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ENGINEERING DESIGN HANDBOOK

ENVIRONMENTAL SERIES

PART FIVE

GLOSSARY OF ENVIRONMENTAL TERMS

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HEADQUARTERS, US ARMY MATERIEL COMMAND

JULY 1975

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DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY MATERIEL COMMAND
5001 Eisenhower Ave., Alexandria, VA 22333

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FOREWORD

1 SCOPE

This glossary is supplied for use with the Environmental Series of Engineering Design Handbooks. Its purpose is to provide definitions of the words and terms used in these handbooks as well as some other closely related words or terms that may be unfamiliar to the average reader. Environmental terms comprise a majority of the contents of this glossary but, since the handbooks also include the effects of environment on materiel and operations, a variety of terms from the related scientific and engineering disciplines are defined. In addition, selected terms unique to military operations are included.

Specifically excluded are definitions of both technical and nontechnical terms that are part of the common lexicon and for which the common definition applies as used in the handbooks. In many cases, only the appropriate uncommon definition of a term is provided. Cross-referencing is employed for definitions common to several terms or that are closely interrelated.

Abbreviations and acronyms that are employed in the Environmental Series and that may be unfamiliar to some readers are included.

2 DEFINITIONS

Terms connected by the word *or* are considered to be equal variants; terms listed after the word *also* are considered to be subordinate variants. Terms shown in bold face in the definition are defined elsewhere in the glossary. Words that are not part of a definition are *italicized*. The instruction *See also* refers the reader to a related term which has collateral information.

Although compound terms are generally listed in the form customarily used, the inverted form is used whenever it has been considered desirable to list two or more terms together for ready comparison.

3 REFERENCES

The reference given *(Ref.)* for a term indicates the source from which the substance of a definition has been drawn. If the reference listed *(Ref.)* is inside the end punctuation of a definition, the reference pertains only to that definition; if the reference is outside the end punctuation, the reference pertains to all listed definitions for that term.

4 SOURCES

Most of the definitions are derived from specialized reference sources which are identified, and a list of these references is provided at the end of the glossary. In cases where the definition is ascribable to no one specific source or is derived from its usage, no reference is given.

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PREFACE

This handbook, *Glossary of Environmental Terms*, is the last in a series on the nature and effects of the environmental phenomena on materiel.

The purpose of this handbook is to provide precise definitions of words and terms comprising the other four handbooks in the environmental series. The definitions may differ slightly from those found in other references. The definitions, however, convey the exact meaning intended when used in context with the environmental series.

The glossary was prepared by Dr. Robert M. Burger, Research Triangle Institute, Research Triangle Park, N.C. Technical guidance and coordination were provided by a committee under the direction of Mr. Richard C. Navarin, Hq, U S Army Materiel Command.

The Engineering Design Handbooks fall into two basic categories, those approved for release and sale and those classified for security reasons. The U S Army Materiel Command policy is to release these Engineering Design Handbooks in accordance with current DOD Directive 7230.7, dated 18 September 1973. All unclassified Handbooks can be obtained from the National Technical Information Service (NTIS). Procedures for acquiring these Handbooks follow:

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A *Abbr. for* ampere; arctic or antarctic (air or region).

Å *Abbr. for* angstrom.

a *Abbr. for* atto (10^{-18}).

aa. Rough, scoriaceous lava; contrasted with pahoehoe *(Ref. 1)*.

AAR *Abbr. for* Association of American Railroads.

ABC *Abbr. for* American-British-Canadian Conference on Unification of Engineering Standards.

ABC soil. *Pedology.* A soil having a distinct profile, including A, B, and C horizons *(Ref. 2)*. *See also:* soil horizon.

ablation. *Meteorology.* The combined processes (such as sublimation, melting, evaporation) that remove snow or ice from the surface of a glacier, snowfield, etc.; in this sense, the opposite of alimentation *(Ref. 1)*. In general, removal; also the wearing away of rocks.

ablation area. The portion of a glacier below the firn line, where the loss of surface material exceeds accumulation *(Ref. 3)*. In general, that part of an area subject to diminution by erosion, melting, or vaporization.

above-ground magazine. A surface structure for the storage of ammunition and explosives. It is constructed with roof, sidewalls, and endwalls using fireproof materials and is well ventilated. Magazines are usually widely separated to reduce the destructiveness of an explosion.

abrasion. The process of rubbing, grinding, or wearing away by friction, as of rocks by a glacier or of cable insulation by moving contact with a bracket *(Ref. 1)*.

abrasion resistance. Ability of material to resist surface wear *(Ref. 4)*.

absolute extreme. *Climatology.* The highest or the lowest value of a climatic element observed during a given period. In general, the highest or lowest value of a variable.

absolute humidity. In a system of moist air, the ratio of the mass of water vapor present to the volume occupied by the mixture; i.e., the density of the water vapor component *(Ref. 1)*. In engineering practice, usually expressed in grains of water vapor per cubic foot or cubic meter.

absolute maximum (minimum) temperature. The highest (lowest) temperature recorded during the period of record at a station *(Ref. 1)*.

absolute pressure. *See:* pressure, absolute.

absolute range of temperature. The difference between the highest and lowest temperatures on record at a station *(Ref. 1)*.

absolute temperature scale. The kelvin temperature scale, a scale for measuring temperature, referenced to absolute zero (0 K) and the triple point of water (273.16 K) such that the ratio of any two temperatures on the scale is the same as the ratios of the heats absorbed and rejected by a Carnot engine operating between reservoirs at these temperatures.

absolute viscosity. *See:* viscosity, absolute.

absolute zero. The zero point of the absolute temperature scale (zero degree kelvin), of fundamental significance in thermodynamics. It results when a Carnot engine operating between two heat reservoirs rejects no heat to the reservoir at the lower temperature which is then defined as absolute zero. It may be interpreted as the temperature at which the volume of a perfect gas would vanish. The value of the absolute zero in degrees Celsius, by definition, is −273.15 *(Ref. 1)*.

absorbed dose. The amount of energy imparted by nuclear (or ionizing) radiation to unit mass of absorbing material. The unit is

the rad which is equal to 10^{-5} J g^{-1} *(Ref. 5)*.

absorbent. A substance or material that sucks up or takes in—by molecular or chemical action—gases, liquids, heat, or light *(Ref. 1)*.

absorber. In general, a medium, substance, or functional part that takes up matter or energy. In radiation and particle physics, an absorber is a body of material introduced between a source of radiation and a detector to determine the energy or nature of the radiation, to shield the detector from radiation, or to transmit selectively one or more components of the radiation, so that the radiation undergoes a change in its energy spectrum. Such an absorber may function through a combination of processes of true absorption, scattering, and slowing down *(Ref. 1)*.

absorptance. The ratio of the radiant flux absorbed in a body of material to the radiant flux incident upon it. Commonly, the material is in the form of a parallel-sided plate and the radiation in the form of a parallel beam incident normally on the surface of the plate. The absorptance may be measured for any radiation, for visible light (optical absorptance), or as a function of the wavelength of the radiation (spectral absorptance) *(Ref. 1)*.

absorption. 1: The process whereby the total number of particles emerging from a body of matter is reduced relative to the number entering, as a result of interaction of the particles with the body.

2: The process whereby the kinetic energy of a particle is reduced while traversing a body of matter. The loss of kinetic energy of corpuscular radiation is also referred to as moderation, slowing, or stopping.

3: The process whereby some or all of the energy of sound waves or electromagnetic radiations is transferred to the substance on which they are incident or which they traverse.

4: The process of "attraction into the mass" of one substance by another so that the absorbed substance disappears physically.

5: *Hydrology*. The entrance of water into the soil or rocks by all natural processes. It includes the infiltration of precipitation or snowmelt, gravity flow or streams into the valley alluvium, into sinkholes or other large openings, and the movement of atmospheric moisture *(Ref. 6)*.

absorption band. A range of wavelengths or frequencies of radiated energy that is absorbed by a substance.

absorption coefficient. 1: As applied to radiation (electromagnetic and corpuscular), a measure of the rate of decrease of a beam of photons as a result of absorption by the material into which the radiation is propagating.

2: The ratio of the sound energy absorbed by a surface of a medium (or material) exposed to a sound field (or to sound radiation) to the sound energy incident on the surface *(Ref. 1)*.

absorptivity. The capacity of a material to absorb incident radiant energy, measured as the ratio of absorbed energy to the total incident energy for a specimen of the material that is thick enough to be completely opaque and that has an optically smooth surface.

accelerated aging. A test performed on material or an assembly in a manner meant to duplicate long-time environmental conditions in a relatively short space of time *(Ref. 4)*.

accelerated test. *See:* test, accelerated.

accelerated weathering chamber. *See:* chamber, accelerated weathering.

acceleration. 1: *Mechanics*. A change in the velocity of a body, or the rate of such change, with respect to speed or direction, or both. It is equal to the force applied to an object divided by the mass of the object.

2: In a more restricted sense but more popular usage, the act or process of moving, or of causing to move, with increasing speed; the state or condition of so moving *(Ref. 7)*.

acceleration due to gravity. The acceleration produced by the force of gravity at the surface of the earth, which varies with the latitude and elevation of the point of observation. By international agreement, the value 9.80665 m s^{-2} has been chosen as the standard acceleration due to gravity for observation at latitude 45 deg. N. and sea level *(Ref. 8)*.

acceleration, equivalent static. An approximate expression for the maximum accelera-

tion obtained from a shock spectrum by an assembly of single-degree-of-freedom systems as a result of shock excitation. It is expressed as a function of frequency *(Ref. 8)*.

accelerometer. A transducer that senses and responds to accelerations for measuring, indicating, or recording such accelerations *(Ref. 7)*.

acclimation. The physiological and behavioral adjustments of an organism to changes in its immediate environment *(Ref. 9)*.

acclimatization. The acclimation or adaptation of a particular species over several generations to a marked change in the environment *(Ref. 9)*.

acclivity. An ascending slope, as opposed to declivity *(Ref. 10)*.

accretion; *also* coagulation. *Cloud Physics.* The growth of a precipitation particle by the collision of a frozen particle (ice crystal or snowflake) with a supercooled liquid droplet that freezes upon contact. This is a form of agglomeration and is analogous to coalescence, in which both particles are liquid *(Ref. 3)*.

accumulation. The snow and other solid precipitation deposited on a glacier or snowfield; the quantity deposited *(Ref. 11)*.

accumulation area. *See:* firn.

acid soil. *Pedology.* Soil with a pH value less than 7.0. For most practical purposes, a soil with a pH value less than 6.6. The pH values obtained vary greatly with the method used and, consequently, there is no unanimous agreement as to what constitutes an acid soil. (The term is usually applied to the surface layer or to the root zone unless specified otherwise.) *(Ref. 1)*.

acoustic; acoustical. Containing, producing, arising from, actuated by, related to, or associated with sound. Acoustic is used when the term being qualified designates something that has the properties, dimensions, or physical characteristics associated with sound; acoustical is used when the term being qualified does not designate explicitly something that has such properties, dimensions, or physical characteristics *(Ref. 1)*.

acoustical scintillation. Irregular fluctuations in the received intensity of sounds propagated through the atmosphere from a source of uniform output. These variations are produced by nonhomogenous structure of the atmosphere along the path of the sound *(Ref. 3)*.

acoustic (audio) interference. Undesired audio signals that interfere with communications, mask important sounds, or distract and irritate personnel.

acoustic noise. Any undesired sound. The frequencies involved include at least the band from 15 to 20,000 Hz *(Ref. 1)*. *See also:* noise.

acoustic refraction. *See:* refraction, acoustic.

acoustics. The science of sound, including its production, transmission, and effects *(Ref. 1)*.

acoustic velocity. The speed of sound or similar pressure waves through the atmosphere; approximately 738 mph at sea level.

acoustic wave velocity. A vector quantity that specifies the speed and direction with which a sound wave travels through a medium. Sonic speed is sometimes used to describe the speed of a body when it is equal to the acoustic wave velocity in the medium in which the body is moving *(Ref. 1)*.

actinic. Pertaining to electromagnetic radiation capable of initiating photochemical reactions, as in photography or the fading of pigments. Because of the particularly strong action of ultraviolet radiation on photochemical processes, the term has come to be almost synonymous with ultraviolet, as in "actinic rays" *(Ref. 3)*.

actinometer. The general name for any instrument used to measure the intensity of radiant energy, particularly that of the sun. Actinometers may be classified, according to the quantities that they measure, in the following manner: (a) pyrheliometer, which measures the intensity of direct solar radiation; (b) pyranometer, which measures global radiation (the combined intensity of direct solar radiation and diffuse sky radiation); and (c) pyrgeometer, which measures the effective terrestrial radiation *(Ref. 3)*. *See also:* radiometer.

activated carbon. A highly adsorbent form of carbon, used to remove odors and toxic substances from gaseous emissions. In advanced waste treatment, activated carbon is used to remove dissolved organic matter from waste water *(Ref. 9)*.

activated charcoal. *See:* activated carbon.

active layer. 1: Annually thawed layer. Layer of ground that thaws in the summer and freezes again in the winter.

2: Equivalent to seasonally frozen ground. *(Ref. 12)*

active storage. Storage in which an item is protected by preservation, sealing, covering, and placing in shelter and buildings either dehumidified or nondehumidified. It is differentiated from dormant storage, however, by periodic inspection, operation, or testing of the item during storage. In the case of equipment, such operation is done primarily to distribute lubricants and greases, thereby reducing corrosion of metals and hardening of seals.

active vibration isolation and absorption systems. Servomechanism-type systems whose sensors detect the vibration environment and provide feedback signals that are proportional to the vibration. These signals are used to control actuators that produce forces or motions to reduce the effect of the vibration environment on the protected component. Their main disadvantage is their complexity.

active zone. Equivalent to annual extent of the active layer *(Ref. 12)*.

acute dose. Total dose of radiation received at one time over a period so short that biological recovery cannot occur *(Ref. 5)*.

acute toxicity. Any poisonous effect produced within a short period of time, usually up to 24-96 hr, resulting in severe biological harm and often death *(Ref. 9)*.

adaptation. A change in structure or habit of an organism that produces better adjustment to the environment *(Ref. 9)*.

adaptation luminance; *also* adaptation brightness; adaptation illuminance; brightness level; field brightness; field luminance. The average luminance (or brightness) of those objects and surfaces in the immediate vicinity of an observer estimating the visual range *(Ref. 1)*.

adfreezing. The process by which two objects adhere to one another because of the binding action of ice *(Ref. 11)*.

adiabat. Usually same as dry adiabat. A line of constant potential temperature on a thermodynamic diagram. Meteorologically, the dry adiabat is intended to represent the lifting of dry air in a dry-adiabatic process *(Ref. 3)*.

adiabatic chart. Any thermodynamic diagram plotting temperature against either log p or $p^{0.288}$ (where p is pressure) and containing dry adiabats, either saturation or pseudoadiabats, and saturation mixing-ratio curves *(Ref. 13)*.

adiabatic process. A thermodynamic change of state of a system in which there is no transfer of thermal energy or mass across the boundaries of the system. In an adiabatic process, compression always results in warming, expansion in cooling. In meteorology the adiabatic process is often also taken to be a reversible process *(Ref. 1)*.

adobe. 1: An impure, alluvial or playa clay widely used in the United States for making sun-dried bricks.

2: A building material composed of sun-dried earth and straw.

adsorption. 1: The adhesion of molecules (gases or liquids) to a surface with which they are in contact, thereby reducing the quantity of fluid in the original substance *(Ref. 1)*.

2: Adsorption is often used to extract pollutants by causing them to be attached to such adsorbents as activated carbon or silica gel. Hydrophobic, or water-repulsing, adsorbents are used to extract oil from water *(Ref. 9)*.

adulterants. 1: Chemicals or substances that by law do not belong in a food, plant, animal, or pesticide formulation. Adulterated products are subject to seizure by the Food and Drug Administration *(Ref. 9)*.

2: A foreign or impure substance that corrupts, debases, or makes impure; a less valuable or inert ingredient added to a more valuable substance.

A-duration. *See:* pressure wave duration.

advection. *Meteorology.* The transport of an atmospheric property solely by mass motion of the atmosphere; also, the rate of change of the value of the advected property at a given point. Advection describes the predominant, horizontal, large-scale motions of the atmosphere while convection describes the predominantly vertical, locally induced motions *(Ref. 1)*.

advection fog. Fog resulting from the movement of moist air over a cold surface and

the consequent cooling of this air to below its dewpoint *(Ref. 1)*. *See:* **sea fog.**

adverse weather. Weather in which operations are generally restricted or impeded *(Ref. 5)*. *See also:* **marginal weather.**

aeolian. Pertaining to the action or the effect of the wind, as in aeolian sounds or aeolian deposits (of dust); derived from the name of the Greek god of the winds, Aeolus, whose harp was held responsible for the murmur of the gentle breezes and whose conch-shell trumpet was regarded as the source of the gale's howl *(Ref. 3)*.

aerial supply. The act or process by which aerial delivery of supplies is made to ground units *(Ref. 5)*.

aerobic. Referring to life or processes that can occur only in the presence of oxygen *(Ref. 9)*.

aerodynamics. The field of dynamics concerned with the motion of air and other gaseous fluids, or of the forces acting on bodies in motion relative to such fluids *(Ref. 14)*.

aerology. The study of the free atmosphere throughout its vertical extent, as distinguished from studies confined to the layer of the atmosphere adjacent to the surface of the earth. Aerological investigations are made directly by means of sounding balloons and aircraft. They are also made indirectly by visual observations from the ground, including observations of clouds, meteor trails, the aurora, etc. *(Ref. 15)*.

aerometeorograph. An instrument that records the pressure and temperature of the air, the amount of moisture in the air, and the windspeed. An aerometeorograph designed to transmit its record by radio from a balloon is called a radio meteorograph or radiosonde *(Ref. 12)*.

aeronomy. The study of the physics of the upper atmosphere; it includes the composition, physical properties, and chemical reactions of the upper atmosphere *(Ref. 1)*.

aerosol. 1: In atmospheric sciences, a colloidal suspension of liquid or solid particles in the air; e.g., haze. Some fogs and clouds are colloidal systems, but only if the drop size is small enough (usually less than 1 μm) to allow colloidal stability *(Ref. 3)*.

2: A term used to denote a method of packaging in which gas under pressure, or a liquefied gas that has a pressure greater than atmospheric at ordinary temperatures, is used to spray a liquid. In insecticide aerosols, as defined by the U.S. Department of Agriculture, all particles must be less than 50 μm in diameter, and 80 percent (by weight) must be less than 30 μm in diameter *(Ref. 1)*.

aerospace. Of, or pertaining to, the atmosphere and the space above it; the two separate entities are considered as a single realm of activity in launching, guidance, and control of vehicles that will travel in both entities *(Ref. 5)*.

AFSSC *Abbr. for* Armed Forces Supply Support Center.

afterwinds. Air currents set up in the vicinity of a nuclear explosion directed toward the burst center, resulting from the updraft accompanying the rise of the fireball *(Ref. 5)*.

agglomerate. 1: A confused or jumbled mass, heap, or collection.

2: A rock composed of volcanic fragments of various sizes and degrees of angularity, especially a rock in which the constituent fragments were produced by explosions in the throat of a volcano.

agglomeration. *Cloud Physics.* The process in which precipitation particles grow by collision with and assimilation of cloud particles or other precipitation particles *(Ref. 1)*.

aggradation. The process of building up a surface by deposition; the growth of a permafrost area due to natural or artificial causes. Opposite to degradation.

aggregate. 1: To bring together; collect or unite into a mass; composed of a mixture of substances, separable by mechanical means; the mineral material such as sand, gravel, shells, slag, or broken stone, or combination thereof, with which cement or bituminous material is mixed to form a mortar or concrete; a single mass or cluster of soil consisting of many particles held together, such as a clod, prism, crumb, or granule.

2: Natural or manmade material, consisting of rocklike particles ranging from ¼ to 2½ in. in diameter, with or without sand and artificial binder, used as a subgrade, base, or surface for a road. Usually refers to grav-

el or crushed rock. Sometimes called road metal (in England) *(Ref. 1)*.

aging. A gradual process involving physical change(s) in the properties or characteristics of a material and proceeding in a manner predictable chiefly as a function of time. In addition, the aging process may be accelerated or slowed when the material is also subjected to factors other than time, such as high or low temperature, or ozone. Aging can weaken or destroy specific properties in a material, or conversely, aging can enhance the desired properties, as in curing lumber *(Ref. 1)*.

aging, accelerated. *See:* **accelerated aging.**

aging, artificial. *See:* **artificial aging.**

aging, natural. *See:* **natural aging.**

aging, undistorted, accelerated. *See:* **undistorted accelerated aging.**

agonic line. The locus of points on the surface of the earth at which magnetic north and true north coincide; the line through these points. This line presently bisects North America on a line running from the Great Lakes to eastern Florida but is drifting slowly westward *(See:* **isogonic line**).

AI *Abbr. for* **articulation index.**

AIEE *Abbr. for* **American Institute of Electrical Engineers.**

aiguille. A sharp-pointed pinnacle of rock resulting from glacier action in mountainous areas.

air. The mixture of gases comprising the atmosphere of the earth. Since the composition of the atmosphere is slightly variable with respect to certain components, the term "pure air" has no precise meaning, but it is commonly used to imply freedom from nongaseous suspensoids (dust, hydrometeors) and also freedom from such gaseous contaminants as industrial effluents *(Ref. 1)*. Normal dry air is 78.1 percent nitrogen, 20.9 percent oxygen, and 0.9 percent argon, with the remainder composed of small quantities of carbon dioxide, neon, helium, methane, krypton, nitrous oxide, hydrogen, xenon, nitrogen dioxide, and ozone. The water vapor content of air may reach 7 percent at 100°F.

airborne dust. Particles of mineral and other substances, usually of silt size (0.002-0.05 μm), suspended in the air, such as those raised by operation of equipment over dry, loessial terrain, or those resulting from dust storms *(Ref. 1)*.

airburst. An explosion of a bomb or projectile above the surface, as distinguished from an explosion on contact with the surface or after penetration *(Ref. 5)*.

air checks. Surface marking and depressions caused by air trapped in rubber and plastics during the curing process *(Ref. 1)*.

air conditioning. The artificial control of humidity, temperature, "purity", and motion of the air within buildings and other enclosed spaces; also the operation of equipment for such controls. The objective may be to secure either maximum human comfort or the best environment for a given operation *(Ref. 3)*.

air current. Any moving stream of air.

air delivery container. A sling, bag, or roll, usually of canvas or webbing, designed to hold supplies and equipment for air delivery *(Ref. 5)*.

air delivery equipment. Special items of equipment, such as parachutes, air delivery containers, platforms, tiedowns, and related items used in air delivery of personnel, supplies, and equipment *(Ref. 5)*.

air delivery system. A system designed to facilitate the delivery of personnel, supplies, and equipment by aircraft. These systems are usually comprised of such items as parachutes, air delivery containers, platforms, tiedown devices, and related items *(Ref. 17)*.

air density. 1: The ratio of the mass of air to the volume occupied by it. In a continuous medium, the density is defined by a limiting process and is a point function. At 0°C and 760 μm Hg pressure, the density of dry air is approximately 1.29 g l^{-1} *(Ref. 1)*.
2: *See:* **ballistic density.**

air discharge. A form of lightning discharge, intermediate in nature between a cloud discharge and a cloud-to-ground discharge, in which the multibranching lightning channel descending from a cloud base does not reach the ground, but rather succeeds only in neutralizing the space charge distributed in the subcloud layer *(Ref. 1)*.

air-dry. 1: The process by which a material reaches equilibrium in moisture content with the surrounding atmosphere.
2: Of soils, when the soil is at equilibrium

with the moisture content of the ambient atmosphere. The moisture content reached at equilibrium depends on the relative humidity and the temperature of the surrounding atmosphere. *(Ref. 2)*

air-earth conduction current; *Also* fair-weather current; air current. The part of the air-earth electrical current contributed by the conduction of the atmosphere itself. It is represented as a downward movement of positive space charge in storm-free regions all over the world. The conduction current is the largest portion of the air-earth current, far outweighing the contributions made by the precipitation current and convection current. *(Ref. 3)*

air-earth current. The rate of transfer of electric charge from the positively charged atmosphere to the negatively charged earth. This electric current is made up of the air-earth conduction current, a precipitation current, a convection current, and miscellaneous smaller contributions. Of these, the first is by far the largest *(Ref. 1)*.

air landed. Moved by air and disembarked, or unloaded, after the aircraft has landed or while a helicopter is hovering *(Ref. 5)*.

air logistic support. Support by air landing or airdrop including air supply, movement of personnel, evacuation of casualties and prisoners of war, and recovery of equipment and vehicles *(Ref. 5)*.

air loss. The loss in weight by an object or substance on exposure to air at room temperature for a specified period of time *(Ref. 1)*.

airmass. A widespread body of air with properties that were established while the air was situated over a particular region of the surface of the earth. It is identified by the region where it receives its characteristic properties but it may undergo modifications as it moves from that region.

airmass classification. A system used to identify and to characterize the different airmasses according to a basic scheme. A number of systems have been proposed, but the Bergeron classification has been the most widely accepted. In this system, airmasses are designated according to the thermal properties of their source regions: tropical (T); polar (P); and less frequently, arctic or antarctic (A). For characterizing the moisture distribution, airmasses are distinguished as to continental (c) and maritime (m) source regions. Further classification according to whether the air is cold (k) or warm (w) relative to the surface over which it is moving indicates the low-level stability conditions of the air, the type of modification from below, and is also related to the weather occurring within the airmass. This outline of classification yields the following identifiers for airmasses: cTk, cTw, mTk, mTw, cPk, cPw, mPk, mPw, cAk, cAw, mAk, mAw; the last of which is never used *(Ref. 1)*.

air, moist. 1: In atmospheric thermodynamics, air that is a mixture of dry air and water vapor *(Ref. 3)*.

