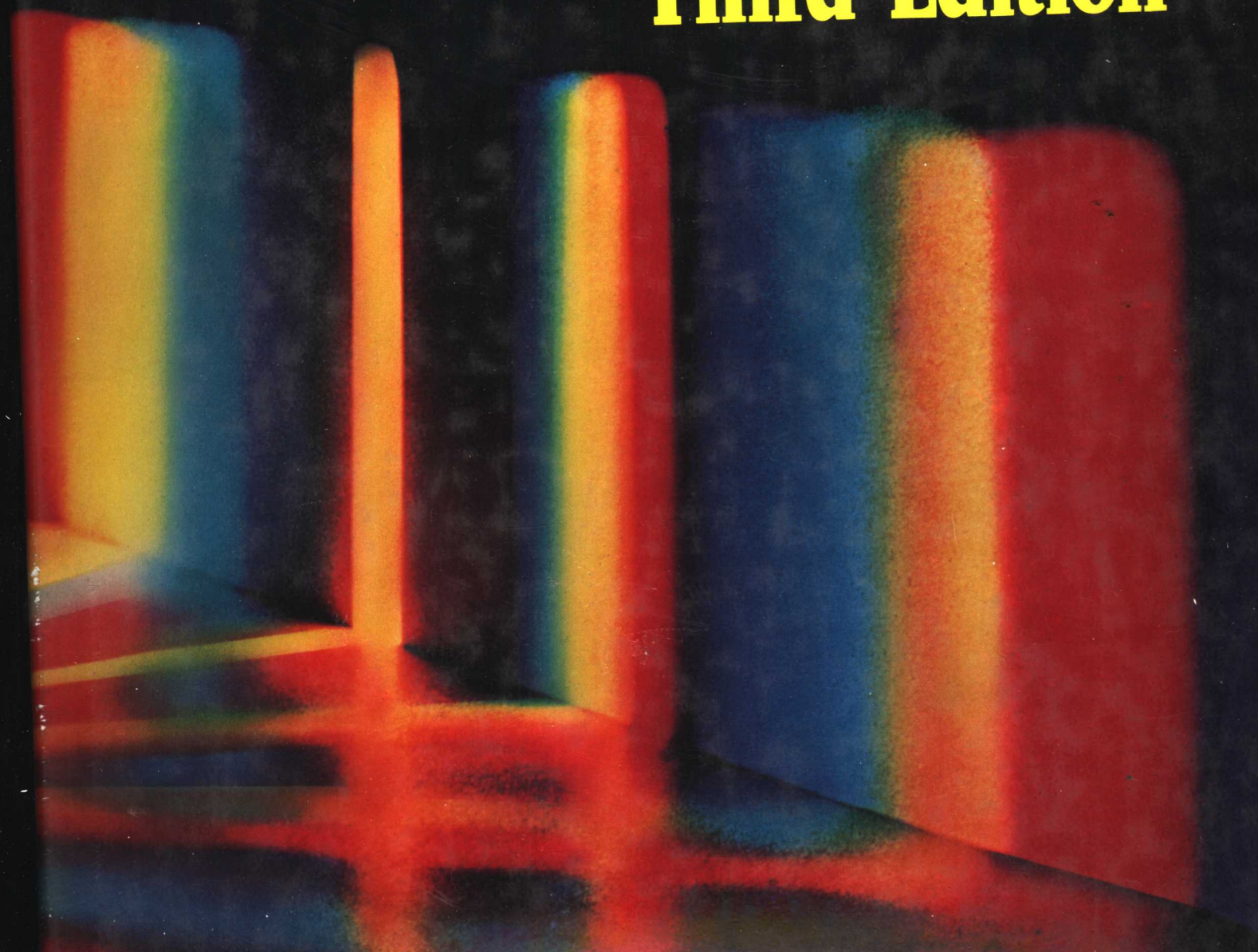


**McGraw-Hill**  
**DICTIONARY OF**  
**SCIENTIFIC AND**  
**TECHNICAL TERMS**  
**Third Edition**



# **McGraw-Hill DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS Third Edition**

**SYBIL P. PARKER** Editor in Chief

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## McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS,

Third Edition

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# Preface

When the first edition of the *McGraw-Hill Dictionary of Scientific and Technical Terms* was published in 1974, its aim was to fill the need created by inadequate representation of the vocabulary of science, engineering, and technology in general English language dictionaries. Now in its third edition, this Dictionary continues that purpose, concentrating on the specialized scientific and technical terminology and providing definitions of this vocabulary for the professional community as well as for the general reader with an interest in science.

To keep pace with the continuing rapid developments and expanding vocabularies in all areas of science and technology, the editors of the Dictionary decided to publish this enlarged third edition. Thoroughly up to date, with the addition of 7500 new entries, the third edition includes 98,500 terms with 115,500 definitions. In selecting entries, most disciplines were covered, but special emphasis was given to electronics and computer science since these areas have experienced the most dramatic growth during the past few years.

The definitions are written in clear, simple language that is understandable even to nonspecialists but is consistent with the complexity of the term itself. Each definition is identified by the field in which it is used. There are 100 fields represented, some of which are highly specialized—such as atomic physics [ATOM PHYS] and molecular biology [MOL BIO]—while others are more general—such as chemistry [CHEM] and science and technology [SCI TECH]. A definition is given a specific field identifier except where it applies to more than one field. In this case, a more general field is designated. For example, if the same definition is used in both invertebrate zoology and vertebrate zoology, it is assigned to the field of zoology. An alphabetical list of field abbreviations and a complete list of fields with an explanation of the scope of each begins on page xii.

In addition to definitions, synonyms, acronyms, and abbreviations are given under the appropriate entry. These also appear in the alphabetical sequence as separate entries providing cross-references to the principal term. Where units of measurement are essential to the definition, U.S. Customary units are used with International System (SI) or metric equivalents. Many definitions are supplemented by detailed, informative illustrations, of which there are approximately 3000.

The definitions were written by the staff of the *McGraw-Hill Encyclopedia of Science and Technology* and by a select group of contributing editors, and were reviewed by the consulting editors. Their efforts were supplemented by existing resources of the McGraw-Hill Book Company, including such published works as: Philip B. Jordain, *Condensed Computer Encyclopedia*; John Markus, *Electronics and Nucleonics Dictionary*; John Quick, *Artists' and Illustrators' Encyclopedia*; Blakiston's *Gould Medical Dictionary*; and Theodore Baumeister and Lionel S. Marks (eds.), *Standard Handbook for Mechanical Engineers*. These and other works from which material was drawn are credited on the copyright page.

The emphasis in the Dictionary is placed on providing definitions rather than on pronunciation, etymology, or syllabication.

The Appendix contains a full explanation of the International System of units with conversion tables for the U.S. Customary and metric systems. It also includes a table of the chemical elements; a periodic table; lists of mathematical notation; tables of mathematical signs and symbols, fundamental constants, and elementary particles; international graphic symbols; semiconductor symbols and abbreviations; schematic electronic symbols; a list of abbreviations for scientific and technical organizations; and a biographical listing comprising noted scientists, both historical and modern. A new feature of the Appendix is an outline of the classification of living organisms, from kingdom down to the ordinal level.

An explanation of how to use the Dictionary, describing alphabetization, cross-referencing, and so on, is on page x.

