphones, also, how sound is produced in musical instruments, and perceived by audiences in concert halls; the protection of workers from damaging levels of sound; and the use of detection techniques, such as sonar and ultrasonic scanning. » anechoic chamber; loudspeaker [1]; microphone [1]; sonar; sound; sound intensity level [1]
- Acra**, Hebrew **Akko**, ancient **Ptolemais** 32°55'N 35°04'E, pop (1982e) 39 100. Ancient town in Northern district, NW Israel; resort centre on the Mediterranean Sea; capital of the Crusader kingdom after capture of Jerusalem in 1187; railway; ancient and modern harbour; fishing, light industry; crypt of the Knights Hospitaller of St John, 18th-c city walls, 18th-c mosque. » Crusades [1]; Israel [1]
- acridine** [akrideen] $C_{13}H_9N$, melting point 111°C. A coal-tar base structurally related to anthracene. An important class of dyestuffs is derived from it. » anthracene [1]; base (chemistry); coal tar; dyestuff
- acromegaly** [akrohmegaiee] An adult disorder which arises from the over-secretion of growth hormone by specific cells of the front pituitary gland. There is enlargement of many tissues, with coarsening and thickening of the subcutaneous tissues and the skin. The skull, jaw, hands, and feet enlarge. » growth hormone; pituitary gland
- acronym** A word formed from the initial letters of the words it represents, as in **NATO** (= *North Atlantic Treaty Organization*). It should be distinguished from an **acrostic**, a composition, usually a poem, in which typically the initial letters of the lines make up words. The pattern may also make use of letters from other parts of the lines or combinations of letters (such as the first and last), to produce a wide variety of puzzles and riddles.
- Acropolis** The citadel of ancient Athens. Rising high above the city, the fortified outcrop contained the national treasury and many sacred sites and shrines, most of them (such as the Parthenon and the Erechtheum) associated with the worship of Athene, the patron goddess of Athens. The present ruins date mainly from the second half of the 5th-c BC. » Areopagus; Athens; Erechtheum; Panathenaea; Parthenon
- acrostic** » acronym
- acrylic** [akrilik] $CH_2=CH.COOH$, IUPAC **prop-2-enoic acid**. The simplest unsaturated carboxylic acid. Its nitrile, $CH_2=CH.C\equiv N$, is the monomer of a range of polymers used as fibres and paints. Its methyl ester and the related $CH_2=C(CH_3)-COOCH_3$, **methylmethacrylate**, form other polymers used in paints, adhesives, and safety glass. » carboxylic acids; ester [1]; IUPAC; monomer
- acrylic painting** An art form using plastic paints, ie colours mixed with a vehicle made from a polymethyl methacrylate solution in mineral spirits. Quick-drying and - so far - permanent, it is therefore useful in picture-conservation. » polymethyl methacrylate
- Act of Congress** A bill sanctioned by the US legislature, consisting of the two houses of Congress: the House of Representatives and the Senate. The bill must then be signed by the president to become law. » Congress
- act of God** In law, any natural phenomenon such as an earthquake or a hurricane, which, without human intervention, directly causes an accident. A gust of wind which directly causes a car to veer off the road constitutes an act of God. Heavy rain or fog to which drivers do not respond appropriately, with the result that their negligence leads to an accident, is not an act of God. The climatic conditions would have to be sufficiently exceptional for the defendant to overcome the test of foreseeability in a negligence action. » negligence
- Act of Parliament** A bill which has passed five stages (first reading, second reading, committee stage, report stage, third reading) in both houses of the UK parliament, and received the royal assent. The same kind of procedure applies in other parliamentary systems, although the specific stages through which a bill passes may vary. » bill, parliamentary
- Actaeon** [akteeon] A hunter in Greek mythology, whose story epitomizes the fate of a mortal who encounters a god. He came upon Artemis, the goddess of chastity, while she was bathing and therefore naked: she threw water at him, changing him into a stag, so that he was pursued and then killed by his own hounds. » Artemis
- actinides** [aktiniydz] Elements with an atomic number between 89 and 104 in which an inner electron shell is filling, the best-known being uranium (92) and plutonium (94). Those heavier than uranium are known as the **transuranic elements**. All of their isotopes are radioactive, and most are artificially made. They are chemically similar to lanthanides. » chemical elements; lanthanides; radioisotope; RR90
- actinomorphic flower** A flower which is radially symmetrical or of regular shape so that, if cut through the middle in any plane, each half is identical. » flower [1]
- actinomycete** [aktinohmysee] A typically filamentous bacterium. Most have branching filaments, forming a fungal-like network, and require the presence of oxygen for growth. They are usually found in soil and decaying vegetation, feeding as saprophytes. Some species are disease-causing in plants and animals, including the causative agents of tuberculosis and potato scab. (Kingdom: *Monera*. Order: *Actinomycetales*.) » bacteria [1]; fungus; saprophyte
- actinomycosis** [aktinohmykohsis] An infection with *Actinomyces israeli*, in which chronic abscesses are formed in many tissues, notably in and around the face and neck, where they discharge onto the skin. The filaments of the organism form yellow granular masses in the abscesses (**sulphur granules**), and can be seen with the aid of a microscope. » abscess; mycetoma
- action** In mechanics, the difference between kinetic energy **K** and potential energy **V** ($K - V$), summed over time; symbol **I** or **S**, units **J.s** (joule.second). Formally, action is the sum over time of the Lagrangian. It is crucial to the least-action formulation of mechanics, and to the path-integral formulation of quantum theory. » Lagrangian; least-action principle; mechanics; quantum mechanics
- action painting** A form of abstract art which flourished in the USA from the late 1940s, its leading exponent Jackson Pollock. The snappy term was introduced by the critic Harold Rosenberg in 1952 in preference to the clumsy and inexact 'abstract expressionism'. The physical act of applying paint to canvas is emphasized, rather than the picture as a finished artefact; so the paint is thrown or dribbled onto the canvas which may be tacked to the floor. Persons may roll naked or ride bicycles across the wet surface. In France, a similar movement was called **Tachisme** (*tache*, 'blot, mark'). » abstract art; Pollock
- action potential** A brief electrical signal transmitted along a nerve or muscle fibre following stimulation. At the site of the action potential, the inside of the fibre temporarily becomes positively charged with respect to the outside, because of a transient change in the permeability of the fibre's plasma membrane to sodium and potassium ions (ie sodium flows in and later potassium flows out of the fibre). It provides the basis for the transmission of information. » ion; membrane potential; muscle [1]; neurone [1]
- actions, limitation of** » **limitation of actions**
- Actium, Battle of** [akteeum] (31 BC) The decisive victory of Octavian (later the Emperor Augustus) over the forces of Antony and Cleopatra off the coast of NW Greece. It traditionally marks the end of the Roman Republic and the beginning of the Roman Empire. » Augustus; Roman history [1]
- activated charcoal** Wood, carbonized by heating in limited air and treated with acid to make it adsorb large quantities of gases and polymeric materials from solution. It is used in gas masks, unducted cooker hoods, and vacuum technology, and for decolourizing solutions. » adsorption; polymerization

activated complex The arrangement of atoms during a chemical reaction involving two or more reacting molecules which is unstable, and which decomposes either to regenerate starting material or to form products. >> chemical reaction; transition state

active galaxy >> galaxy

activity (physics) >> radioactivity units [1]

Actors' Studio A workshop for professional actors founded in New York City by Elia Kazan, Cheryl Crawford, and Robert Lewis in 1947. Under Lee Strasberg, it was the major centre for US acting – not a school, but a laboratory where trained actors could work on inner resources free from the pressures of a production. After Strasberg's death, Ellen Burstyn and Al Pacino became artistic co-directors, with Paul Newman as president of the Board of Directors. >> Method, the; Strasberg; theatre

Acts of the Apostles A New Testament book, the second part of a narrative begun in Luke's Gospel, which traces the early progress of Jesus' followers in spreading the Christian faith. It begins with the resurrection and ascension of Jesus, but concentrates largely upon the growth of the Jerusalem Church, its spread to Samaria and Antioch, and the missionary journeys of Paul to Asia Minor, the Aegean lands, and Rome. >> apostle; Jesus Christ; Luke, Gospel according to; New Testament

actual bodily harm >> bodily harm

actuary A statistician specializing in life expectancy, sickness, retirement, and accident matters. Actuaries are employed by insurance companies and pension funds to calculate probability and risk. >> insurance

actuator A mechanical or electrical device used to bring other equipment into operation: sometimes called a *servomotor*. It commonly refers to the equipment used for the automatic operation of brake valves in car or train brake systems. >> brake [1]; servo system

acuity [akyootee] Acuteness of perception, especially of vision or hearing; the smallest visual features (usually measured in terms of angular size in the retinal image) that can be seen, or auditory difference that can be heard. The bars of a fine grating can just be resolved when the spacing of the bars in the image is approximately equal to the diameter of a single retinal receptor (about a 500th of a millimetre). >> threshold; vision

acupuncture A medical practice known in China for over 4000 years, which has recently attracted attention in the West. It consists of the insertion into the skin and underlying tissues of a hot or cold needle, usually made of steel, several cm long, and sometimes driven in with considerable force. The site of insertion of the needle is chosen in relation to the site of the tissue or organ believed to be disordered, and several hundred specific points are identified on body maps or models. Areas of skin which are painful on pressure may also be selected.