2: Generally, air with a high relative humidity *(Ref. 3)*.

3: In environmental engineering, a mixture of air and condensed or entrained beads of airborne water, specifically air containing water in the liquid state *(Ref. 1)*.

air movement. Air transport of units, personnel, supplies, and equipment including airdrops and air landings *(Ref. 5)*. *See also:* **free drop; free fall; high-velocity drop; low-velocity drop.**

air pollution. The presence of contaminants in the air in concentrations that are sufficient to cause deleterious effects on human, animal, or plant life or on materials. Many contaminants are maintained below concentrations where their effects become apparent by the natural dispersive properties of the atmosphere. The important air pollutants are sulfur dioxide, oxides of nitrogen, carbon monoxide, gaseous hydrocarbons, oxidants, and particulate matter *(Ref. 9)*.

air pressure. The static pressure exerted by air. Although this is a very general term, it is best used in cases where a limited volume of air is concerned, as within an enclosed space. This term should never be used to denote a dynamic effect such as wind pressure *(Ref. 1)*.

airspace. The space above the surface of the earth and its appurtenances, such as buildings, trees, or a part of such space *(Ref. 15)*.

air stability. The condition of the atmosphere as affected by the gradient of air

temperature in the vertical direction, which determines the extent of mixing or exchange between air layers at different altitudes *(Ref. 12)*.

air transported operations. The movement by aircraft of troops and their equipment for an operation *(Ref. 5)*.

air transportable units. Those units, other than airborne, whose equipment is adapted for air movement *(Ref. 5)*.

Aitken nuclei. Small, hygroscopic condensation nuclei less than 0.1 μm in size. They number over tens of thousands per cubic centimeter in city air, and they may be either solid or liquid particles.

albedo. The ratio of the amount of electromagnetic radiation reflected by a body to the amount incident upon it, commonly expressed as a percentage. The albedo is to be distinguished from the reflectivity, which refers to one specific wave length (monochromatic radiation) *(Ref. 1)*.

albedometer. An instrument used for the measurement of the reflecting power (the albedo) of a surface. A pyranometer or radiometer adapted for the measurement of radiation reflected from the surface of the earth is sometimes employed as an albedometer *(Ref. 3)*.

alga *(pl.* **algae**). 1: A thallophyte possessing chlorophyll; includes almost all seaweeds *(Ref. 18)*.

2: A plant of relatively simple structure which grows chiefly in water, such as the various forms of seaweed. Algae range in size from a microscopic plant, large numbers of which sometimes cause discoloration of water, to the giant kelp which may have a length of more than 600 ft *(Ref. 15)*.

algal bloom. A proliferation of living algae on the surface of lakes, streams or ponds. Algal blooms are stimulated by phosphate enrichment *(Ref. 9)*.

alimentation. Generally, the process of providing nourishment or sustenance; thus in glaciology, the combined processes that serve to increase the mass of a glacier or snowfield; the opposite of ablation. The deposition of snow is the major form of glacial alimentation, but other forms of precipitation, along with sublimation, refreezing of melt water, etc., also contribute. The additional mass produced by alimentation is termed accumulation *(Ref. 3)*.

alkali flat. 1: A level lakelike plain formed in low depressions where accumulated water evaporates, depositing fine sediment and dissolved minerals and forming a hard surface if mechanical sediments prevail or a crumbly, powdered surface if efflorescent salts are abundant.

2: The bed of a dried-up saline lake that is heavily impregnated with alkaline salts *(Ref. 10)*; a playa.

alkali soil. 1: A soil with a pH of 8.5 or higher or with a high exchangeable sodium content or both.

2: A soil with sufficient alkali (sodium) to interfere with the growth of most crop plants. *(Ref. 2)*

alkaline soil. Soil with pH greater than 7.0 *(Ref. 2)*. *(See:* **acid soil**).

all-aged. Applied to a stand of trees in which trees of all ages up to and including those of felling age are found *(Ref. 19)*.

Allard's law. The relation, in the theory of the night visual range, describing the variation of illuminance with distance from a point source of light.

alligatoring. A coating failure attributed to improper use or application of paints, varnishes, lacquers, and allied formulations. It is characterized by the formation or separation of large surface cracks and segments in a characteristic pattern resembling the hide of an alligator *(Ref. 1)*.

allowable stress. *See:* **stress, allowable.**

alluvial cone *(or* **alluvial fan**). A body of sand, silt, or mud, shaped like a segment or sector of a low cone, formed where the gradient of a stream valley decreases abruptly, as where a steep mountain canyon emerges into an open valley or onto a plain. The surface of an alluvial cone is normally marked by stream channels and former channels that radiate from the apex of the cone, at the mouth of the mountain canyon, in a pattern somewhat like that of the ribs of an open Japanese fan. The profile of a large alluvial cone is normally concave, the slope decreasing progressively away from the apex. Alluvial cones may extend for many miles covering and filling large basins *(Ref. 1)*.

alluvium. A general term for all detrital deposits of streams or rivers, thus including the sediments laid down in river beds, flood plains, lakes, cones at the foot of mountain slopes, and estuaries *(Ref. 20)*.

all-weather route. A road or highway that, with reasonable maintenance, is passable throughout the year for traffic densities never appreciably less than maximum capacity.

all-weather route (limited traffic due to weather). A road or highway that, with reasonable maintenance, can be kept open in all weather, but sometimes only at traffic densities considerably less than maximum capacity.

alp. 1: A high, steep-sided mountain.
2: *Botany.* A mountain pasture or meadow between timberline and snowline. *(Ref. 11)*

alpha particle. A positively charged particle emitted from the atomic nuclei of certain radioactive materials. It is the least penetrating of the three common types of radiation (alpha, beta, and gamma) and usually not dangerous to plants, animals, or man. It is composed of two protons and two neutrons and is identical in all measured properties with the nucleus of a helium atom *(Ref. 9)*.

alpha ray. A stream of alpha particles *(Ref. 3)*.

alpine. 1: Of, pertaining to, or like the Alps in Europe.
2: Descriptive of the plants, animals, and ecological associations of any high mountain region above timberline, hence alpine heath, alpine meadow, alpine pasture, alpine fauna.
3: Pertaining to alpine topography *(Ref. 11)*.

alpine topography. Mountainous terrain modified by glaciation to display an assortment of physiographic features such as arêtes, aiguilles, cirques, and U-shaped valleys *(Ref. 11)*.

altimeter. An instrument for indicating altitude above or below a given reference level, usually the ground or sea level *(Ref. 1)*.

altimeter setting. The value of atmospheric pressure to which the scale of a pressure altimeter is set as a reference datum *(Ref. 1)*.

altitude. 1: The vertical distance between a point and a reference surface *(Ref. 18)*.
2: The vertical angle between the plane of the horizon and the line to the observed point, as a star *(Ref. 18)*.
3: The height of an airborne object above the surface of the earth, above a constant-pressure surface, or above mean sea level *(Ref. 1)*.

altitude acclimatization. A slow physiological adaptation resulting from prolonged exposure to significantly reduced atmospheric pressure such as occurs at high elevations *(Ref. 5)*.

altitude chamber. *See:* chamber, altitude.

altitude sickness. The syndrome of depression, anorexia, nausea, vomiting, and collapse, due to decreased atmospheric pressure, occurring in an individual exposed to an altitude beyond that to which acclimatization has occurred *(Ref. 5)*.

altocumulus. A principal cloud type, white and/or gray in color, that occurs as a layer or patch with a waved aspect, its elements appearing as laminae, rounded masses, rolls, etc. Small liquid water droplets invariably comprise the major part of the composition of altocumulus. This results in sharpness of outline, small internal visibility (both common cumuliform characteristics), and the occurrence of coronae and irisation (diffraction phenomena) *(Ref. 3)*.

altostratus. A principal cloud type in the form of a gray or bluish (never white) sheet or layer of striated, fibrous, or uniform appearance. This cloud type often covers the sky over an area of several thousand square miles.

AM *Abbr. for* amplitude modulated.

ambient air. Any unconfined portion of the atmosphere; the outside air *(Ref. 9)*.

ambient noise. *See:* noise, ambient.

ambient temperature. The temperature of the air or other medium surrounding an object *(Ref. 18)*.

ambient vibration. The all-encompassing vibration associated with a given environment, being usually a composite of vibration from many sources near and far *(Ref. 8)*.

AMC *Abbr. for* Army Materiel Command.

AMCP *Abbr. for* Army Materiel Command Pamphlet.

ammunition. A contrivance charged with

explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological, or chemical material for use in connection with defense or offense including demolitions. Certain ammunition can be used for training, ceremonial, or nonoperational purposes *(Ref. 5)*.

ammunition and toxic material open space. Area especially prepared for storage of explosive ammunition and toxic material. For reporting purposes, it does not include the surrounding area restricted for storage because of safety distance factors. It includes barricades and improvised coverings *(Ref. 5)*.

amphibious vehicle. A wheeled or tracked vehicle capable of operating on both land and water *(Ref. 5)*.

amphibole. A common rock-forming mineral containing silica, magnesium, calcium, and often aluminum and iron.

amphitheater. A relatively flat valley or gulchlike depression, generally oval or circular in outline surrounded by abrupt slopes, formed by glaciation in alpine mountains at or near the head of drainage *(Ref. 21)*. Commonly, an oval or circular building with rising tiers of seats around an open area.

amplitude. 1: A measure of the magnitude of the deviation from the rest position of a parameter. Amplitude may be expressed in either a positive or negative direction, polarity, or sense, depending on the parameter.
2: *Mechanics.* The extent of the force, displacement velocity, or acceleration of a vibration.
3: (a) *Electricity.* The maximum variation or departure from the average of an alternating current, voltage, charge, or magnetic flux.
(b) *Electronics.* The maximum value of an alternating radio wave or the like in one direction, measuring from zero.
4: The magnitude of the displacement of a wave from a mean value. For simple harmonic, complex harmonic, or random waves, the amplitudes of concern may be peak, average, root-mean-square, peak-to-peak, or one-half the mean difference between maxima and minima *(Ref. 1)*.

amplitude modulation. *See:* modulation, amplitude.

amplitude, peak to peak. Of an oscillating quantity, the algebraic difference between the extremes of the quantity. Two times the amplitude of a simple harmonic oscillatory quantity is its peak-to-peak amplitude, or double amplitude *(Ref. 1)*.

anabatic wind. An upslope wind; usually applied only when the wind is blowing up a hill or mountain as the result of local surface heating, and apart from the effects of the larger-scale circulation; the opposite of katabatic wind. The most common type is the valley wind *(Ref. 3)*.

anaerobic. Refers to life or processes that occur in the absence of oxygen *(Ref. 9)*.

analog. 1: In synoptic meteorology, a past large-scale weather pattern that resembles a given (usually current) situation in its essential characteristics.
2: Any environmental factor or factor-complex that has basic similarities to another factor or factor-complex located in a different part of the world *(Ref. 1)*.
3: Generally, a thing that is similar to something else.

anchorage. An area where a vessel anchors or may anchor, either because of suitability or designation *(Ref. 18)*.

anchor ice; *also* bottom ice. The very solid film of ice that develops on rocks and other obstructions on the bottom of a stream, lake, or shallow sea, irrespective of the nature of its formation *(Ref. 18)*.

anechoic room. A room whose boundaries absorb effectively all the sound incident thereon, thereby affording essentially free-field conditions *(Ref. 1)*.

anemometer. The general name for instruments designed to measure the speed (or force) of the wind. These instruments may be classified according to the means of transduction employed: those used in meteorology include the rotation anemometer, pressure-plate anemometer, pressure-tube anemometer, bridled-cup anemometer, contact anemometer, cooling-power anemometer, and sonic anemometer *(Ref. 3)*.

aneroid barograph. A recording barometer consisting of a sealed capsule restrained from collapsing by a spring and arranged so that the deflection of the capsule actuates a pen which graphs a record of atmospheric

pressure on a rotating drum. The magnification of the deflection of the capsule may be adjusted so that records of small fluctuations in pressure may be obtained. The aneroid barograph is subject to the uncertainties of the aneroid barometer, and therefore must be calibrated periodically. Sometimes called aneroidograph *(Ref. 3)*.

aneroid barometer. An instrument for measuring atmospheric pressure. It consists of a thin corrugated hollow disk-shaped capsule partially evacuated of gas which is restrained from collapsing by an external or internal spring. The deflection of the spring is nearly proportional to the difference between the internal and external pressures. Magnification of the spring deflection is obtained both by connecting capsules in series and by mechanical linkages *(Ref. 3)*.

angel. A radar echo caused by a physical phenomenon not discernible to the eye. Angels are usually coherent echoes and sometimes of great signal strength (up to 40 dB above the noise level). They have been ascribed to insects flying through the radar beam, but have also been observed under atmospheric conditions that indicate other causes. Studies indicate that a fair portion are caused by strong temperature and/or moisture gradients such as might be found near the boundaries of cells of especially warm or moist air. They frequently occur in shallow layers at or near temperature inversions within the lowest few thousand feet of the atmosphere *(Ref. 3)*.

angle of incidence. The angle between the direction of travel of a ray or object incident on a surface and a line normal to the surface at the point of incidence.

angle of repose. The maximum slope or angle at which a material such as soil or loose rock remains stable. When exceeded, mass movement by slipping as well as by water erosion may be expected *(Ref. 20)*.

angstrom (*Abbr:* Å). A unit of length used in the measurement of very small lineal dimensions, such as the wavelength of light, X rays, and other electromagnetic radiation or molecular and atomic diameters. One angstrom equals 10^{-8} cm or 10^{-4} μm. The wavelength of visible light ranges from about 4,000 to 7,000 angstroms; whereas X-ray wavelengths and atomic diameters are of the order of a few angstroms. The unit is named in honor of the 19th century Swedish spectroscopist, A. J. Ångström *(Ref. 3)*.

animal fog. *See:* biofog.

animal transport. The use of animals such as dogs or pack mules for the purpose of carrying various types of cargo.

annual flood. The highest flow at a point on a stream during any particular calendar year or water year *(Ref. 3)*.

annual range of temperature. The difference between the highest and lowest temperatures recorded at a station in any given year *(Ref. 1)*.

anodising. Forming a protective coating on a metal surface by anodic oxidation; most frequently applied to aluminum. Generally, anodized coatings are hard, abrasion resistant, and offer excellent resistance to corrosion *(Ref. 1)*.

ANSI *Abbr. for* American National Standards Institute.

antarctic air. A type of air whose characteristics are developed in an antarctic region. Antarctic air appears to be colder at the surface in all seasons, and at all levels in fall and winter, than arctic air *(Ref. 1)*.

antenna, dipole. *See:* dipole antenna.

antenna, loop. *See:* loop antenna.

anticyclone. An atmospheric circulation pattern in which the winds blow clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere, usually around a high pressure region; a closed circulation. With respect to the direction of its rotation, it is the opposite of a cyclone. Because anticyclonic circulation and relative high atmospheric pressure usually coexist, the terms anticyclone and high are used interchangeably in common practice *(Ref. 3)*.

antifouling. Pertaining to a protective coating, usually containing copper compounds such as cuprous oxide or metallic copper powder. These are formulated in a suitable vehicle to provide a toxic environment which retards or prevents the growth of barnacles and other marine organisms on the underwater hull of vessels or on other objects submerged in sea water *(Ref. 1)*.

antinode. 1: A point, line, or surface in a standing wave pattern at which the wave

has maximum amplitude *(Ref. 22)*.

2: A region of maximum amplitude between adjacent nodes in a vibrating body.

antioxidant. A substance that prevents or slows down the reaction of oxygen with a material *(Ref. 4)*.

antiozonant. A substance that prevents or slows down material degradation due to reaction with ozone *(Ref. 4)*.

antiresonance. A frequency in the vibration frequency spectrum of a system undergoing forced oscillation, at which a change in excitation frequency, either positively or negatively, causes an increase in the system response *(Ref. 22)*.

aphelion. The point in the orbit of any body in orbit about the sun that is farthest from the sun.

API *Abbr. for* American Petroleum Institute.

apogean tidal current. A tidal current of decreased speed occurring at the time that the moon is near the point in its orbit that is farthest from the earth; i.e., near apogee *(Ref. 18)*.

apogean tides. Tides of decreased range occurring when the moon is near the point in its orbit that is farthest from the earth; i.e., near apogee. The range at this time is called apogean range and usually does not occur until 1 to 3 days after the moon reaches apogee *(Ref. 18)*.

apogee. The point at which a rocket trajectory or a satellite orbit is farthest from the center of the gravitational field of the controlling body or bodies *(Ref. 5)*.

apparent brightness. With respect to the visual range of a dark, distant object: luminance, created by airlight, of that portion of the visual field subtended by the object; i.e., the light scattered into the eye by particles, including air molecules, lying along the optic path from eye to object *(Ref. 3)*.

apparent horizon. The visible line of demarcation between land/sea and sky as seen at a distance. Nearby features, natural or manmade, may obscure the horizon and produce a local horizon that differs from the apparent horizon.

applied climatology. The scientific analysis of long-term statistically treated weather data for useful operational purposes. "Operational" is interpreted as any specialized endeavor such as industrial, manufacturing, agricultural, military, or technical pursuits. This is the general term for all such work and includes agricultural climatology, aviation climatology, bioclimatology, industrial climatology, and others *(Ref. 3)*.

applied environmental research. The collation of statistical, meteorological, climatic, and geographical data; the interpretation of these data; and the presentation of the evaluated information in suitable form for useful applications, such as to problems of equipment, personnel, and operational functions, and as an aid to designers of military equipment *(Ref. 1)*.

applied meteorology. The application of current weather data, analyses, and forecasts to specific practical problems. It is distinguished from applied climatology, which deals with the similar application of long-period, statistically treated weather data *(Ref. 3)*.

applied research. Research performed to accomplish specific objectives *(Ref. 5)*. *See also:* **basic research.**

apron. An extensive alluvial deposit with generally low outward slope, essentially a mature coalesced series of alluvial cones or a well-developed bajada.

aquatic. Growing or living in, or frequenting or performing in or on water.

aquifer. An underground bed or stratum of earth, gravel, or porous stone that contains water in sufficient quantity to supply wells *(Ref. 9)*.

archipelago. Any sea or broad sheet of water interspersed with many islands or with a group of islands; also a group of islands.

arctic air. A type of air whose characteristics are developed mostly in winter over arctic surfaces of ice and snow. Arctic air is cold aloft and extends to great heights, but the surface temperatures are often higher than those of polar air. For 2 or 3 mo in summer, arctic airmasses are shallow and rapidly lose their characteristics as they move southward *(Ref. 3)*.

arctic blackout. A prolonged fadeout of radio communications that occurs naturally in polar regions but may be induced artificially at lower latitudes. An arctic blackout may last for days or even weeks during

periods of intense auroral activity. Recent experiments with high-altitude nuclear detonations have produced blackouts and artificial auroras over the subtropics *(Ref. 3)*.

arctic climate. Characterized by extremely low temperatures, snow cover in winter, long periods of darkness in winter, and long hours of daylight in summer. Climate of a region too cold to support the growth of trees. Usually applied to geographic polar regions.

arctic regions. The portion of the Northern Hemisphere that is characterized by having an average temperature for the warmest month of between 0° and 10°C (32° and 50°F). These areas generally correspond with those seasonally frozen lands that do not support forest vegetation and include the adjacent lakes, seas, or oceans *(Ref. 12)*.

arctic sea smoke. Steam fog rising from small areas of open water in sea ice.

arctic zone. The area north of the Arctic Circle (lat. 66 deg 32 min N.) *(Ref. 1)*.

area of northern operations. A region of variable width in the Northern Hemisphere that lies north of the 50-deg isotherm; a line along which the average temperature of the warmest 4-mo period of the year does not exceed 10°C (50°F). Mountain regions located outside of this area are included in this category of operations provided that these same temperature conditions exist *(Ref. 5)*.

arête. An acute and rugged crest of a mountain range, or a subsidiary ridge between two mountains, or of a mountain spur, such as that between two cirques *(Ref. 10)*.

arid. Without moisture: excessively dry; parched and barren; having insufficient rainfall to support agriculture, usually less than 10 to 15 in. annually.

arid chamber. *See:* chamber, arid.

arid climate. A climate in which at least 10 mo of the year have no more than 3 days with precipitation of 0.1 in. or more *(Ref. 23)*.

aridity. The degree to which a climate lacks effective, life-promoting moisture; the opposite of humidity, in the climatic sense of the term *(Ref. 1)*.

armature. 1: The component of a rotating electric machine in which an alternating voltage is generated as a result of relative motion with respect to a magnetic flux field; commonly applied to the entire rotor.

2: The moving element of a relay that performs the switching or accomplishes the movement required for the relay to accomplish its function. It usually has associated with it a part of the relay contact assembly *(Ref. 24)*.

armor. 1: A protective covering including that for military vehicles or personnel; sheathing for wire, cable, cording, or hose. 2: Armored forces and vehicles.

arroyo. The channel of an ephemeral or intermittent stream, usually with vertical banks of unconsolidated material 2 ft or more high *(Ref. 20)*. *See:* dry wash; barranca.

artesian water. Ground water that is under sufficient pressure to rise above the level at which it is encountered by a well, but which does not necessarily rise to or above the surface of the ground *(Ref. 1)*.

articulation index. A numerical system for describing the intelligibility of speech in noise, using measures of the speech levels and noise levels measured at the ear.

artificial aging. The change of material properties with time when exposed to an artificial environment, as in a test chamber *(Ref. 1)*.

artificial daylight. Illumination of an intensity greater than the light of a full moon on a clear night. (The optimum illumination is with the equivalent intensity and spectral distribution of daylight.) *(Ref. 5)*

artificial environment. An environment that exists in a test facility under controlled conditions, some elements of which are an imitation of conditions found in nature *(Ref. 1)*.

artificial moonlight. Illumination of an intensity between that of starlight and that of a full moon on a clear night *(Ref. 5)*.

ASA *Abbr. for* American Standards Association.

ASAC *Abbr. for* Asian Standards Advisory Committee.

ascendent. 1: The point of the elliptic that rises above the eastern horizon at any moment.

2: The vector with magnitude equal to the rate of change of a function in space and directed normal to surfaces of constant value of the function and toward increasing values of the function. It is the negative of gradient when gradient is a similar vector but directed toward decreasing values of a function.

ash breeze. *See:* **breeze.**

A-scope. A type of radar indicator in which signal strength and target range are presented in rectangular coordinates.

