dictionary of the environmental sciences

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compiled by
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preface

Current interest in the environment has led to the development of a number of new courses and curricula in the colleges and universities in this country and abroad. Multidisciplinary teams are at work to solve problems associated with various types of pollution and with the management of our natural resources. Terminology and concepts drawn from a broad spectrum of academic disciplines are now frequently used by those concerned with the environment.

One difficulty for these individuals is in communicating their ideas to each other and to their students, for certain words mean different things to individuals trained in different academic fields. This *Dictionary* was prepared to help people concerned with the environment, whether professionals or novices, to bridge the gap between and among the various environmental disciplines so that they can convey their thoughts to one another with clarity and understanding.

The *Dictionary* was conceived and developed in its early stages by my son Daniel and my daughter Mary Ann who labored through one hot summer in Illinois to prepare an initial word list and a set of definitions. Since then, as I have encountered new terms in the daily press, in scientific journals, and in scholarly books on environmental topics, I have added to the list. Although the number of entries is extensive, it is not exhaustive: new terms constantly enter our vocabulary or old terms take on new definitions to fit new needs.

A broad range of academic disciplines will find the *Dictionary* useful, including economics, engineering, geology, geography, anthropology, architecture, botany, zoology, agriculture, and many more. Students from junior high school through college who are enrolled in courses on the environment or in earth sciences will find the book particularly helpful because of the way in which

many of the concepts are illustrated. In addition, Appendix I is a Geologic Time Scale and Appendix II consists of tables of equivalents and conversions—for length, area, volume, weight, pressure and flow—that will be particularly useful to students enrolled in introductory courses.

Special recognition should go to Don Ryan who prepared the original sketches. And to all the students in my classes and to many other individuals who have assisted in the preparation of this book, I wish to express my appreciation.

a

A horizon The surface horizon of soil having maximum biological activity or eluviation or both. See: horizon

aa A type of basaltic lava (Hawaiian).

ABC soil A soil with a complete profile, including an A, a B, and a C horizon. See: horizon

abiotic (adj.) Characterized by a lack of living organisms.

ablation The process by which ice and snow waste away due to melting and evaporation.

abnormal (adj.) Deviating from the normal. In meteorology, applied to values of the weather elements, such as temperature, that deviate from the normal values by amounts so much greater than usual that they deserve comment.

abnormality The state of the atmosphere when abnormal values of any element occur; e.g., conditions during a January thaw in southern Canada.

aborigine The original inhabitant of an area.

Abraham's tree The popular name for a cloud form of long feathers and plumes of cirrus, which seem, by an effect of perspective, to radiate from a single point on the horizon. In popular tradition, it is a sign of rain if the base of this cloud appears to touch a sheet of water.

abrasion The removal of bedrock material by the grinding action of other material being moved by wind, water, or ice.

abrolhos A squall occurring on the coast of Brazil between May and August.

abscissa The x-coordinate, representing the distance of a point from the y-axis measured parallel to the x-axis. See: Cartesian coordinates

abscission The natural separation of parts of a plant (such as flowers, bark,

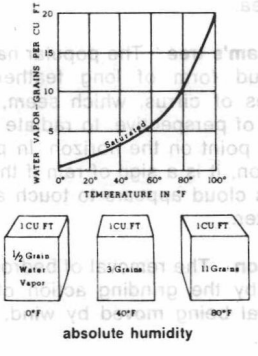
fruit, leaves, or branches) by the breakdown of the absciss layer.

absciss layer In plants, a layer of cells, across the base of a branch or embedded in the bark, through which the leaf or branch or other part breaks off.

absolute (adj.) 1. In climatology, the highest and lowest values of any given meteorological element during a particular period at the place of observation. 2. The difference between the absolute extremes defined above.

absolute extremes See: absolute

absolute humidity The mass of water vapor present per unit volume of space, i.e., the density of water vapor; usually expressed in grams per cubic meter or grains per cubic foot.



absolute humidity

absolute instability The state of an air mass with a lapse rate greater than the dry adiabatic, so that a parcel of air within it displaced vertically would continue to move vertically.

absolute maximum See: absolute

absolute minimum See: absolute

absolute stability The condition in an air mass with a lapse rate less than the moist adiabatic, which makes it tend to resist displacement.