It is difficult to obtain a clear idea of which disorders, if any, benefit from acupuncture, but neuralgia, migraine, sprains, and asthma are claimed to respond, while infectious disease and tumours are unlikely to do so. It is also employed as an analgesic during surgery in the Far East, where skills in local or general anaesthesia are often not easily available. Today, acupuncture is used widely among the general population in China; equipment can be purchased in shops, and used in the way simple pain killers are employed in the West. The efficacy of the method has not been subjected to statistically-controlled trials, and successes remain anecdotal. Its mechanism of action is also unknown. In Chinese philosophy it was believed to alter the balance of the contrasting principles of 'Yin' and 'Yang', which flowed in hypothetical channels of the body. Recent research in the UK has shown that brain tissue contains morphine-like substances called *endorphins*, and these may be released in increased amounts when deep sensory nerves are stimulated by injury near the body surfaces. A possible mode of action therefore is that these substances are released by acupuncture, and some degree of tranquillity and analgesia is induced. >> alternative medicine; yin and yang

acyl [asiyl] In chemistry, the general name for an organic functional group R.CO-, where R represents H or an alkyl group. >> alkyl; functional group; organic chemistry

ADA A computer programming language developed for the US Department of Defense which permits the development of very large computer systems, and can cope with complex real-time applications. It was named after Augusta Ada Lovelace, daughter of Lord Byron, who worked with Charles Babbage. >> Babbage; programming language; real-time computing

Adad [aydad] The Mesopotamian god of storms, known throughout the area of Babylonian influence; the Syrians called him Hadad, and in the Bible he is Rimmon, the god of thunder. He helped to cause the Great Flood in *Gilgamesh*. His symbol was the lightning held in his hand; his animal was the bull. >> Baal; Gilgamesh

Adalbert, St (939–97), feast day 23 April. Apostle of the Prussians, born in Prague, and chosen Bishop of Prague in 982. The hostility of the corrupt clergy whom he tried to reform obliged him to withdraw to Rome. He carried the Gospel to the Hungarians, the Poles, and then the Prussians, by whom he was murdered, near Gdansk. He was canonized in 999. >> apostle; missions, Christian; Prussia

Adam, Adolphe (Charles) [ada] (1803–56) French composer, born in Paris. He wrote several successful operas, such as *Le Postillon de Lonjumeau* (1836), but is chiefly remembered for the ballet *Giselle* (1841). He died in Paris. >> ballet; opera

Adam, Robert (1728–92) British architect, born at Kirkcaldy, Scotland. He studied at Edinburgh and in Italy, and became architect of the king's works (1761–9). He established a London practice in 1758, and during the next 40 years he and his brother James (1730–94) succeeded in transforming the prevailing Palladian fashion in architecture by a series of romantically elegant variations on diverse classical originals, as in Home House, Portland Square, London. They also designed furniture and fittings to suit the houses they planned and decorated. He died in London. >> Palladianism

Adam and Eve Biblical characters described in the Book of Genesis as the first man and woman created by God. Adam was formed from the dust of the ground and God's breath or spirit (*Gen* 2.7); Eve was made from Adam's rib. Traditions describe their life in the garden of Eden, their disobedience and banishment, and the birth of their sons Cain, Abel, and Seth. Their fall into sin is portrayed as a temptation by the serpent (the devil) to disobey God's command not to eat the fruit of the tree of the knowledge of good and evil (*Gen* 3). >> Abel; Bible; Cain; Genesis, Book of

Adam's needle A species of yucca native to SE USA with short, woody trunk, stiff erect leaves, and numerous white bell-shaped flowers; commonly grown in gardens. (*Yucca gloriosa*). Family: *Agavaceae*. >> yucca

Adam's Peak. Sinhala *Sri Pada* 6°49'N 80°30'E. Sacred mountain in Sri Lanka, rising to 2243 m/7359 ft NE of Ratnapura; pilgrimages are made (Dec–Apr) to the foot-shaped hollow found on the mountain's summit, believed to be the footprint of Buddha by Buddhists, of Adam by Muslims, of God Siva by Hindus, and of St Thomas the Apostle by some Christians. >> Sri Lanka [1]

Adam Stokes attacks Brief sudden periods of unconsciousness (*syncope*) resulting from a transient cessation of the action of the heart (*asystole*) or of a disorder of rhythm, such as ventricular fibrillation. The patient is pulseless, and may develop convulsions. Recovery is attended by flushing of the face, but sudden death may occur. >> heart [1]; pulse (physiology)

Adamnan, St (c.625–704), feast day 23 September. Irish monk, born and educated in Donegal. At 28 he joined the Columban brotherhood of Iona, and was chosen abbot in 679. He came to support the Roman views on the dating of Easter and the shape of the tonsure. His works include the *Vita Sancti Columbae* (Life of St Columba), which reveals much about the Iona community. >> Columba, St; Easter; tonsure

Adamov, Arthur [adahmof] (1908–70) French dramatist, born at Kislovodsk, Russia. His family lost their fortune in 1917, and moved to France, where he was educated and met Surrealist artists. His early absurdist plays *L'Invasion* (1950, *The Invasion*) and *Le Professeur Taranne* (1953) present the dislocations and cruelties of a meaningless world; *Ping-Pong* (1955) sees humanity reduced to mechanism. Later plays such as *Paolo Paoli* (1957) and *La Politique des restes* (1967, *The*

Politics of Waste) show a transition to commitment. He committed suicide in Paris. » French literature

Adams, Ansel (1902–84) US photographer, born and died in San Francisco, famous for his landscapes of the Western States, and an influential writer and lecturer on photographic image quality. He was co-founder of the photography departments at the Museum of Modern Art in New York and the California School of Fine Art.

Adams, John (1735–1826) US statesman and second President (1796–1800), born in Braintree (now Quincy), Massachusetts. Educated at Harvard, he was admitted to the Bar in 1758, emerged as a leader of American resistance to Britain, and was the 'colossus of the debate' on the Declaration of Independence. He retired from Congress in 1777, only to be sent to France and Holland as commissioner. After a period as Minister to England (1785–8), he became the first US Vice-President under Washington (1789). They were re-elected in 1792; and in 1796 Adams was chosen President by the Federalists. Defeated on seeking re-election in 1800, he retired to his home at Quincy, where he died. » Declaration of Independence; Federalist Party

Adams, John Couch (1819–92) British astronomer, born at Laneast, Cornwall. He was educated at Cambridge, where he progressed to professor of astronomy (1858). In 1845 he and Leverrier independently predicted the existence of Neptune by analysing irregularities in the motion of Uranus. He died at Cambridge. » astronomy; Leverrier; Neptune (astronomy)

Adams, John Quincy (1767–1848) US statesman and sixth President (1825–9), son of John Adams, born at Quincy, Massachusetts. He studied at Harvard, and was admitted to the Bar in 1790. Successively Minister to the Hague, London, Lisbon, and Berlin, he was elected to the US Senate in 1803. In 1809 he became Minister to St Petersburg, and in 1815–17 Minister at the Court of St James's. As Secretary of State under Monroe, he negotiated with Spain the treaty for the acquisition of Florida, and was alleged to be the real author of the 'Monroe Doctrine'. In 1830 he was elected to the lower house of Congress, where he became a strong promoter of anti-slavery views. He died in Washington, DC. » Monroe Doctrine; slavery