ASME *Abbr. for* American Society of Mechanical Engineers.

aspect. 1: The compass direction toward which a land slope faces. The direction is taken downslope and normal to the contours of elevation *(Ref. 3)*.

2: The overall physical appearance of an object or area, or the seasonal appearance of a formation, as for example, the spring aspect *(Ref. 19)*.

assimilation. 1: The process or act of taking in and using as nourishment, as the incorporation of absorbed nutrients by protoplasm.

2: The process by which a body of water purifies itself of pollutants.

3: The process of taking knowledge into the mind and thoroughly comprehending it.

association. An assemblage or gathering of objects or people brought together for a purpose or related by a common property, thrust, or occurrence; e.g., an assemblage of plants usually over a wide area that has one or more dominant species from which it derives a definite common aspect.

ASTM *Abbr. for* American Society for Testing and Materials.

atmometer. The general name for an instrument that measures the evaporation rate of water into the atmosphere. Four main classes of atmometers may be distinguished: (a) large evaporation tanks sunk into the ground or floating in water, (b) small evaporation pans, (c) porous porcelain bodies, and (d) porous paper wick devices *(Ref. 1)*.

atmosphere. 1: *Meteorology.* The envelope of air surrounding the earth and bound to it by gravitational attraction. It extends from the solid or liquid surface of the earth to an indefinite height, its density asymptotically approaching that of interplanetary space *(Ref. 1)*. The atmosphere is odorless, colorless, tasteless, very mobile, flowing readily under even a slight pressure gradient, elastic, compressible, capable of unlimited expansion, a poor conductor of heat, but able to transmit vibrations with considerable velocity.

2: *Physics.* A unit of pressure equal to 101,325 N m^{-2} (14.70 lb $in.^{-1}$), representing the atmospheric pressure at mean sea level under standard conditions.

atmosphere, standard. A hypothetical vertical distribution of atmospheric temperature, pressure, and density which, by international agreement, is taken to be representative of the atmosphere for purposes of pressure altimeter calibrations, aircraft performance calculations, aircraft and missile design, ballistic tables, etc. The current standard atmosphere is that adopted on 15 March 1962 by the United States Committee on Extension to the Standard Atmosphere (COESA). The U.S. Standard Atmosphere, 1962, up to 32 km, has been adopted by the International Civil Aeronautical Organization (ICAO) *(Ref. 1)*.

atmospheric acoustics. The study of (a) sounds of meteorological origin and (b) the role of the atmosphere in the propagation of sound. Examples of sounds of meteorological origin are thunder and any of the varied aeolian sounds, such as the humming of telegraph wires or the murmuring of trees when winds are blowing. The atmosphere influences the propagation of sound in many ways; the velocity of sound in the atmosphere is governed by the air temperature and by its molecular composition; sharp inversions may produce marked sound reflection; strong temperature gradients yield sonic refraction; small turbulent eddies may cause diffraction and scattering of sound which results in acoustical scintillation *(Ref. 3)*.

atmospheric boil; *also* **terrestrial scintillation; shimmer.** A scintillation phenomenon caused by light that reaches the eye from sources within the atmosphere of the earth. It is produced by irregular refraction effects due to passage, across the line of sight, of air parcels whose densities differ

slightly from that of their surroundings. It is seen over paved surfaces on bright summer days *(Ref. 3)*.

atmospheric density. The ratio of the mass of the atmosphere (or any part of it) to the volume occupied by it. This ratio is greatest at sea level and decreases with increasing altitude; it also may vary horizontally depending on conditions of atmospheric temperature and pressure. It is usually expressed in grams per cubic meter, although other unit systems may be used *(Ref. 1)*.

atmospheric dust. Particles derived from soils (primarily of arid areas) ranging in size from about 0.1 to 10 μm.

atmospheric electric field. A quantitative term, denoting the electric field strength of the atmosphere at any specified point in space and time. In areas of fair weather, the atmospheric electric field near the surface of the earth typically is about 100 V m^{-1} and is directed vertically in such a sense as to drive positive charges downward to the earth. In areas of fair weather, this field decreases in magnitude with increasing altitude, falling, for example, to only about 5 V m^{-1} at an altitude of about 10 km *(Ref. 1)*.

atmospheric electricity. Electrical phenomena, regarded collectively, that occur in the atmosphere of the earth. These phenomena include not only such striking manifestations as lightning and St. Elmo's fire, but also less noticeable but more common effects such as atmospheric ionization, the air-earth current, and other quiescent electrical processes *(Ref. 1)*.

atmospheric optics. The study of the optical characteristics of the atmosphere and of the optical phenomena produced by the atmosphere and by particles suspended in the atmosphere; e.g., aerosols and water vapor. It includes the study of refraction, reflection, diffraction, scattering, and polarization of light but is not commonly regarded as including the study of other kinds of radiation *(Ref. 1)*.

atmospheric phenomenon. As commonly used in weather observing practice, an observable occurrence of particular physical (as opposed to dynamic or synoptic) significance within the atmosphere. Included are all hydrometeors (except clouds, which are usually considered separately), lithometeors, igneous meteors, and luminous meteors. From the viewpoint of weather observations, thunderstorms, tornadoes, waterspouts, and squalls are also included. This usage excludes such "phenomena" as the local or large-scale characteristic of wind, pressure, and temperature; it also excludes clouds, although it includes many products of cloud development and composition. In aviation weather observation, atmospheric phenomena are divided into two categories: weather and obstructions to vision *(Ref. 3)*.

atmospheric pressure. The pressure exerted by the atmosphere as a consequence of gravitational attraction exerted upon the "column" of air lying directly above the point in question *(Ref. 3)*. Pressure is usually given in millibars, inches of mercury, pounds per square inch, or pounds per square foot. Its standard value at sea level is about 14.7 lb $in.^{-2}$ *(Ref. 1)*.

atmospheric radiation. 1: Electromagnetic radiation emitted by the atmosphere.
2: *Meteorology.* Thermal radiation (about 3- to 80-μm wavelengths) emitted by, or propagating through, the atmosphere, which interacts with the atmosphere and provides one of the important mechanisms by which the heat balance of the earth-atmosphere system is maintained; also called long-wave radiation *(Ref. 1)*.

atmospherics. The radiofrequency electromagnetic radiations originating, principally, in the irregular surges of charge in thunderstorm lightning discharges. Atmospherics are heard as a quasi-steady background of crackling noise (static) in ordinary amplitude-modulated radio receivers *(Ref. 1)*. *See also:* sferics.

atmospheric temperature. The degree of heat or cold in the envelope of air surrounding the earth as measured on some definite temperature scale (usually Celsius or fahrenheit) by means of any of various types of thermometers *(Ref. 1)*.

atmospheric transmittance. The ratio between the intensity of the extraterrestrial solar radiation and the intensity of the solar radiation after passing through the atmosphere.

atoll. A ring-shaped organic reef that is sur-

rounded by the open sea and partially encloses a lagoon in which there is no land above sea level *(Ref. 18)*.

attenuation. 1: In general, the decrease in flux density (or power, amplitude, intensity, particles, etc.) with distance from the energy source by any process; it includes diminution by distance (inverse square law), absorption, scattering, refraction, and diffusion.

2: In atmospheric sciences, the decrease in flux of a "parallel beam" of radiation caused by the effects of the transmitting medium (mainly absorption and scattering by the atmosphere); the effect of distance from the source (inverse square law) is specifically excluded *(Ref. 3)*.

3: In vibration mechanics, resonant response attenuation will occur if a structure or system is detuned, or if resonant damping increases progressively with fatigue, or if elastic isolation media are inserted. Electrical attenuation is used in the standardization of multichannel recording of accelerometer signals, and with filters for signal conditioning and random vibration equalization *(Ref. 1)*.

Atterberg limits. Measures of soil consistency for differentiation between materials of appreciable plasticity (clays) and slightly plastic or nonplastic materials (silts). The measures include the liquid limit, the plastic limit, and the plasticity index *(Ref. 25)*.

audible sound. Sound containing frequency components lying between about 15 and 20,000 Hz with sufficient sound pressure to be heard *(Ref. 1)*.

audio. Pertaining to frequencies of audible sound waves between about 15 and 20,000 Hz *(Ref. 1)*.

audiofrequency. Any frequency corresponding to a normally audible sound wave. Audiofrequencies range from 15 to 20,000 Hz *(Ref. 1)*.

aurora. The sporadic radiant emission from the upper atmosphere over middle and high latitudes that is related to magnetic storms and the influx of charged particles from the sun.

autoconvection. A spontaneous overturning of layers of the atmosphere which may occur if the lapse exceeds 3.4 deg C/100 m and if density increases with height. This situation arises in shallow layers due to surface heating and also develops aloft due to evaporative cooling of virga and hydrometeors into dry air.

autocorrelation. The simple linear mutual relationship of a time-dependent function or series with its own past history.

available water. Water in the soil that can be extracted by plant roots, thus the water available to plants.

avalanche. A large mass of snow or ice, or other surface materials, moving rapidly down a mountain slope *(Ref. 11)*.

average discharge. In the annual series of the Geological Survey's reports on surface-water supply, the arithmetic average of the volumetric flow of water past a point in streams or rivers for all complete water years of record whether or not they are consecutive. Average discharge is not published for less than 5 yr of record. The term "average" is generally reserved for average of record and "mean" is used for averages of shorter periods, namely, daily mean discharge *(Ref. 6)*.

average indoor temperature *or* sensible temperature. The temperature at which "average indoor air" of moderate humidity would induce, in a lightly clothed person, the same sensation of comfort as that induced by the actual environment *(Ref. 1)*. It depends on the air temperature; radiation from the sun, sky, and surrounding objects; relative humidity; and air motion *(Ref. 3)*.

average life. *See:* life, average.

Avogadro's number. The constant number of molecules in 1 gram-mole of gas (6.022169×10^{23}) for all permanent gases. Under standard conditions (0°C and 1 atmosphere pressure), the volume occupied by 1 gram-mole of gas is $2.24136 \times 10^{-2} m^3$.

awash. 1: Tossed about or bathed by waves or tide *(Ref. 18)*.

2: A rock exposed or one just bare at any stage of the tide between the datum of mean high water and the sounding *(Ref. 18)*.

azimuth. Direction expressed as horizontal angle usually in degrees or mils and measured clockwise from north. Thus, azimuths

will be true azimuths, grid azimuths, or magnetic azimuths, depending on which north is used *(Ref. 12)*.

azonal soils. Soils without distinct genetic horizons *(Ref. 1)*.

B

B *Abbr. for* bel.

b *Abbr. for* bar.

back blast. Rearward blast of gases from the breech of recoilless weapons upon the burning of the propellant charge. It is sometimes referred to as breech blast *(Ref. 12)*.

background. Ever-present effects in physical or chemical systems above which a phenomenon must manifest itself in order to be measured. "Background" can take various forms, depending on the nature of the measurement *(Ref. 1)*.

background count. The evidence or effect on a detector of radiation, other than that which it is desired to detect, caused by any source. In connection with health protection, the background count usually includes radiations produced by naturally occurring radioactivity and cosmic rays *(Ref. 5)*.

background level. In any physical or chemical system, the level of a measured parameter or constituent that is characteristic of the environment. The value of a quantity to be measured must be separable from the background in order to indicate an effect or variance from normal conditions; e.g., with respect to air pollution, amounts of pollutants present in the ambient air due to natural sources *(Ref. 9)*.

background luminance. In visual range theory, range theory, the luminance (brightness) of the background against which a target is viewed. In estimating the visual range by objects on the horizon, for example, the background luminance is that of the sky near the horizon. In the problem of downward oblique visual range, the pertinent background luminance is that of the surface of the earth *(Ref. 3)*.

background noise. *See:* noise, background.

background radiation. Normal radiation present in the lower atmosphere from cosmic rays and earth sources *(Ref. 9)*.

backlash. The loose motion in a device or instrument due to the clearance existing between mechanical parts.

backshore. 1: The part of a beach that is usually dry, being reached only by the highest tides, and, by extension, a narrow strip of relatively flat coast bordering the sea *(Ref. 18)*.

2: One or more nearly horizontal surfaces called berms formed landward from the beach crest; they may slope inland.

backward scatter. The scattering of radiant energy into the hemisphere of space bounded by a plane normal to the direction of the incident radiation and lying on the same side as the incident ray; the opposite of forward scatter. In radar usage, backward scatter refers only to that radiation scattered at 180 deg to the direction of the incident wave *(Ref. 1)*.

bacteria. Unicellular microscopic organisms, simpler and less complex in structure than the fungi and only obscurely related to other organisms. Their unicellular form, lack of definite nucleus, and method of reproduction by fission remotely suggest a relationship with blue-green algae, from which most are distinguished by the absence of pigments. The absence of chlorophyll makes it necessary for bacteria to obtain their nutritional requirements from organic sources *(Ref. 1)*. Some bacteria are capable of causing human, animal, or plant diseases; others are essential in pollution control because they break down organic matter in the air and in the water *(Ref. 9)*.

badlands. A region nearly devoid of vegetation where erosion, instead of carving hills and valleys of the ordinary type, has cut the

land into an intricate maze of narrow ravines and sharp crests and pinnacles. This extremely rough topography is formed in an advanced stage of gullying in poorly consolidated sediments and is characterized by sharp-edge ridges separated by narrow and steep gullies. Travel across such a region is almost impossible.

bajada. A long outwash detrital slope at the base of a mountain range, resulting from the coalescence of alluvial cones *(Ref. 10)*.

ballast. 1: A heavy material used in a vehicle or ship to improve its stability.
2: Any material that gives stability; e.g., selected materials (usually crushed rock that is irregular in shape, easily tamped, fireproof, well drained, resistant to plant growth and evenly distributed) placed on a railroad to hold the track in proper alignment *(Ref. 1)*.

ball ice. Small spheres of sea ice, 1 to 2 in. in diameter, rounded and shaped by the waves. They are very soft and spongy and are generally found in belts similar to sludge which forms at the same time *(Ref. 3)*.

ballistic density. A representation of the atmospheric density actually encountered by a projectile in flight expressed as a percentage of the density according to the standard artillery atmosphere. Thus, if the actual density distribution produced the same effect upon a projectile as the standard density distribution, the ballistic density would be 100 percent *(Ref. 3)*.

ballistic efficiency. A measure of the ability of a projectile to overcome the resistance of the air; it depends chiefly on the weight, diameter, and shape of the projectile *(Ref. 12)*.

ballistic impact. The impact of a body during or at the end of its ballistic flight; i.e., target impact. The impact caused by the impingement of particles, fragments, bullets, or other objects on the target after their trajectory flight through space. This type of impact is differentiated from the impacting of components in a weapon system during environmental impact tests *(Ref. 1)*.

ballistic pendulum. An accelerometer calibrator in which the velocity of an initially stationary suspended mass, on which the accelerometer to be calibrated is mounted, is known when the mass is struck by a second suspended mass released from a predetermined height *(Ref. 22)*.

ballistics. 1: The science or art that deals with the motion, behavior, appearance, or modification of missiles or other projectiles while in flight as acted upon by propellants, wind, gravity, temperature, or any other modifying substance, condition, or force.
2: The study of the processes within and characteristics of firearms.

ballistic temperature. A computed constant temperature that would have the same total effect or a projectile during its flight as the varying temperatures actually encountered *(Ref. 12)*.

ballistic wind. An assumed constant wind that would have the same total effect on a projectile during its flight as the varying winds actually encountered *(Ref. 12)*.

ball lightning. A relatively rare type of lightning consisting of a luminous ball which may move rapidly across an object or may remain suspended in air for a brief period. They are of the order of 1 ft in diameter.

band, frequency. In communications and electronics, a continuous range of frequencies extending between two limiting frequencies. The term may also be applied to those frequencies encountered in shock and vibration excitation *(Ref. 1)*.

band-pass filter. An electrical or mechanical network designed to attenuate all signals that do not lie within a specified frequency band *(Ref. 3)*.

band width. The difference between the limiting wavelengths of a band *(Ref. 1)*.

band width, effective. The band width of an ideal transmission system with uniform transmission in its pass band equal to the maximum transmission of the specified system. It transmits the same power as the specified system when both receive equal input signals having a uniform distribution of energy at all frequencies *(Ref. 22)*.

bank. 1: An elevation of the sea floor located on a continental (or island) shelf and over which the depth of water is relatively shallow but sufficient for safe navigation. It may support shoals or bars on its surface which are dangerous to navigation *(Ref. 18)*.
2: In its secondary sense, a shallow area consisting of shifting forms of silt, sand,

mud, gravel, etc., but in this case it is used only with a qualifying word such as "sandbank", "gravelbank", etc. *(Ref. 18)*.

3: A ridge of any material such as earth, rock, snow, or anything resembling such a ridge, as a fog bank or cloud bank *(Ref. 15)*.

4: The border or shore of a river *(Ref. 15)*.

5: The margin of a channel. Banks are called right or left as viewed facing in the direction of the flow *(Ref. 6)*.

bar. 1: *Meteorology*. A unit of pressure equal to 10^6 dyn cm^{-2} (10^6 bar), 1,000 mb, 29.53 in. of mercury.

2: As a coastal landform, a ridge of unconsolidated material lying seaward of a shore (offshore bar). A bar may be submerged even at low tide, it may be tidal, or it may rise above high tide level. Most bars consist of sand or gravel.

3: As a landform in a stream channel, an accumulation of alluvium, usually ridgelike and elongate in the direction of the current. Most rivers bars consist of sand (sandbars) or gravel (gravel bars), but some are of mud (sometimes called mudbanks) and some consist of cobbles or even boulders. Many river bars are emergent at low water, and some are only covered at flood stage *(Ref. 1)*.

barb. A means of representing windspeed on a synoptic weather chart; it is a short line drawn obliquely toward lower pressure from the end of a wind-direction shaft. The windspeed is indicated by the number of barbs, with each barb representing 10 kt and each half-barb representing 5 kt.

barchan. An independent, traveling, crescent-shaped dune or drift of wind-blown sand or snow, with the crescent facing toward the prevailing winds. A transverse-type dune, it has an asymmetrical and crested cross section with a steep inter slope and a relatively gentle outer slope. Conditions under which barchans form include a relatively small to moderate supply of material and winds of almost constant direction and moderate speed *(Ref. 1)*.

barnacle. A marine crustacean that has feathery appendages (cirri) for gathering food, and is found attached to rocks, floating logs, and bottoms of ships *(Ref. 1)*.

baroclinity. The state of stratification in a fluid in which surfaces of constant pressure (isobaric) intersect surfaces of constant density (isosteric). The number, per unit area, of isobaric-isosteric solenoids intersecting a given surface is a measure of the baroclinity *(Ref. 3)*.

barograph. A recording barometer. Barographs may be classified on the basis of their construction into the following types: (a) aneroid barograph (including microbarograph), (b) float barograph, (c) photographic barograph, and (d) weight barograph. The aneroid barograph, which is the least complicated and possibly least accurate of the barographs, is the one most commonly used in weather stations *(Ref. 3)*.

barometer. An instrument for measuring atmospheric pressure *(Ref. 18)*. A mercurial barometer employs a column of mercury supported by the atmosphere. An aneroid barometer has a partially evacuated, thin-metal cylinder that is compressed or expanded depending on the relative differences between the gas pressure inside the cylinder and the atmospheric pressure.

barometric corrections. The corrections that must be applied to the reading of a mercury barometer in order that this observed value may be rendered accurate. There are four kinds:

(a) The instrument correction is the mean difference between the readings of a given mercury barometer and those of a standard instrument. It is a composite correction, including the effects of capillarity, index misalignment, imperfect vacuum, and scale correction, which are the barometric errors.

(b) The temperature correction is applied to account for the difference between the coefficient of expansion of mercury and that of the scale.

(c) The gravity correction is necessary because the acceleration of gravity varies both with altitude and latitude.

(d) The removal correction is applied when the barometer elevation differs from the adopted station elevation and/or climatological station elevation *(Ref. 3)*.

barometric pressure. Atmospheric pressure as indicated by a barometer. This atmospheric pressure is the pressure exerted by

the atmosphere as a consequence of gravitational attraction exerted upon the "column" of air lying directly above the point in question *(Ref. 1)*.

barometric tendency. *See:* pressure tendency.

barothermohygrograph. An instrument that automatically records pressure, temperature, and humidity of the atmosphere *(Ref. 15)*.

barranca. A dry wash or ravine having steep sides and a narrow bed less than 2 m wide *(Ref. 1)*. *See also:* arroyo; wadi.

barrens. A relatively desolate area, where vegetation either is lacking (as in an ice cap or desert) or is scanty and restricted to a few species, as compared with adjacent areas, because of adverse soil, wind, or other environmental factors *(Ref. 1)*.

barrier material. A material designed to withstand, to a specified degree, penetration of water, oils, water vapor, or certain gases such as CO_2 and N_2. Barrier materials are also used to exclude thermal and acoustic energy *(Ref. 1)*.

barrier reef. A coral reef parallel to and separated from the coast by a lagoon that is too deep for coral growth. Generally, barrier reefs follow the coasts for long distances and are cut through at irregular intervals by channels or passes *(Ref. 18)*.

basalt. Any one of a group of fine-grained, dark, heavy, widely distributed volcanic rocks. No strict definition of basalt as a mineralogic type has been agreed upon *(Ref. 1)*.

base level. The level below which a land surface cannot be reduced by running water. Sea level is considered the principal base level. Principal streams serve as local or temporary base levels for their tributaries.

base line. A surveyed line established with more than usual care for use as a reference.

base surge. A cloud that rolls out from the bottom of the column produced by a subsurface burst of a nuclear weapon. For underwater bursts the surge is, in effect, a cloud of liquid droplets which has the property of flowing almost as if it were a homogeneous fluid. For subsurface land bursts, the surge is made up of small solid particles but still behaves like a fluid *(Ref. 5)*.

basic research. Efforts directed toward an increase in fundamental knowledge *(Ref. 5)*. *See also:* applied research.

basilar membrane. The part of the ear set in motion by sound at the eardrum. Its movement stimulates hair cells, which in turn activate auditory nerve fibers.

basin. 1: A depression of the sea floor more or less equidimensional in form and of variable extent *(Ref. 18)*.

2: An area in a tidal region in which water can be kept at a desired level by means of a gate. Also called tidal basin *(Ref. 15)*.

3: A relatively small cavity in the bottom or shore, usually created or enlarged by excavation, large enough to receive one or more vessels for a specific purpose *(Ref. 15)*.

4: An area of land that drains into a particular lake or sea through a river and its tributaries *(Ref. 15)*.

5: The drainage or catchment area of a stream or lake *(Ref. 10)*.

batholith. A great mass of intruded igneous rock, most of which is a considerable distance below the surface of the earth and extends downward to unknown depths.

bathymeter. An instrument primarily designed for measuring depth of water. Bathymetric surveys, previously done by lead line, are now performed by using an echo sounder and precision depth recorder *(Ref. 18)*.

battlefield illumination. The lighting of the zone of action of ground combat and combat support troops by artificial means *(Ref. 5)*.

B-duration. *See:* pressure envelope duration.

beach. 1: The area extending from the shoreline inland to a marked change in physiographic form or material, or to the line of permanent vegetation (coastline) *(Ref. 5)*.

2: A gently sloping area of wave-deposited unconsolidated material bordering a sea or lake; also, the unconsolidated material making up such a beach.

beach berm. Nearly horizontal bench or narrow terrace formed by wave action in unconsolidated material on the backshore of a beach with surface rising behind it and sloping off in front.

beam wind. Nautical term for a crosswind, especially a wind blowing 90 deg from the heading of a ship. A wind with a compo-

nent that is directed perpendicularly to the course (or heading) of an exposed, moving object; more popularly, a wind that predominantly acts in this manner. In the broadest sense, any wind except a direct headwind or direct tailwind is a cross wind. The drift produced by cross wind is critical to air navigation, being especially dangerous during landing and takeoff *(Ref. 3)*.

bearing. The horizontal direction from one terrestrial point to another expressed as true bearing or magnetic bearing if measured in degrees clockwise from true or magnetic north, respectively; compass bearing (points of the compass); or relative bearing referred to direction of travel of moving craft.

beat frequency. Either of the two additional frequencies obtained when signals of two frequencies are combined, equal to the sum or difference, respectively, of the original frequencies *(Ref. 15)*.