absolute temperature Temperature measured from a zero point corresponding to the absence of molecular motion on the Kelvin scale.

absolute temperature scale See: Kelvin scale of temperature

absolute zero That point on the Kelvin scale of temperature at which the random molecular motions of an ideal gas become zero, i.e., at which the molecules are at rest. This occurs at about –273°C.

absorption 1. In meteorology, the depletion that radiant energy undergoes in traversing the earth's atmosphere (either from sun to earth or from earth to space), and also in penetrating the oceans or other bodies of water and the solid earth. 2. In physics the holding by capillary action of a liquid in the pores of a solid, as water is held by a sponge or by soil. 3. In chemistry, the holding by chemical attraction of the molecules of a gas or liquid between the molecules of a liquid or solid.

absorption bands Dark bands (aggregates of lines) in the spectrum of radiant energy resulting from the absorption of particular wave lengths of the radiation by the constituents of the medium through which it passes. The amount of absorption varies with rays of different wave length or refrangibility, and is in general highly selective, producing lines or bands according as the absorption is by atoms or molecules. See: absorption; radiation; selective absorption

absorption spectrum The spectrum that results after any radiation has passed through an absorbing substance.

absorptivity The ratio of the radiant energy absorbed during transmission through a medium to the incident amount, which ratio varies from unity for a black body to zero for a perfectly transparent body.

abyssal (adj.) Pertaining to great depths. Usually refers to those parts of the ocean more than 6000 feet below the surface; sometimes refers to great depths within the solid earth.

abyssalbenthic zone The ocean bottom of the deep sea zone.

abyssalpelagic zone The waters above the bottom layers of the deep sea zone.

acacia A woody tree or shrub of the mimosa family found throughout the tropics and subtropics; some yield valuable gums and tanning extracts.

acceleration The time rate of change of velocity, either linear or angular; it may be either positive or negative.

access road A road built into isolated stands of commercial timber so they can be reached by loggers, fire fighters, and others.

acclimate (v.) To become naturally accustomed to a different climate; not synonymous with acclimatize.

acclimation The process of becoming acclimated; not synonymous with acclimatization.

acclimatization The adaptation of animals or plants to a different climate, through a process in which nature is assisted by the intervention of man.

acclimatize To bring about the adaptation of animals or plants to a different climate, in part by the intervention of man.

accretion The process by which bodies grow larger by the addition of particles to the outside.

accretion theory A theory of the origin of the solar system through the growth of planets from a disk-shaped mass of gas and space dust.

acculturation The process by which the cultural traits of one group of people are acquired by another.

accumulated excess (or deficiency) A phrase used in the U. S. Weather Bureau to indicate the total excess or deficiency from the normal of either temperature or precipitation from any stated time, as the beginning of the month or of the calendar year to date. The accumulated excess (or deficiency) of temperature since January 1st of the current year to any date for any station is the difference between the sum of the daily means since January 1st and the sum of the daily normals. The average daily excess (or deficiency) of temperature is the result obtained by dividing the accumulated excess (or deficiency) by the number of days in the period considered.

accumulated (or cumulative) temperature An index to both the amount and the duration of an excess or deficiency of air temperature above or below an adopted standard, or base temperature; usually expressed by means of the total degree days for a given period. The standard of 42°F, adopted primarily for agricultural purposes is the temperature above which the sun's heat is said to be effectual in starting and maintaining plant growth and in completing the ripening of crops in a European climate. The summation of degree days may begin with the first of January, the first of December, or the date of sowing the seed, according to the special crop or plant.

acetone A colorless organic liquid that forms fragrant and inflammable vapor at room temperatures. It dissolves natural and synthetic resins, guncotton, and cellulose acetate, and is extensively used as a solvent in lacquers and as nail-polish remover.

acid A compound, capable of neutralizing an alkali containing hydrogen, that can be replaced by a metal or an electropositive group to form a salt, or containing an atom that can accept a pair of electrons from a base.

acidic (adj.) 1. Acid-forming. 2. Having a high hydrogen ion concentration (low pH). 3. In geology, any rock containing more than two-thirds silica is acidic.

acidity The state of being acid in reaction, which would be evident to the taste as sourness. The degree of acidity of a solution (or soil) may be expressed as pH (hydrogen-ion concentration).