Adams, Richard (1920–) British novelist, born in Berkshire, and educated at Oxford. He worked in the Civil Service from 1948, and came to prominence with his first novel, *Watership Down* (1972), a fable about a warren of rabbits fleeing from land threatened by builders on the downs near Newbury. Later novels include *Shardik* (1974) and *The Plague Dogs* (1977). » English literature

Adams, Samuel (1722–1803) US statesman, born in Boston. Educated at Harvard, he became Lieutenant-Governor (1789–94) and Governor (1794–7) of Massachusetts. A strong supporter of revolution against Britain, he helped to plan the Boston Tea Party, and was one of the signatories of the Declaration of Independence. He died in Boston. » Boston Tea Party; Declaration of Independence

Adams, Will(iam) (1564–1620) English sailor, born at Gillingham, Kent. He was pilot of a Dutch ship stranded off Japan in 1600, and was kept by Ieyasu Tokugawa, first Shogun, as an advisor on such areas as shipbuilding, navigation, gunnery, foreign relations, and trade. He built the first European type of ocean-going vessel in Japan. The first Englishman to enter the service of a Japanese ruler, he lived at Edo (now Tokyo), where he was given an estate by Ieyasu. He is buried at Pilot Hill, Yokosuka, and is commemorated by monuments at Ito and Tokyo. » Shogun; Tokugawa

Adan » **Aden**

Adana [adana] 37°00N 35°19E, pop (1980) 574 515. Commercial capital of Adana province, S Turkey, on R Seyhan; fourth largest city in Turkey; railway; airfield; university (1973); centre of a fertile agricultural region. » Turkey^[1]

adaptation The process of adjustment of an individual organism to environmental conditions. It may occur by natural selection, resulting in improved survival and reproductive success, or may involve physiological or behavioural changes that are not genetic. As well as being a process, an adaptation can also be the end product of such a process, ie any structural,

behavioural, or physiological character that enhances survival or reproductive success. » natural selection

adaptive radiation A burst of evolution in which a single ancestral type diverges to fill a number of different ecological roles or modes of life, usually over a relatively short period of time, resulting in the appearance of a variety of new forms. This phenomenon may occur after the colonization of a new habitat, such as the radiation of Darwin's finches in the Galapagos Is. » Darwin, Charles; ecology; evolution

adaptive suspension A pneumatic or hydro-pneumatic suspension system fitted to a motor car or a commercial vehicle that damps out the variations in road surface, and maintains the vehicle at a constant level whilst in use. This levelling device can be controlled electronically, allowing the suspension system to adapt itself automatically to the road surface conditions and the speed of travel. » car^[1]

Addams, Jane (1860–1935) US social reformer, born at Cedarville, Illinois. After visiting Toynbee Hall in London, she founded Hull House in Chicago, where she worked to secure social justice in housing, factory inspection, female suffrage, and the cause of pacifism. In 1931 she shared the Nobel Peace Prize, and in 1910 became the first woman President of the National Conference of Social Work. She died in Chicago. » women's liberation movement

addax [adaks] A horse-like antelope native to N African deserts; resembles the oryx, but has thicker, spiralling horns; pale with clump of brown hair on the forehead; never drinks; lives in herds. (*Addax nasomaculatus*.) » antelope; horse^[1]; oryx

adder A venomous snake of the family *Viperidae*; three species: *Vipera berus* (European adder or common European viper, the only venomous British snake) and the puff adders; also Australian death adders of family *Elapidae* (2 species). The name is used in place of viper for some other species, such as the horned adder/viper and saw-scaled adder/viper. » horned viper; puff adder; snake; viper^[1]

adder's tongue A fern native to grasslands of Europe, Asia, N Africa, and N America; underground rhizome producing a fertile spike 5 cm 2 in long bearing sporangia and sheathed by a single oval; the entire frond is 10–20 cm, 4–8 in long. (*Ophioglossum vulgatum*. Family: *Ophioglossaceae*.) » fern; rhizome; sporangium

Addington » **Sidmouth**

Addinsell, Richard (1904–77) British composer, born at Oxford, where he read law at Hertford College before studying music in London, Berlin, and Vienna. He composed much film music, including the popular *Warsaw Concerto* for the film *Dangerous Moonlight* (1941). He died in London.

Addis Ababa or **Adis Abeba** [adis ababa] 9°02N 38°42E, pop (1984e) 1 412 575. Capital of Ethiopia; altitude 2 400 m; 7 874 ft; founded by Menelik II, 1887; capital, 1889; occupied by Italy, 1936–41, declared capital of Italian East Africa; airport; railway to port of Djibouti; university (1950); tobacco, foodstuffs, textiles, chemicals, cement; national museum, national library, St George Cathedral, Menelik II's tomb; headquarters of UN Economic Commission for Africa, and of the Organization of African Unity. » Ethiopia^[1]

Addison, Joseph (1672–1719) English essayist and poet, born at Milston, Wiltshire, and educated at Charterhouse and Oxford. In 1708–11 he was secretary to the Lord-Lieutenant of Ireland, where he formed a warm friendship with Swift. He became an MP, and contributed largely to the *Tatler*. In 1711 the *Spectator*, 274 numbers of which were his work, was founded. He was satirized by Pope in the famous character of Atticus. Addison was made a commissioner for trade and the colonies, and in 1717 was appointed Secretary of State, but a year later resigned his post on health grounds. He died in London. » English literature; Pope, Alexander; Swift

Addison, Thomas (1793–1860) British physician, born at Longbenton, Northumberland. He graduated in medicine at Edinburgh in 1815, and in 1837 became physician to Guy's Hospital. His chief research was into the disease of the adrenal glands which has since been named after him, and into pernicious anaemia (Addisonian anaemia). He died in Bristol, Gloucestershire. » Addison's disease; anaemia

Addison's disease A medical condition resulting from the

destruction of the adrenal cortex by infection (commonly tuberculosis) or by an auto-immune reaction. A fall in the output of corticosteroids causes physical weakness, mental apathy, low blood pressure, and increased skin pigmentation. Without treatment, death is unavoidable. Taking synthetic steroids by mouth restores the patient to normal health, but these must be continued for life. > Addison, Thomas; adrenal glands; auto-immune diseases; corticosteroids

addition reaction A chemical reaction in which a product contains all atoms of two or more reactants, eg the chlorination of ethylene, $\text{CH}_2 = \text{CH}_2 + \text{Cl}_2 \rightarrow \text{CH}_2\text{Cl}\cdot\text{CH}_2\text{Cl}$. Similarly, **addition polymerization** is the formation of a polymer without elimination from the reactants, for example the formation of polyethylene, $n\text{CH}_2 = \text{CH}_2 \rightarrow (-\text{CH}_2\text{CH}_2-)_n$. The product of an addition reaction is known as an **adduct**. > chemical reaction; ethylene; polymerization

additives Strictly, any chemical, even a vitamin, added to a food during its processing or preparation; more usually, chemicals which have been added in order to achieve a specific aim. They include (a) *preservatives*, which reduce spoilage by bacteria, (b) *anti-oxidants*, which prevent fats from becoming rancid, (c) *emulsifiers*, which permit a stable mixture of oil and water, (d) *colouring matter*, to vary colour to specifications, and (e) *flavouring agents/enhancers*, to achieve a given flavour. Many additives are naturally-occurring compounds; others are synthetic. Legislation exists in most countries to ensure that food additives are technologically desirable and at the same time safe. However, in recent years many consumers have come to fear synthetic additives, leading to an increase in the use of natural additives. > antioxidants; E-number; emulsifiers; food preservation

address bus A system of wires or connections (*bus*) within a computer that communicates information about which memory location is being used. > data bus; input-output bus; memory; computer

adduct > addition reaction

Adela, Princess (c.1062–1137) Fourth daughter of William the Conqueror, who in 1080 married Stephen, Count of Blois, by whom she had nine children. Her third son, Stephen, became King of England in her lifetime. > William I (of England)