Beaufort wind scale. A system of estimating and reporting windspeeds, invented in the early 19th century by Admiral Beaufort of the British Navy. In its present form for international meteorological use, it equates (a) Beaufort force (or Beaufort number), (b) windspeed, (c) descriptive term, and (d) visible effects upon land objects or sea surface. As originally given, Beaufort numbers ranged from 0, calm, to 12, hurricane. They have now been extended to 17 *(Ref. 1)*.

bed. A layer of rock differing from layers above and below, or set off by more or less well-marked divisional planes; a layer in a series of stratified (sedimentary) rocks *(Ref. 1)*.

bedrock. The solid rock beneath the loose material, or soil and subsoil, with which most of the land surface of the earth is covered. It is sometimes several hundred feet beneath the surface, but it usually is found at a much smaller depth; in places, especially on steep slopes, it has no soil cover at all *(Ref. 20)*.

before the wind. The direction toward which the wind is blowing; with the wind *(Ref. 3)*. *See also:* downwind.

bel *(Abbr:* B). A unit expressing the relation between amounts of signal power and differences in sound-sensation levels. The number of bels is equal to the common logarithm of the ratio of the two powers or sound levels involved. Two powers or levels differ by one bel when their actual ratio is 10:1 *(Ref. 27)*. *See also:* decibel.

belgium block course. A test facility for simulating the conditions of transportation. The course is a specially prepared roadbed having varying degrees of roughness, waviness, and other controlled characteristics over which wheeled equipment is moved at varying speeds to study the effects of shock and vibration caused by transportation. Belgium block is only one section of the Munson Test Course which also includes a course washboard, a radial washboard, and a single corrugation section *(Ref. 1)*.

bench. A strip of relatively level earth or rock, raised and narrow. A small terrace or comparatively level platform breaking the continuity of a declivity *(Ref. 10)*.

bench mark. In surveying, a mark, usually cut in stone as a relatively permanent material object, natural or artificial, bearing a marked point whose elevation above or below an adopted datum (such as sea level) is known.

benthic region. The bottom of a body of water. This region supports the benthos, a type of life that not only lives upon, but contributes to the character of, the bottom *(Ref. 9)*.

benthos. The plant and animal life whose habitat is the bottom of a sea, lake, or river *(Ref. 9)*.

bergy bit. A medium-sized piece of ice, generally less than 5 m (16.4 ft) high and about the size of a small cottage. It usually originates from glacier ice but occasionally from a massive piece of sea ice or hummocked ice. When it is known to be sea ice, the term "floeberg" may be used *(Ref. 18)*.

berm. The nearly horizontal portion of a beach or backshore having an abrupt fall. It is formed by deposition of material by wave action and marks the limit of ordinary high tides *(Ref. 18)*.

Bermuda high. The semipermanent subtropical high pressure region located in the western part of the North Atlantic Ocean. It has much influence on weather in the eastern United States, particularly in the summer.

beta particle *or* **beta ray.** A positive or negative electron emitted by the nucleus during radioactive transformation. By extension, electrons accelerated to extremely high speeds (kinetic energies about 1 million electronvolts or more) are called beta particles *(Ref. 1)*. Beta particles may cause skin burns but may be easily stopped by a thin sheet of metal *(Ref. 9)*.

bevameter. A mobile or portable instrument developed by the U S Army Land Locomotion Laboratory for measuring horizontal and vertical stress-deformation curves of natural soils or soil simulating materials. It consists of one or more rotating horizontal shear heads and one or more vertical displacement penetrometers *(Ref. 1)*.

B-horizon. *See:* **soil horizon.**

bimetallic thermometer. A temperature-measuring instrument consisting of a compound strip of two metals with different coefficients of thermal expansion so that the curvature of the strip is proportional to temperature.

bioassay. The employment of living organisms to determine the biological effect of some substance, factor, or condition *(Ref. 9)*.

biodegradable. The characteristic of decomposing as a result of the action of micro-organisms *(Ref. 9)*.

biofog. Basically, a type of steam fog caused by contact between extremely cold air and the warm, moist air surrounding human or animal bodies or generated by human activity. These fogs are sometimes named after their specific sources, such as animal fog, human fog, or town fog *(Ref. 3)*.

biological agent. A micro-organism that causes disease in man, plants, or animals or causes the deterioration of material *(Ref. 5)*.

biosphere. The portion of the earth and its atmosphere capable of supporting life *(Ref. 9)*.

biotic. Pertaining to living things, of life.

bittern. *See:* **brine.**

bivane. A bidirectional wind vane; a sensitive wind vane used in turbulence studies to obtain a record of the horizontal and vertical components of the wind. The instrument consists of two lightweight airfoil sections mounted orthogonally on the end of a counterbalanced rod which is free to rotate in the horizontal and vertical planes. The positions of the rod may be recorded by electrical techniques *(Ref. 3)*.

blackbody. A hypothetical "body" that absorbs all of the electromagnetic radiation striking it; i.e., one that neither reflects nor transmits any of the incident radiation. No actual substance behaves as a true blackbody, although platinum black, carbon black, lampblack, and other soots rather closely approximate this ideal *(Ref. 1)*.

blackbody radiation. The electromagnetic radiation emitted by an ideal blackbody; it is the theoretical maximum amount of radiant energy of all wavelengths that can be emitted by a body at a given temperature *(Ref. 1)*.

black-bulb thermometer. A thermometer whose sensitive element has been made to approximate a blackbody by covering it with lampblack. The thermometer is placed in an evacuated transparent chamber that is maintained at constant temperature. The instrument responds to insolation, modified by the transmission characteristics of its container *(Ref. 3)*.

black frost. A dry freeze, with respect to its effects upon vegetation; i.e., the internal freezing of vegetation unaccompanied by the protective formation of hoarfrost. A black frost is always a killing frost, and its name derives from the resulting blackened appearance of affected vegetation *(Ref. 3)*.

blackout. *See:* **arctic blackout.**

blade passage frequency. *See:* **propeller blade passage frequency.**

blast. The brief and rapid movement of air, vapor, or fluid away from a center of outward pressure, as in an explosion or in the combustion of rocket fuel; the pressure accompanying this movement. This term is commonly used for "explosion", but the two terms may be distinguished *(Ref. 5)*.

blast effect. Destruction of or damage to structures and personnel by the force of an explosion on or above the surface of the ground. Blast effect may be contrasted with the cratering and ground shock effects of a projectile or charge that goes off beneath the surface *(Ref. 5)*.

blast wave. A sharply defined wave of increased pressure rapidly propagated

through a surrounding medium from a center of detonation or similar disturbance *(Ref. 5)*.

blink. A glare on the underside of extensive cloud areas, created by light reflected from snow- or ice-covered surfaces. Snow blink is whitish and brighter than the yellowish-white glare of ice blink *(Ref. 15)*.

blistering. A coating failure common to paints, varnishes, lacquers, and related formulations. It is characterized by the formation of local or scattered blisters varying in size from small pimples to large patches, usually attributed to surface contamination or endo-osmosis of water as the result of exposure of coatings to excessive moisture *(Ref. 1)*.

blizzard. A severe weather condition characterized by low temperatures and strong winds bearing a great amount of snow (mostly fine, dry snow picked up from the ground). The National Weather Service specifies, for blizzard, a wind of 32 mph or higher, low temperatures, and sufficient snow in the air to reduce visibility to less than 500 ft; and for severe blizzard, windspeeds exceeding 45 mph, temperature near or below −12°C (10°F), and visibility reduced by snow to near zero *(Ref. 1)*.

block. 1: *Hydrography.* A sea ice fragment more than 6 but less than 30 ft in diameter.
2: *Geomorphology.* An elongate or quadrangular, often tilted section of a faulted part of the crust of the earth, hence block mountains *(Ref. 11)*.

block diagram. 1: Three-dimensional perspective representation of geologic or topographic features showing a surface area and generally two vertical cross sections.
2: A schematic representation of a system of interrelated elements wherein the individual elements are identified with rectangular blocks in which their function is identified and interrelationships are shown by connective lines between blocks.

bloom. 1: A surface coating failure associated with high gloss paints, varnishes, lacquers, and related formulations. It is characterized by the formation of surface haze which lowers the original specular gloss, imparting a dull or semigloss appearance to the coating *(Ref. 1)*.
2: A proliferation of living algae and/or other aquatic plants on the surface of lakes or ponds. Blooms are frequently stimulated by phosphate enrichment *(Ref. 9)*.

blowdown. 1: A windfall *(Ref. 11)*.
2: Trees knocked down as a result of an explosion (e.g., nuclear detonation).

blowing dust. Dust picked up locally from the surface of the earth and blown about in clouds or sheets. It may completely obscure the sky; in its extreme form it is a dust-storm *(Ref. 1)*.

blowing sand. Sand picked up from the surface of the earth by the wind and blown about in clouds or sheets. In its extreme form, blowing sand constitutes a sandstorm *(Ref. 1)*.

blowing snow. Snow lifted from the surface of the earth by the wind to a height of 6 ft or more above the surface (higher than drifting snow), and blown about in such quantities that horizontal visibility is restricted at and above that height. Blowing snow is one of the requirements for a blizzard *(Ref. 1)*.

blown-out land. Areas from which all or almost all of the soil has been removed by wind erosion. Usually barren, shallow depressions with a flat or irregular floor consisting of a more resistant layer and/or an accumulation of pebbles, or a wet zone immediately above a water table. Usually unfit for crop production *(Ref. 1)*.

bluff. 1: A cliff with a broad face, or a relatively long strip of land rising abruptly above surrounding land or a body of water *(Ref. 15)*.
2: Any high headland or bank presenting a precipitous front; it is usually applied to the slopes bordering a river; these bluffs are often formed by the action of the river in cutting into the valley sides.

blush. Of a doped fabric or surface: To become dull or pale as a result of rapid evaporation or high humidity, with a consequent weakening of the dope film *(Ref. 7)*.

blushing. A condition in which a cloudy film appears on a newly lacquered surface. It is caused directly by the precipitation of a portion of the solid content of the material. This is usually due to oil or water mixed in the lacquer, a relatively high humidity condition, or too rapid drying *(Ref. 1)*.

BOD *Abbr. for* biological oxygen demand.

bog. 1: A quagmire or morass; an area of wet, highly acid, peaty, spongy ground, usually lacking in mineral nutrients, often interspersed with pools of open water, where any dense body is likely to sink.

2: *Botany.* The vegetation of saturated, peaty land in open or forest areas; hence moss bog, juncus bog, carex or sedge bog, sphagnum bog, birch bog, tamarack bog, black spruce bog *(Ref. 11).*

bogie. One of the several wheels supporting the track of a tracked vehicle.

bole. 1: The stem or trunk of a tree, usually the lower, usable or salable portion of the tree trunk.

2: A lump of earth formed of any of several varieties of friable clay, usually colored red by iron oxide *(Ref. 1).*

bolometer. An instrument that measures the intensity of radiant energy by employing a thermally sensitive electrical resistor *(Ref. 1).*

bolson. A basin; a depression or valley having no outlet; a wide valley drained by a stream flowing through canyons at each end.

Boltzmann's constant. The ratio of the universal gas constant to Avogadro's number; equal to 1.3806×10^{-23} J m^{-1}. Sometimes called gas constant per molecule, Boltzmann's universal conversion factor *(Ref. 3).*

bonfire. *See:* cascade.

bora. A fall wind whose source is so cold that when the air descends to the lowlands or coast the dynamic warming is insufficient to raise the air temperature to the normal level for the region; hence, it appears as a cold wind. The terms borino and boraccia denote a weak bora and strong bora, respectively. The term was originally and still is applied to the cold northeast wind on the Dalmatian coast of Yugoslavia in winter when cold air from Russia crosses the mountains and descends to the relatively warm coast of the Adriatic. The term bora is now applied to similar winds in other parts of the world *(Ref. 1).*

boraccia. *See:* bora.

bore; *also* eagre. A restricted tidal current of considerable force and size *(Ref. 11).*

boreal forest. The forested region that adjoins the tundra along the arctic tree line. It has two main divisions: Its northern portion is a belt of taiga or boreal woodland; its southern portion is a belt of true forest, mainly conifers but with some hardwoods. On its southern boundary the boreal forest passes into "mixed forest" or "parkland", prairie, or steppe, depending on the rainfall *(Ref. 3).*

borino. *See:* bora.

botanical pesticide. A plant-produced chemical used to control pests; for example, nicotine, strychnine, or orpyrethrun *(Ref. 9).*

bottom. Any ground covered by water. Bed refers more specifically to the whole submerged basin, and floor is the essentially horizontal surface of the ground beneath the water *(Ref. 18).*

bottom ice. *See:* anchor ice.

bottoming. The occurrence of rapidly increasing acceleration forces when a load or device, supported by resilient mountings, is subjected by shock or vibration stimulation to displacements exceeding normal limits such that the resilient mounting no longer provides a cushioning effect.

boulder. A piece of rock, separate from bedrock, more than 256 mm in maximum dimension. Sometimes considered to apply only to rounded stones of this size *(Ref. 1).*

boulder clay. *See:* till.

bounce. 1: A colloquial term used in sound recording, implying that reverberation is relatively high and for high-frequency components.

2: In shock and vibration mechanics, a term used to denote repetitive resonant bottoming *(Ref. 1).*

bounce test. A loose cargo vibration test. The material to be tested is placed on a platform that is driven at constant frequency and amplitude for a specified time.

boundary friction. *See:* friction.

boundary layer. 1: The layer of fluid in the immediate vicinity of a bounding surface, referring ambiguously to the laminar boundary layer, turbulent boundary layer, and the planetary or surface boundary layer *(Ref. 3).*

2: A thin layer of fluid next to the surface of a body in a moving stream (as an airfoil in an airstream) having distinctive flow characteristics as a result of friction be-

tween the fluid and the surface of the body. The flow in the boundary layer may be laminar, turbulent, or transitional between laminar and turbulent *(Ref. 7)*.

bourdon tube. A closed, curved tube of elliptical cross section used in some temperature-sensing and pressure-sensing instruments. One end is fixed, and the expansion of the fluid due to a temperature change causes an increase in the radius of curvature of the tube. The curvature may then be measured by the travel of the tip of the tube. The curvature is a measure of the difference between the pressure inside the tube and that outside *(Ref. 1)*.

box. *See:* chamber.

brackish. Containing salt to a moderate degree, such as sea water that has been diluted by fresh water, as near the mouth of a river. Brackish water has salinity values ranging from approximately 0.50 to 17.00 parts per thousand *(Ref. 18)*.

braided stream. A stream flowing in several channels, which divide and reunite in a pattern resembling the strands of a braid *(Ref. 1)*.

brash. Loose accumulation of fragments of sea ice (or fresh-water ice); each piece is less than 6 ft across and is called a "bit" of ice. Sometimes called rubble *(Ref. 1)*.

brashness. An abnormal condition sometimes associated with fungous attack or with short grain that causes some pieces of wood to be relatively low in shock resistance for the species. When broken in flexure, the wood fails abruptly without splintering and at comparatively small deflections *(Ref. 19)*.

breakaway. The separating of a boundary layer from a surface *(Ref. 7)*. The onset of a condition in which the shock front moves away from the exterior of the expanding fireball produced by a nuclear explosion.

breaker. A wave breaking on the shore, over a reef, etc. Breakers may be roughly classified into three kinds, although the categories may overlap:

(a) Spilling breakers break gradually over a considerable distance;

(b) Plunging breakers tend to curl over and break with a crash; and

(c) Surging breakers peak up; but then, instead of spilling or plunging, they surge up on the beach face *(Ref. 18)*.

breaks. An area in rolling land eroded by small ravines and gullies; also used to indicate any sudden change in topography, as from a plain to hilly country *(Ref. 10)*.

breakup. In general, the spring melting of snow, ice, and frozen ground. Specifically the destruction of the ice cover on rivers during the spring thaw or the occurrence of the solid sheet of ice on rivers breaking into pieces that move with the current *(Ref. 11)*.

breakwater. *See:* jetty.

breech blast. *See:* back blast.

breeze. 1: Wind of force 2 to 6 (4-31 mph or 4-27 kt) on the Beaufort scale. Wind of force 2 (4-7 mph or 4-6 kt) is classified as a light breeze; wind of force 3 (8-12 mph or 7-10 kt), a gentle breeze; wind of force 4 (13-18 mph or 11-16 kt) a moderate breeze; wind of force 5 (19-24 mph or 17-21 kt) a fresh breeze; and wind of force 6 (25-31 mph or 22-27 kt), a strong breeze.

2: Any light wind. A land breeze flows from the land to the sea, and usually alternates with a sea breeze blowing in the opposite direction. A mountain breeze blows down a mountain slope due to gravity flow of cooled air, and a valley breeze blows up a valley or mountain slope because of the warming of the mountainside and valley floor by the sun. A puff of wind, or light breeze affecting a small area, may be called a cat's paw. Absence of wind is sometimes called ash breeze *(Ref. 15)*.

bridgewire. The part of an electroexplosive device that is heated by electrical energy to initiate the detonation of munitions.

brightness. *See:* luminance.

brightness contrast threshold. The limiting or threshold value of the contrast between the apparent luminance of an object and the luminance of the background at which the object is only just visible.

brightness level. *See:* adaptation luminance.

brine. Sea water containing a higher concentration of dissolved salt than that of the ordinary ocean. Brine is produced by the evaporation or freezing of sea water, for in the latter case, the sea ice formed is much less saline than the initial liquid, leaving the adjacent unfrozen water with increased sa-

linity. The liquid remaining after sea water has been concentrated by evaporation until salt has crystallized is called bittern *(Ref. 1)*.

brisance. The shattering effect of an explosion on materials *(Ref. 1)*.

brittleness. The quality of a material that leads to crack propagation without appreciable plastic deformation *(Ref. 1)*.

broken ice; *also* loose ice; open ice; slack ice. In sea ice reporting, ice that covers one-half to four-fifths of the local sea surface *(Ref. 11)*.

Brownian motion. The rapid irregular motion of small particles in a fluid. It occurs due to random collisions between the molecules of the fluid and the dispersed particles of a colloidal system in which the particles are less than 0.1 μm in diameter. For larger particles, the collisions are so numerous as to cancel and no motion results.

browning reaction. A type of food spoilage that results in darkening or "browning" of the product, loss in flavor, decrease in certain nutrients, and undesirable changes in taste.

brush. Shrubs and stands of short, scrubby tree species that do not reach sufficient size for use as timber *(Ref. 19)*.

Btu *Abbr. for* British thermal unit.

bubble *or* bubble high. The small anticyclones (i.e., shallow domes of cooled air) causing slightly higher pressure, complete with clockwise circulation, of the order of 50 to 300 mi across, that are caused by precipitation and vertical currents associated with thunderstorms. These transitory small highs have the effect of a different airmass, and unstable air overrunning them may form squall lines on their leading edge.

bucket temperature. *See:* temperature, surface.

bulk petroleum products. Liquid petroleum products that are normally transported by pipeline, rail tank car, road tank truck, road tank trailer, barge, harbor or coastal tanker, and oceangoing tanker and stored in a tank or container having a fill capacity greater than 55 U S gallons (45 Imperial gallons) *(Ref. 5)*.

bulk storage. 1: Storage in a warehouse of supplies and equipment in large quantities, usually in original containers, as distinguished from bin storage.

2: Storage of liquids, such as petroleum products in tanks, as distinguished from drum or packaged storage *(Ref. 5)*. *See also:* storage.

bump. A mechanical shock of relatively low magnitude *(Ref. 8)*.

bump tester. A shock machine that is capable of generating bumps repetitively *(Ref. 1)*.

buoyancy. 1: The property of an object that enables it to float in a liquid, or ascend through and remain freely suspended in a compressible fluid such as the atmosphere. Quantitatively, it may be expressed as the ratio of the specific weight of the fluid to the specific weight of an object; or, in another manner, by the weight of the fluid displaced minus the weight of the object *(Ref. 3)*.

2: The upward force exerted upon a parcel of fluid (or an object within the fluid) in a gravitational field by virtue of the density difference between the parcel (or object) and that of the surrounding fluid *(Ref. 1)*.

burble. 1: A separation or breakdown of the streamline flow past a body.

2: The eddying or turbulent flow resulting from this *(Ref. 7)*.

buried soil. Soil that has been covered over by deposition of other material. The depth of deposited material is generally greater than the thickness of the solum *(Ref. 2)*.

burn. A section of forest or scrub devastated by fire; the clearing made by fire *(Ref. 11)*.

burst. Increased energy transmission of brief duration; particularly, increased radio wave or thermal radiation from the sun, lasting from a fraction of a second to about a minute. An isolated burst is one of large magnitude occurring during a relatively quiet period *(Ref. 15)*.

bush. *See:* cascade.

butte. An isolated, flat-topped hill or mountain with steep sides, smaller than a mesa. Buttes are most common in arid regions *(Ref. 1)*.

buzz. 1: A rapid vibration or oscillation of a structure or body.

2: The noise resulting from the rapid vibration or oscillation of a structure or body *(Ref. 7)*.

buzz. To vibrate or oscillate rapidly, making a humming noise *(Ref. 7)*.

C

C *Abbr. for* Celsius (°C: degree Celsius).

c *Abbr. for* centi (10^{-2}); cycle; continental (air).

cabinet. *See:* chamber.

cable. An insulated conductor or twisted group of conductors used for the transmission of electrical energy *(Ref. 4)*.

cable effect. The effect on the measured response of a structure caused by the stiffness and weight of attached instrumentation cables; electrical noise caused by cable movement; and the resistance, capacitance, and inductance effect on the frequency response of the measured signal *(Ref. 22)*.

cabling. The act of twisting together two or more insulated components by machine to form a cable *(Ref. 4)*.

cake ice *or* **ice cake.** Flat pieces of sea ice larger than brash. Cake ice often is tightly packed giving a mosaic appearance, but its surface is generally smooth in contrast to rough, hummocked pressure ice *(Ref. 3)*.

cal *Abbr. for* calorie.

calcareous soil. A soil that effervesces visibly when treated with a cold solution of 0.1N hydrochloric acid as a result of the presence of calcium carbonate along with, many times, magnesium carbonate *(Ref. 2)*.

calcium carbonate. A mineral comprising one of the principal constituents of the crust surface in many dry salt flats and playa depressions.

calcium sulfate. A mineral comprising one of the principal constituents of the crust surface in many dry salt flats and playa depressions.

caldera. A basin-shaped volcanic depression with a diameter many times greater than that of the included volcanic vent or vents. Many calderas contain one or more volcanic cones within them *(Ref. 1)*. There are three major types: (a) explosion, (b) collapse, and (c) erosion.

calibrate. To fix, check, or correct a measuring instrument to agree with a reference standard; to standardize *(Ref. 1)*.

caliche. Secondary calcareous material occurring in a layer or layers at or near the surface. It may be a soft or hard horizon of lime accumulation in the soil, but more commonly the term refers to a cemented layer a few inches to many feet in thickness containing impurities of clay, sand, or gravel. Most caliche deposits appear to form by a variety of processes whereby soil moisture evaporates or deposits its content of calcium carbonate *(Ref. 20)*.

California bearing ratio. *(Abbr:* CBR). A parameter, based on a standard test procedure, describing the ability of a soil or soil-like material to support a load. It is given as 100 times the ratio of the load-supporting ability of the material to that of a reference standard material. The reference material requires 1,000 lb $in.^{-2}$ to produce a 0.1 in. penetration.

calm. The absence of apparent motion of the air. In the Beaufort wind scale, this condition is reported when smoke is observed to rise vertically, or the surface of the sea is smooth and mirrorlike. In United States weather observing practice, the wind is reported as calm if it is determined to have a speed of less than 1 mph (or 1 kt) *(Ref. 3)*.

calorimeter. An instrument for measuring quantities of heat.