Through the collaborative efforts of the editorial staff, the contributing editors, and the consulting editors, the third edition of the *McGraw-Hill Dictionary of Scientific and Technical Terms*, now a standard international reference, will continue to serve the information needs of readers within and outside the scientific community.

SYBIL P. PARKER  
EDITOR IN CHIEF

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# How to Use the Dictionary

## I. ALPHABETIZATION

The terms in the *McGraw-Hill Dictionary of Scientific and Technical Terms* are alphabetized on a letter-by-letter basis; word spacing, hyphen, comma, solidus, and apostrophe in a term are ignored in the sequencing. For example, an ordering of terms would be:

**air-earth current**  
**air ejector**  
**airfield**  
**air filter**  
**AKF diagram**

Also ignored in the sequencing of terms (usually, chemistry terms) are italic elements, numbers, small capitals, and Greek letters. For example, the following terms appear within alphabet letter "A":

**N-acetyethanolamine**  
**2-aminobutane**  
 **$\alpha$ -aminohydrocinnamic acid**  
**ortho-aminophenol**

## II. FORMAT

The basic format for a defining entry provides the term in boldface, the field in small capitals, and the single definition in lightface:

**term** [FIELD] Definition.

A field may be followed by multiple definitions, each introduced by a boldface number:

**term** [FIELD] **1.** Definition. **2.** Definition. **3.** Definition.

A term may have definitions in two or more fields:

**term** [BOT] Definition. [GEOL] Definition.

A simple cross-reference entry appears as:

**term** See another term.

A cross-reference may also appear in combination with definitions:

**term** [BOT] Definition. [GEOL] See another term.

## III. CROSS-REFERENCING

A cross-reference entry directs the user to the defining entry. For example, the user looking up "average life" finds:

**average life** See mean life.

The user then turns to the "M" terms for the definition.

Cross-references are also made from variant spellings, acronyms, abbreviations, and symbols.

**aesthacyte** See esthacyte.

**ASROC** See antisubmarine rocket.

**at. wt** See atomic weight.

**Au** See gold.

The user should observe that an element ignored in alphabetizing may appear in a cross-reference entry. For example, the following directs the user to a term in alphabet letter "V," not in "N":

**amyl aldehyde** See *n*-valeraldehyde.

## IV. ALSO KNOWN AS . . . , etc.

A definition may conclude with a mention of a synonym of the term, a variant spelling, an abbreviation for the term, or other such information, introduced by "Also known as . . . ," "Also spelled . . . ," "Abbreviated . . . ," "Symbolized . . . ," "Derived from . . . ." When a term has more than one definition, the positioning of any of these phrases conveys the extent of applicability. For example:

**term** [BOT] **1.** Definition. Also known as synonym.

**2.** Definition. Symbolized T.

In the above arrangement, "Also known as . . ." applies only to the first definition; "Symbolized . . ." applies only to the second definition.

**term** [BOT] **1.** Definition. **2.** Definition. [GEOL] Definition. Also known as synonym.

In the above arrangement "Also known as . . ." applies only to the second field.

**term** [BOT] Also known as synonym. **1.** Definition.

**2.** Definition. [GEOL] Definition.

In the above arrangement, "Also known as . . ." applies to both definitions in the first field.

**term** Also known as synonym. [BOT] **1.** Definition.

**2.** Definition. [GEOL] Definition.

In the above arrangement, "Also known as . . ." applies to all definitions in both fields.

## V. CHEMICAL FORMULAS

Chemistry definitions may include either an empirical formula (say, for acetaldehyde, C<sub>2</sub>H<sub>4</sub>O) or a line formula (for acrylic acid, CH<sub>2</sub>CHCOOH), whichever is appropriate.

# Field Abbreviations

ACOUS	acoustics	INV ZOO	invertebrate zoology
AERO ENG	aerospace engineering	LAP	lapidary
AGR	agriculture	MAP	mapping
ANALY CHEM	analytical chemistry	MATER	materials
ANAT	anatomy	MATH	mathematics
ANTHRO	anthropology	MECH	mechanics
ARCH	architecture	MECH ENG	mechanical engineering
ARCHEO	archeology	MED	medicine
ASTRON	astronomy	MET	metallurgy
ASTROPHYS	astrophysics	METEOROL	meteorology
ATOM PHYS	atomic physics	MICROBIO	microbiology
BIOCHEM	biochemistry	MIN ENG	mining engineering
BIOL	biology	MINERAL	mineralogy
BIOPHYS	biophysics	MOL BIO	molecular biology
BOT	botany	MYCOL	mycology
BUILD	building construction	NAV	navigation
CHEM	chemistry	NAV ARCH	naval architecture
CHEM ENG	chemical engineering	NUCLEO	nuclear physics
CIV ENG	civil engineering	NUC PHYS	nuclear physics
CLIMATOL	climatology	OCEANOGR	oceanography
COMMUN	communications	OPTICS	optics
COMPUT SCI	computer science	ORD	ordnance
CONT SYS	control systems	ORG CHEM	organic chemistry
CRYO	cryogenics	PALEOBOT	paleobotany
CRYSTAL	crystallography	PALEON	paleontology
CYTOL	cytology	PARTIC PHYS	particle physics
DES ENG	design engineering	PATH	pathology
ECOL	ecology	PETR	petrology
ELEC	electricity	PETRO ENG	petroleum engineering
ELECTR	electronics	PHARM	pharmacology
ELECTROMAG	electromagnetism	PHYS	physics
EMBRYO	embryology	PHYS CHEM	physical chemistry
ENG	engineering	PHYSIO	physiology
ENG ACOUS	engineering acoustics	PL PATH	plant pathology
EVOL	evolution	PL PHYS	plasma physics
FL MECH	fluid mechanics	PSYCH	psychology
FOOD ENG	food engineering	QUANT MECH	quantum mechanics
FOR	forestry	RELAT	relativity
GEN	genetics	SCI TECH	science and technology
GEOCHEM	geochemistry	SOLID STATE	solid-state physics
GEOD	geodesy	SPECT	spectroscopy
GEOGR	geography	STAT	statistics
GEOL	geology	STAT MECH	statistical mechanics
GEOPHYS	geophysics	SYS ENG	systems engineering
GRAPHICS	graphic arts	SYST	systematics
HISTOL	histology	TEXT	textiles
HOROL	horology	THERMO	thermodynamics
HYD	hydrology	VERT ZOO	vertebrate zoology
IMMUNOL	immunology	VET MED	veterinary medicine
IND ENG	industrial engineering	VIROL	virology
INORG CHEM	inorganic chemistry	ZOO	zoology



# Scope of Fields

**acoustics**—The science of the production, transmission, and effects of sound.

**aerospace engineering**—Engineering pertaining to the design and construction of aircraft and space vehicles and of power units, and dealing with the special problems of flight in both the earth's atmosphere and space, such as in the flight of air vehicles and the launching, guidance, and control of missiles, earth satellites, and space vehicles and probes.

**agriculture**—The production of plants and animals useful to humans, involving soil cultivation and the breeding and management of crops and livestock.

**analytical chemistry**—Science and art of determining composition of materials in terms of elements and compounds which they contain.

**anatomy**—The branch of morphology concerned with the gross and microscopic structure of animals, especially humans.

**anthropology**—The study of the interrelations of biological, cultural, geographical, and historical aspects of the human race.