acid soil Generally, a soil having a high concentration of acid throughout most or all of the parts that plant roots occupy. Commonly, only the surface-plowed layer or some other specific layer or horizon of a soil. Practically, this means a soil more acid than pH 6.6; precisely, a soil with a pH value less than 7.0.

acid wood Wood cut for use by manufacturers of charcoal, acetic acid, and methanol by destructive distillation; sometimes called distillation wood or chemical wood.

aclinic line See: magnetic equator

acoustic cloud A cloud occurring at a boundary between two air layers of sharply different densities (owing to differences in temperature or humidity, or both), so that sound waves are reflected from the interface.

acoustic pollution Sounds objectionable to man because of either their nature or their volume.

acoustics See: atmospheric acoustics

acquired characteristic A noninheritable characteristic acquired by an organism during its lifetime as a result of the use or disuse of an organ because of environmental influences.

acre Originally used to designate an enclosed or tilled field; now a measure of area equivalent to 43,560 square feet.

acre foot A unit for measuring the volume of water equal to the quantity of water required to cover one acre to a depth of one foot or to 43,560 cubic feet or to 325,851 gallons. The term is commonly used in measuring volumes of water used or stored.

actinic (adj.) 1. Applied to light capable of initiating or causing chemical changes, as in photography or the fading of colors. 2. Applied to wave lengths of light too small to affect our sense of sight, such as the ultraviolet rays.

actinomycetes A group of soil microorganisms that produce an extensive thread-like network. They resemble soil molds in some respects but are more like bacteria in size.

activated (adj.) Rendered active, capable of reaction, or promoting reaction; descriptive of various unrelated chemical and physical conditions. Carbons and bleaching clays used for adsorbing color bodies and other substances from liquids are considered activated when they have been treated to increase their surface areas. It is said

that a pound of activated carbon can have 1.5 million square feet of surface area.

activated sludge Material precipitated by removing organic material from sewage by saturating it with air and adding biologically active sludge.

active layer The layer of soil above the permafrost, which alternately thaws and freezes from summer to winter.

active storage capacity The total amount of usable reservoir capacity available for seasonal or cyclic water storage. It is gross reservoir capacity minus inactive storage capacity.

acyl The organic radical or group that remains intact when an organic acid forms an ester; more specifically, the group left by the removal of the hydroxyl group from an organic acid.

adaptation Any alteration, resulting from the processes of natural selection, by which the organism becomes better fitted to survive and multiply in its environment.

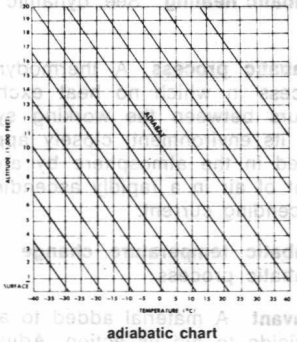
adaptive disease The physiologic changes experienced by an organism because of exposure to a new environment.

adaptive radiation The diversification of a group of organisms into subgroups because of the interaction of its genetic potentialities with the environments it encounters.

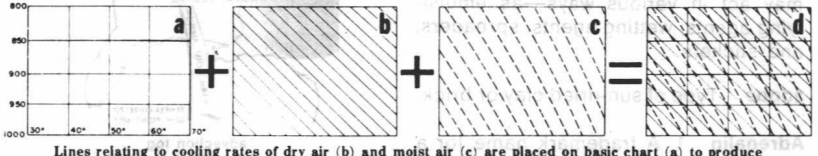
adiabat A line of constant potential temperature on an adiabatic chart or the path along which a thermodynamic change takes place in a system when there is no exchange of heat with the environment. See: adiabatic; adiabatic gradient (or lapse rate); adiabatic process; dry adiabat; wet adiabat

adiabatic (adj.) Applied to a thermodynamic process during which no heat is communicated to or withdrawn from the body or system concerned. In the atmosphere, adiabatic changes of temperature occur only in consequence of compression or expansion, accompanying an increase or decrease of atmospheric pressure. Thus, a descending body of air undergoes compression and adiabatic heating, while an ascending air parcel experiences expansion and adiabatic cooling. See: adiabatic gradient (or lapse rate); dynamic heating; dynamic cooling

adiabatic chart (or diagram) A thermodynamic diagram with pressure and temperature as co-ordinates, which shows the thermodynamic states of atmospheric air over a wide range of conditions and by which the changes



adiabatic chart



Lines relating to cooling rates of dry air (b) and moist air (c) are placed on basic chart (a) to produce adiabatic chart (d) which is used to determine degree of air's stability.