Campbell-Stokes recorder. A sunshine recorder of the type in which the time scale is supplied by the motion of the earth. It consists essentially of a spherical lens which burns an image of the sun upon a specially prepared card. The instrument must be oriented carefully so that the time scale on the card agrees with the sun time. The depth and breadth of the trace may be interpreted in terms of the intensity of the sun. This instrument is used at many European weather stations *(Ref. 3)*.

camouflage. The use of concealment and disguise to minimize the possibility of detection and/or identification of troops, materiel, equipment, and installations. It includes taking advantage of the natural environment as well as the application of natural and artificial materials *(Ref. 5)*.

camouflet. *See:* crater.

cannibalize. To remove serviceable parts from one item of unserviceable equipment in order to install them on another item of equipment *(Ref. 5)*.

canopy. In a forest, the cover of leaves and branches formed by the crowns of all the individual trees. Its density is ordinarily expressed as the amount (or percentage) of the ground that would be completely covered by the forest if the sun were directly overhead *(Ref. 1)*.

cantilever beam accelerometer. An accelerometer in which four strain gages, connected as a Wheatstone bridge, are bonded to a cantilever beam. The device is sensitive to acceleration perpendicular to the beam in the bending plane of the beam.

canyon; *also* **submarine canyon.** 1: A deep ravine or gorge with steep sides.

2: A long narrow submarine depression with relatively steep sides. If the sides are more gently sloping, the depression is called a submarine valley. Most canyons penetrate a continental or insular shelf more or less perpendicularly to the coast line *(Ref. 15)*.

capacitance. The ratio of the electrostatic charge on a conductor to the potential difference between the conductors required to maintain that charge *(Ref. 4)*.

capacitive coupling. Electrical interaction between two conductors caused by the capacitance between them *(Ref. 4)*.

capillarity. The phenomenon whereby the surface of a liquid, where it is in contact with a solid, is elevated or depressed depending on the attractive forces between molecules of the liquid and between molecules of the liquid and the solid; the raising or lowering of a liquid column in a tube due to the action of surface tension.

capillary action. The phenomenon of liquid rising in a small interstice due to surface tension *(Ref. 4)*.

carbonaceous. Relating to, containing, or composed of carbon *(Ref. 3)*.

carbonation. A process of chemical weathering by which minerals that contain lime, soda, potash, or other basic oxides are changed to carbonates by the action of carbonic acid in water or air.

carbon dioxide (CO_2). A colorless, odorless, nonpoisonous gas that is a normal part of the ambient air. CO_2 is a product of fossil fuel combustion, and some researchers have theorized that excess CO_2 raises atmospheric temperatures *(Ref. 9)*.

carbon monoxide (CO). A colorless, odorless, highly toxic gas that is a normal byproduct of incomplete fossil fuel combustion. CO, one of the major air pollutants, can be harmful in small amounts if breathed over a certain period of time *(Ref. 9)*.

cargo tiedown point. A point on military material designed for attachment of various means for securing the item for transport *(Ref. 5)*.

cargo transporter. A reusable, metal shipping container designed for worldwide surface and air movement of suitable military supplies and equipment through the cargo transporter service *(Ref. 5)*.

Carnot cycle. An idealized, reversible thermodynamic cycle consisting of four stages:

(a) An isothermal expansion of gas
(b) An adiabatic expansion of the gas
(c) An isothermal compression
(d) An adiabatic compression to the initial state thus completing the cycle.

The work done is the difference between the heat input at the higher temperature and the heat extracted at the lower temperature.

cascade. 1: The mass of spray thrown outward from around the base of a waterspout *(Ref. 18)*. *Also called* **bonfire, bush.**

2: A fall of water over steeply sloping rocks *(Ref. 15)*.

3: Disturbed ice of a glacier over a steep incline, called ice cascade *(Ref. 15)*.

CAT *Abbr. for* clean air turbulence.

cataract. A waterfall, usually of great volume; a cascade in which the vertical fall has been concentrated in one sheer drop or overflow *(Ref. 10)*.

catena. *Pedology.* A sequence of soils having different characteristics due to variation in relief and in drainage although derived from

similar parent material, of the same age, and under similar climatic conditions.

cathode. A negatively charged electrode.

cathodic protection. Reduction or prevention of corrosion on a metal by a change of polar qualities by either electrical, magnetic, or electrostatic means so that the surface will repel corrosive oxide-producing material; e.g., by use of sacrificial anodes or impressed currents *(Ref. 1)*.

cathode-ray tube. A vacuum tube consisting of an electron gun producing a concentrated electron beam (or cathode ray) which impinges on a phosphorescent coating on the back of a viewing face (or screen). The excitation of the phosphor produces light, the intensity of which is controlled by regulating the flow of electrons. Deflection of the beam is achieved either electromagnetically by currents in coils around the tube, or electrostatically by voltages on internal deflection plates.

cat ice; *also* **shell ice.** Ice, on a body of water, that remains as an unbroken surface when the water level drops so that a cavity is formed between the water surface and the ice *(Ref. 18)*.

cat's paw. *See:* breeze.

cave. A hollow space developed in a portion of the crust of the earth. A sea cave may be produced by the action of the waves and also by boulders and pebbles being thrown against a cliff by the sea. It may also be formed by the contraction and expansion of the air in a rock fissure as the waves advance and retreat. Inland caves are often formed in a limestone region where water containing carbon dioxide dissolves out underground channels and enlarges them in places to form caves, usually with a stream flowing through them.

cavern. A large natural underground cave or series of caves. Often but not always used to imply largeness or indefinite extent to distinguish from cave *(Ref. 1)*.

cavitation. The formation of local cavities in a liquid or vapor, as a result of the reduction of total pressure usually occurring in a sound wave. For nondegassed liquids, these cavities are filled with the gases dissolved in the liquids and are produced whenever the instantaneous pressure falls below the vapor pressure. This effect is sometimes called pseudocavitation, to distinguish it from the effect in pure degassed liquids, where an actual rupture of the the medium occurs (at much higher sound pressures). Collapse of such cavities produces very large impulsive pressures that may cause considerable mechanical damage to neighboring solid surfaces *(Ref. 1)*.

cavitation damage. Wearing away of solid material through the formation and collapse of cavities in an adjacent liquid *(Ref. 1)*.

Cb *Abbr. for* cumulonimbus.

CBR *Abbr. for* California bearing ratio.

Cc *Abbr. for* cirrocumulus.

CCL *Abbr. for* convective condensation level.

cd *Abbr. for* candela.

CEE *Abbr. for* International Commission on Rules for the Approval of Electric Equipment.

ceiling. The height above the surface of the earth of the lowest layer of the clouds or obscuring phenomena that is reported as broken, overcast, or obscuration, and not classified as thin or partial *(Ref. 15)*.

ceiling light. A type of cloud-height indicator that uses a searchlight to project vertically a narrow beam of light onto a cloud base. The height of the cloud base is determined by using a clinometer, located at a known distance from the ceiling light, to measure the angle included by the illuminated spot on the cloud, the observer, and the ceiling light *(Ref. 3)*.

ceilometer. An automatic, recording, cloud-height indicator *(Ref. 1)*.

celestial sphere. The apparent sphere of infinite radius, having Earth as its center. It is upon the "inner surface" of this sphere that all heavenly bodies appear, and across which the sun moves along the ecliptic *(Ref. 3)*.

cellulose. Any of several fibrous substances constituting the chief part of the cell walls of plants and of many fibrous products.

celsius temperature scale; *same as* **centigrade temperature scale.** The most common and convenient temperature scale in which the temperature interval between the ice and steam points is divided into 100 degrees starting with 0°C at the ice point. The

Ninth General Conference on Weights and Measures (1948) replaced the designation "degree centigrade" by "degree Celsius".

CEN *Abbr. for* European Committee for Standardization.

CENEL *Abbr. for* European Electrical Standards Coordinating Committee.

centigrade temperature scale. A temperature scale with the ice point at 0 deg and the boiling point of water at 100 deg. Conversion to the fahrenheit temperature scale is according to the formula °C = 5/9 (°F − 32). *(Ref. 3). See also:* celsius temperature scale.

centrifuge. A machine used in environmental testing to subject material to steady-state rotational acceleration about a fixed axis *(Ref. 1).* A rotating machine that uses centrifugal force for subjecting materials or assemblies to various forces for testing, particularly for simulating various gravitational effects, and for separating materials of different densities.

CFR *Abbr. for Code of Federal Regulations.*

CH *Abbr. for* heavy clay.

CHABA *Abbr. for* Committee on Hearing, Bioacoustics, and Biomechanics.

chain. A mountain system consisting of a collection of more or less parallel ranges, and possibly including plateaus, provided that the general longitudinal arrangement is maintained.

chalk. A very soft, white to light gray, fine-grained variety of limestone composed largely of the calcareous shells of small marine organisms *(Ref. 1).*

chalking. A surface coating failure common to paints, varnishes, lacquers, and related formulations, particularly when exposed to exterior environmental weathering. It is characterized by the formation of a chalk-like powder on the surface attributed to film deterioration by the blue and ultraviolet wavelengths of solar radiant energy. In white exterior paints, chalking may be desirable to impart self-cleaning properties. In colored exterior paints on buildings or equipment, chalking imparts a faded-out appearance and dullness from accumulation of surface chalk *(Ref. 1).*

chamber. An enclosed environmental laboratory facility used for duplicating, accelerating, or simulating one or more natural environmental phenomena, singly or in various combinations *(Ref. 1).*

chamber, accelerated weathering. An enclosed laboratory facility designed to accelerate the effects of natural aging. Some are oriented to a single material, others to several materials. Usually contains controls for light and heat, and, in some cases, for humidity *(Ref. 1).*

chamber, altitude. A combined-function test chamber furnishing controlled conditions of temperature and low absolute pressure (altitude). Temperature requirements vary from −73°C (−100°F), or lower, to 538°C (1,000°F). Altitude requirements vary up to and above 1.52×10^5 m (5×10^5 ft) which is a pressure of 2.33×10^{-4} N m^{-2} (1.75×10^{-6} mm Hg) *(Ref. 1).*

chamber, arid. An environmental test facility simulating high temperature, low humidity, and solar radiation heat and light as found in arid areas of the earth *(Ref. 1).*

chamber, clean. An enclosed area in which airborne contamination (particulate matter) and, if necessary, temperature, humidity, and air pressure are controlled to a far higher degree than in conventional air-conditioned areas. Commonly referred to as clean room. (Federal Standard No. 209) *(Ref. 1).*

chamber, fog. A confined space in which supersaturation of air or other gas is produced by reduction of pressure, cooling, or other means, producing an artificial fog *(Ref. 1).*

chamber, high temperature. An enclosed facility for producing thermostatically controlled high temperatures (usually by resistance heaters) used to determine the effect of high temperatures on a test item *(Ref. 1).*

chamber, humidity. A laboratory facility constructed with a conditioning device used to maintain a specified humidity at a specified temperature. The control range may vary with specific applications and construction. The normal range is: humidity, frost point (F.P.) −15°C to dewpoint 85°C; dry bulb temperature, 15° to 93°C; barometric pressure, 24.90 to 30.27 in. of mercury. This chamber is a specialized facility with difficult control requirements *(Ref. 1).*

chamber, low temperature. An enclosed,

thermally insulated facility with equipment and controls to produce an internal temperature below the ambient temperature. Refrigeration can be accomplished by mechanical single-stage systems, mechanical two-stage compound systems, multistage cascade systems, dry ice, or liquid carbon dioxide. Low temperatures can be attained down to −101°C (−150°F), depending on the system and the refrigerant used. The chambers maintain internal temperature conditions by convection and/or radiation *(Ref. 1)*.

chamber, reverberant. A type of acoustical testing facility in which a specimen is subjected to simultaneous impingement of acoustical energy from many directions. It is characterized by highly reflective walls and may have nonparallel opposing walls or multiple energy sources *(Ref. 1)*.

chamber, salt spray. An environmental test chamber for accelerated corrosion testing. A salt solution is atomized by the use of suitable nozzles in conjunction with a compressed air supply and sprayed into the chamber. The chamber is also equipped for heating the system *(Ref. 1)*.

chamber, solar radiation. An enclosed facility provided with a means for producing a simulated solar radiation environment including thermostatically controlled temperature. There are two types of solar simulation: terrestrial and space *(Ref. 1)*.

chamber, temperature. An enclosed, thermally insulated space with equipment and controls to produce a chamber temperature differing from ambient *(Ref. 1)*.

channel. 1: A band of radio frequencies wide enough to allow transmission without interference from transmission on adjacent bands.

2: A natural or artificial waterway that either periodically or continuously contains moving water, or that forms a connecting link between two bodies of water *(Ref. 18)*.

3: The part of a body of water deep enough to be used for navigation through an area otherwise too shallow for navigation *(Ref. 18)*.

4: The deepest portion of a stream, bay, or strait through which the main volume or current of water flows *(Ref. 18)*.

5: A lead in pack ice *(Ref. 18)*.

6: The complete route for transmission of data, from source to recorder.

channelization. The straightening and deepening of streams to permit water to move faster, to reduce flooding, or to drain marshy acreage for farming. Channelization reduces the organic waste assimilation capacity of the stream and may disturb fish breeding and destroy the natural beauty of the stream *(Ref. 9)*.

channel, telemeter. The complete route for transmission of a telemetered function, including pickup, commutator, modulator, transmitter, receiver, demodulator, decoder, and recorder.

chaparral. Low dense scrub vegetation, principally drought-resistant shrubs and bushes which is characteristic of regions having a subtropical summer-dry (Mediterranean) climate; usually applied to the part of California that enjoys this climate. It corresponds to the maquis of the Mediterranean area in Europe. In some places it is almost impenetrable, consisting of thickets of stiff or thorny shrubs or dwarf trees *(Ref. 1)*.

Chapman curves. A series of curves that relates mechanical condition of rotating machinery to the measured vibration levels of the machinery.

chatter. In cutting or braking processes, a self-induced vibration caused by forces generated in the cutting or braking process.

chatter calibration. A type of accelerometer calibration employing a gravity-constrained "chatter-ball" mounted on a vertical vibration table. One g of downward acceleration is indicated by separation of the ball from the table *(Ref. 22)*.

checking. A surface coating failure of paints, varnishes, lacquers, and related formulations. It is characterized by the formation of small surface breaks in the coating which do not penetrate to the underlying surface. If the underlying surface is visible, crackling is the term used to denote these breaks *(Ref. 1)*.

chemical conversion coatings. Thin inorganic films produced by chemical or electrochemical reactions with the surface of a base metal. They differ from paints and most metallic coatings in that they are an integral part of the base metal. Conversion coatings can be divided into phosphate,

chromate, chemical oxide, and anodic coatings *(Ref. 1)*.

chemical energy. Energy produced or absorbed in a chemical reaction.

chemical oxygen demand (COD). A measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water. The COD test, like the BOD test, is used to determine the degree of pollution in an effluent *(Ref. 9)*.

chemical stability. The ability of a material to resist decomposition caused by chemical attack *(Ref. 1)*.

chemical weathering. The weathering of rock by chemical processes such as oxidation, carbonation, hydration, and solution.

chemiluminescent. Any luminescence produced by chemical action *(Ref. 3)*.

chemosphere. The portion of the atmosphere in which photochemical reactions occur *(Ref. 3)*.

chemosterilant. A pesticide chemical that controls pests by destroying their ability to reproduce *(Ref. 9)*.

chernozem. A very black soil, rich in humus and carbonates, that forms under cool to temperate, semiarid climatic conditions *(Ref. 20)*.

chilling effect. The lowering of the temperature of the earth due to the increase of atmospheric particulates that inhibit penetration of solar energy *(Ref. 9)*.

chinook. The name given to the warm dry wind or foehn on the eastern side of the Rocky Mountains generally blowing from the southwest and sometimes producing a temperature rise of 20 to 40 deg F in 15 min. *See:* foehn.

chloride. A compound in which chlorine is combined with another element or radical (e.g., a salt of hydrochloric acid). One of the constituents of sea salt particles.

chlorinity. A measure of the chloride content, by mass, of sea water (grams per kilogram of sea water, or per mille). Originally, chlorinity was defined as the weight of chlorine in grams per kilogram of sea water after the bromides and iodides had been replaced by chlorides. To make the definition independent of atomic weights, chlorinity is now defined as 0.3285233 times the weight of silver equivalent to all the halides *(Ref. 1)*. The chlorinity of sea water is generally determined in order to permit the calculation of salinity.

chocking. The condition that prevails in compressible fluid flow when the upper limit of mass flow is reached, or when Mach 1 is reached in a duct *(Ref. 1)*.

choppy. 1: Of the sea, having short, abrupt, breaking waves dashing against each other; chopping.
2: Of the wind, variable, unstable, changeable; chopping *(Ref. 15)*.

CI *Abbr. for* cone index.

cinder-cone; *also* **ash cone.** A conical elevation formed by the accumulation of volcanic ash or cinderlike material around a vent *(Ref. 10)*.

cinders. *See:* volcanic cinders.

cinder surface. The surface formed by small particles of vesicular lava ejected from a volcano. Often many feet deep around the vent and gradually thinning out until the layer is no thicker than the individual cinder at distances of a few miles *(Ref. 1)*.

circular mil. A measurement used in determining the area of wire. The area of a circle one-thousandth inch in diameter *(Ref. 4)*.

circular motion. A special case of curvilinear motion in which the path of motion follows a curve of constant radius.

circular polarization. *See:* polarization.

circumpolar. Around either the North or the South Pole.

cirque. A deep, steep-walled recess in a mountain, caused by glacial erosion *(Ref. 1)*.

cirrocumulus *(Abbr.:* Cc). A principal cloud type appearing as a thin white patch of cloud without shadows and composed of small merged or separate elements more or less regularly arranged.

cirrostratus *(Abbr.:* Cs). A principal cloud type appearing as a whitish veil, either fibrous or smooth, which may cover the entire sky.

CISPR *Abbr. for* International Special Committee in Radio Interference.

civil day. A mean solar day reckoned from midnight, usually divided into two 12-hr divisions, although now often regarded as a single 24-hr series *(Ref. 3)*.

civil twilight. The interval of incomplete darkness between sunrise (or sunset) and the time when the center of the solar disc is

6 deg below the horizon. The limiting angle of solar depression of 6 deg was chosen to correspond approximately to the minimum sky illumination required to carry on normal work out of doors. It also represents the time at which stars of the first magnitude are just discernible near zenith. As in the case of any of the several defined types of twilight, the actual duration of civil twilight varies considerably with latitude and time of year *(Ref. 3)*.

CL *Abbr. for* lean clay.

cladding. A method of applying a layer of metal over another metal, whereby the junction of the two metals is continuously welded *(Ref. 4)*.

classes of supply. *See:* supplies.

classical absorption. Extraction of energy from a sound wave propagating in still, homogeneous air as a result of inertial and frictional forces involved in molecular motion. It is a function of the frequency squared, but independent of humidity.

clastics. Deposits made up of fragments of preexisting rocks or of the solid products formed during the chemical weathering of such older rocks. Familiar examples of sediments belonging to this group are gravel, sand, mud, and clay, and their consolidated equivalents, conglomerate, sandstone, and shale *(Ref. 1)*.

claus reaction. A chemical reaction between sulfur dioxide and hydrogen sulfide producing elemental sulfur and water.

clay. 1: A soil material that is plastic when moist but hard when fired, composed mainly of fine particles of hydrous aluminum silicates, and other minerals.

2: *Soil Mechanics.* In the Unified Soil Classification System, defined as a soil that contains more than 50 percent particles with diameters less than 0.047 mm and that has a high plasticity at its liquid limit. Types are identified as CL (lean clay), CH (heavy clay), OL (organic clay of low plasticity) and OH (organic clay of high plasticity) *(Ref. 28)*.

3: *Pedology.* The U S Department of Agriculture textural class name for soil that contains 40 percent or more of clay, less than 45 percent of sand, and less than 40 percent of silt *(Ref. 16)*.

clay loam. Soil that contains 20 to 45 percent sand and 27 to 40 percent clay *(Ref. 16)*.

claypan. A dense, compact layer in the subsoil separated from overlying material by a sharply defined boundary. It has a very high clay content compared with the overlying material and is formed by downward movement of clay or by synthesis of clay in place during soil formation. Claypans are usually hard when dry, and slippery and sticky when wet. Because of their poor porosity, they usually impede the movement of water and air, and the growth of plant roots *(Ref. 2)*.

clean chamber. *See:* chamber, clean.

clean room. *See:* chamber, clean.

clear. The state of the sky when it is cloudless or when the sky cover is less than 0.1, the term may be applied to average cloudiness of an entire day or to the general condition of the atmosphere.

clear air turbulence (CAT). Turbulence encountered by aircraft when flying through air space devoid of clouds. The main causes are wind shears and small-scale rising currents of clear air (thermals) *(Ref. 1)*.

clear ice. *See:* ice, clear.

cleavage. The characteristic of many crystallized substances of splitting readily in one or more definite directions. The surfaces thus cleaved are always parallel to actual or possible crystal faces.

cliff. A high steep face of rock. A cliff of considerable length is often called an escarpment or scarp. Cliffs are usually produced by erosion, less commonly by faulting *(Ref. 1)*.

climate. The long-term manifestations of weather, however they may be expressed. More rigorously, the climate of a specified area is represented by the statistical collective of its weather conditions during a specified interval of time (usually several decades) *(Ref. 1)*.

climatic categories. Specific climatic regions defined by regulation (AR 70-38) for use in specifying and designing material *(Ref. 29)*. The eight climatic categories are wet-warm, wet-hot, humid-hot coastal desert, hot-dry, intermediate hot-dry, intermediate cold, cold, and extreme cold. These are character-

ized by the occurrence of particular combination of natural environmental factors and factor values.

climatic chamber. A generic term embracing all enclosures in which the conditions associated with various climates can be simulated or in which specific climatic environmental factors can be controlled within certain limits.

climatic snow line. The altitude above which snow accumulates in excess of ablation over an extended period of time. It corresponds closely to the firn line and to the average summer position of the snow line. The climatic snow line specifically applies to flat surfaces fully exposed to sun and wind; however, most glaciologists consider the precise application as theoretical, rarely observable in nature *(Ref. 11)*.

climatic stress. *See:* stress, climatic.

climatic test. A generic term describing any test designed to evaluate the effects of climatic conditions on the equipment undergoing the test. Climatic tests usually include sunshine, rain, hail, snow, sleet, wind, humidity, sand, dust, temperature, fungus, and salt spray *(Ref. 1)*.

climatic types. Principal natural combinations of environmental factors and factor values that occur. The four climatic types are hot-dry, hot-wet, cold, and intermediate. More detailed descriptions of different climates are employed in the definitions of the climatic categories used in the RDT&E of materiel *(Ref. 29)*.

climatization. All measures taken to provide for the satisfactory operation, packaging, transportation, and storage of equipment under specified climatic conditions *(Ref. 1)*.

climatology. The scientific study of climate. In addition to the presentation of climatic data (climatography), it includes the analysis of the causes of differences of climate (physical climatology), and the application of climatic data to the solution of specific design or operational problems (applied climatology). Climatology may be further subdivided according to purpose or point of view: agricultural climatology, airmass climatology, aviation climatology, bioclimatology, dynamic climatology, medical climatology, macroclimatology, mesoclimatology, microclimatology, paleoclimatology, synoptic climatology, upper-air climatology, descriptive climatology, and others *(Ref. 1)*.

clinkers. Stony matter vitrified or fused together; usually formed as impurities or unwanted byproducts in furnaces, boilers, and other high temperature combustion chambers.

clinometer. Any of various instruments for measuring angles of slope, inclination, elevation, or the like, such as the angle between the horizontal and the line of sight to the spot of light thrown by a ceiling projector, or between the horizontal and the axis of a ship *(Ref. 7)*.

clo. The unit of measurement used in evaluating the insulative quality of clothing. A clo is the amount of insulation needed to assure a mean skin temperature of 33.3°C in an ambient temperature of 21.1°C, with relative humidity not over 50 percent and air movement of 0.1 m s^{-1} or less, and with an assumed metabolic rate of 50 Kcal m^{-2} hr^{-1}. Allowing 76 percent heat loss through clothing, a clo has been defined as the amount of insulation required to permit the escape of 1 Kcal m^{-2} hr^{-1} with a temperature gradient of 0.18 deg C between the two surfaces *(Ref. 1)*.

clock-hourly rainfall rate. Total rainfall in 1 hr, measured on the hour, every hour.

clod. An artifically produced soil mass ranging in size from 0.5 to as much as 25 cm. Plowing, digging, etc., form clods, especially when soils are too wet or too dry for normal tillage operations *(Ref. 2)*.

close ice. Ice floes that cover at least 80 percent of the sea surface but are not frozen together *(Ref. 31)*.

cloud. 1: A visible aggregate of minute water and/or ice particles in the atmosphere above the surface of the earth. Cloud differs from fog only in that the latter is, by definition, in contact with the surface of the earth *(Ref. 1)*.