**archeology**—The scientific study of the material remains of the cultures of historical and prehistorical peoples.

**architecture**—The art or practice of designing structures, especially habitable structures in accordance with principles determined by esthetic and practical or material considerations.

**astronomy**—The science concerned with celestial bodies and with the observation and interpretation of radiation received in the vicinity of earth from the component parts of the universe.

**astrophysics**—A branch of astronomy that treats of the physical properties of celestial bodies, such as luminosity, size, mass, density, temperature, and chemical composition, and their origin and evolution.

**atomic physics**—A branch of physics concerned with the structures of the atom, the characteristics of the electrons and other elementary particles of which the atom is composed, the arrangement of the atom's energy states, and the processes involved in the radiation of light and x-rays.

**biochemistry**—The study of the chemical substances that occur in living organisms, the processes by which these substances enter into or are formed in the organisms and react with each other and the environment, and the methods by which the substances and processes are identified, characterized, and measured.

**biology**—The science of living organisms, concerned with the study of embryology, anatomy, physiology, cytology, morphology, taxonomy, genetics, evolution, and ecology.

**biophysics**—The hybrid science involving the methods and ideas of physics and chemistry to study and explain the structures of living organisms and the mechanics of life processes.

**botany**—That branch of biological science which embraces the study of plants and plant life, including algae; deals with taxonomy, morphology, physiology, and other aspects.

**building construction**—The art of business of assembling materials into a structure, especially one designated for occupancy.

**chemical engineering**—A branch of engineering that deals with the development and application of manufacturing processes, such as refinery processes, which chemically convert raw materials into a variety of products, and that deals with the design and operation of plants and equipment to perform such work.

**chemistry**—The scientific study of the properties, composition, and structure of matter, the changes in structure and composition of matter, and accompanying energy changes.

**civil engineering**—The planning, design, construction, and maintenance of fixed structures and ground facilities for industry, for transportation, for use and control of water, for occupancy, and for harbor facilities.

**climatology**—That branch of meteorology concerned with the mean physical state of the atmosphere together with its statistical variations in both space and time as reflected in the weather behavior over a period of many years.

**communications**—The science and technology by which information is collected from an originating source, transformed into electric currents or fields, transmitted over electrical networks or space to another point, and reconverted into a form suitable for interpretation by a receiver.

**computer science**—The branch of knowledge concerned with information processes, the structures and procedures that represent these processes, and their implementation in information-processing systems.

**control systems**—The study of those systems in which one or more outputs are forced to change in a desired manner as time progresses.

**cryogenics**—The science of producing and maintaining very low temperatures, of phenomena at those temperatures, and of technical operations performed at very low temperatures.

**crystallography**—The branch of science that deals with the geometric description of crystals, their internal arrangement, and their properties.

**cytology**—The branch of biological science which deals with the structure, behavior, growth, and reproduction of cells and the function and chemistry of cells and cell components.

**design engineering**—A branch of engineering concerned with the design of a product or facility according to generally accepted uniform standards and procedures, such as the specification of a linear dimension, or a manufacturing practice, such as the consistent use of a particular size of screw to fasten covers.

**ecology**—The study of the interrelationships between organisms and their environment.

**electricity**—The science of physical phenomena involving electric charges and their effects when at rest and when in motion.

**electromagnetism**—The branch of physics dealing with the observations and laws relating electricity to magnetism, and with magnetism produced by an electric current.

**electronics**—The branch of science and technology relating to the conduction of electricity through gases or vacuum or through semiconducting materials; concerned with the design, manufacture, and application of electron tubes.

**embryology**—The study of the development of the organism from the zygote, or fertilized egg.

**engineering**—The science by which the properties of matter and the sources of power in nature are made useful to man in structures, machines, and products.

**engineering acoustics**—A field of acoustics that deals with the production, detection, and control of sound by electrical devices, including the study, design, and construction of such things as microphones, loudspeakers, sound recorders and reproducers, and public address systems.

**evolution**—The processes of biological and organic change in organisms by which descendants come to differ from their ancestors, and a history of the sequence of such change.

**fluid mechanics**—The science concerned with fluids, either at rest or in motion, and dealing with pressures, velocities, and accelerations in the fluid, including fluid deformation and compression or expansion.

**food engineering**—Technical discipline involved in food manufacturing and processing.

**forestry**—The science of developing, cultivating, and managing forest lands for wood, forage, water, wildlife, and recreation; the management of growing timber.

**genetics**—The science concerned with biological inheritance, that is, with the causes of the resemblances and differences among related individuals.

**geochemistry**—The study of the chemical composition of the various phases of the earth and the physical and chemical processes which have produced the observed distribution of the elements and nuclides in these phases.

**geodesy**—A subdivision of geophysics which includes determinations of the size and shape of the earth, the earth's gravitational field, and the location of points fixed to the earth's crust in an earth-referred coordinate system.

**geography**—The science that deals with the description of land, sea, and air and the distribution of plant and animal life, including humans.

**geology**—The study or science of earth, its history, and its life as recorded in the rocks; includes the study of the geologic features of an area, such as the geometry of rock formations, weathering and erosion, and sedimentation.

**geophysics**—A branch of geology in which the principles and practices of physics are used to study the earth and its environment, that is, earth, air, and (by extension) space.

**graphic arts**—The fine and applied arts of representation, decoration, and writing or printing on flat surfaces together with the techniques and crafts associated with each; includes painting, drawing, engraving, etching, lithography, photography, and printing arts.

**histology**—The study of the structure and chemical composition of animal tissues as related to their function.

**horology**—Science of time measurement and the principles and technology of constructing time-measuring instruments.

**hydrology**—The science that treats of the surface and ground waters of the earth; their occurrence, circulation, and distribution; their chemical and physical properties; and their reaction with their environment.

**immunology**—The division of biological science concerned with the native or acquired resistance of higher animal forms and humans to infection with microorganisms.

**industrial engineering**—The application of engineering principles and training and the techniques of scientific management to the maintenance of a high level of productivity at optimum cost in industrial enterprises, as by analytical study, improvement, and installation of methods and systems, operating procedures, quantity and quality measurements and controls, safety measures, and personnel administration.

**inorganic chemistry**—A branch of chemistry that deals with reactions and properties of all chemical elements and their compounds, excluding hydrocarbons but usually including carbides and other simple carbon compounds (such as  $\text{CO}_2$ ,  $\text{CO}$ , and  $\text{HCN}$ ).

**invertebrate zoology**—A branch of zoology concerned with the taxonomy, behavior, and morphology of invertebrate animals.

**lapidary**—The study relating to precious stones or the art of cutting them.

**mapping**—The art and practice of making a drawing or other representation, usually on a flat surface, of the whole or part of an area (as the surface of the earth or some other planet), indicating relative position and size according to a specified scale or projection of selected features, as countries, cities, rock formations, or bodies of water.

**materials**—The study of admixtures of matter or the basic matter from which products are made; includes adhesives, building materials, fuels, paints, leathers, and so on.

**mathematics**—The deductive study of shape, quantity, and dependence; the two main areas are applied mathematics and pure mathematics, the former arising from the study of physical phenomena, the latter involving the intrinsic study of mathematical structures.

**mechanical engineering**—The branch of engineering concerned with the generation, transmission, and utilization of heat and mechanical power, and with the production and operation of tools, machinery, and their products.