of state and the energy transformations during any prescribed process may be traced out. By plotting on this chart, the values of temperature, pressure, and specific humidity at various levels in the atmosphere may be determined and many weather phenomena may be inferred.

adiabatic compression See: adiabatic; dynamic heating

adiabatic cooling See: dynamic cooling

adiabatic expansion See: adiabatic; dynamic cooling

adiabatic gradient (or lapse rate) The rate of decrease of temperature of a sample of adiabatically ascending air. For dry (i.e., unsaturated) air it is approximately 1°C per 100 meters. After saturation is reached, the rate of cooling, now called the saturated-adiabatic lapse rate has no fixed value, but varies from 0.04°C to 1°C per 100 meters. See: adiabat; adiabatic; adiabatic process

adiabatic heating See: dynamic heating

adiabatic process A thermodynamic process in which no heat exchange occurs between the working system and its environment; closely approximated in the atmosphere by an element of air in a rapidly ascending or descending current.

adiabatic temperature change See: adiabatic process

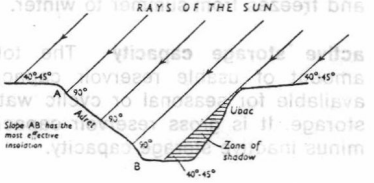
adjuvant A material added to an insecticide to aid its action. Adjuvants may act in various ways—as emulsifying agents, wetting agents, spreaders, and stickers.

adobe Type of sun-dried clay or brick.

Adrenalin 1. A trademark name for a drug, also known as epinephrine. 2. a hormone produced in the medulla of the adrenal glands.

adreno-cortical stress The pressures on the adrenal cortex thought to be brought on by urban crowding.

adret The sunny side of a slope in the Alps also called the sonnenseite. See: ubac



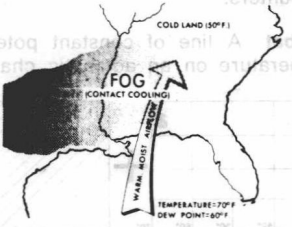
adret

adsorb (v.) To retain upon the surface through the force of adhesion some of the gas, liquid, or dissolved substance with which a solid body has been in contact.

adsorption The attachment of compounds or ionic parts of salts to a surface or another phase. Nutrients in solution (ions) carrying a positive charge become attached to (adsorbed by) negatively charged soil particles.

advection Horizontal flow of air at the surface or aloft; one of the means by which heat is transferred from one region of the earth to another.

advection fog A fog due to the transport of warm air over a cold surface,



advection fog

either land or water, or to the transport of cold air over a warm-water surface. Since many fogs are caused by the joint action of two or more processes, fogs classified as of the advection type may have been formed in part in other ways.

advective (adj.) Pertaining to atmospheric phenomena or conditions in which advection is the dominating influence.

advective cooling Decrease of air temperature when cold air moves into an area previously occupied by warmer air. It may be sufficient to cause a temperature decrease on the earth's surface, even though the surface is absorbing solar radiation. Warm air advection over a colder surface will result in conductive cooling of the lower air layers.

advective thunderstorm A thunderstorm resulting from instability produced by horizontal advection of colder air at higher levels or by horizontal advection of warmer air at lower levels, or by a combination of both.

AEC The U.S. Atomic Energy Commission.

aeolian (adj.) Pertaining to the action or effect of the wind.

aeration The process whereby any substance becomes permeated with air.

aeration zone That portion of the lithosphere in which the functional interstices of permeable rock or earth are not ordinarily filled with water under hydrostatic pressure, or are filled with water that is held by capillarity.

aerobic (adj.) 1. Conditions of environment in which oxygen gas is present. 2. Living or acting only in the presence of air or free oxygen.

aerobiology The science that treats of the small organisms, both plant and animal, that are borne aloft by the air and investigates their behavior in the air and their effects on other organisms.

aerodynamic (adj.) Pertaining to the laws of motion of air or other gases.