Adelaide 34°56S 138°36E, pop(1986) 993 100. Port capital of South Australia, on the Torrens R where it meets the St Vincent Gulf; founded, 1837; the first Australian municipality to be incorporated, 1840; two universities (1874, 1966); airfield; railway; oil refining, motor vehicles, electrical goods, shipbuilding; trade in wool, grain, fruit, wine; fine beaches to the W, including Maslin Beach (the first nude bathing beach in Australia); many parks; two cathedrals; major wine-growing area to the S (McLaren Vale) and to the N (Barossa Valley); Adelaide Festival Centre; South Australian Museum (large collection of aboriginal art); Art Gallery of South Australia; Constitutional Museum; Ayers House (1846), headquarters of the South Australian National Trust; Maritime Museum in Port Adelaide; arts festival, held every two years; Adelaide Cup Day (May). > South Australia

Adélie Land or Adélie Coast, Fr Terre Adélie [adályec] area c.432 000 sq km/166 752 sq ml. Territory in Antarctica 66°–67°S, 136°–142°E; first seen by the French navy in 1840; explored 1911–14 and 1929–31; French territory, 1938; French research station at Base Dumont d'Urville. > French Southern and Antarctic Territories

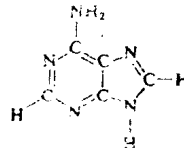
Aden or Adan [aydn] 12°50N 45°00E, pop(1981c) 264 326. Seaport capital in Adan governorate, South Yemen; on the Gulf of Aden, at the entrance to the Red Sea; taken by British, 1839; capital of former Aden protectorate; after opening of Suez Canal (1869), an important coaling station and transshipment point; British crown colony, 1937; scene of fighting between nationalist groups in 1960s; capital of new republic, 1968; airport; oil refining, shipping. > Yemen, South [1]

Aden, Gulf of [aydn] W arm of the Red Sea, lying between South Yemen (N) and Somalia (S); connected to the Red Sea by the Strait of Bab al Mandab; length 885 km/550 ml. > Red Sea

Adenauer, Konrad [ahdenower] (1876–1967) German statesman, born at Cologne, who became the first Chancellor of the

Federal Republic of Germany (1949–63). He studied at Freiburg, Munich, and Bonn, before practising law in Cologne, where he became Lord Mayor (1917). He was president of the Prussian State Council 1926–33. In 1933 the Nazis dismissed him from all his offices, and imprisoned him in 1934, and again in 1944. In 1945, under Allied occupation, he founded the Christian Democratic Union. As Chancellor, he established closer links with the Russians and the French, and aimed to rebuild West Germany on a basis of partnership with other European nations through NATO and the EEC. He retired in 1963, and died at Rhöndorf, Germany. > European Economic Community; Germany [1]; NATO

adenine [aduhneen] $\text{C}_4\text{H}_5\text{N}_5$. A base derived from purine, one of the four found in nucleic acids, where it is generally paired with thymine. > base (chemistry); DNA [1]; purines; thymine [1]



adenoids An accumulation of lymphoid tissue, arranged as a series of folds behind the opening of the auditory tube in the nasopharynx; also known as the *pharyngeal tonsils*. When enlarged in children they can block or reduce the size of the auditory tube opening and fill the nasopharynx, giving an abnormal resonance to speech. > Eustachian tube; lymphoid tissue; pharynx; tonsils

adenosine triphosphate (ATP) [adenuhsejn] A molecule formed by the condensation of adenine, ribose, and triphosphoric acid: $\text{HO}-\text{P}(\text{O})(\text{OH})-\text{O}-\text{P}(\text{O})(\text{OH})-\text{O}-\text{P}(\text{O})(\text{OH})-\text{OH}$. It is a key compound in the mediation of energy in both plants and animals, energy being stored in its synthesis from *adenosine diphosphate* (ADP) and phosphoric acid, and released when the reaction is reversed. > adenine [1]; phosphoric acid; ribose [1]

Ader, Clément [aday] (1841–1926) French engineer, who in 1872 made a man-powered aeroplane, and in 1886 and 1891 larger, steam-powered, bat-like flying machines. The third machine was called *Avion*, which became the French term for an aircraft. In 1897 his fourth machine, still steam-powered, proved to be capable of flight, but was seriously damaged in proving it. > aircraft [1]

adhesives Materials whose function is to bind one substance to another. Examples are (1) substances of biological origin, generally water soluble, known as *glues*, which are usually proteins or carbohydrates, and (2) synthetic materials, both thermoplastic and thermosetting resins and rubbers. > carbohydrate; protein; resin; thermoplastic; thermoset

Adi Granth [ahdec grant] ('First Book') The principal Sikh scripture, originally called the *Granth Sahib* ('Revered Book'). The name *Adi Granth* distinguishes it from the *Dasam Granth*, a later second collection. The text used today is an expanded version of *Guru Arjan's* original compilation, and is revered by all Sikhs. > guru; Sikhism

adiabatic demagnetization > magnetic cooling

adiabatic process [adeebatik] In thermodynamics, a process in which no heat enters or leaves a system, such as in a well-insulated system, or in some process so rapid that there is not enough time for heat exchange. Sound waves in air involve adiabatic pressure changes. The compression and power strokes of a car engine are also adiabatic. > engine; heat; magnetic cooling; sound; thermodynamics

Adige, River [adeejay], Ger Etsch, ancient *Athesis* River in N Italy, rising in three small Alpine lakes; flows E and S, then E into the Adriatic Sea, SE of Chioggia; length 408 km/253 ml, chief river of Italy after the Po. > Italy [1]

adipic acid [adipik] $\text{HOOC}-(\text{CH}_2)_4-\text{COOH}$. IUPAC *hexanedioic acid*, melting point 153°C. It is one of the monomers for nylon, the other being 1,6-diaminohexane. > monomer; polyamides

adipose tissue > fat 2

Adirondack Mountains [adirondak] Mountain range largely

in NE New York state, USA; rises to 1 629 m/5 344 ft at Mt Marcy; named after an Indian tribe; source of the Hudson and Ausable Rivers; locations such as L Placid are noted winter resorts; largest state park in USA. » United States of America [1]

Adie Ababa » **Addis Ababa**

adjutant A stork native to tropical SE Asia. There are two species: the greater adjutant stork (*Leptoptilos dubius*), and the lesser, haircrested, or Javan adjutant stork (*Leptoptilos javanicus*); grey and white; head nearly naked; eats carrion, frogs or fish; related to marabou. » marabou; stork

Adler, Alfred (1870–1937) Pioneer Austrian psychiatrist, born in Vienna. He graduated as a doctor in 1895, and became a member of the psychoanalytical group that formed around Freud. His most widely referenced work is *Studie über Minderwertigkeit von Organen* (1907, Study of Organ Inferiority and its Psychological Compensation), which aroused great controversy, and led to one of the early schisms in psychoanalysis. He died while on a lecture tour, at Aberdeen, Scotland. » Freud, Sigmund; inferiority complex; psychoanalysis

administrative law The body of law relating to administrative powers exercised principally by central and local government. The exercise of such powers can be the subject of scrutiny by the courts on legal, but not policy, grounds. » court of law; judicial review; law

Admiral's Cup A yacht race for up to three boats per nation, first contested in 1957 and held biennially. Races take place in the English Channel, at Cowes, and around the Fastnet rock. The trophy is donated by the Royal Ocean Racing Club. » sailing

Admiralty Court An English court which is part of the Queen's Bench Division of the High Court. Its work deals with maritime claims in civil law, such as salvage. In the USA, the federal district courts exercise jurisdiction over maritime actions. » civil law; High Court of Justice; salvage; sea, law of the

Admiralty Islands pop (1980) 25 844; area 2 000 sq km/800 sq ml. Island group in N Papua New Guinea, part of the Bismarck Archipelago; c.40 islands, main island, Manus; chief town, Lorengau; German protectorate, 1884; under Australian mandate, 1920; fishing, copra, pearls. » Bismarck Archipelago

adolescence That period of personal development marked by the onset of puberty and continuing through the early teenage years. While it is associated with the process of physical maturation, normally occurring more quickly in girls than in boys, the actual age-range and behavioural patterns involved can vary considerably from one society to another. Adolescence in the Third World, for example, is more likely to mean working in the fields for one's parents and taking on adult responsibilities from as young as age 9 or 10 than a prolonged period of schooling as it does in more prosperous societies. Whatever the differences, adolescents commonly want to be independent of their parents; the conflicts this may generate are sometimes said to reflect 'the generation gap'. » hormones; puberty

Adonis [adohnis] In Greek mythology, a beautiful young man who was loved by Aphrodite. He insisted on going hunting and was killed by a boar, but Persephone saved him on condition that he spent part of the year with her. There was a yearly commemoration of the event, with wailing and singing. There is a clear connection with the growth and death of vegetation, and similar Eastern ceremonies. » Persephone; Tammuz

adoption A legal procedure in which a civil court makes an order giving parental rights and duties over a minor to someone other than the natural parents. On adoption, the minor becomes the legal child of his or her adoptive parents. » court of law; legitimacy; minor

adoptionism The understanding of Jesus as a human being of sinless life adopted by God as son, usually thought to be at the time of his baptism by John in the R Jordan. Such teaching was declared heretical, in that it implied that Jesus could not have had a fully divine nature. Associated with Arianism, it figured in 4th-c controversies over the person of Christ, in Spain in the 8th-c, and in some scholastic theology (eg Abelard, Lombard).