**mechanics**—The branch of physics which seeks to formulate general rules for predicting the behavior of a physical system under the influence of any type of interaction with its environment.

**medicine**—The study of cause and treatment of human disease, including the healing arts dealing with diseases which are treated by a physician or a surgeon.

**metallurgy**—The branch of engineering concerned with the production of metals and alloys, their adaptation to use, and their performance in service; and the study of chemical reactions involved in the processes by which metals are produced, and of the laws governing the physical, chemical, and mechanical behavior of metallic materials.

**meteorology**—The science concerned primarily with the ob-

servation of the atmosphere and its phenomena, including temperature, density, winds, clouds, and precipitation.

**microbiology**—The science and study of microorganisms, especially bacteria and rickettsiae, and of antibiotic substances.

**mineralogy**—The science concerning the study of natural inorganic substances called minerals, including origin, description, and classification.

**mining engineering**—A branch of engineering concerned with the location and evaluation of coal and mineral deposits, the survey of mining areas, the layout and equipment of mines, the supervision of mining operations, and the cleaning, sizing, and dressing of the product.

**molecular biology**—That branch of biology which attempts to interpret biological events in terms of the molecules in the cell.

**mycology**—A branch of biological science concerned with the study of fungi.

**naval architecture**—The study of the physical characteristics and the design and construction of buoyant structures which operate in water, and of the construction and operation of the power plant and other mechanical equipment of these structures.

**navigation**—The science or art of conducting ships or aircraft from one place to another, especially the method of determining position, course, and distance traveled over the surface of the earth by the principles of geometry and astronomy and by reference to devices (radar, beacons, and instruments) designed as aids.

**nuclear physics**—The study of the characteristics, behavior, and internal structure of the atomic nucleus.

**nucleonics**—The technology based on phenomena of the atomic nucleus such as radioactivity, fission, and fusion; includes nuclear reactors, various applications of radioisotopes and radiation, particle accelerators, and radiation detection devices.

**oceanography**—The scientific study and exploration of the oceans and seas in all their aspects.

**optics**—The study of phenomena associated with the generation, transmission, and detection of electromagnetic radiation in the spectral range extending from the long-wave edge of the x-ray region to the short-wave edge of the radio region; and the science of light.

**ordnance**—That military area concerned with supplies, including weapons, ammunition, combat vehicles, and the necessary repair equipment; and with heavy firearms discharged from mounts, including cannons and artillery.

**organic chemistry**—The study of the composition, reactions, and properties of carbon compounds except  $\text{CO}_2$ ,  $\text{CO}$ , and certain ionic compounds such as  $\text{Na}_2\text{CO}_3$  and  $\text{NaCN}$ .

**paleobotany**—The study of fossil plants and vegetation of the geologic past.

**paleontology**—The study of life in the geologic past as recorded by fossil remains.

**pathology**—The branch of biological science which deals with the nature of disease, through study of its causes, its processes, and its effects, together with the associated alterations of structure and function; and the laboratory findings of

disease, as distinguished from clinical signs and symptoms.

**particle physics**—The branch of physics concerned with understanding the properties, behavior, and structure of elementary particles, especially through study of collisions or decays involving energies of hundreds of MeV or more.

**petroleum engineering**—A branch of engineering concerned with the search for and extraction of oil, gas, and liquefiable hydrocarbons.

**petrology**—The branch of geology dealing with the origin, occurrence, structure, and history of rocks, especially igneous and metamorphic rocks.

**pharmacology**—The science of detection and measurement of the effects of drugs or other chemicals on biological systems; includes all chemicals used as drugs.

**physical chemistry**—The description and prediction of chemical behavior by means of physical theory, with extensive use of graphs and mathematical formulas; main subject areas are structure, thermodynamics, and kinetics.

**physics**—The science concerned with those aspects of nature which can be understood in terms of elementary principles and laws.

**physiology**—The branch of biological science concerned with the basic activities that occur in cells and tissues of living organisms and involving physical and chemical studies of these organisms.

**plant pathology**—The branch of botany concerned with diseases of plants.

**plasma physics**—The study of highly ionized gases.

**psychology**—The science of the function of the mind and the behavior of an organism, both animal and human, in relation to its environment.

**quantum mechanics**—The modern theory of matter, of electromagnetic radiation, and of the interaction between matter and radiation; it differs from classical physics, which it generalizes and supersedes, mainly in the realm of atomic and subatomic phenomena.

**relativity**—The study of physics theory which recognizes the universal character of the propagation speed of light and the consequent dependence of space, time, and other mechanical measurements on the motion of the observer performing the measurements; the two main divisions are special theory and general theory.

**science and technology**—The study of the natural sciences and the application of this knowledge for practical purposes.

**solid-state physics**—The branch of physics centering on the physical properties of solid materials; it is usually concerned with the properties of crystalline materials only, but it is sometimes extended to include the properties of glasses or polymers.

**spectroscopy**—The branch of physics concerned with the production, measurement, and interpretation of electromagnetic spectra arising from either emission or absorption of radiant energy by various substances.

**statistical mechanics**—That branch of physics which endeavors to explain and predict the macroscopic properties and behavior of a system on the basis of the known characteristics and interactions of the microscopic constituents of the system, usually when the number of such constituents is very large.

**statistics**—The science dealing with the collection, analysis, interpretation, and presentation of masses of numerical data.

**systematics**—The science of animal and plant classification.

**systems engineering**—The branch of engineering dealing with the design of a complex interconnection of many elements (a system) to maximize an agreed-upon measure of system performance.

**textiles**—Area of industry involving the production of fibers, filaments, or yarn, and the cloth made from these materials.

**thermodynamics**—The branch of physics which seeks to derive, from a few basic postulates, relations between proper-

ties of substances, especially those which are affected by changes in temperature, and a description of the conversion of energy from one form to another.

**vertebrate zoology**—A branch of zoology concerned with the taxonomy, behavior, and morphology of vertebrate animals.

**veterinary medicine**—That branch of medical practice which treats of the diseases and injuries of animals.

**virology**—The science that deals with the study of viruses.

**zoology**—The science that deals with the taxonomy, behavior, and morphology of animal life.

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## A

**a** See ampere; atto-.

**aΩ** See abohm.

**(aΩ)<sup>-1</sup>** See abmho.

**A** See ampere; angstrom.

**Å** See angstrom.

**A+** See A positive.

**A-1** See Skyraider.

**A-3** See Skywarrior.

**A-4** See V-2.

**A-5** See Vigilante.

**aA** See abampere.

**AA** See antiaircraft.

**AAA** See antiaircraft artillery.

**aaa disease** [MED] An endemic hookworm disease accompanied by anemia that occurred in ancient Egypt and is designated in the Ebers Papyrus.

**aa channel** [GEOL] A narrow, sinuous channel in which a lava river moves down and away from a central vent to feed an aa flow.

**aAcm<sup>2</sup>** See abampere centimeter squared.

**aA/cm<sup>2</sup>** See abampere per square centimeter.

**aa lava** [GEOL] Type of lava with a rough, fragmental surface; consists of clinkers and scoria.

**Aalenian** [GEOL] Lowermost Middle or uppermost Lower Jurassic geologic time.

**AAM** See air-to-air missile; antiaircraft missile.

**A AND NOT B gate** See AND NOT gate.

**apamoor** [ECOL] A moor with elevated areas or mounds supporting dwarf shrubs and sphagnum, interspersed with low areas containing sedges and sphagnum, thus forming a mosaic.