2: Any collection of particulate matter in the atmosphere dense enough to be perceptible to the eye, as a dust cloud or a smoke cloud *(Ref. 3)*.

cloud bank. Generally, a fairly well defined mass of cloud observed at a distance; it covers an appreciable portion of the horizon sky, but does not extend overhead *(Ref. 3)*.

cloudburst. A sudden and extremely heavy downpour of rain, sometimes limited to a rainfall rate greater than 100 mm hr^{-1} *(Ref. 15).*

cloud-chamber effect. The condensation of moisture in the air due to cooling caused by the rapid expansion of air after an explosion (analogous to the effect used by nuclear physicists in the Wilson cloud chamber) *(Ref. 1).*

cloud column. The visible column of smoke subsequent to an air burst of an atomic weapon, which may extend to the tropopause and the corresponding smoke column subsequent to any other type of burst *(Ref. 1).*

cloud electrification. The process whereby a cloud acquires a net electrical charge. Continued cloud electrification leads to lightning discharges.

cloud physics. The body of knowledge concerned with physical properties of clouds in the atmosphere and the processes occurring therein. Cloud physics, broadly considered, embraces not only the study of condensation and precipitation processes in clouds, but also radiative transfer, optical phenomena, electrical phenomena, and a wide variety of hydrodynamic and thermodynamic processes peculiar to natural clouds *(Ref. 1).*

cloud seeding. Any technique carried out with the intent of adding to a cloud certain particles that will alter the natural development of that cloud. Cloud seeding may involve a number of different types of seeding particles and may be done with the objective of increasing the amount of precipitation obtainable from the cloud, decreasing the amount, or merely changing the phase of the cloud particles *(Ref. 3).*

clutter. Atmospheric noise, extraneous signals, etc. that tend to obscure the reception of a desired signal in a radio receiver, radar scope, etc. As compared with interference, clutter refers more particularly to unwanted reflections on a radar display, such as ground return, but the terms are often used interchangeably *(Ref 15).*

coalescence. In cloud physics, the merging of two water drops into a single larger drop such as occurs in warm clouds to produce precipitation *(Ref. 3).*

coastal plain. A plain that borders the sea coast and extends from the sea to the nearest elevated land. It is sometimes formed through denudation by the sea, the beach being later raised by earth movement to form a plain, frequently known as a raised beach, or by deposition of solid matter at river mouths.

coating, anodized. An oxide coating, produced by electrolytic means, for aluminum, magnesium, and their alloys. Generally, anodized coatings are hard, abrasion resistant, and offer excellent resistance to corrosion *(Ref. 1). See also:* **anodizing.**

cobble *or* **cobblestone.** Rounded or partially rounded rock or mineral fragment between 3 and 10 in. in diameter *(Ref. 1).*

cochlea. A cavity of the inner ear containing the essential organs of hearing. Its shape resembles a snail shell.

COD *Abbr. for* chemical oxygen demand.

coefficient of attenuation. The proportion of the light flux removed from a beam of light in unit distance. Sometimes called the coefficient of extinction.

coefficient of thermal expansion. The relative increase of the volume of a system (or substance) with increasing temperature in an isobaric process *(Ref. 1).*

coefficient of viscosity. *See:* **viscosity, dynamic.**

COESA *Abbr. for* United States Committee on Extension to the Standard Atmosphere.

COH *Abbr. for* coefficient of haze. *See:* **COH unit.**

coherence. A property of two periodic functions indicating the degree of correlation between them. It is described by a correlation function which is zero if the two functions are completely uncorrelated or which is one if they are completely correlated. Coherent radar waves have fixed phase relationships. Coherent optical waves, brought into coincidence, produce interference phenomena.

cohesion. The force that causes like materials to stick or adhere together. Shear strength of soil is due to two causes: (a) cohesion and (b) interparticle friction. True cohesion is attributed to the shearing strength of the cement or to the absorbed water films that separate the individual grains at their areas of contact. Apparent

cohesion of moist soils, which is due to surface tension in capillary openings, disappears completely on immersion *(Ref. 32)*.

COH unit. The quantity of particulate matter on white filter paper that produces an optical density of 0.01 when measured by light transmittance in the spectral range of 375-450 nm. COH is an acronym for "coefficient of haze".

col. A short ridge connecting two higher elevations; a narrow pass joining two valleys; a pass between adjacent peaks in a mountain chain *(Ref. 10)*.

cold pole. The location that has the lowest mean annual temperature in its hemisphere. In the Northern Hemisphere, the cold pole is in Siberia near Verkhoiansk with an annual mean temperature of −16°C. In the Southern Hemisphere, the cold pole is in Antarctica.

cold rain. Rain formed by condensation of water vapor onto ice crystals above the 0°C-temperature level in the atmosphere. The ice melts before the precipitation reaches the surface.

cold soak. The exposing of equipment to low temperatures for an extended period of time. Cold soak of engines sometimes necessitates preheating before their use, as lubricants have thickened, metal has become brittle, and tolerances have diminished *(Ref. 11)*.

cold work. The hardening and embrittlement of a metal by repeated flexing action *(Ref. 4)*.

coliform index. An index of the purity of water based on a count of its coliform bacteria *(Ref. 9)*.

coliform organism. Any of a number of organisms common to the intestinal tract of man and animals whose presence in waste water is an indicator of pollution and of potentially dangerous bacterial contamination *(Ref. 9)*.

colloidal system. An intimate mixture of two substances, one of which, the colloid, is uniformly distributed in a finely divided state throughout the second substance, which is the dispersing medium.

colloid, soil. Organic or inorganic matter of very small particle size and very large surface area per unit of mass. Inorganic colloidal matter consists almost entirely of clay minerals of various kinds. Not all clay particles are colloids; usually only particles smaller than 0.00024 mm are so designated *(Ref. 21)*.

colluvium. A deposit of rock fragments and soil material accumulated at the base of steep slopes as a result of gravitational action *(Ref. 1)*.

colorimetry. The science measurement of the quantitative differences of colors.

column. A type of ice crystal found, for example, in ice fog and hourfrost and having a relatively short prismatic form either solid or hollow. Its ends may be plane, pyramidal, truncated, or hollow. Pyramids and combinations of columns are included in this class *(Ref. 3)*.

combat loading. The arrangement of personnel and the stowage of equipment and supplies in a manner designed to conform to the anticipated tactical operation of the organization embarked. Each individual item is stowed so that it can be unloaded at the required time *(Ref. 5)*.

combustion. Burning. Technically, a rapid oxidation accompanied by the release of energy in the form of heat and light. It is one of the three basic contributing factors causing air pollution, the others being attrition and vaporization *(Ref. 9)*.

common supplies. Supplies common to two or more Services *(Ref. 5)*.

common-user military land transportation. Point-to-point land transporation service operated by a single Service for common use by two or more Services *(Ref. 5)*.

common-user ocean terminals. A military installation, part of a military installation, or a commercial facility operated under contract or arrangement by the Military Traffic Management and Terminal Service that regularly provides for two or more Services, terminal functions of receipt, transit storage or staging, and loading and unloading of passengers or cargo aboard ships *(Ref. 5)*.

communications band. The portion of the electromagnetic spectrum encompassing the lf, mf, hf, vhf, and uhf bands including frequencies from approximately 20 kHz to 2 GHz.

compaction. 1: *Geology*. The changing of

loose sediments to hard, firm rocks.

2: *Soil Mechanics.* Any process by which soil grains are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the weight of solid material per cubic foot. Noncohesive soils are most effectively compacted by vibration; moderately cohesive soils are compacted by sheepsfoot or other types of rollers *(Ref. 1)*.

compass rose. A graduated circle, usually marked in degrees, indicating directions, and printed or inscribed on an appropriate medium *(Ref. 5)*.

compatibility. The particular quality or characteristic of a component, an item of equipment, or a system that permits it to function in harmony with other equipment, environments, or systems with a minimum amount of adapters, extensions, transformers, or other equalizer units *(Ref. 1)*.

complex periodic vibration. Vibration whose amplitude can be described by a periodic function having a DC component and a large number of sinusoidal components.

complex wave vibration. *See:* vibration, complex wave.

compliance. The ratio of the change in deflection of an elastic element to the change of applied force *(Ref. 22)*.

compression set. The difference between the original thickness of a cushioning material and the thickness of the same material after having been released from compression.

concretion. 1: An aggregate of rounded masses found in sedimentary rocks and usually formed around a central core.

2: A nodule or grain of varying size, shape, hardness, and color occurring as a result of the local concentration of some chemical compound such as calcium carbonate *(Ref. 2)*.

condensation. The physical process by which a gas or vapor becomes a liquid or solid; the opposite of evaporation. In meteorological usage, this term is applied only to the transformation from vapor to liquid; any process in which a solid forms directly from its vapor is termed sublimation, as is the reverse process. In meteorology, condensation is considered almost exclusively with reference to water vapor that changes to dew, fog, or cloud. It is important to avoid confusing condensation with precipitation, for condensation is by no means equivalent to precipitation, though it must always precede precipitation *(Ref. 1)*.

condensation nuclei. Particles of any nature in the atmosphere upon which molecules of water or ice accumulate. They are commonly classified as: (a) Aitken ($r \leq 0.1\ \mu m$), (b) large ($0.1\ \mu m\ r \leq 1.0\ \mu m$), and (c) giant ($r > 1.0\ \mu m$) where r is the particle radius. Large nuclei are the principal agents in fog formation.

condensation trail; *also* vapor trail; contrail. A visible cloud streak, usually brilliantly white in color, that trails behind a missile or other vehicle in flight in clear, cold, humid air. Condensation trails may result either from the water vapor in engine exhaust products in high attitude flight or from the condensation of atmospheric water vapor caused by low-pressure-induced cooling at propeller and wing tips during low altitude flight *(Ref. 1)*.

conduction. The transfer of energy within and through a conductor by means of internal particle or molecular activity, and without any net external motion. Conduction is to be distinguished from convection (of heat) and radiation (or all electromagnetic energy). Heat is conducted by molecular motion within only a few centimeters of a source (e.g., the surface of the earth). The distribution of heat away from that source is accomplished by convection and (in analogy to molecular conduction) by eddy heat conduction *(Ref. 1)*.

conduction current. The flow of energy resulting from conduction. In the atmosphere, the flow of electrical current due to the movement of charged particles acted upon by an electric field.

conductive hearing loss. A reduction or loss of hearing in which the conduction of sound to the cochlea is attenuated due to some outer or middle ear problem.

conductivity. *Electrical.* A measure of the capability of a material to carry an electrical charge; i.e., the conductance of a unit cube of any material. Conductivity of metals is often expressed as a percentage of copper conductivity, copper being 100 percent *(Ref. 4)*. In absolute terms, the units

of conductivity are $(ohm\text{-}cm)^{-1}$; i.e., the reciprocal of resistivity.

conductometry. A method of determining the concentration of ionizable substances present in a solution by measuring the conductivity of the solution. It depends on the fact that the conductance of electrolytes in solution is proportional to the number and mobilities of the ions present in solution.

conductor. Any material capable of easily carrying an electrical current *(Ref. 4)*.

cone index. An index of the shearing resistance of soil obtained with the cone penetrometer; a number representing resistance to penetration into the soil of a 30-deg cone with a ½-in. base (actually, load in pounds divided by cone base area in square inches) *(Ref. 1)*.

cone of silence. An inverted cone-shaped space directly over the aerial towers of some forms of radio beacons in which signals are undetected or greatly reduced in strength *(Ref. 5)*.

cone penetrometer. An instrument used to measure the ability of a soil to support traffic movements *(Ref. 12)*.

confined compression test. *See:* triaxial test.

confluence. 1: The rate at which adjacent flow is converging along an axis oriented normal to the flow at the point in question. It is the opposite of diffluence *(Ref. 3)*.

2: The juncture of streams.

congelifraction. The splitting of rocks as the result of the freezing of the water contained in them *(Ref. 1)*. *See also:* frost action.

congeliturbation. The stirring and mixing of soil caused by repeated cycles of freezing and thawing *(Ref. 1)*. *See also:* frost action.

conglomerate. Hard rock formed by the natural cementing together of rounded pebbles (gravel). A similar rock formed of larger fragments may be called a cobble conglomerate or a boulder conglomerate, as the case may be *(Ref. 1)*.

conifer. A tree or shrub belonging to the order *Coniferales*. Most conifers are needleleaf plants, but some have scalelike leaves ranging from small, as in many junipers and cedars, to more than an inch wide, as in the monkeypuzzle tree. Most species of conifers are evergreen, but the larches, and some others, are deciduous *(Ref. 1)*.

coniferous forest. A forest of evergreen coniferous or cone-bearing trees carrying needle-shaped leaves. From such forests is obtained the valuable soft-wood timber of commerce.

conimeter. *See:* konimeter.

conjunctiva. The mucous membrane covering the anterior surface of the eyeball and lining the lids.

conjunctivitis. Inflammation of the mucous membrane lining the inner surfaces of the eyelids and covering the anterior surface of the eyeball.

consensus. A collective opinion or general agreement. Consensus is employed by many organizations that prepare or coordinate standards and specifications to insure impartiality and broad acceptability. Consensus is achieved through balanced representation of producers, consumers, and other interested parties throughout the development, review, and acceptance process.

consolidated ice. Ice that completely covers the sea surface; the floes are frozen together *(Ref. 31)*.

consolidation. 1: *Geology*. Any or all of the processes whereby loose, soft, or liquid earth materials become firm and coherent. Any action that increases the solidity, firmness, and hardness is important in consolidation. Cementation is probably the most important factor, followed by mechanical rearrangement of constituents through pressure, crystallization, and loss of water. The term also describes the change of lava or magma to firm rock.

2: *Soil Mechanics*. The adjustment of a saturated soil in response to increased load, involving the squeezing of water from the pores and decrease in void ratio. The rate of consolidation depends upon the rate at which the pore water escapes, and hence upon the permeability of the soil *(Ref. 1)*.

contact hazard. A hazard resulting from direct bodily contact with foreign substances (nuclear, chemical, biological), or from prolonged contact with contaminants *(Ref. 1)*.

contact corrosion. *See:* corrosion crevice.

contact pesticide. A chemical that kills pests on contact with the body, rather than by ingestion (stomach poison) *(Ref. 9)*.

contamination. The deposit or absorption of radioactive material, biological, or chemical

agents on and by structures, areas, personnel, or objects *(Ref. 5)*.

continental air. A type of air whose characteristics are developed over a large land area and that therefore has the basic continental characteristic of relatively low moisture content *(Ref. 3)*.

continental climate. The climate that is characteristic of the interior of a landmass of continental size. It is marked by large annual, daily, and day-to-day ranges of temperature, low relative humidity, and (generally) by a moderate or small and irregular rainfall. The annual extremes of temperature occur soon after the solstices *(Ref. 1)*.

continental drift. The horizontal displacement of portions of the original continent that comprised the entire landmass of the earth to form the present-day continents. This process continues at a very slow but detectable rate.

continental ice. *See:* ice sheet.

continental shelf *or* **continental platform.** A zone adjacent to a continent extending from the low water line to the depth at which there is usually a marked increase of slope to greater depth *(Ref. 18)*.

continental slope. A declivity seaward from a continental shelf edge into greater depth *(Ref. 18)*.

continuous spectrum. A distribution of the amplitude of the components of a wave as a function of frequency in which the amplitude does not vanish at any frequency in a specified range.

contour line. A line on a map or chart connecting points of equal elevation *(Ref. 5)*.

contrail. *See:* condensation trail.

contrast. The ratio of the apparent luminance of an object minus that of its background to the apparent luminance of the background.

controlled humidity warehouse. *See:* dehumidified structural storage.

convection. 1: Mass motions within a fluid resulting in transport and mixing of the properties of that fluid. Convection, along with conduction and radiation, is a principal means of energy transfer.

2: *Meteorology*. Atmospheric motions that are predominantly vertical, resulting in vertical transport and mixing of atmospheric properties; distinguished from advection.

3: *Atmospheric Electricity*. A process of vertical charge transfer by transport of air containing a net space charge, or by motion of other media (e.g., rain) carrying net charge. Eddy diffusion of air containing a net charge gradient may also yield a convection current *(Ref. 3)*.

convection current *or* **convective current.** Any current of air involved in convection. In meteorology, this is usually applied to the upward moving portion of a convection circulation, such as a thermal or the updraft in cumulus clouds *(Ref. 3)*.

convection temperature. The surface temperature that must be reached to initiate convective currents that will extend high enough to reach saturation. The convection temperature is found on an adiabatic chart by ascending from the mean dewpoint to the moist layer along the mixing ratio curve to the sounding, then descending along the dry adiabat to the surface pressure.

convective condensation level. *(Abbr.:* CCL). The level in the atmosphere where saturation occurs when surface air undergoes adiabatic ascent due to heating. This may be found on an adiabatic chart by starting at the mean mixing ratio of the surface moist layer (or lowest 150 mB, whichever is most representative) and ascending this constant mixing ratio line to its intersection with the sounding. This point is the convective condensation level.

convective rain. Rain resulting from convective uplift of air.

convergence. The coming together or gradual merging of a flow or other property; may be applied to mass flow, windspeed, or wind direction. Both conditions are usually indicative of mass convergence.

cooling power. In the study of human bioclimatology, one of several parameters devised to measure the cooling effect of air upon a human body. Essentially, cooling power is determined by the amount of applied heat required by a device to maintain it at a constant temperature (usually 34°C); the entire system should be made to correspond, as closely as possible, to the external heat exchange mechanism of the human body *(Ref. 1)*.

COPANT *Abbr. for* Pan American Standards Commission.

coquina. Soft porous limestone composed of broken shells, with or without corals and other organic debris *(Ref. 1)*.

coral. The hard calcareous skeleton of various small sea animals (polyps), or the stony solidified mass of a number of such skeletons. In warm waters colonial coral forms extensive reefs of limestone. In cool or cold water coral usually appears in the form of isolated solitary individuals. Occasionally, large reefs formed in cold waters by calcareous algae have been referred to as coral *(Ref. 18)*.

coral reef. A ridge or mass of limestone built up of detrital material deposited around a framework of the skeletal remains of mollusks, colonial coral, and massive calcareous algae. Coral may constitute less than half of the reef material *(Ref. 18)*. Three more or less distinct kinds of coral reef are recognized: (a) fringing reefs, (b) barrier reefs, and (c) atolls.

corduroy road. A form of support or roadway over soggy or soft terrain, usually made from logs laid crosswise to the direction of travel *(Ref. 1)*.

core sample. A sample of rock, soil, snow, or ice obtained by driving a hollow tube into the medium and withdrawing it with the contained sample or core.

coriolis effect. 1: The apparent deflection of an object (e.g., a missile, airplane, or airmass) in motion above the surface of the earth relative to positions on the surface, which is rotating beneath the moving object; the deflection is to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

2: A phenomenon observed in rotating systems *(Ref. 1)*. *See also:* coriolis force.

coriolis force. An apparent force on a body moving within a rotating system. It is always at right angles to the direction of the motion of the body and proportional to the angular velocity (ω) of the rotating system and to the momentum (mv) of the body; the magnitude is $2\,\omega mv$ *(Ref. 1)*. *See also:* coriolis effect.

cornea. A transparent membrane in the anterior portion of the eyeball.

corn snow. *See:* spring snow.

corona. 1: A set of one or more prismatically colored rings of small radii, concentrically surrounding the disk of the sun, moon, or other luminary when veiled by a thin cloud. The corona is due to diffraction by numerous water drops. It can be distinguished from the relatively common halo of 22 deg by the much smaller angular diameter of the corona, which is often only a few degrees, and by its color sequence, which is from blue inside to red outside, the reverse of that in the 22-deg halo *(Ref. 1)*.

2: The pearly outer envelope of the sun. It is observed at solar eclipse or with the coronagraph *(Ref. 1)*.

3: A discharge due to ionization of a gas (usually air) due to a potential gradient exceeding a certain critical value *(Ref. 4)*.

corona discharge. The flow of electrical energy from a conductor at high potential to the surrounding air. If the conductor has an insulating covering, the corona discharge will take place at the outer surface of the insulation, and if there are voids or air spaces between the conductor and its insulation, corona discharge will probably take place at these points. The discharge is accompanied by a faint glow and a "frying" noise and has the ability to convert the oxygen in the air to ozone *(Ref. 1)*.

coronagraph. An instrument for photographing the corona and prominences of the sun at times other than at solar eclipse. An occulting disk is used to block out the image of the body of the sun in the focal plane of the objective lens. The light of the corona passes the occulting disk and is focused on a photographic film *(Ref. 3)*.

corona resistance. The ability of a material to withstand the effects of corona discharge *(Ref. 1)*.

corrasion. Mechanical erosion performed by moving agents such as wear by glacial ice, wind, running water, etc., but generally restricted to basal rather than lateral excavation *(Ref. 18)*.

corrective maintenance. Maintenance performed to restore an item to a satisfactory condition by providing correction of a malfunction that has caused degradation of the item below the specified performance *(Ref. 33)*.

correlation. A mutual relationship between variables or other entities, a form of statistical dependence.

corrosion. The gradual deterioration of material by chemical processes, such as oxidation or attack by acids; if caused by atmospheric effects, a form of weathering. Of great significance is the corrosion due to the combined effects of atmospheric temperature, humidity, and suspended impurities; for example, the rusting of iron *(Ref. 1)*.

corrosion, cathodic. Corrosion of electrochemical origin usually caused by the reaction of alkaline products of electrolysis with an amphoteric metal *(Ref. 34)*.

corrosion, crevice. Corrosion of a metal at an area where contact is made with another material, usually nonmetallic. Also known as contact corrosion *(Ref. 1)*.

corrosion, destructive. Any type of corrosion that so weakens the basic metal that it can no longer function or support the functions for which it was originally intended *(Ref. 1)*.

corrosion, electrochemical. Localized corrosion that results from exposure to an electrolyte or an assembly of dissimilar metals in contact or coupled with one another; or of a metal containing macroscopic or microscopic areas dissimilar in composition or structure. The dissimilar elements form short-circuited electrodes; the corrosive medium is the electrolyte and an electric current is induced, which results in the dissolution of the electrode that has the more anodic solution potential, while the other is unattacked. The same condition may result from local differences within the corroding medium *(Ref. 1)*. Major factors in electrochemical corrosion are salt water and airborne salt particles.

corrosion embrittlement. The severe loss of ductility of a metal or alloy resulting from corrosion, usually intergranular and often not visually apparent *(Ref. 1)*.

corrosion fatigue. The reduction of the ability of a metal to withstand prolonged stress cycling as a result of exposure to a corrosive environment *(Ref. 34)*.

corrosion fatigue limit. The maximum repeated stress that a metal can withstand without failure in a stated number of stress applications under defined conditions of corrosion and stressing *(Ref. 34)*.

corrosion, fretting. Corrosion occurring at the interface between two contacting surfaces which is accelerated by relative vibration between the two surfaces of amplitude high enough to produce slip *(Ref. 34)*.

corrosion, galvanic. Metallic corrosion caused by electrolytic action resulting from the flow of electric current between two dissimilar metal electrodes forming a galvanic cell *(Ref. 34)*.

corrosion, intergranular. A type of electrochemical corrosion that progresses preferentially along the grain boundaries of an alloy, usually because the grain boundary regions contain material anodic to the central regions of the grains *(Ref. 1)*.

corrosion prevention. The protection given metallic items by covering surfaces subject to corrosion to prevent contact with water, water vapor, acids, and other contaminating substances; or storage in a dehumidified air. It includes careful cleaning of all or part of the items; the application of a barrier of oil, grease, or moisture-vaporproof paper to exclude air and moisture; and the covering of the barrier to provide for its protection *(Ref. 12)*.

corrosion preventive. Any agent such as oil, plastic, paint, wrap, or other surface treatment of metals whose primary function is to prevent corrosion. It may exclude atmosphere by means of a continuous film, or it may direct corrosion to another element (cathodic protection) *(Ref. 12)*.

corrosion preventive compound. A compound applied to metal surfaces to prevent rust or corrosion. The term is usually applied to a compound that can be removed by water or solvent cleaners in order to distinguish them from paint films *(Ref. 12)*.

corrosion, stray current. Metallic corrosion caused by electrolytic action resulting from the flow of current through paths other than the intended circuit or by an extraneous current in the earth. Buried current-carrying conductors are particularly susceptible *(Ref. 34)*.

corrosion, stress. Corrosion of a metal accelerated by stress *(Ref. 1)*.

corrosion test. A test designed to determine the adequacy of a part for withstanding corrosion under specified conditions for a known length of time. Various test procedures are spelled out in applicable literature of the Institute of Environmental Science,

ASTM, American Electroplater's Society (AES), National Association of Corrosion Engineers, and in Government specifications *(Ref. 1)*.

corrosion, underfilm. Metallic corrosion that occurs underneath protective coatings (such as paints and lacquers) on metals. It occurs as randomly distributed hairlines, spots, or bubbles *(Ref. 34)*.

cosmic rays (*or* cosmic radiation). Extremely high-energy-charged particles arriving in the vicinity of earth from beyond the solar system (galactic cosmic rays) or from the sun (solar cosmic rays). They consist mostly of protons (hydrogen nuclei) and alpha particles (helium nuclei). Secondary cosmic rays are produced by the interaction of the incoming (primary) cosmic rays with the atmosphere *(Ref. 1)*.

cosmic rays, hard component. The portion of cosmic radiation that penetrates a moderate thickness of an absorber (usually 10 cm of lead). The hard component, except near the top of the atmosphere, consists of mesons predominatly but includes some fast protons and electrons *(Ref. 1)*.

cosmic ray shower. The simultaneous appearance of several or many light ionizing particles with or without accompanying photons, the particles being directed predominantly downward and having a common ultimate origin in an event caused by a single cosmic ray. Showers reveal themselves by the simultaneous actuation of separated counters and (sometimes spectacularly) in cloud chambers. They can be classified roughly according to their properties as narrow showers, exclusive (or Auger) showers, penetrating showers, and cascade showers *(Ref. 1)*.

cosmic rays, soft component. The portion of cosmic radiation that is absorbed in a moderate thickness of an absorber (usually 10 cm of lead). It consists mainly of electrons, positrons, and photons, but contains some slow mesons, slow protons, and other heavy particles often present in cosmic radiation *(Ref. 1)*.

coulee; *also* arroyo; barranca; dry wash; wadi. 1: A steep-walled, trenchlike valley of considerable size through which water flows intermittently.