aerodynamics A branch of physics defined broadly as the science of motion of air or an aeriform fluid. Commonly, air alone is implied in the word.

aeroembolism The formation of bubbles of nitrogen in the blood stream caused by a rapid decrease of pressure; symptoms are discomfort, pain in the joints, and loss of mental alertness.

aerography The science dealing especially with the description of the atmosphere as a whole and its various phenomena.

aerology A term formerly used synonymously with meteorology. The science of the atmosphere.

aeronomy The study of chemical and physical phenomena in the upper atmosphere.

aerosol 1. A dispersed system in which the dispersion medium is a gas. 2. An aggregation of dispersed particles suspended in the atmosphere. 3. The special type of colloid, formed by the liquid or solid particles, organic and inorganic, and the gases of the atmosphere in which these particles float.

aesthetic (adj.) Pertaining to a feeling or a sense of the beautiful.

aestivate See: estivate

afforestation The process of transforming an area into forest, usually when trees have not previously grown there.

aftercooling The cooling of a reactor after it has been shut down.

afterglow A broad high arch of radiance or glow seen occasionally in the western sky above the highest clouds in deepening twilight, caused by the scattering effect exerted upon the components of white light by very fine particles of dust suspended in the upper atmosphere.

aftershock An earthquake or earthquakes occurring soon after a larger earthquake.

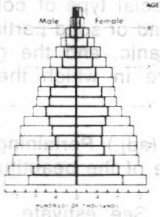
aftersummer A recurrent mild period in autumn. See: Indian summer

agave A member of the amaryllis family of perennial lilylike plants with narrow, flat leaves, widely distributed in the lowlands of the tropics and subtropics. They provide soap, food, beverages, and fiber and are grown as ornamentals. The century plant, maguey, and sisal are agaves.

age Any of the great periods of time in the earth's history marked by special phases or events.

age dating See: radioactive age determination

age pyramid The graphic representing of age structure in a population; typically, the vertical dimension is graduated in groups of years, usually five, beginning with zero at the base; the horizontal axis shows the number or percentage of males to the left and females to the right of the central axis.



age pyramid

age ratio The ratio of the amount of daughter isotope in a given specimen to that of the parent isotope after a period of radioactive decay. Used to calculate the age of the specimen when the rate of decay of the given substance is known. See: radioactive dating; carbon 14.

age-specific birth rate Number of births for each age group in the population.

age-specific death rate Mortality rate for each age group in a population.

agglomerate 1. Rock composed of rounded or subangular volcanic fragments. 2. (v.) To gather into a cluster.

aggradation The process of building up an area by deposition.

aggrade (v.) To build up a surface by deposition.

aggregate (of soil) Many fine soil particles held in a single mass or cluster, such as a clod, crumb, block, or prism.

agonic line An imaginary line passing through points on the earth's surface at which the magnetic declination is zero, i.e., where the magnetic needle points to true north.

agricultural climatology The branch of climatology that deals with climate in its relation to agriculture.

agricultural revolution The change in agricultural production that involves: (a) farming of large-scale units of land; (b) intensive livestock production; (c) large increases in agricultural produc-

tivity due principally to larger inputs of capital in the form of equipment, fertilizer, and hybrid seeds.

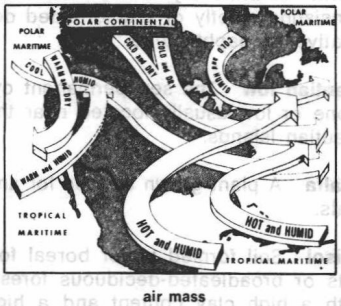
agriculture The production of crops, livestock, or poultry.

agronomy The science of soil management and the production of field crops.

air The mixture of gases comprising the earth's atmosphere. See: atmosphere.

air drainage The flow of air down a slope or channel. Air pockets with greater density than surrounding air tend to flow downhill, due to gravity.

air mass A wide-spread body of air that approximates horizontal homogeneity: that is, its physical properties, level for level, are about the same over a wide area.



air mass

air-mass analysis The analysis of a synoptic weather map in respect to: (a) the extent and physical properties of each of the air masses over the region covered by the map, (b) the relations of the different air masses to each other, and (c) the location, structure, and movement of the fronts along which the different masses meet.