**aardvark** [VERT ZOO] A nocturnal, burrowing, insectivorous mammal of the genus *Orycteropus* in the order Tubulidentata. Also known as earth pig.

**aardwolf** [VERT ZOO] *Proteles cristatus*. A hyenalike African mammal of the family Hyaenidae.

**Aaron's rod** [ARCH] A decorative rounded molding on which are entwined a single serpent and sometimes vines and leaves.

**a axis** [CRYSTAL] One of the crystallographic axes used as reference in crystal description, usually oriented horizontally, front to back. [GEOL] The direction of movement or transport in a tectonite.

**ab-** [ELECTROMAG] A prefix used to identify centimeter-gram-second electromagnetic units, as in abampere, abcoulomb, abfarad, abhenry, abmho, abohm, and abvolt.

**abac** See nomograph.

**abaca** [BOT] *Musa textilis*. A plant of the banana family native to Borneo and the Philippines, valuable for its hard fiber. Also known as Manila hemp.

**abactinal** [INV ZOO] In radially symmetrical animals, pertaining to the surface opposite the side where the mouth is located.

**abacus** [ARCH] A slab forming the topmost division of the capital of a column. [MATH] An instrument for performing arithmetical calculations manually by sliding markers on rods or in grooves.

**abaft** [NAV ARCH] In a direction farther aft in a ship than a specified reference position, such as abaft the mast.

**abalienation** [PSYCH] Mental deterioration or derangement.

**abalone** [INV ZOO] A gastropod mollusk composing the single genus *Haliotis* of the family Haliotidae. Also known as ear shell; ormer; paua.

**abalyne** [ORG CHEM] A liquid rosin that is a methyl ester of abietic acid; prepared by treating rosin with methyl alcohol; used as a plasticizer.

**abampere** [ELEC] The unit of electric current in the electromagnetic centimeter-gram-second system; 1 abampere equals 10 amperes in the absolute meter-kilogram-second-ampere system. Abbreviated aA. Also known as Bi; biot.

**abampere centimeter squared** [ELECTROMAG] The unit of magnetic moment in the electromagnetic centimeter-gram-second system. Abbreviated aAcm<sup>2</sup>.

**abampere per square centimeter** [ELEC] The unit of current density in the electromagnetic centimeter-gram-second system. Abbreviated aA/cm<sup>2</sup>.

**abamurus** [ARCH] A masonry block, in the form of a buttress, used to support a structure.

**A band** [HISTOL] The region between two adjacent I bands in a sarcomere; characterized by partial overlapping of actin and myosin filaments.

**abandon** [ENG] To stop drilling and remove the drill rig from the site of a borehole before the intended depth or target is reached.

**abandoned channel** See oxbow.

**abandoned mine** See abandoned workings.

**abandoned workings** [MIN ENG] Deserted excavations, either caved or sealed, in which further mining is not intended, and opening workings which are not ventilated and inspected regularly. Also known as abandoned mine.

**abandonment** [MIN ENG] Failure to perform work, by conveyance, by absence, and by lapse of time, on a mining claim. [PETRO ENG] See abandonment contour.

**abandonment contour** [PETRO ENG] A graph of actual cumulative yield of an oil well compared with its estimated ultimate yield; useful in determining the most economic time to abandon an oil well. Also known as abandonment.

**abapertural** [INV ZOO] Away from the shell aperture, referring to mollusks.

**abapical** [BIOL] On the opposite side to, or directed away from, the apex.

**abarognosis** [MED] Lack of ability to estimate the weight of an object one is holding.

**abasia** [MED] Lack of muscular coordination in walking.

**abate** [ENG] 1. To remove material, for example, in carving stone. 2. In metalwork, to excise or beat down the surface in order to create a pattern or figure in low relief.

**abatement** [ENG] 1. The waste produced in cutting a timber, stone, or metal piece to a desired size and shape. 2. A decrease in the amount of a substance or other quantity, such as atmospheric pollution.

**abat-jour** [BUILD] A device that is used to deflect daylight downward as it streams through a window.

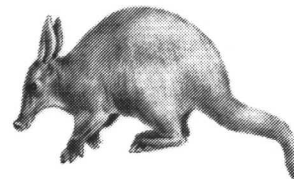
**A battery** [ELECTR] The battery that supplies power for filaments or heaters of electron tubes in battery-operated equipment.

**abattoir** [IND ENG] A building in which cattle or other animals are slaughtered.

**abat-vent** [BUILD] A series of sloping boards or metal strips, or some similar contrivance, to break the force of wind without being an obstruction to the passage of air or sound, as in a louver or chimney cowl.

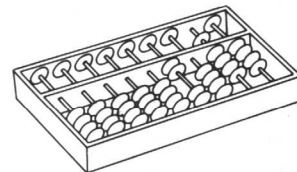
**abaxial** [BIOL] On the opposite side to, or facing away from, the axis of an organ or organism.

## AARDVARK



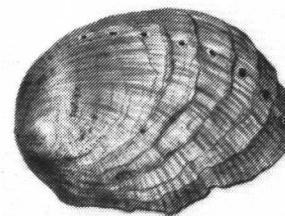
The armadillo (*Orycteropus afer*), a nocturnal, burrowing animal ranging from Ethiopia to southern Africa.

## ABACUS



Drawing of an abacus.

## ABALONE



Typical abalone ear-shaped shell perforated by pores.

**abb** [TEXT] Yarn made of abb wool. [VERT ZOO] A coarse wool from the fleece areas of lesser quality.

**abbazzo** [GRAPHICS] A rough sketch, draft, or model.

**Abbe condenser** [OPTICS] A variable large-aperture lens system arranged substage to image a light source into the focal plane of a microscope objective.

**Abbe number** [OPTICS] A number which expresses the deviating effect of an optical glass on light of different wavelengths.

**Abbe prism** [OPTICS] A system used for image erection which is composed of two double right-angle prisms and involves four reflections.

**Abbe refractometer** [OPTICS] An optical instrument for the measurement of the refractive index of liquids.

**Abbe's sine condition** [OPTICS] A relationship which must hold to prevent aberration of a mirror or lens from producing a coma.

**Abbe's theory** [OPTICS] The theory that for a lens to produce a true image, it must be large enough to transmit the entire diffraction pattern of the object.

**abbreviated dialing** [COMMUN] A method comprising special circuits which require less than the usual number of dialing operations to connect two or more subscribers.

**ABC** See automatic brightness control.

**abcoulomb** [ELEC] The unit of electric charge in the electromagnetic centimeter-gram-second system, equal to 10 coulombs. Abbreviated aC.

**abcoulomb centimeter** [ELEC] In the electromagnetic centimeter-gram-second system of units, the unit of electric dipole moment. Abbreviated aCm.

**abcoulomb per cubic centimeter** [ELEC] The electromagnetic centimeter-gram-second unit of volume density of charge. Abbreviated aC/cm<sup>3</sup>.

**abcoulomb per square centimeter** [ELEC] The electromagnetic centimeter-gram-second unit of surface density of charge, electric polarization, and displacement. Abbreviated aC/cm<sup>2</sup>.

**ABC system** [GEOD] See airborne control system.

[GEOPHYS] A procedure in seismic surveying to determine the effect of irregular weathering thickness. [ORD] An atomic, biological, or chemical weapons system.