2: More specifically, any of a number of steep-walled, trenchlike valleys cut into the Columbia Plateau lava sheets in the State of Washington, and formerly occupied by glacial meltwater rivers *(Ref. 1)*.

coulomb damping *or* dry friction damping. Arises from the rubbing of dry surfaces with each other. The damping force is assumed to be independent of the velocity and acceleration of the oscillating mass and is a function only of the materials involved and the normal force acting on them.

coupled mode. *See:* modes, coupled.

cover. Shelter or protection, either natural or artificial *(Ref. 5)*.

cover, forest. All trees and other woody plants in a forest *(Ref. 19)*.

covertness. Marked as or by concealment; kept hidden or camouflaged: concealed.

crack. 1: Fissure or crevice in a rock or ice formation *(Ref. 11)*.

2: A water-revealing narrow break in sea ice that may be expanded to lead size by boring. It is usually possible to jump across a crack *(Ref. 31)*.

3: A fissure or crevice type of failure in materials caused by operational or environmental tests.

crackling. *See:* checking.

crash safety test. A type of shock test intended to determine the mechanical integrity of equipment hardware under simulated aircraft crash landing loads *(Ref. 1)*.

crater. 1: The bowl-shaped depression around the vent of a volcano or a geyser.

2: A hole formed by the impact of a meteorite, the detonation of a mine, or the like *(Ref. 10)*.

3: The pit, depression, or cavity formed in the surface of the earth by an explosion. It may range from saucer shaped to conical, depending largely on the depth of burst. In the case of a deep underground burst, rupture of the surface may not occur. The resulting cavity is termed a camouflet *(Ref. 5)*.

crazing. A network of checks or cracks, caused by extremes of temperature, appearing on a surface. It may also be caused in plastics by certain cleaning fluids, age, and ultraviolet exposure *(Ref. 1)*.

creep. 1: The flow or plastic deformation of materials held for long periods of time at stresses lower than the rupture stress.

2: *Geology.* A slow downslope movement of soil or rock debris, usually imperceptible except by prolonged observation, tree tilt, or ragged scars in the ground cover. Creep is caused by the combined actions of gravity, ground water flow, freezing and thawing, or swelling and shrinking of the soil *(Ref. 11).*

creosote. A heavy, oily liquid obtained from coal tar or wood tar. Applied to wood by surface coating or pressure impregnation as a preservative.

crest. 1: The summit land of any eminence; the highest natural projection that crowns a hill or mountain, from which the surface dips downward in opposite directions *(Ref. 10).*

2: The highest part of a wave or swell *(Ref. 15).*

3: The more or less narrow, irregular longitudinal top of an elevation of the sea bottom, such as a ridge or seamount *(Ref. 15).*

4: A terrain feature of such altitude that it restricts fire or observation in the area beyond resulting in dead space, limits the minimum elevation, or both *(Ref. 12).*

crevasse. 1: A fissure or rift in a glacier or other land ice mass, caused by movement of the ice *(Ref. 11).* Transverse crevasses develop across a glacier wherever there is a marked steepening of the slope of its floor. Longitudinal crevasses, roughly parallel to the direction of flowage, are formed whenever ice is obliged to spread out. Marginal crevasses point upstream from the sides of the glacier.

2: A break in a levee or other stream embankment *(Ref. 10).*

crevice corrosion. *See:* corrosion, crevice.

critical energy. The minimum or critical quantity of heat energy per unit area necessary to produce a defined change in a given material; e.g., charring, melting, burning; expressed in calories per square centimeter *(Ref. 1).*

critical point. The thermodynamic state in which liquid and gas phases of a substance coexist in equilibrium at the highest possible temperature; at higher temperatures, no liquid phase can exist. The critical point of water is at 647 K and a vapor pressure of 2.21×10^8 mb.

2: A point at which there is a change in direction or change in slope in a ridge or stream *(Ref. 5).*

critical temperature. 1: The temperature at which magnetic materials lose their magnetic properties; about 800°C for iron and steel.

2: The temperature at which some change occurs in a metal or alloy during heating or cooling.

3: The temperature above which a given gas cannot be liquefied *(Ref. 1).*

crocking. 1: The loose black particles collected from combustion as on pots and kettles, or in a chimney; soot.

2: Coloring matter that rubs off cloth, dyed leather, etc. *(Ref. 1).*

cross correlation function. The averaged product of the amplitudes of two waveforms indicative of the similarities of the two waveforms at any point in time.

cross-country terrain. Terrain not specifically improved for vehicular traffic *(Ref. 35).*

cross talk. 1: An interfering signal received from a transmitter other than that to which a receiver is tuned. Cross talk can occur between adjacent channels of multichannel instrumentation *(Ref. 15).*

2: Electrical interference between two adjacent insulated conductors, whereby a signal in one of the conductors will be picked up by the adjacent conductor *(Ref. 4).*

crosswind. The wind vector component that is perpendicular to the course of an exposed moving object. A wind blowing in a direction approximately 90 deg from the heading of a ship is called a beam wind. In common usage these two expressions are often used synonymously, crosswind being favored by aviators and beam wind by mariners *(Ref. 18).*

crown. The upper part of a tree, including the branches with their foliage *(Ref. 1).*

CRREL *Abbr. for* U S Army Cold Regions Research and Engineering Laboratory.

crumb. A soft, porous, more or less rounded unit of soil structure from 1 to 5 mm in diameter *(Ref. 1).*

crust. 1: The surface layer of ice or hard snow overlying a deposit of softer snow. A crust is formed by the melting and refreezing of the superficial layer, sometimes augmented by wind compaction *(Ref. 11).*

2: A soil surface layer significantly more compact, hard, and brittle, when dry, than the material immediately beneath it. Its thickness varies, with a maximum of approximately 1 in. *(Ref. 2).*

cryogenics. 1: The study of physical phenomena at temperatures below approximately − 150°C (−238°F).

2: More generally, a term referring to methods of producing very low temperatures *(Ref. 1).*

cryology. 1: The study of ice and snow *(Ref. 11).*

2: The study of sea ice *(Ref. 11).*

3: In the United States, the study of refrigeration *(Ref. 11).*

4: In Europe, a synonym for glaciology.

Note: The term cryology has become almost meaningless unless it is defined in context *(Ref. 1).*

cryopedology. The study of intensive frost action and permafrost, their causes and occurrences, and the engineering devices and practices that overcome difficulties brought about by them *(Ref. 11).*

crystalline rock. Rock consisting of closely fitted mineral crystals rather than of cemented grains or volcanic glass; e.g., most metamorphic and igneous rocks *(Ref. 1).*

Cs *Abbr. for* cirrostratus.

Cu *Abbr. for* cumulus.

cuesta. An asymmetric ridge with a steep slope or cliff on one side and a gently sloping plain, the dip-slope, on a gently inclined layer of resistant rock, on the other *(Ref. 1).*

cultural eutrophication. Acceleration by man of the natural aging process of bodies of water *(Ref. 9).*

cultural landscape. *See:* landscape.

culture. Features of the terrain that have been constructed by man. Included are such items as roads, buildings, canals, boundary lines, and, in a broad sense, all names and legends on a map *(Ref. 5).*

cumulonimbus (*Abbr.:* Cb). A principal cloud type (cloud genus), exceptionally dense and vertically developed, occurring either as isolated clouds or as a line or wall of clouds with separated upper portions. These clouds appear as mountains or huge towers, at least a part of the upper portions of which are usually smooth, fibrous, or striated, and almost flattened. This part often spreads out in the form of an anvil (incus) or vast plume *(Ref. 3).*

cumulus. (*Abbr.:* Cu). A principal cloud type (cloud genus) in the form of individual, detached elements that are generally dense and possess sharp nonfibrous outlines. These elements develop vertically, appearing as rising mounds, domes, or towers, the upper parts of which often resemble a cauliflower. The sunlit parts of these clouds are mostly brilliant white; their bases are relatively dark and nearly horizontal. Near the horizon the vertical development of cumulus often causes the individual clouds to appear merged. If precipitation occurs, it is usually of a showery [illegible] *(Ref. 3).*

cup anemometer. A rotation anemometer whose axis of rotation is vertical. Cup anemometers usually consist of three or four hemispherical or conical cups mounted with their diametrial planes vertical and distributed symmetrically about the axis of rotation. The rate of rotation of the cups, which is a measure of the windspeed, is determined indirectly by gearing a mechanical or electrical counter to the shaft *(Ref. 1).*

current. 1: A horizontal movement of water *(Ref. 18).*

2: Air in essentially vertical motion, usually called air current *(Ref. 18).*

3: The flowing of liquids, gases, particles, or electrons, in conductors.

curvilinear motion. Motion along a curved path.

cushioning. 1: The protection from physical and mechanical damage afforded an item by means of compressible and resilient materials designed to absorb the energy and vibration caused by external forces.

2: Material used in packaging to protect material from shock and vibration. Typical materials include blankets, cotton padding, crushed paper, and various types of crushable foam and plastic particles.

cutoff. A new and relatively short channel formed when a stream cuts through the neck of an oxbow or horseshoe bend *(Ref. 10).*

cut-through resistance. The ability of a material to withstand mechanical pressure,

usually a sharp edge of prescribed radius, without separation *(Ref. 4)*.

CW *Abbr. for* continuous wave.

cycle. The complete range of states or values through which a phenomenon or periodic function passes before repeating itself identically *(Ref. 8)*.

cyclic preservation. *See:* **preservation, cyclic.**

cyclic salt. Wind-deposited salt on the surface of the earth having as its origin the oceans or other salt-water bodies *(Ref. 2)*.

cycling. A type of vibration testing in which the applied frequency is periodically increased and decreased between two frequency limits, the rate of change of frequency being a particular function of time or frequency *(Ref. 1)*.

cycling, linear. A type of cycling in which the rate of change of frequency is proportional to time. An equal time is spent at all frequencies in the range of interest *(Ref. 1)*.

cycling, logarithmic. A type of cycling in which the rate of change of frequency is proportional to the frequency. An equal time is spent between half-power points for resonant systems of equal transmissibility *(Ref. 1)*.

cycling, log-log. A type of cycling in which the rate of change of frequency is proportional to the square of the frequency. An equal number of vibratory stress reversals is generated between half-power points for resonant systems having equal transmissibility *(Ref. 1)*.

cycling test. *Vibration.* A simple test to simulate actual transportation vibrational environments in which the amplitude and frequency of the vibration applied to the test item can be varied.

cyclone. A closed atmospheric circulation, counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. Usually coexisting with a low pressure region and inclement weather.

cyclonic rain. Rain resulting from cyclonic uplift of air associated with frontal action.

cytoplasm. The part of the protoplasm of a cell outside the nucleus.

D

d *Abbr. for* deci (10^{-1}); day.

da *Abbr. for* deka (10).

daily mean. 1: The average value of a meteorological element over a period of 24 hours. The "true daily mean" is usually taken as the mean of 24 hourly values between midnight and midnight, either as continuous values taken from an autographic record or as point readings at hourly intervals. When hourly values are not available, approximations must be made from observations at fixed hours.

2: The long-period mean value of a climatic element on a given day of the year. *(Ref. 1)*

Dalton's law of partial pressure. The empirical generalization that, for many so-called perfect gases, a mixture of these gases will have a pressure equal to the sum of the partial pressures that each of the gases would have as sole component with the same volume and temperature, provided there is no chemical interaction *(Ref. 3)*.

damage risk. In noise exposure limits, the risk of temporary or permanent threshold shift in a portion of the noise-exposed population.

damage summation. An analytic process in which the assumed or measured physical parameters of the materials and mechanical structure of a system, and of the fatigue-producing energy applied to the system, are analyzed to establish a relationship between damage accumulation and time, or to predict the time to failure *(Ref. 1)*.

damped oscillation. An oscillation in which the amplitude of the oscillating quantity decreases with time.

damp haze. Small water droplets or very

hygroscopic particles in the air, reducing the horizontal visibility somewhat, but to not less than 1.25 mi. Damp haze is similar to a very thin fog, but the droplets or particles are more scattered than in light fog and presumably smaller *(Ref. 15)*.

damping. The dissipation of energy with time or distance, such as the effect of friction or its equivalent in reducing oscillation of a system. Other dissipative mechanisms include coulomb, viscous, structural, eddy-current, nonlinear, material, interface, and tuned dynamic damping *(Ref. 1)*.

damping capacity. The ability of a material to absorb vibrations by changing the mechanical energy into heat *(Ref. 1)*.

damping coefficient. The quotient of the force applied to a viscous damper divided by the relative velocity between its connecting points, when the displacement of a vibrating system is zero; i.e., in the characteristic equation of a second-order linear system, say $M\ddot{x} + B\dot{x} + Kx = 0$, the coefficient B of the first derivative of the damped variable x *(Ref. 24)*.

damping, critical. The minimum viscous damping required to eliminate oscillation in a mechanical system. A critically damped system when displaced will return to its initial position without oscillation *(Ref. 22)*.

dangerous cargo. Cargo, which because of its dangerous properties, is subject to special regulations for its transport *(Ref. 3)*.

dart leader. The initiating portion of a lightning stroke associated with strokes of a composite flash after the first stroke and following in the path of the residual ionization from the previous return streamer.

dashpot. A device between shock input source and materiel, used for cushioning or damping a movement to attenuate shock. It consists of a fluid-filled (air or liquid) cylinder in which a piston moves.

datum. A reference point, line, or surface from which unknown positions are calculated or measured, such as mean sea level in a topographical survey.

day with precipitation. A day in which the total precipitation received equals or exceeds a specified amount (in the United States, water equivalency = 0.01 in.) *(Ref. 1)*.

d.b.h. *Abbr. for* diameter, breast height (trees).

DDT *Abbr. for* dichlorodiphenyltrichloroethane.

deactivation. 1: *Metallurgy*. The process of prior removal of the active corrosive constituents, usually oxygen, from a corrosive liquid by controlled corrosion of expendable metal or by other chemical means.
2: Act of rendering ordnance inert *(Ref. 12)*.

dead space. 1: An area within the maximum range of a weapon, radar, or observer which cannot be covered by fire or observation from a particular position because of intervening obstacles, the nature of the ground, the characteristics of the trajectory, or the limitations of the pointing capabilities of the weapon.
2: An area or zone that is within range of a radio transmitter, but in which a signal is not received.
3: The volume of space above and around a gun or guided missile system into which it cannot fire because of mechanical or electronic limitations *(Ref. 5)*.

debacle. 1: The rush of water or ice in a stream immediately following the ice breakup *(Ref. 18)*.
2: Any violent rush or flood of water *(Ref. 15)*.
3: A violent disruption.

debris. 1: Any accumulation of loose material, consisting of rock fragments, sand, earth, and organic matter. Such an accumulation at the foot of a slope is called a talus.
2: The waste silt, sand, and gravel produced by hydraulic mining operations.

debris ice; *also* **muddy ice.** Ice that contains mud, stones, shells, etc. *(Ref. 15)*.

decay. 1: The decomposition of wood by fungi. Two stages of decay, the incipient and advanced stages, are ordinarily recognized *(Ref. 19)*.
2: The decrease in the energy of anything after new energy ceases to be supplied, as in the case of wind waves after the wind ceases to act *(Ref. 15)*.
3: Decrease in quantity, activity, or force.
4: Aerobic decomposition of proteins by micro-organisms.

decay curves (radioactive). Graph lines rep-

resenting the decrease of radioactivity with the passage of time *(Ref. 5)*.

decay rate (radioactive). The time rate of the disintegration of radioactive material generally accompanied by the emission of particles or gamma radiation *(Ref. 5)*.

decentralized items. Items of supply for which appropriate authority has prescribed local management and procurement *(Ref. 5)*.

decibel. 1: Unit to express differences of power level. Example: The decibel is 10 times the common logarithm of the power ratio. It is used to express power gain in amplifiers or power loss in passive circuits or cables *(Ref. 4)*.

2: A unit for expressing the loudness of sounds, one decibel being approximately the least change detectable by the average human ear. The difference in decibels of two sounds is exactly equal to 10 times the common logarithm of the ratio of their powers *(Ref. 15)*.

deciduous. In botany, losing the leaves during a certain period of the year, generally either the cold season or dry season *(Ref. 1)*.

deciduous forest. A forest consisting of trees that lose their leaves at some season of the year. In the case of the monsoon forests, such as those of India and Burma, the trees shed their leaves during the hot season in order to protect themselves against excessive loss of moisture by evaporation. Much of the valuable hardwood timber of commerce is obtained from deciduous forests. The deciduous forests of the temperate zones lose their leaves at the onset of the cold season. *(Ref. 20)*

declination. In terrestrial magnetism, the angle between true north and magnetic north. It is either east or west of the geographical meridian. Lines of constant declination are called isogonic lines.

declivity. A descending slope, as opposed to acclivity *(Ref. 10)*.

decomposition. 1: The chemical separation of a substance into two or more substances, which may differ from each other and from the original substances *(Ref. 1)*.

2: Reduction of the net energy level and change in chemical composition of organic matter because of the actions of aerobic or anaerobic micro-organisms *(Ref. 9)*.

decompression. The act or process of lowering the air pressure within a cabin, chamber, etc., or of subjecting to, or undergoing, a decrease in air or atmospheric pressure *(Ref. 7)*.

decontamination. The process of making any person, object, or area safe by absorbing, destroying, neutralizing, or making harmless, by removing chemical or biological agents, or by removing radioactive material clinging to or around it *(Ref. 5)*.

decoupling. The process of designing or redesigning a mechanical structure to possess a minimum number of resonances in the frequency range of the vibration environment. Decoupling reduces the number of coupled resonators between the vibration environment and the component to be protected.

deep contour. A line connecting points of equal depth below the hydrographic datum *(Ref. 5)*.

deep fording. The ability of a self-propelled gun or ground vehicle, equipped with built-in waterproofing and/or a special waterproofing kit, to negotiate a water obstacle with its wheels or tracks in contact with the ground *(Ref. 5)*. *See also:* flotation; shallow fording.

defense standardization program. An activity to obtain uniformity in materiel specification, procurement, and usage within the Department of Defense. It was established pursuant to the Cataloging and Standardization Act, Title 10, United States Code, Chapter 145, Sections 2451-2456. It is described in the Defense Standardization Manual 4120.3-M.

defilade. 1: Protection from hostile ground observation and fire provided by an obstacle such as a hill, ridge, or bank.

2: A vertical distance by which a position is concealed from enemy observation.

3: To shield from enemy fire or observation by using natural or artificial obstacles. *(Ref. 5)*

defile. A deep, narrow mountain pass *(Ref. 10)*.

deflation. 1: A reduction in size or importance; a release of air or gas from, so as to reduce size.

2: The process by which fine soil particles are removed from the soil and become airborne by wind *(Ref. 2)*.

deflocculate. To reduce or break up from a flocculent or clumped state; to disperse or maintain in a dispersed state.

defoliant. A chemical used to remove prematurely the leaves from plants *(Ref. 12)*.

defoliate. To cause a tree or other plant to lose its leaves *(Ref. 1)*.

degradation. Deterioration, usually in the sense of a physical or chemical process rather than a mechanical one. There may be a specific amount of degradation permitted as a result of performance of environmental testing *(Ref. 1)*.

degree day; *also* freezing degree day. 1: Generally, a measure of the departure of the mean daily temperature from a given standard: one degree day for each degree (deg C or deg F) of departure above (or below) the standard during one day. Recently, degree days have been applied to fuel and power consumption, with the standard being 65°F.

2: As used by U S Army Corps of Engineers, degree days are computed as departure above and below 32°F, positive if above and negative if below. *(Ref. 1)*

degree hour. As used by the U.S. Army Corps of Engineers, the departure (in deg F) of the hourly temperature from a standard of 32°F, positive if above and negative if below. Degree hours may be accumulated (summed) over any period of time, depending upon the use to which they are applied *(Ref. 3)*.

degrees-of-freedom. In a mechanical system, the minimum number of independent coordinates required to define the positions of all parts of the system at any specific time. It is usually equal to the number of independent displacements that are possible *(Ref. 22)*. In an electrical system, the number of independent meshes, closed paths, or loops *(Ref. 24)*.

dehumidification. The removal of water vapor from air by chemical or physical (adsorption) methods, such as the condensation of water vapor from air by cooling below the dewpoint *(Ref. 1)*.

dehumidified nonstructural storage. Storage of individual items in sealed containers in which the relative humidity is maintained at 40 percent or less.

dehumidified structural storage. Storage of materiel in structures in which atmospheric humidity is maintained at 40 percent relative humidity or less.

dehumidifier. A substance or apparatus for removing moisture. A material or device employed to remove water vapor from the atmosphere, thus providing a drier and less deteriorative atmosphere for most materiel.

dehumidify. To reduce, by any process, the amount of water vapor in a space *(Ref. 1)*.

deicing. The removal of ice accumulation on aircraft, ships, and other objects by ice pick, shovel, steam jet, chemical treatment, heating, or mechanical devices *(Ref. 31)*.

delayed fallout. Radioactive fallout resulting from high-yield atomic or thermonuclear detonations that thrust their clouds into the stratosphere, the fallout occurring some period of time after the detonation. Storage times vary from less than 1 yr to as high as 10 yr, depending upon the latitude and altitude of detonation. The particles are of submicrometer size *(Ref. 1)*.

deliquescence. The change undergone by certain substances that become damp and finally liquefy when exposed to the air, owing to the very low vapor pressure of their saturate solutions *(Ref. 1)*.

delta. A deposit of alluvium at the mouth(s) of a river. The term refers particularly to that part of the deposit forming a tract of land above water, usually roughly triangular in shape, as the Greek letter Δ *(Ref. 15)*.

demiarid (climate). A climate in which 4 or 5 mo of the year average no more than 3 days per month with 0.1 in. or more precipitation *and* a total of at least 10 mo having averages of no more than 6 days per month with 0.1 in. or more precipitation *(Ref. 23)*.

dendritic drainage. A treelike arrangement of a main stream and successively smaller tributaries joining it at acute angles *(Ref. 20)*.

density. 1: The quantity per unit volume, unit area, or unit length.