» Abelard; Arius; Jesus Christ; Lombard

Adrastea [adrastea] A tiny natural satellite of Jupiter, discovered in 1979 by Voyager 2; distance from the planet 129 000 km 80 000 ml; diameter 24 km/15 ml. » Jupiter (astronomy); Voyager project [1]; RR4

adrenal glands [adrenal] Paired compound endocrine glands in mammals, situated one near each kidney; also known as the **suprarenal glands**. Each comprises an outer cortex and an inner medulla. The cortex consists of three zones, which produce specific steroid hormones: the outer zone produces mineralocorticoids (eg aldosterone), whereas the intermediate and inner zones produce glucocorticoids (eg cortisol) and sex hormones (eg androgens). The medulla secretes a specific catecholamine (either adrenaline or noradrenaline). The various groups of hormones are chemically similar in all vertebrates. » Addison's disease; adrenaline; aldosterone; cortisol; Cushing's disease; embryology; endocrine glands; hormones

adrenaline or **adrenalin** [adrenalin] A hormone released from the adrenal medulla in response to stress, and in some other circumstances; also known as **epinephrine** in the USA. It increases heart rate, raises blood pressure, and causes release of sugar into the blood from liver stores. Thus, in situations of stress the body is prepared for the 'fight or flight reaction'. It may also be a neurotransmitter in the brain, where it is associated with many functions, including cardiovascular and respiratory responses. Therapeutic uses include acute asthma, heart attack, and severe allergic responses. » adrenal glands; allergy; catecholamine; hormones; noradrenaline

adrenocorticotrophic hormone (ACTH) [adrenohkawti-kohtróhfik] A chemical substance (a peptide) produced in the front lobe of the pituitary gland; also known as **corticotrophin**. It stimulates the synthesis and release of glucocorticoids from the adrenal cortex, and is released in response to physical, emotional, or chemical stress. » adrenal glands; glucocorticoids; peptide; pituitary gland

Adrian, Edgar Douglas, 1st Baron (1889–1977) British neurophysiologist, born in London. He was educated at Cambridge, where he became professor of physiology (1937–51). A founder of modern neurophysiology, he used sensitive amplifiers to record activity in single nerve cells, and from 1934 studied electrical brain wave rhythms and their clinical uses. He shared the 1932 Nobel Prize for Physiology or Medicine for his work on the function of neurones. He was made a baron in 1955 and died in London. » nervous system; neurology; Sherrington

Adrian IV, also Hadrian, originally **Nicholas Breakspear** (c.1100–59) The only Englishman to become Pope (1154–9), born at Langley, Hertfordshire. He became first a lay brother in the monastery of St Rufus, near Avignon, and in 1137 was elected its abbot. His zeal for strict discipline led to an attempt to defame his character, and he had to appear before Eugenius III at Rome. Here he not only cleared himself, but acquired the esteem of the Pope, who appointed him Cardinal Bishop of Albano in 1146. As Pope, he is said to have granted Ireland to Henry II. He died near Rome. » Henry II (of England); pope

Adrianople, Battle of (AD 378) A battle between the Romans and the Visigoths at present-day Edirne in European Turkey. This was one of the crucial battles of the ancient world, as the crushing Visigoth victory, under Fritigern, opened up Roman territory to Germanic invasion. Two-thirds of the Roman army, including Emperor Valens, were killed. » Roman history [1]; Visigoths

Adriatic Sea [aydreeatik] Arm of the Mediterranean Sea, between the E coast of Italy and the Balkan Peninsula (Yugoslavia and Albania); Gulf of Venice at its head (NW); separated from the Ionian Sea (S) by the Strait of Otranto; length 800 km 500 ml; width 93–225 km 58–140 ml; maximum depth 1 250 m 4 100 ft; highly saline; lobster, sardines, tuna; chief ports, Venice, Rijeka, Ancona, Bari, Brindisi; flat, sandy Italian coast; rugged, irregular Yugoslav coast. » Mediterranean Sea

adsorption The extraction of a component from one phase into another phase, usually by chemical interaction (*chemisorption*) between the material adsorbed (the **adsorbate**) and the surface of the adsorbing material (the **adsorbent**). Sometimes, the

adsorbate is incorporated into the structure of the adsorbent; an example is the adsorption of hydrogen gas by palladium, which can adsorb several hundred times its own volume of the gas. » gas I; hydrogen

adult education The provision of further or continuing educational opportunities for people over the minimum school-leaving age; also known as **continuing education**. Frequently this takes place in institutions specially set up to cater for mature learners, but it is also common for schools and colleges and other centres of learning to be used. A wide network of providers exists. In addition to the formal opportunities offered by institutions, there are numerous informal sources of adult education, such as broadcast programmes on radio and television, as well as correspondence and distance-learning courses, for people who wish to or must learn at home or as part of their job. » community school; distance education

Advaita [advīta] (Sanskrit, 'non-dual') An influential school of Vedanta Hinduism, revived in a modern form during the 20th-c. Associated primarily with the thought of Shankara, it holds that there is only one absolute reality, Brahman. All selves are in effect identical, since in essence they are one with Brahman. » atman; Brahman; Hinduism; Veda

Advent In the Christian Church, the four weeks before Christmas, beginning on the Sunday nearest 30 November (Advent Sunday); a period of penitence and preparation for the celebration of the first coming of Christ at Christmas, and for his promised second coming to judge the world. » Christmas; Jesus Christ

Adventists Those Christians whose most important belief is in the imminent and literal Second Coming of Christ. Found in most periods of history and in most denominations, a separate movement began in the USA with William Miller (1781-1849), who predicted Christ's return (and the end of the world) in 1843-4, and whose followers eventually formed a denomination called Seventh Day Adventists. They believe that the Second Coming of Christ is delayed only by a failure to keep the Sabbath (Friday evening to Saturday evening), which, along with Old Testament dietary laws, is held to rigorously. » Jesus Christ; millenarianism

adversary politics A political situation said to exist in two-party electoral systems (eg the UK) where the policies of the parties and government are polarized between right and left, resulting in significant reversals in policy when government changes. Because the electoral system works against successful challenges from third parties, the views of the majority of the electorate occupying the 'middle ground' are not reflected. » proportional representation

advertising The practice of informing and influencing others not personally known to the communicator through paid messages in the media; also the advertisements themselves. From humble origins (eg tradesmen's signs), advertising has developed in parallel with modern industrial society and the mass media. News-sheets in the 17th-c carried brief statements (eg announcing the sale of patent medicines), but it was not until the late 19th-c, with the advent of mass production of consumer goods, that the industry developed on the huge scale found today. Advertising for consumer goods, whether of the 'fast moving' variety (eg washing powders) or 'durables' (eg cars) has long been the most conspicuous kind, on poster sites, in the press, and on television. 'Display' ads for such products in newspapers or magazines are characterized by their size and use of graphics (especially photographs), slogans, and large type. In contrast, 'classified' ads are typically single-column width, consisting of words only, and grouped together under headings (eg 'personal', 'situations vacant', or 'wanted'). Other approaches include direct marketing (by post or telephone) and direct response advertising (via tear-off coupons), both of which have resulted from the difficulty mass media advertising has in reaching a target audience and measuring its own effectiveness.