**Abderhalden reaction** [PATH] A chemical blood test for the identification of certain enzymes associated with pregnancy and a few diseases.

**abdomen** [ANAT] 1. The portion of the vertebrate body between the thorax and the pelvis. 2. The cavity of this part of the body. [INV ZOO] The elongate region posterior to the thorax in arthropods.

**abdominal apoplexy** [MED] Vascular occlusion and hemorrhage in an abdominal organ, usually the small intestine, or in the peritoneal cavity.

**abdominal depth** [ANTHRO] Maximum horizontal contact dimension, measured front to back.

**abdominal gestation** [MED] Development of a fetus outside the uterus in the abdominal cavity.

**abdominal hernia** See ventral hernia.

**abdominal hysterectomy** [MED] Surgical removal of all or part of the uterus through an incision in the abdomen.

**abdominal regions** [ANAT] Nine theoretical areas delineated on the abdomen by two horizontal and two parasagittal lines: above, the right hypochondriac, epigastric, and left hypochondriac; in the middle, the right lateral, umbilical, and left lateral; and below, the right inguinal, hypogastric, and left inguinal.

**abducens** [ANAT] The sixth cranial nerve in vertebrates; a paired, somatic motor nerve arising from the floor of the fourth ventricle of the brain and supplying the lateral rectus eye muscles.

**abduction** [PHYSIO] Movement of an extremity or other body part away from the axis of the body.

**abductor** [PHYSIO] Any muscle that draws a part of the body or an extremity away from the body axis.

**abeam** See on the beam.

**Abegg's rule** [CHEM] An empirical rule, holding for a large number of elements, that the sum of the maximum positive and negative valencies of an element equals eight.

**Abelian domain** See Abelian field.

**Abelian field** [MATH] A set of elements  $a, b, c, \dots$  forming Abelian groups with addition and multiplication as group opera-

tions where  $a(b + c) = ab + ac$ . Also known as Abelian domain; domain.

**Abelian group** [MATH] A group whose binary operation is commutative; that is,  $ab = ba$  for each  $a$  and  $b$  in the group.

**abelite** [MATER] A substance made of ammonium nitrate and a nitrated aromatic hydrocarbon and used as an explosive.

**Abel's inequality** [MATH] An inequality which states that the absolute value of the sum of  $n$  terms, each in the form  $ab$ , where the  $b$ s are positive numbers, is not greater than the product of the largest  $b$  with the largest absolute value of a partial sum of the  $a$ s.

**Abel's integral equation** [MATH] The equation

$$f(x) = \int_0^x u(z)(x - z)^{-a} dz \quad (0 < a < 1, x \geq a),$$

where  $f(x)$  is a known function and  $u(z)$  is the function to be determined; when  $a = 1/2$ , this equation has application to Abel's problem.

**Abel's problem** [MATH] The problem which asks what path a particle will follow if it moves under the influence of gravity alone and its altitude-time function is to follow a specific law.

**Abel tester** [PHYS CHEM] A laboratory instrument used in testing the flash point of kerosine and other volatile oils having flash points below 120°F (49°C); the oil is contained in a closed cup which is heated by a fixed flame below and a movable flame above.

**Abel theorem** [MATH] 1. A theorem stating that if a power series in  $z$  converges for  $z = a$ , it converges absolutely for  $|z| < |a|$ . 2. A theorem stating that if a power series in  $z$  converges to  $f(z)$  for  $|z| < 1$  and to  $a$  for  $z = 1$ , then the limit of  $f(z)$  as  $z$  approaches 1 =  $a$ . 3. A theorem stating that if the three series with  $n$ th term  $a_n$ ,  $b_n$ , and  $c_n = a_0b_n + a_1b_{n-1} + \dots + a_nb_0$ , respectively, converge, then the third series equals the product of the first two series.

**abend** [COMPUT SCI] An unplanned program termination that occurs when a computer is directed to execute an instruction or to process information that it cannot recognize. Also known as bomb; crash.

**abenteric** [MED] Involving abdominal organs and structures outside the intestine.

**aberrant** [BIOL] An atypical group, individual, or structure, especially one with an aberrant chromosome number.

**aberration** [ASTRON] The apparent angular displacement of the position of a celestial body in the direction of motion of the observer, caused by the combination of the velocity of the observer and the velocity of light. [OPTICS] See optical aberration.

**abfarad** [ELEC] A unit of capacitance in the electromagnetic centimeter-gram-second system equal to  $10^9$  farads. Abbreviated aF.

**abhenry** [ELEC] A unit of inductance in the electromagnetic centimeter-gram-second system of units which is equal to  $10^{-9}$  henry. Abbreviated aH. Also known as centimeter.

**abherent** [MATER] A substance that inhibits a material from adhering to itself or another material.

**Abies** [BOT] The firs, a genus of trees in the pine family characterized by erect cones, absence of resin canals in the wood, and flattened needlelike leaves.

**abietic acid** [ORG CHEM]  $C_{20}H_{30}O_2$  A tricyclic, crystalline acid obtained from rosin; used in making esters for plasticizers.

**abietine** [MATER] The distillate of the gums of the Jeffrey and digger pines; comprises 96% heptane; used as a cleaning agent, insecticide, and constituent of standard gasolines to measure detonation of engines.

**abiocoen** [ECOL] A nonbiotic habitat.

**abiogenesis** [BIOL] The obsolete concept that plant and animal life arise from nonliving organic matter. Also known as autogenesis; spontaneous generation.

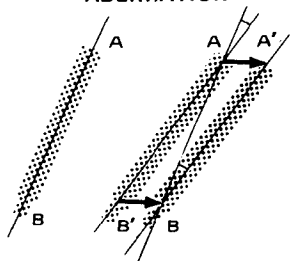
**abiotic** [BIOL] Referring to the absence of living organisms.

**abiotic environment** [ECOL] All physical and nonliving chemical factors, such as soil, water, and atmosphere, which influence living organisms.

**abiotic substance** [ECOL] Any fundamental chemical element or compound in the environment.

**abirotrophy** [MED] Disordered functioning of an organ or system, as in Huntington's chorea, due to an inherited pathological trait, which trait, however, may remain latent in the individual rather than becoming apparent; this mechanism is still conceptual.

## ABERRATION



The aberration of light as seen in astronomy. Starlight arriving along AB and seen in this direction by a stationary observer (left) appears to the observer in transverse motion AA' (right) to come from the direction AB' (or A'B). (From G. de Vaucouleurs, *Discovery of the Universe*, 1957; reprinted by permission of Faber and Faber Ltd.)



**abjection** [MYCOL] The discharge or casting off of spores by the spore-bearing structure of a fungus.

**ablastin** [IMMUNOL] An antibodylike substance elicited by *Trypanosoma lewisi* in the blood serum of infected rats that inhibits reproduction of the parasite.

**ablation** [AERO ENG] The carrying away of heat, generated by aerodynamic heating, from a vital part by arranging for its absorption in a nonvital part, which may melt or vaporize and then pass away, taking the heat with it. Also known as ablative cooling. [GEOL] The wearing away of rocks, as by erosion or weathering. [HYD] The reduction in volume of a glacier due to melting and evaporation. [MED] The removal of tissue or a part of the body by surgery, such as by excision or amputation.