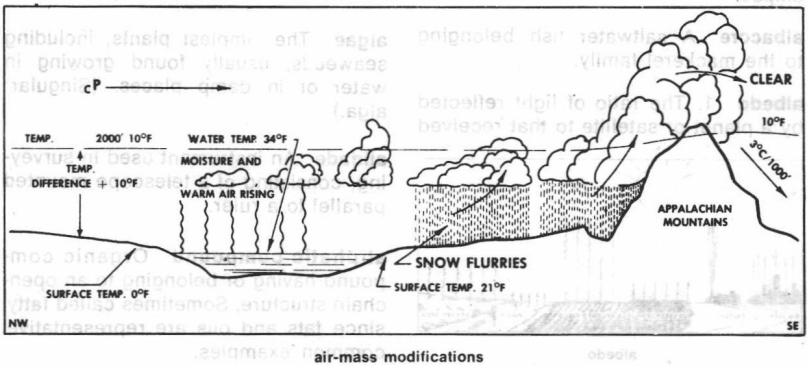
air-mass classifications The systems devised by meteorologists to characterize and identify different air masses.

air-mass climatology The study of climate from a dynamic and thermodynamic point of view, with particular reference to the air masses involved.

air-mass modifications The alterations in physical characteristics that occur in an air mass once it has left its source region.

air-mass thunderstorm A thunderstorm that occurs in an air mass whose chief characteristics are instability and high moisture content.

air pocket A downward current of air that causes an aircraft to drop abruptly in altitude.



air-mass modifications

air pollution See: smog

air pollution control district Agency created by state and county legislation as early as 1947 to combat air pollution from all sources. The programs presently administered by these agencies control emissions from stationary sources only.

air pressure See: atmospheric pressure

air resistance The frictional resistance offered by air to the motion of bodies passing through it.

air shed A region with common sources and problems of air pollution; it may coincide with a drainage basin or be a part of a large urban agglomeration.

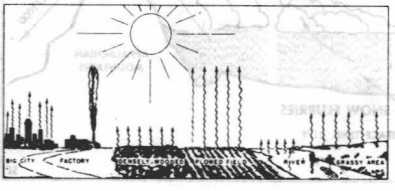
Aitken nuclei Microscopic solid and liquid particles in the atmosphere counted by an Aitken nucleus counter, that serve as condensation nuclei for droplet growth in clouds. They play a role in atmospheric electrical processes by capturing small ions to form large ions, thus bringing about a condition where the air conductivity is low.

Aitoff's projection

Aitoff's projection An equal-area map projection in which the whole of the earth's surface is represented on an ellipse.

albacore A saltwater fish belonging to the mackerel family.

albedo 1. The ratio of light reflected by a planet or satellite to that received on its whole illuminated hemisphere. 2. The reflectivity of one of the different materials forming the surface of the earth. See: reflectivity



albedo

albumin Water soluble proteins composed of nitrogen, carbon, hydrogen, oxygen, and sulfur, occurring in animal and vegetable juices and tissues.

alchemist A medieval chemist, primarily concerned with (a) the search for ways to turn one substance into another and (b) the search for medicines that would cure all diseases or prolong human life.

aldehyde A colorless, volatile liquid, CH_3ChO, obtained by the oxidation of alcohol.

aldrin A white crystalline insecticide consisting chiefly of a chlorinated derivative of naphthalene.

Aleutian low The semipermanent cyclone or low usually located near the Aleutian Islands.

alfalfa A plant grown as feed for animals.

alfisol Soil formed under boreal forests or broadleafed-deciduous forests with a high clay content and a high base saturation. See also: planosol

algae The simplest plants, including seaweeds, usually found growing in water or in damp places. (Singular: alga.)

alidade An instrument used in surveying, consisting of a telescope mounted parallel to a ruler.

aliphatic compound Organic compound having or belonging to an open-chain structure. Sometimes called fatty, since fats and oils are representative, common examples.

alkali A salt of sodium or potassium, or, more generally, any bitter-tasting salt capable of neutralizing acids.

alkali soil A soil of so high a degree of alkalinity—pH 8.5 or higher—or so high a percentage of exchangeable sodium—15 percent or higher—or both, that the growth of most crop plants is reduced.

alkaline (adj.) Having the qualities of a base.