Manufacturers and retailers are not the only groups to realize the value of communicating with the general public through advertising. Governments, political parties, service industries (eg banks and financial institutions), trade unions, employers' associations, pressure groups, and charities also

employ advertising as a major means of promoting ideas and causes. Regulations on who may advertise and on the quantity and nature of ads, especially commercials, vary from country to country. In recent years some advertisers have found the sponsorship of sporting and cultural events a convenient way to side-step controls applying elsewhere to the promotion of their products (especially cigarettes) and a means of associating these with healthy or prestigious activities. From being small-scale brokers of advertising space on behalf of newspaper proprietors, most modern advertising agencies now offer a 'full service', comprising market research and creative expertise, media planning, and media buying. Since the 1960s, however, 'creative shops' have offered specialist design and copywriting services, with 'media independents' later doing the same for media planning and buying.

Advertising is only one, though perhaps the most controversial, of the elements of the 'marketing mix'. As such it has always been subject to attack, whether on moral, ideological, or aesthetic grounds. Underlying this criticism is the presumption that advertising has pernicious effects on individuals, social groups, or whole societies. Apologists respond by claiming that advertising merely reflects the values and styles already existing in society. » subliminal advertising

Advisory, Conciliation, and Arbitration Service » ACAS

advocacy planning A form of planning in which the planner acts for the interests of a particular group or community in opposition to plans prepared by the official planning authority. It is a means of aiding groups whose interests may be damaged or not represented by the planning authority. The planner is responsible to the group, and not to the authority.

advocate A term generally applied to lawyers practising in the courts as professional representatives of those who bring or defend a case. In Scotland, the term is used as an equivalent to an English barrister. » barrister; court of law; solicitor

aechmea [akmaja] A genus of plants (epiphytes) native to tropical America; rosettes of succulent leaves forming a water-filled cup in the centre, inflorescence produced on a stout, well-developed stalk. Many species are grown as house plants. (Genus: *Aechmea*, 172 species. Family: *Bromeliaceae*.) » bromeliad; epiphyte; inflorescence¹

Aedes [ayēdeez] The yellow-fever mosquito, found in coastal and riverside habitats throughout the tropics and subtropics; eggs laid in stagnant water; aquatic larvae colourless except for black respiratory siphon. The adult females feed on blood, transmitting diseases such as yellow fever and dengue. (Order: *Diptera*. Family: *Culicidae*.) » dengue; larva; mosquito; yellow fever

Aegean civilization [eējean] The Bronze Age cultures which flourished in the third and second millennia BC on the islands of the Aegean Sea and around its coasts. » Minoan/Mycenaean civilization

Aegean Islands [eējean] pop (1981) 428 533; area 9 122 sq km 3 521 sq ml. Island group and region of Greece; the name is generally applied to the islands of the Aegean Sea, including Lesbos, Chios, Samos, Limnos, and Thasos; a major tourist area. » Aegean Sea; Greece¹

Aegean Sea [eējean] Arm of the Mediterranean Sea, bounded W and N by Greece, NE and E by Turkey, S by islands of Crete and Rhodes; dotted with islands on which the Aegean civilization of 3000-1000 BC flourished; length (N-S) 645 km 400 ml; width 320 km 200 ml; greatest depth, 2 013 m 6 604 ft; sardines, sponges; natural gas off NE coast of Greece; tourism. » Mediterranean Sea

Aegina [eējīna] Gr *Aiyina* pop (1981) 11 127; area 83 sq km 32 sq ml. One of the largest of the Saronic Islands, Greece, SW of Athens; chief town Aiyina; a popular resort; Temple of Aphaia. » Greece¹

aegis [eējis] Originally a goatskin, and then, in Greek mythology, a fringed piece of armour or a shield. Zeus shakes his aegis, which may possibly be the thunder-cloud; Athene's is equipped with the Gorgon's head. » Athena; Gorgon; Zeus

Aegisthus [eējisthus, eējisthus] In Greek legend, the son of Thyestes; while Agamemnon was absent at Troy he became the lover of Clytemnestra. Together they killed Agamemnon on his

return to Argos. Aegisthus was later killed by Orestes. » Agamemnon; Clytemnestra; Orestes; Thyestes

Aelfric [ælfrik] called **Grammaticus** (c.955–c.1020) English writer, known for his use of the Anglo-Saxon vernacular. He taught at the monastery of Cerne Abbas, later becoming abbot of Eynsham. His writings include a collection of homilies, *Lives of the Saints*, and a Latin-English grammar, glossary, and dialogue (*Colloquium*). » Anglo-Saxon; English literature

Aelrad of Rievaulx » **Ailrad of Rievaulx**

Aemilian Way [jymeelian] A continuation of Rome's major trunk road to the N, the Flaminian Way. It ran from Rimini on the Adriatic coast to the R. Po. » Roman roads [1]

Aeneas [æneæəs] In Roman legend, the ancestor of the Romans. He was a Trojan hero, the son of Anchises and Venus, who escaped after the fall of Troy, bearing his father on his shoulders. After wandering through the Mediterranean, he reached Italy at Cumae and visited the Underworld, where the destiny of Rome was made clear to him. He married the daughter of the King of Latium, and allied himself to the Latins in local wars. His son founded Alba Longa, and a line of kings from whom Romulus was said to be descended. » Romulus and Remus; Trojan War; Virgil

aeolian harp A wooden soundbox fitted with strings (usually about a dozen) of various thicknesses, but tuned to a single pitch, which are made to vibrate freely by the surrounding air, producing an ethereal, 'disembodied' sound. It takes its name from Aeolus, god of the winds. » Aeolus; chordophone; zither

Aeolians [æohlianz] A sub-group of Hellenic peoples who colonized the NW coast of Asia Minor and the islands of the N Aegean (e.g. Lesbos) towards the end of the second millennium BC. » Greek history

Aeolus [æeolus] In Greek mythology, the god of the winds. In the *Odyssey* Aeolus lived on an island, and gave Odysseus the winds tied in a bag so that his ship would not be blown off course. The ship had nearly reached Ithaca when Odysseus' men opened the bag, thinking it contained treasure. As a result, the ship was blown far away. » Odysseus

Aepyornis [æepeeəwnis] » **elephant bird**

aerial (photography) » **antenna** (photography)

aerial photography Photography of the ground surface from an aerial viewpoint such as a balloon or aircraft, with application to archaeology, ecology, geology and wartime reconnaissance. In **aerial survey mapping**, the aircraft flies at a constant height along specified paths, taking pictures at regular intervals to build up a mosaic of overlapping images; ground contour and building heights are measured by viewing pairs of images stereoscopically. » photogrammetry; stereoscopic photography; Plate III

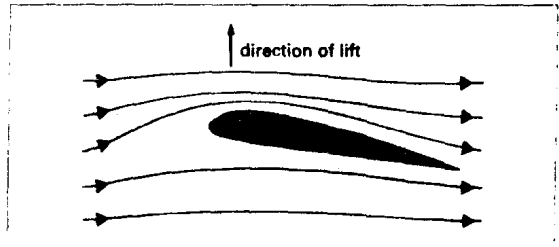
aerobe [aeroʊb] An organism that requires the presence of oxygen for growth and reproduction. The great majority of all living organisms are aerobic, requiring oxygen for respiration. Some micro-organisms, typically bacteria, are anaerobic, able to grow only in the absence of oxygen; these are known as **anaerobes**. » bacteria [1]; oxygen

aerobics A system of physical training in which exercises such as walking, swimming, and running are pursued for a sufficiently long period to increase performance. The increases can be assessed using a point scoring system available on charts for different ages and types of effort. In the 1980s, the term was particularly used for movement exercises in time to music, which became popular among keep-fit groups at all ages. The use of oxygen by muscles in carrying out any form of physical activity is known as **aerobic metabolism**. » calisthenics

aerocapture A proposed technique for placing a spacecraft in orbit around a planet, without the expenditure of chemical propulsives, by taking advantage of planetary atmosphere. The spacecraft would be equipped with an aerobrake similar to the heat shields on space capsules like Apollo, and would be navigated into the planet's upper atmosphere, where friction would slow it down. The technique offers the prospect of reducing trip times to the outer planets by using less massive spacecraft, and of carrying heavier payloads to Mars for sample return missions and, eventually, human exploration. » Mars (astronomy); planet; spacecraft

aerodynamics The study of the flow of air and the behaviour of objects moving relative to air; a subject which is applicable to other gases, and is part of the larger subject of fluid mechanics. Aerodynamic principles explain flight. The shape and orientation of an aircraft wing (curved upper surface, wing tilted down) mean that the air above the wing travels further than the air beneath. Air above the wing thus travels faster and so has lower pressure (Bernoulli's principle). The pressure difference provides lift to support the aircraft. The available lift increases with wing area, and decreases with altitude. The movement of an aircraft through the air produces a force which impedes motion, called *drag*, dependent on the aircraft size and shape. Air movement across the surface is impeded by friction, which produces additional drag called *frictional drag*; this causes heating, which can sometimes be extreme, as in the case of space re-entry vehicles. Friction losses increase with wing area and velocity, and decrease with altitude.