**ablation area** [HYD] The section in a glacier or snowfield where ablation exceeds accumulation.

**ablation cone** [HYD] A debris-covered cone of ice, firn, or snow formed by differential ablation.

**ablation factor** [HYD] The rate at which a snow or ice surface wastes away.

**ablation form** [HYD] A feature on a snow or ice surface caused by melting or evaporation.

**ablation moraine** [GEOL] 1. A layer of rock particles overlying ice in the ablation of a glacier. 2. Drift deposited from a superglacial position through the melting of underlying stagnant ice.

**ablative agent** [MATER] A material from which the surface layer is to be removed, often for the purpose of dissipating extreme heat energy, as in space vehicles reentering the earth's atmosphere. Also known as ablative material.

**ablative cooling** See ablation.

**ablative material** See ablative agent.

**ablative shielding** [AERO ENG] A covering of material designed to reduce heat transfer to the internal structure through sublimation and loss of mass.

**ablatograph** [ENG] An instrument that records ablation by measuring the distance a snow or ice surface falls during the observation period.

**A block** [CIV ENG] A hollow concrete masonry block with one end closed and the other open and with a web between, so that when the block is laid in a wall two cells are produced.

**ABM** See antiballistic missile.

**abmho** [ELEC] A unit of conductance in the electromagnetic centimeter-gram-second system of units equal to  $10^9$  mhos. Abbreviated (a $\Omega$ )<sup>-1</sup>. Also known as absiemens (aS).

**Abney effect** [OPTICS] A shift in the apparent hue of a light which occurs as colored light is desaturated by the addition of white light.

**Abney level** See clinometer.

**abnormal anticlinorium** [GEOL] An anticlinorium with axial planes of subsidiary folds diverging upward.

**abnormal behavior** [PSYCH] Personality functioning that is socially undesirable or that renders the individual unable to cope with day-to-day living. Also known as behavior disorder.

**abnormal fold** [GEOL] An anticlinorium in which there is an upward convergence of the axial surfaces of the subsidiary folds.

**abnormal glow discharge** [ELECTR] A discharge of electricity in a gas tube at currents somewhat higher than those of an ordinary glow discharge, at which point the glow covers the entire cathode and the voltage drop decreases with increasing current.

**abnormality** [SCI TECH] Any deviation from normal characteristics.

**abnormal magnetic variation** [GEOPHYS] The anomalous value in magnetic compass readings made in some local areas containing unknown sources that deflect the compass needle from the magnetic meridian.

**abnormal place** [MIN ENG] An area in a coal mine where geological conditions render mining uneconomical.

**abnormal propagation** [COMMUN] Phenomena of unstable or changing atmospheric or ionospheric conditions acting upon transmitted radio waves, preventing such waves from following their normal path through space, and causing difficulties and disruptions of communications.

**abnormal psychology** [PSYCH] A branch of psychology that deals with behavior disorders and internal psychic conflict in addition to certain normal phenomena such as dreams, motivations, and anxiety.

**abnormal reflections** [ELECTROMAG] Sharply defined re-

flections of substantial intensity at frequencies greater than the critical frequency of the ionized layer of the ionosphere.

**abnormal statement** [COMPUT SCI] An element of a FORTRAN V (UNIVAC) program which specifies that certain function subroutines must be called every time they are referred to.

**abnormal synclinorium** [GEOL] A synclinorium with axial planes of subsidiary folds converging downward.

**ABO blood group** [IMMUNOL] An immunologically distinct, genetically determined group of human erythrocyte antigens represented by two blood factors (A and B) and four blood types (A, B, AB, and O).

**abohm** [ELEC] The unit of electrical resistance in the centimeter-gram-second system; 1 abohm equals  $10^{-9}$  ohm in the meter-kilogram-second system. Abbreviated a $\Omega$ .

**abohm centimeter** [ELEC] The centimeter-gram-second unit of resistivity. Abbreviated a $\Omega$ cm.

**abomasitis** [VET MED] Inflammation of the abomasum in ruminants.

**abomasum** [VERT ZOO] The final chamber of the complex stomach of ruminants; has a glandular wall and corresponds to a true stomach.

**A bomb** See atomic bomb.

**aboral** [INV ZOO] Opposite to the mouth.

**abort** [AERO ENG] 1. To cut short or break off an action, operation, or procedure with an aircraft, space vehicle, or the like, especially because of equipment failure. 2. An aircraft, space vehicle, or the like which aborts. 3. An act or instance of aborting.

**aborted firing** [ORD] A firing of a gun or launching of a missile which is cut off either manually or automatically after the firing command has been given but before ignition has been initiated.

**abortifacient** [MED] Any agent that induces abortion.

**abortion** [MED] The spontaneous or induced expulsion of the fetus prior to the time of viability, most often during the first 20 weeks of the human gestation period.

**abortive** [BIOL] Imperfectly formed or developed.

**abortive transduction** [MICROBIO] Failure of exogenous fragments that were introduced into a bacterial cell by viruses to become inserted into the bacterial chromosome.

**abortus** [MED] An aborted fetus.

**abort zone** [AERO ENG] The area surrounding the launch within which malfunctioning missiles will be contained with known and acceptable probability.

**aboundikro** See Sapele mahogany.

**about-sledge** [MET] A large hammer that is utilized in blacksmithing.

**a-b plane** [GEOL] The surface along which differential movement takes place.

**AB power pack** [ELEC] 1. Assembly in a single unit of the A battery and B battery for a battery-operated vacuum-tube circuit. 2. Unit that supplies the necessary A and B direct-current voltages from an alternating-current source of power.

**abrachiocephalia** [MED] Congenital lack of arms and head. Also known as acephalobrachia.

**abrade** [GEOL] To wear away by abrasion or friction.

**Abraham's tree** [METEOROL] The popular name given to a form of cirrus radiatus clouds, consisting of an assemblage of long feathers and plumes of cirrus that seems to radiate from a single point on the horizon.

**Abrams' law** [CIV ENG] In concrete materials, for a mixture of workable consistency the strength of concrete is determined by the ratio of water to cement.

**abbranchiate** [ZOO] Without gills.

**abrasion** [ENG] 1. The removal of surface material from any solid through the frictional action of another solid, a liquid, or a gas or combination thereof. 2. A surface discontinuity brought about by roughening or scratching. [GEOL] Wearing away of sedimentary rock chiefly by currents of water laden with sand and other rock debris and by glaciers. [MED] A spot denuded of skin, mucous membrane, or superficial epithelium by rubbing or scraping.

**abrasion platform** [GEOL] An uplifted marine peneplain or plain, according to the smoothness of the surface produced by wave erosion, which is of large area.

**abrasion resistance** [MATER] The ability of a surface to resist wearing due to contact with another surface moving with respect to it.

**abrasion resistance index** [MATER] In vulcanized material or synthetic rubber compounds, a measure of abrasion resis-

tance relative to a standard rubber compound under defined conditions.

**abrasion test** [MECH ENG] The measurement of abrasion resistance, usually by the weighing of a material sample before and after subjecting it to a known abrasive stress throughout a known time period, or by reflectance or surface finish comparisons, or by dimensional comparisons.