alkaloid Any of a group of nitrogenous organic compounds (especially one of vegetable origin). They have a powerful physiological effect on animals, and constitute the active principals of the common vegetable drugs and poisons. Atropin, codeine, morphine, nicotine, quinine, and strychnine are alkaloids.

alkoxides Metallic salts of alcohols or phenols in which the hydrogen atom of the hydroxyl group is replaced by a metal.

allele A gene, usually developed through mutation, that is responsible for hereditary variation.

allelomorph One of the pair of genes that have identical positions in homologous chromosomes of two uniting gametes but have opposite effects on the same developmental element (size or color), thus producing variation among mixed offspring in accordance with Mendel's law.

allergen A foreign substance, generally a protein, which upon being introduced into the tissues of a sensitive person causes inflammation, swelling, or more serious consequences.

allocation The process by which society sets aside or uses portions of particular resources.

alloy A metal consisting of a fusion or mixture of two or more metals, or of metals with other substances.

All Saints' summer Indian summer.

alluvial (adj.) Pertaining to water-carried material.

alluvial fan A fan- or cone-shaped deposit of alluvium formed where a stream flows out onto a level area or into a slower stream; usually found along the base of desert mountain ranges.

alluvial fan

alluvial soils Soils developing from transported and relatively recently deposited material (alluvium) with little or no modification of the original materials by soil forming processes. (Soils with well-developed profiles that have formed from alluvium are grouped with other soils having the same kinds of profiles, not with the alluvial soils.)

alluvium Material, including sand, clay, gravel, and mud, deposited in riverbeds, lakes, alluvial fans, valleys, and elsewhere by modern streams.

alpaca A domestic animal of the camel family, usually raised for its wool. It is smaller than a llama and larger than a vicuña. Its fine, long, woolly hair is used to make lightweight cloth.

alpaca

alpenglow A reappearance of sunset colors on a mountain summit after the original colors have faded; also a simi-

lar phenomenon preceding the regular coloration at sunrise.

alpha particle A positively charged particle given off by the nucleus of some radioactive substances. It is identical to a helium atom that has lost its two electrons.

alpine (adj.) Pertaining to the Alps or any other high mountain range.

alpine glacier A glacier located in a mountainous area.

alpine orogeny A series of mountain-building movements beginning in the Triassic and continuing into the present.

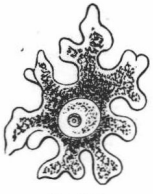
altimeter

altimeter An aneroid barometer graduated to show elevation instead of pressure.

altithermal A period of high temperature in past geological time, especially the postglacial period.

altitude 1. Vertical distance above the surface of the earth. 2. Angular distance above the horizon of a heavenly body.

altitudinal zones See: tierra caliente; tierra fria; tierra nevada; tierra templada.



amoeba

altocumulus A form of middle cloud, composed of laminae or rather flattened globular masses, the smallest elements of the regularly arranged layer being fairly small and thin, with or without shading.

altostratus A form of middle cloud, a striated or fibrous veil, more or less gray or bluish in color.

alum A chemical substance that is gelatinous when wet, usually potassium aluminum sulfate, used in water-treatment plants for settling out small particles of foreign matter.

alumino-silicates Compounds containing aluminum, silicon, and oxygen atoms as main constituents.

aluminum A metallic element, silverish, light in weight, used for utensils, airplane parts, etc.

amber A fossilized resin from prehistoric conifers.

amino acids Nitrogen-containing organic compounds, large numbers of which link together in the formation of a protein molecule. Each amino acid molecule contains one or more amino groups and at least one carboxyl group; some contain sulfur.

ammonia A colorless gas composed of one atom of nitrogen and three atoms of hydrogen. Ammonia liquefied under pressure is used as a fertilizer.

ammonium ion The positively charged NH_4+ ion. The form in which nitrogen occurs in many commercial fertilizers.

amoeba A simple form of life consisting of a nucleated mass of protoplasm that obtains sustenance by enveloping minute particles of plant and animal life.

amorphous (adj.) Without form. Usually applied to rocks and minerals having no definite crystalline structure.

amphibian A cold-blooded vertebrate; the young breathe through gills, the adults by lungs.

amphibole Common rock-forming minerals containing chiefly calcium, magnesium, sodium, iron and aluminum.

amplitude In hydrodynamics, a value that is one-half the wave height.