At velocities greater than the speed of sound (Mach 1, approximately 331.5 metres per second) air can no longer be treated as incompressible and new rules apply, giving rise to **supersonic aerodynamics**. Passing from subsonic to supersonic speeds, aircraft cross the 'sound barrier', marked by a dramatic increase in drag. Supersonic drag is reduced using thin, swept-back wings typical of military fighter aircraft. Aircraft flying at supersonic speeds produce sonic booms – shock waves in the air around the aircraft, produced because the aircraft's velocity is too great to allow the air pressure to adjust smoothly around it. Vehicles moving through air experience drag forces which increase fuel consumption. Also, buildings and bridges sway due to wind. These effects must be allowed for in design, and can be minimized by attending to the shape of the object as seen by the oncoming air stream. Wind tunnels allow scale models to be exposed to simulated wind conditions, and aerodynamic properties of design can be determined. Of special importance are effects of abnormal air flows such as turbulence and vortices. » Bernoulli's principle; fluid mechanics; Mach number; turbulence



Section of an aerofoil or aircraft wing, showing air flow lines.

aerometry [aeromuɪtree] The measurement of airflow through the nose and mouth during speech. In the pronunciation of most sounds, air comes through the mouth; but in the case of nasal consonants (eg [m], [n]) and nasal vowels (eg [ɔ̃]), as in French *bon* the air travels wholly or partly through the nose. Using an *aerometer*, the variations in the use of the nasal cavity in running speech can be plotted. » phonetics

aeronautics The broad body of scientifically-based knowledge describing aeroplanes as objects subject to the laws of physics. The term is usually taken to mean knowledge which focuses upon the vehicle itself, rather than upon the associated commercial or operational usage, although in practice such a definition is not rigidly adhered to. Thus, aeronautics is taken to cover such topics as the generation of lift to make the aeroplane fly, the physical factors affecting manoeuvring, the production of thrust through the use of propellers and jets, the strength of the structure, and the way these various elements are combined to produce a functioning vehicle. » aeroplane; aircraft [1]

aerophone Any musical instrument in which air is the main vibrating agent. Aerophones form one of the main categories of instruments in the standard classification of Hornbostel and

Sachs (1914). They are subdivided into types according to (a) the main material they are made of, and (b) how the air is set in motion (via a mouthpiece, a reed, or neither). > brass/reed/woodwind instrument [1]; musical instruments; organ

aeroplane The general name given to a vehicle whose operational medium is air and which supports itself in the Earth's atmosphere by means of lift. Lift is produced through specially shaped fixed wings attached to the aeroplane's body or fuselage; these alter the airflow so that the pressure distribution of the air over the wing creates an upward force. The airflow is in turn produced by the aeroplane being 'pushed' or 'pulled' through the air by the propulsion device driven by a motor. By means of design, the lift produced by the wing can be made greater than the weight of the airframe and propulsive system, allowing a payload to be carried.

The first truly powered flight was made by Orville Wright in December 1903, when he flew 260 m/852 ft. However, it was not until World War I that governments on both sides of the conflict put money into the development of engines and airframes. This led to the rapid development of specialized aircraft, particularly the fighter. After the War, the needs of American transcontinental passenger travel produced aircraft with multi-engines, metal skins, and retractable undercarriages to replace the previously fabric-covered types. World War 2 saw a further investment in aircraft by both the Axis and Allied powers, culminating in the world's first operational jet fighter, the Me 262. In the period following the War, jet engines were applied to ever larger passenger aircraft, culminating in the introduction of the Boeing 747 Jumbo Jet in 1970. This period also saw the arrival of the supersonic Concorde in 1976. Similarly, warplanes of all types had jet engines applied to them, the trend being towards ever higher speeds. Recent developments in civilian aircraft have been away from high speed towards more economical and quieter operation, whilst military aircraft are becoming increasingly reliant upon electronics to control and keep them stable in flight. > aircraft [1]; Concorde; jet engine [1]; propeller; turbine; Wright brothers

aerosol An airborne suspension of microscopic particles or liquid droplets, typically formed by forcing a liquid through a fine nozzle under pressure. Aerosol sprays are useful as a means of depositing fine even layers of material, such as in paint sprays. > CFCs

Aeschines [æskineez] (c.390 BC-?) Athenian orator, second only to Demosthenes. Prominent in Athenian politics between 348 and 330 BC, his advocacy of peace with Macedon brought him frequently into bitter conflict with Demosthenes, his chief opponent. Defeated in his attempt to undermine Demosthenes in 330 BC, he went into voluntary exile, where he taught rhetoric, and later died. Of his speeches, only three survive. > Demosthenes; Philip II (of Macedon)

Aeschylus [æskiluhz] (c.525-c.456 BC) Greek tragic dramatist, born at Eleusis, near Athens. He fought for Athens in the great Persian wars, and was wounded at Marathon. His first victory as a poet was gained in 485 BC. Out of some 60 plays ascribed to him, only seven are extant, including the trilogy of the *Oresteia*: *Agamemnon*, *Choephoroi* (The Libation Bearers), and *Eumenides* (The Furies). He died at Gela, Sicily. > Greek literature; tragedy

Aesculapius [æskjulapeeus] The Latin form of Asclepius, the Greek god of healing. His cult was transferred from Epidauros to Rome in 291 BC after a plague. > Asclepius

Aesop [æsoʊp] (?6th-c BC) The traditional name of a Greek writer of fables. He is supposed to have been a native of Phrygia and a slave who, after being set free, travelled to Greece. The fables are anecdotes which use animals to make a moral point. Some of the stories are known from the folklore of earlier periods, and none of his actual writings have survived; but versions bearing the name of Aesop have remained popular throughout history. > fable; Greek literature

Aesthetic/Esthetic Movement A view of art based on the theory that art is autonomous and should not be judged by non-aesthetic criteria, whether moral, religious, or political; it flourished in the 19th-c. The French writer Victor Cousin first used the phrase *l'art pour l'art* ('art for art's sake') in 1836, but the doctrine occurs in various forms in the writings of (among

others) Kant, Coleridge, and Emerson. Aestheticism was attacked for its exaggerated detachment from everyday life by Ruskin and later by Tolstoy. The view that purely 'formal' rather than associational or 'literary' qualities are paramount has played a major role in 20th-c discussion. > art; Arts and Crafts Movement

aesthetics The philosophical investigation of art, understood to include the visual arts (painting, sculpture, photography, film), music, literature, drama, and dance. Aesthetics deals with such issues as what it is to perceive an object or a performance as a work of art; what features, if any, are important or essential to it; whether there are objective standards for judging it; and what meaning and function can be ascribed to art criticism.

aestivation > hibernation

Aethel- (Anglo-Saxon names) > **Athel-**, **Ethel-**
aether > **ether**

Aëtius [aheeshius] (c.?-454) Roman general, born in Moesia, who effectively ruled the Western Empire for Valentinian III (c.433-51). His main achievements were the destruction of the Burgundian Kingdom in E Gaul, and the defeat of Attila the Hun in 451. > Attila; Catalaunian Plains, Battle of the

affhinscher [afuhpinshuh] A breed of dog; small with long dark wiry coat; usually black; face like a monkey, with short muzzle and large black eyes; very old breed, originally from Germany, now rare. > dog

affinity A relationship by marriage. Countries generally have rules prohibiting marriage between certain people where there is an affinity - for example between parents and their stepchildren. Prohibitions also apply where there is *consanguinity* (a blood relationship). > annulment; marriage

affirmative action Policies requiring institutions to act 'affirmatively' in employment practices to avoid discrimination on grounds of race, ethnic origin, or sex; usually found in the USA. Executive Order 10925 issued by President Kennedy contained the first use of the term. Affirmative action policies can range from encouraging the employment of minorities to the setting of quotas of minorities to be employed.

affix A grammatical element which cannot occur on its own, but must always attach to the root or stem of a word. Every language has a limited or closed set of affixes. In English, they may precede the stem (*prefixes*), as in *impossible*, or follow it, as in *formal* (*suffixes*). Some other languages have *infixes*, which are attached within the word. > morpheme

afforestation The planting of woodland areas. The aim may be to increase the extent of economically useful wood (eg conifer plantations in upland UK) or to protect against soil erosion and desertification by providing shelter belts and vegetation cover on bare ground. > deforestation; desertification

Afghan hound A breed of dog; large, slender, with a bouncing step; hair very long, silky (short-haired forms also exist); long thin muzzle; originated in Middle East; was used for hunting in N Afghanistan; hunts by sight. > dog; hound

Afghan Wars A series of wars (1838-42, 1878-80, 1919) between Britain and Afghanistan, prompted by the British desire to extend control in the region to prevent the advance of Russian influence towards India. The third Afghan War resulted in the country's independence (1921).