**abrasive** [GEOL] A small, hard, sharp-cornered rock fragment, used by natural agents in abrading rock material or land surfaces. Also known as abrasive ground. [MATER] **1.** A material used, usually as a grit sieved by a specified mesh but also as a solid shape or as a paste or slurry or air suspension, for grinding, honing, lapping, superfinishing, polishing, pressure blasting, or barrel tumbling. **2.** A material sintered or formed into a solid mass such as a hone or a wheel disk, cone, or burr for grinding or polishing other materials. **3.** Having qualities conducive to or derived from abrasion.

**abrasive belt** [MECH ENG] A cloth, leather, or paper band impregnated with grit and rotated as an endless loop to abrade materials through continuous friction.

**abrasive blasting** [MECH ENG] The cleaning or finishing of surfaces by the use of an abrasive entrained in a blast of air.

**abrasive cloth** [MECH ENG] Tough cloth to whose surface an abrasive such as sand or emery has been bonded for use in grinding or polishing.

**abrasive cone** [MECH ENG] An abrasive sintered or shaped into a solid cone to be rotated by an arbor for abrasive machining.

**abrasive disk** [MECH ENG] An abrasive sintered or shaped into a disk to be rotated by an arbor for abrasive machining.

**abrasive drilling** [MIN ENG] A rotary drilling method in which drilling is effected by the abrasive action of the drill steel or drilling medium which rotates while being pressed against the rock.

**abrasive ground** See abrasive.

**abrasive jet cleaning** [ENG] The removal of dirt from a solid by a gas or liquid jet carrying abrasives to ablate the surface.

**abrasive machining** [MECH ENG] Grinding, drilling, shaping, or polishing by abrasion.

**abrasiveness** [MATER] **1.** The property of a material causing wear of a surface by friction. **2.** The quality or characteristic of being able to scratch, abrade, or wear away another material.

**abrasive paper** [MATER] Tough paper to whose surface an abrasive, such as sand or emery, has been bonded for use in grinding or polishing.

**abrasive sand** [MATER] Grit used as abrasive, usually graded as to which sieve mesh it will pass through.

**abreast milling** [MECH ENG] A milling method in which parts are placed in a row parallel to the axis of the cutting tool and are milled simultaneously.

**abreuvoir** [CIV ENG] A space between stones in masonry to be filled with mortar.

**Abridged Nautical Almanac** See Nautical Almanac.

**abrupt** [BOT] Ending suddenly, as though broken off.

**abrupt junction** [ELECTR] A *pn* junction in which the concentration of impurities changes suddenly from acceptors to donors.

**abs** [COMPUT SCI] A special function occurring in ALGOL, which yields the absolute value, or modulus, of its argument. [METEOROL] See absolute.

**ABS** See acrylonitrile butadiene styrene.

**absarokite** [PETR] An alkalic basalt of about equal portions of olivine, augite, labradorite, and sanidine with accessory biotite, apatite, and opaque oxides; leucite is occasionally present in small amounts.

**abscess** [MED] A localized collection of pus surrounded by inflamed tissue.

**abscisic acid** [BIOCHEM]  $C_{15}H_{20}O_4$  A plant hormone produced by fruits and leaves that promotes abscission and dormancy and retards vegetative growth. Formerly known as abscisin.

**abscisin** See abscisic acid.

**abscissa** [MATH] The horizontal coordinate denoted on *y*, the vertical axis.

**abscission** [BOT] A physiological process promoted by abscisic acid whereby plants shed a part, such as a leaf, flower, seed, or fruit.

**absence-of-ground searching selector** [COMMUN] In dial telephones, an automatic switch which rotates, or rises vertically and rotates, in search of an ungrounded contact.

**abslemens** See abmho.

**absinthe** [FOOD ENG] A green liqueur having a bitter licorice flavor and a high alcohol content.

**absinthe oil** [MATER] A toxic essential oil obtained from the dried leaves of *Artemisia absinthum*; soluble in alcohol; formerly used in medicine. Also known as wormwood oil.

**absolute** [METEOROL] Referring to the highest or lowest recorded value of a meteorological element, whether at a single station or over an area, during a given period. Abbreviated *abs*.

**absolute address** [COMPUT SCI] The numerical identification of each storage location which is wired permanently into a computer by the manufacturer.

**absolute addressing** [COMPUT SCI] The identification of storage locations in a computer program by their physical addresses.

**absolute age** [GEOL] The geologic age of a fossil, or a geologic event or structure expressed in units of time, usually years. Also known as actual age.

**absolute alcohol** [ORG CHEM] Ethyl alcohol that contains no more than 1% water. Also known as anhydrous alcohol.

**absolute altimeter** [ENG] An instrument which employs radio, sonic, or capacitive technology to produce on its indicator the measurement of distance from the aircraft to the terrain below. Also known as terrain clearance indicator.

**absolute altitude** [ENG] Altitude above the actual surface, either land or water, of a planet or natural satellite.

**absolute angle of attack** [AERO ENG] The acute angle between the chord of an airfoil at any instant in flight and the chord of that airfoil at zero lift.

**absolute blocking** [CIV ENG] A control arrangement for rail traffic in which a track is divided into sections or blocks upon which a train may not enter until the preceding train has left.

**absolute boiling point** [CHEM] The boiling point of a substance expressed in the unit of an absolute temperature scale.

**absolute ceiling** [AERO ENG] The greatest altitude at which an aircraft can maintain level flight in a standard atmosphere and under specified conditions.

**absolute code** [COMPUT SCI] A code used when the addresses in a program are to be written in machine language exactly as they will appear when the instructions are executed by the control circuits.

**absolute convergence** [MATH] That property of an infinite series (or infinite product) of real or complex numbers if the series (product) of absolute values converges; absolute convergence implies convergence.

**absolute coordinate system** [NAV] The inertial coordinate system which has its origin on the axis of the earth and is fixed with respect to the stars. Also known as absolute reference frame.

**absolute delay** [NAV] In loran, the time interval between transmission of a signal from the A station and transmission of the next signal from the B station.

**absolute density** See absolute gravity.

**absolute deviation** [ORD] The shortest distance between the center of the target and the point where a projectile hits or bursts. [STAT] The difference, without regard to sign, between a variate value and a given value.

**absolute drought** [METEOROL] In Britain, a period of at least 15 consecutive days during which no measurable daily precipitation has fallen.

**absolute efficiency** [ENG ACOUS] The ratio of the power output of an electroacoustic transducer, under specified conditions, to the power output of an ideal electroacoustic transducer.

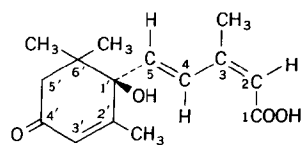
**absolute electrometer** [ELEC] A very precise type of attracted disk electrometer in which the attraction between two disks is balanced against the force of gravity.

**absolute error** [MATH] In an approximate number, the numerical difference between the number and a number considered exact. [ORD] **1.** Shortest distance between the center of impact or the center of burst of a group of shots and the point of impact or burst of a single shot within the group. **2.** Error of a sight consisting of its error in relation to a master service sight with which it is tested and of the known error of the master service sight.

**absolute expansion** [THERMO] The true expansion of a liquid with temperature, as calculated when the expansion of the container in which the volume of the liquid is measured is taken into account; in contrast with apparent expansion.

**absolute gain of an antenna** [ELECTROMAG] Gain in a given direction when the reference antenna is an isotropic anten-

#### ABSCISIC ACID



Structural formula for (+)-abscisic acid, the naturally occurring form.