Afghanistan, official name (Democratic) Republic of Afghanistan. De Afghanistan Democrateek Jamburiat area 647 497 sq km 249 934 sq mi; pop (1990e) 15 592 000, plus an estimated 2½ million nomadic tribesmen and 2 million living in Pakistan and Iran as refugees. Republic in S Asia, divided into 29 provinces; bounded N by republics of the former USSR, E and S by Pakistan, W by Iran, and in the extreme NE by China and India; timezone GMT +4½; capital, Kabul; chief towns include Mazar-e-Sharif, Herat, Kandahar; Pathans the main ethnic group, with several minorities; official languages Pushtu, Dari (Persian); chief religion Islam, mostly Sunni; unit of currency the Afghani, subdivided into 100 puls.

Physical description and climate. A mountainous country centred on the Hindu Kush system, reaching over 7 000 m 24 000 ft in the C and NE; many secondary ranges; to the NW, height decreases towards the USSR border; also NW, the fertile valley of Herat; arid uplands to the S; desert in the SW; landlocked, over 500 km 300 mi from the sea; continental



climate, winter severity increased by altitude; summers warm everywhere except on highest peaks; protected from summer monsoons by S mountains; rain mostly during spring and autumn; annual rainfall averages 338 mm 13¼ in; winters generally cold, with much snow at higher altitudes; a desert or semi-arid climate at lower levels.

History and government. Nation first formed in 1747 under Ahmed Shah Durrani; seen by Britain as a bridge between India and the Middle East, but Britain failed to gain control during a series of Afghan Wars (the last in 1919); feudal monarchy survived until after World War 2, when the constitution became more liberal under several Soviet-influenced 5-year economic plans; king deposed 1973, and a republic formed; new constitution 1977; coup (1978) installed a new government under the communist leader, Nur Mohammad Taraki; further coup (1979) brought to power Hafizullah Amin, which led to the invasion by USSR forces and the establishment of Babrak Karmal as head of state; new constitution, 1987, provides for an executive president, bicameral National Assembly, and council of ministers; Soviet withdrawal implemented 1988-9; regime has met heavy guerrilla resistance from the Mujahadeen (Islamic fighters), and its influence extends effectively over only 20% of the population.

Economy. Traditionally based on agriculture, especially wheat, fruit and vegetables, maize, barley, cotton, sugar-beet, sugar cane; sheep, cattle, goats; forest wood for fuel; food processing, textiles (especially carpets), leather goods, plastics, furniture, footwear, mechanical spares; natural gas production in the N, largely for export; most sectors have been affected by the Civil War, especially sugar and textiles. » communism; Hindu Kush; Islam; Kabul; Mujahadeen; Sunnis; RR24 national holidays; RR42 political leaders

AFL/CIO » American Federation of Labor - Congress of Industrial Organizations

afatoxin [aflatoksin] A toxin produced by the mould *Aspergillus flavus* (from *Aspergillus flavus toxin*) commonly found in peanuts, cottonseed, soybeans, wheat, barley, sorghum, and nuts such as pistachios, almonds, and cacao, where the climate favours its growth. The major epidemic of 'Turkey-X disease' in turkeys in the USA in 1960 was caused by feeding with contaminated groundnuts. Symptoms of poisoning include weight loss, loss of co-ordination, convulsions, and death. It also damages the liver, and causes liver tumours when fed long-term at low doses. » liver, toxin

Africa area c.29.8 million sq km/11.5 million sq ml. Second largest continent, extending S from the Mediterranean Sea,

bounded W by the Atlantic Ocean and E by the Indian Ocean and the Red Sea; bisected by the Equator; maximum length, 8 000 km 5 000 ml; maximum width, 7 200 km 4 500 ml; highest point, Mt Kilimanjaro (5 895 m 19 340 ft); major rivers include the Congo, Niger, Nile, Zambezi. » Africa, Partition of; African art/dance/history/languages/literature/music; Rift Valley; Sahara Desert; Plate VI

Africa, Partition of The division of the continent of Africa into colonial territories, which occurred in the last three decades of the 19th-c. Europeans had traded with Africa for several centuries, using a series of coastal settlements. Portuguese efforts to penetrate the interior in the 16th-17th-c had largely failed, and only the Dutch at the Cape had been able to establish a dynamic permanent settlement. In the course of the 19th-c, efforts to abolish the slave trade, missionary endeavours, and optimistic views of African riches helped to encourage colonial ambitions. The countries involved in the Partition included Britain, France, Germany, Portugal, and Italy, as well as the Boers in the S, and (in his private capacity) King Leopold of the Belgians. When the French and the Italians completed the Partition of N Africa in the years before World War I, only Liberia and Ethiopia remained independent. At the end of the two World Wars, a repartitioning occurred with the confiscation of German and Italian territories. Most of the countries created by the Partition achieved independence in or after the 1960s, and the Organization of African Unity pledged itself to the maintenance of the existing boundaries. » Africa; Fashoda; Organization of African Unity; slave trade

African art Visual art forms of the Continent of Africa, originally rock painting and drawings, in open shelters rather than caves. Scratched or incised drawings occur more abundantly throughout the Sahara than anywhere else in the world, and extend chronologically from ancient times almost to the present day. Early representations of wild animals, some now extinct, attest to a hunting culture that flourished before c.4000 BC. The style, as in European Palaeolithic art, is naturalistic. Later rock art is more schematic. Horses and chariots, and later camels, appear. In S Africa the Bushmen have practised their own form of rock painting and drawing from early times to the present. The major form of African tribal (as opposed to prehistoric) art, practised mainly in the W Sudan, the Guinea Coast, Middle Africa, and the Congo, has been sculpture, especially masks and small figures, stools and thrones, as well as everyday objects. Materials, apart from wood, include ivory, metal (mostly bronze), terracotta, raffia, and occasionally stone. Painting has been much less important. In the early 20th-c, African sculpture inspired artists such as Picasso to employ 'primitive' forms in reaction against the conventions of 19th-c naturalism. In recent years, especially since c.1960, artists working in independent states have created original forms of art by combining traditional African with modern Western ideas, techniques, and aesthetic attitudes. » art

African buffalo A member of the cattle family, native to S and E Africa; heavy black or brown body; thick horns lying across head like a helmet, with tips curved upwards; large drooping ears; also known as **Cape buffalo** (small form called **dwarf forest buffalo**). (*Syncerus caffer*.) » Bovidae; cattle

African dance A vast number of dances, often part of traditional tribal structures, which operate within larger geographical boundaries (not always identical with current political boundaries). Some relate to religious belief or communicate socially acceptable moral codes; others express social hierarchies or celebrate ceremonial and social events. Dancing and drumming occur together with clapping and singing. Performances take place within a community as part of a carnival or an arts festival, and in a theatrical context for tourists. Movement is typically from a crouched position, bare-footed with knees bent and shuffling steps, the motion beginning in the hips. » Caribbean dance

African history The study of the history of the continent of Africa. Early approaches were bedevilled by the way Europeans regarded history as the study of societies through literacy, the examination of pre-literate societies being dubbed