2: *Soil Mechanics.* The unit weight of a soil in pounds per cubic foot. The type of

density—i.e., natural or in place, wet, dry, remolded natural, relative, etc.—should be specified *(Ref. 25)*.

3: *Oceanography*. The equivalent of specific gravity, or the ratio, at atmospheric pressure, of the weight of a given volume of sea water to that of an equal volume of distilled water at 4.0°C *(Ref. 18)*.

4: *Optics*. A measure of the light transmitting or reflective properties of an area or object.

density altitude. The height above sea level at which the existing density of the atmosphere would be duplicated in the standard atmosphere; atmospheric density expressed as height according to a standard scale *(Ref. 15)*.

deposit. A material that has been transported from some other geographic location to its present position by natural transporting agents such as water, wind, ice, or gravity, or by the activity of man *(Ref. 2)*.

deposit attack. Corrosion that occurs under or around a discontinuous deposit on a metallic surface *(Ref. 34)*.

deposition. The laying down in a new location of material that has been carried from another place.

depot maintenance. Maintenance performed on materiel requiring major overhaul or a complete rebuilding of parts, assemblies, subassemblies, and end items, including the manufacture of parts, modifications, testing, and reclamation as required. Depot maintenance serves to support lower categories of maintenance by providing technical assistance and performing that maintenance beyond their responsibility. Depot maintenance provides stocks of serviceable equipment by using more extensive facilities for repair than are available in lower level maintenance activities *(Ref. 5)*.

depot supply. Depot supply is that service authorized and prescribed to be performed by specially trained and designated semimobile and fixed organizations and/or specially trained personnel of fixed installations in the determination of requirements for, acquisition of, accounting for, and wholesale distribution of supplies and equipment to supported retail echelons of supply and to collateral depot maintenance activities *(Ref. 26)*.

depression. 1: *Meteorology*. An area of low pressure; a low or a trough. This is usually applied to a certain stage in the development of a tropical cyclone, to migratory lows, and troughs, and to upper-level lows and troughs that are only weakly developed *(Ref. 1)*.

2: *Geomorphology*. A low place of any size on a plain surface, with drainage underground or by evaporation; a hollow completely surrounded by higher ground and having no natural outlet for surface drainage *(Ref. 10)*.

depth hoar or sugar snow. 1: Ice crystals (usually cup crystals) formed by sublimation within snow but beneath the snow surface; a type of hoarfrost. This is one way in which firn formation may begin. Depth hoar is similar in physical origin to crevasse hoar.

2: (Rare) Hoarfrost composed of crystals that have built up a three-dimensional complex *(Ref. 3)*.

dermal toxicity. The ability of a chemical to poison an animal or human being by skin absorption *(Ref. 9)*.

desert. An almost barren tract of land in which the precipitation is so scanty or spasmodic that it will not adequately support vegetation *(Ref. 20)*.

desert climate. The single outstanding characteristic of desert climate is aridity. By most classification systems, areas with an annual rainfall of less than 10 in. are considered desert. Areas considered as deserts are also characterized by clear atmospheres and high solar radiation.

desert crust. The hard surface layer of the earth in desert regions. It contains deposited calcium carbonate, gypsum, and similar materials which bond or cement the individual grains together *(Ref. 2)*.

desert flats. The essentially flat surface extending from the edges of playas to the alluvial fans or bajadas *(Ref. 1)*.

desert pavement. A mosaic of closely packed pebbles and broken rock fragments usually coated with a stain or crust of manganese or

iron oxide (*See:* desert varnish) and caused by wind removal of sand, silt, and clay particles *(Ref. 1)*.

desert soil. A zonal great soil group formed in arid regions under sparse shrub vegetation. It has a thin, light-colored surface horizon underneath which is calcareous material *(Ref. 2)*.

desert varnish. The glossy surface or coating on stones and pebbles occurring in desert regions *(Ref. 2)*.

desiccant. A drying or dehydrating agent that absorbs water vapor by physical or chemical means *(Ref. 1)*.

desiccant machines. Devices used in humidity-controlled warehouses to remove water vapor from the atmosphere inside the warehouse, thus reducing the humidity.

desiccator. An enclosed apparatus in which substances can be kept in a dry atmosphere. The latter is obtained by the inclusion of drying agents such as phosphorus pentoxide or concentrated sulphuric acid *(Ref. 1)*.

destructive local storm *(Abbr:* **DLS).** Atmospheric disturbances of limited extent exemplified by tornadoes, hail, and thunderstorm gusts over 50 kt at the surface.

destructive test. *See:* **test, destructive.**

detector, infrared. A device for observing and measuring infrared radiation, such as the bolometer, radiomicrometer, thermopile, pneumatic cell, photocell, photographic plate, and photoconductive cell *(Ref. 1)*.

deterioration. 1: The loss in the value of a material or a decrease in the ability of a product to fulfill the function for which it was intended.

2: A process of transition from a higher to a lower energy level *(Ref. 1)*.

deterioration pattern. Listing of the various deterioration processes noticed on an item in the order of their intensities or rates of progress or in the order of their deterioration potentials *(Ref. 1)*.

deterioration potential. The minimum change resulting from a deterioration process that affects the suitability of the item to serve its intended purpose *(Ref. 1)*.

deterioration process. Any change in physical characteristics or any chemical reaction occurring as the result of the storage or use of an item. As a rule, a deterioration process is the result of the environmental exposure of the item. Also, it can be generated by internal conditions and can be promoted by the environmental stresses *(Ref. 1)*.

deterioration product. New or changed compounds formed as a result of a particular deterioration process *(Ref. 1)*.

deterioration resistance. The ability of an item to withstand the effects of environmental exposures and to prevent deterioration that might result from internal item conditions *(Ref. 1)*.

detrainment. *See:* **entrainment.**

detritus. An accumulation of the fragments resulting from the disintegration of rocks *(Ref. 15)*.

detuning. 1: The process of separating the resonant frequencies of structural members and components from other structural resonant frequencie by adjusting inertial and stiffness properties to eliminate coincident resonant frequencies.

2: Decreasing the response of an electrical circuit to a particular frequency or band of frequencies for which it possesses a greater response.

deviation. The difference between two numbers, usually of a variable from its mean value or of an observed value from a theoretical value.

dew. Water condensed onto grass and other objects near the ground, the temperature of which has fallen below the dewpoint of the surface air due to radiational cooling during the night, but is still above freezing. If the temperature falls below freezing after dew has formed, the frozen dew is known as white dew *(Ref. 1)*.

dew cell. An instrument used to determine the dewpoint. It consists of a pair of spaced bare electrical wires wound spirally around an insulator and covered with a wicking wetted with a water solution containing an excess of lithium chloride. An electrical potential applied to the wires causes a flow of current through the lithium chloride solution which raises the temperature of the solution until its vapor pressure is in equilibrium with that of the ambient air *(Ref. 1)*.

dew point. The temperature to which a given weight of air must be cooled at constant pressure and constant water-vapor content in order for saturation to occur. When this

temperature is below 0°C, it is sometimes called the frost point *(Ref. 1)*.

dewpoint hygrometer *or* **dewpoint apparatus.** An instrument for determining the dewpoint; a type of hygrometer. It operates in the following manner. A parcel of air is cooled at constant pressure, usually by contact with a refrigerated, polished metal surface. Condensation appears upon the metal surface at a temperature slightly below that of the thermodynamic dewpoint of the air. The observed dewpoint will differ from the thermodynamic dewpoint depending upon the nature of the condensing surface, the condensation nuclei, and the sensitivity of the condensate-detecting apparatus *(Ref. 3)*.

dewpoint index. The difference between the 500-mb temperature and the mean dewpoint of the moist layer raised along a pseudoadiabat to 500 mb. This index varies less than the stability index with diurnal surface heating.

diameter, breast high *(Abbr:* d.b.h.). The diameter of a tree at 4.5 ft above average ground level. In National Forest practice, it is measured from the highest ground level. The abbreviations o.b. and i.b. are used to designate measurement outside or inside the bark *(Ref. 19)*.

diamond dust *or* **ice crystals.** Precipitation composed of slowly falling, very small, unbranched crystals of ice which seem to float in the air. It may fall from a cloud or from a cloudless sky.

diastrophism. Deformation of the crust of the earth by folding, bending, warping, or faulting.

diathermy equipment. Therapy apparatus in which microwave radiation is used to produce local heating in body tissues below the skin.

diatom. One of a class of microscopic phytoplankton organisms, possessing a wall of overlapping halves (valves) impregnated with silica. Diatoms are one of the most abundant groups of organisms in the sea and the most important primary food source of marine animals *(Ref. 18)*.

diatomaceous earth. A deposit of siliceous material consisting principally of the remains of plants classified as Diatomaceae. It occurs as a powder or a porous, rigid solid and is used as an abrasive or a pottery glaze. *(Ref. 2)*

dielectric. An insulating material, usually having a very low loss factor *(Ref. 4)*.

dielectric constant. The property of an insulating material, which is the ratio of the parallel capacitance of a given configuration of electrodes with the material as the dielectric, to the capacitance of the same electrode configuration with a vacuum as the dielectric *(Ref. 4)*.

dielectric strength. A term used to describe the limiting potential gradient or voltage per unit distance, that can be applied to a dielectric material without damage.

differential transformer. A special electrical transformer used for detecting displacement in which the transformer core and windings are movable with respect to each other. One component (the core or the windings) is attached to the moving object and the other to a reference point. Electrical output of the differential transformer is proportional to the relative displacement between core and windings.

diffluence. The rate at which adjacent flow is diverging along an axis oriented normal to the flow.

diffracted wave. *See:* **wave, diffracted.**

diffraction. 1: The bending of the rays of radiant energy around the edges of an obstacle or when passing near the edges of an opening, or through a small hole or slit, resulting, in the case of light, in the formation of a spectrum or alternate light and dark bands.

2: The bending of a wave as it passes an obstruction. *(Ref. 15)*

diffraction zone. With respect to radio propagation, the portion of any propagation path that lies below a line-of-sight path. It is generally applied to the region below the radio horizon of the earth and, in this case, is often referred to as the earth shadow. Energy enters this zone by diffraction and scattering processes, and the interference lobes produced by the addition of the direct and surface-reflected waves for line-of-sight conditions are not present *(Ref. 3)*.

diffuse acoustic field. A volume in which sound comes from all directions equally

(with random phase relationships); normally the case for indoor measurements because of reflections.

diffuse reflection. 1: Any reflection process in which the reflected radiation is sent out in many directions usually bearing no simple relationship to the angle of incidence; the opposite of specular reflection. 2: A term frequently applied to the process by which solar radiation is scattered by dust and other suspensoids in the atmosphere. *(Ref. 3)*

diffuse sky radiation *or* **skylight.** Radiation reaching the surface of the earth after having been scattered from the direct solar beam by molecules or suspensoids in the atmosphere. Of the total light removed from the direct solar beam by scattering in the atmosphere (approximately 25 percent of the incident radiation), about two-thirds ultimately reaches the earth as diffuse sky radiation *(Ref. 1)*.

diffusion. 1: The spreading out or scattering of anything. For example, light is diffused when reflected from a rough surface *(Ref. 15)*.

2: The process by which particles of liquids, gases, or solids intermingle as the result of their spontaneous movement from a region of higher concentration to a region of lower concentration.

dike. 1: *Geology.* A sheetlike body of igneous rock that fills a fissure in older rocks which it entered while in a molten condition. Dikes occur in all types of material, igneous, metamorphic, and sedimentary; if in sedimentary rocks or bedded volcanic rocks, they "cut" the formations or transect the beds at an angle. Dikes vary from less than 1 in. in width and a few yards in length to thousands of feet in width and many miles in length.

2: *Civil Engineering.* A bank of earth, stones, etc., constructed to prevent low-lying land from being inundated by the sea, a river, etc. *(Ref. 1)*.

dip. The angle at which a stratum or any planar feature is inclined from the horizontal.

dipcoat. A method of applying a protective or decorative coating to an article by dipping the piece into the coating material *(Ref. 1)*.

dipole antennas *or* **dipole.** A type of antenna for radiating or receiving electromagnetic energy; it consists of a straight metal conductor one-half wavelength long energized across a gap at its midpoint. It is frequently used as the radiation element in radar antennas because of its directivity *(Ref. 3)*.

direction of current. The direction toward which a current is flowing, called the *set* of the current *(Ref. 15)*.

direction of waves. The direction from which waves are moving *(Ref. 15)*.

direction of wind. The direction from which a wind is blowing *(Ref. 15)*.

direct runoff. The runoff entering stream channels promptly after rainfall or snowmelt. Superposed on base runoff, it forms the bulk of the hydrograph of a flood *(Ref. 6)*.

direct shear test. *Soil Mechanics.* A test to determine the maximum shearing strength and angle of friction of soils for use in stability analyses *(Ref. 1)*.

direct solar radiation. In actinometry, the portion of the radiant energy received at the instrument or pyrheliometer "direct" from the sun, as opposed to diffuse sky radiation, effective terrestrial radiation, or radiation from any other source *(Ref. 1)*.

discharge (streamflow). The rate of flow of water past a point in a stream, expressed as volume per unit time (usually cubic feet per second). This measure of stream flow is used in preference to stage in most technical studies and where volume of water is of primary importance *(Ref. 3)*.

discrete component circuits. Electrical circuits consisting of a number of individual components connected together.

disinfectant lamps. Lamps that provide light output in the ultraviolet region of the light spectrum; such lamps are used for their germicidal effect by directing their rays to surfaces on which it is desired to kill bacteria.

disinfection. Effective killing by chemical or physical processes of all organisms capable of causing infectious disease. Chlorination is the disinfection method commonly employed in sewage treatment processes *(Ref. 9)*.

disintegration, nuclear. A nuclear transformation characterized by the emission of

mass and energy from the nucleus. If the emission is spontaneous, it is said to be radioactive; if the disintegration results from collision, it is said to be induced. When numbers of nuclei are involved, the process is characterized by a definite half-life *(Ref. 1). See also:* radioactivity.

disintegration rate. 1: The absolute rate of decay of a radioactive substance, usually expressed in terms of disintegration per unit of time.
2: The absolute rate of the transformation of a nuclide under bombardment. *(Ref. 1)*

dispersion. 1: The process in which radiation is separated into its component wavelengths. Dispersion results when an optical process, such as diffraction, refraction, or scattering, varies according to wavelength.
2: The rate of change with wavelength of the index of refraction of any refractive interface or discontinuity. *(Ref. 1)*

displacement. A vector quantity that specifies the change of position of a body or particle and is usually measured from the mean position or position of rest. In general, it can be represented as a rotation vector or a translation vector, or both *(Ref. 1). See also:* amplitude, peak to peak.

displacement meter. A generic term applied to instruments designed to measure displacement. A variety of types with different displacement sensors are employed.

displacement pickup. A device that converts a detectable change in a medium, such as that produced by a sound wave or an electromagnetic wave, into some form of electrical energy *(Ref. 1)*.

dissipation factor. A measure of the energy loss in a dielectric material situated in an electromagnetic field. It is a function of the material temperature and of the frequency of the field and is equal to the cotangent of the phase angle between the applied voltage on a capacity in which the material serves as a dielectric and the current flowing. It is also equal to the ratio of conductance of a capacitor, in which the material is used as a dielectric, and its susceptance.

dissolved oxygen (DO). The oxygen dissolved in water or sewage. Adequate amounts of dissolved oxygen are necessary for the life of fish and other aquatic organisms and for the prevention of offensive odors. Low dissolved oxygen concentrations generally are due to excessive organic solids in the water that react with the oxygen that is present. This often results from inadequate waste treatment. *(Ref. 9)*

distillation. A process whereby gas or vapor is obtained from liquids or solids by heating and is subsequently condensed so as to separate substances having different boiling points or to purify, by separating a substance from others having lower or higher boiling temperatures.

distribution point. A point at which supplies and/or ammunition, obtained from supporting supply points by a division or other unit, are broken down for distribution to subordinate units. Distribution points usually carry no stocks; drawn items are issued completely as soon as possible *(Ref. 5)*.

distribution system. The complex of facilities, installations, methods, and procedures designed to receive, store, maintain, distribute, and control the flow of military materiel between the point of receipt into the military system and the point of issue to using activities and units *(Ref. 5)*.

disturbed ice. Any land ice that is broken by pressure into a chaotic pattern of elevations and depressions *(Ref. 15)*.

dither. A signal of controlled amplitude and frequency applied to the servo motor operating a transfer valve, such that the transfer valve is constantly being "quivered" and cannot stick at its null position *(Ref. 1)*.

diurnal. Daily, especially pertaining to actions that are completed within 24 hr and that recur every 24 hr; thus, most reference is made to diurnal cycles, variations, ranges, maxima, etc. *(Ref. 1)*.

divergence. A drawing apart, acquisition of dissimilar characteristics, or changing of course. The expansion of a vector field; also, a measure thereof.

divide. The line of separation between drainage systems; the summit of an interfluve. The highest summit of a pass or gap *(Ref. 10)*.

DLS *Abbr. for* destructive local storm.

DNA *Abbr. for* desoxyribonucleic acid.

DO *Abbr. for* dissolved oxygen.

DOD *Abbr. for* Department of Defense.

DODISS *Abbr. for* Department of Defense *Index of Specifications and Standards.*

doldrums; *also* **equatorial calms.** A nautical term for the equatorial trough, with special reference to the light and variable nature of the winds *(Ref. 3).*

dolomite. 1: A rock whose primary ingredient is magnesium carbonate and/or calcium carbonate.

2: Limestone or marble having large amounts of magnesium carbonate.

dome. A curved stratum of rock in which the slope is in all directions away from a central point.

Doppler effect. The phenomenon evidenced by the change in the observed frequency of a sound or radio wave caused by a time rate of change in the effective length of the path of travel between the source and the point of observation *(Ref. 5).*

Doppler radar. A radar that detects and interprets the Doppler effect in terms of the radial velocity of a target. The signal received by a radar from a moving target differs slightly in frequency from the transmitted wave *(Ref. 3).*

dormant storage. Storage in which the packaged item is protected by preservation, sealing, covering, and placing in shelter and buildings, either dehumidified or nondehumidified. Items in dormant storage are not operated.

dosage. *Radiation.* The amount of nuclear radiation received by a person under a given set of circumstances *(Ref. 1).*

dose. *Radiation.* Properly, the absorbed dose from any ionizing radiation. Sometimes refers to the exposure dose, properly expressed in roentgens, which is a measure of the total amount of ionization that X rays or gamma rays produce in the air. Sometimes improperly used for radiation outside the applicability of the roentgen, as the ionization that would be produced in air. It is more advisable to restrict the term to the absorbed dose, commonly given in rads *(Ref. 1).*

dosimeter *or* **dosemeter.** An instrument for measuring and registering total accumulated exposure to ionizing radiations *(Ref. 1).*

dote. An early stage of wood decay. It is usually characterized by a change in color of the wood in patches or streaks which may be lighter or darker than normal *(Ref. 19).*

double-leaf wall. A wall containing two planar members separated by an air space, such as in dry-wall construction.

downrush. The strong downward-flowing air currents associated with thunderstorms.

downrush temperature. The temperature found by lowering the wet-bulb-zero down a pseudoadiabat to the surface pressure. This closely approximates the temperature of downrush currents in thunderstorms when they reach the surface.

downtime. The portion of calendar time when an item is not in condition to perform its intended function *(Ref. 33).*

downward atmospheric radiation. Downward longwave atmospheric radiation, mainly emitted by the atmosphere.

downward radiation. Downward solar and atmospheric radiation.

downwash. The downward flow of gases under pressure resulting from the application of power to the lifting or propelling, or both, of airborne vehicles, vertiplanes, helicopters, rockets, guided missiles, etc. *(Ref. 12).*

downwind. In the direction toward which the wind is blowing. The term applies particularly to the situation of moving in this direction, whether desired or not. Before the wind implies assistance from the wind in making progress in a desired direction. Leeward applies to the direction toward which the wind blows, without implying motion. The opposite is upwind *(Ref. 15).*

drag. The frictional impedance offered by a fluid to the motion of bodies passing through it; more precisely, the component of aerodynamic or hydrodynamic force parallel to the direction of mean flow *(Ref. 1).*

drainage area. The area, measured in a horizontal plane, that is enclosed by a drainage divide *(Ref. 4). See also:* divide.

drainage basin. A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water *(Ref. 6).*

drainage divide. *See:* divide.

drainage system. Rivers, streams, and other inland water features *(Ref. 5)*.

draw. A shallow dry wash or arroyo, characterized by low banks that are gentler than those of the wash or arroyo *(Ref. 1)*.

drawbar pull. The pulling force exerted at the drawbar of a ground vehicle *(Ref. 5)*.

DRC *Abbr. for* damage risk criteria.

drift. 1: The effect of the velocity of fluid flow upon the velocity (relative to a fixed external point) of an object moving within the fluid; the vector difference between the velocity of the object relative to the fluid and its velocity relative to the fixed reference *(Ref. 18)*.

2: To the mariner, drift is the speed of a field of ice floe usually given in nautical miles per day or in knots *(Ref. 18)*.

3: To the oceanographer, drift is a wide, slow-moving current principally caused by winds *(Ref. 18)*.

4: The component of an aircraft's ground speed perpendicular to the heading *(Ref. 15)*.

5: Material moved from one place and deposited in another, as sand by a river, rocks by a glacier, material washed ashore and left stranded, or snow or sand piled up by wind *(Ref. 15)*.

6: Gradual movement from a set position, as of a control by vibration *(Ref. 15)*.

7: The change of frequency in an oscillator during warmup *(Ref. 15)*.

8: For a gyroscope, the horizontal component of precession or wander, or the algebraic sum of the two. When it is desired to differentiate between the sum and its components, the sum is called total drift *(Ref. 15)*.

drift, glacial. All rock material in transport by glacier ice, all deposits made by glacier ice, and all deposits predominantly of glacial origin made in the sea or in bodies of glacial melt water, including rocks rafted by icebergs. Glacial drift occurs as scattered rock fragments, as till, and as outwash *(Ref. 11)*.

drift ice. *See:* pack ice.

drifting sand. An ensemble of particles of dust or sand raised from the ground to small or moderate height by a sufficiently strong and turbulent wind *(Ref. 36)*.

drifting snow. Snow particles being blown about close to the ground (less than 6 ft above the surface), differing from blowing snow in that vertical visibility is not appreciably affected *(Ref. 11)*.

drizzle. Fairly uniform precipitation composed exclusively of fine drops of water (diameter less than 0.5 mm or 0.02 in.), very close to one another *(Ref. 36)*.

drizzle drops. *See:* raindrop.

drop height. The vertical distance between the drop zone and the aircraft *(Ref. 5)*.

droplet *or* **drop.** A small spherical particle of any liquid; in meteorology, particularly, a water droplet. There is no defined size limit separating droplets from drops of water, but it is sometimes convenient to denote two disparate size ranges, such as the often-used distinction of liquid cloud particles (droplets) from liquid precipitation (drops), thereby implying that a maximum diameter of 0.2 mm is the limit for droplets *(Ref. 3)*.

drop-size distribution. The frequency distribution of drop sizes, either in terms of diameter or volume, that is characteristic of a cloud or of a rainfall. It is an important parameter in determining the radar reflectivity of a cloud or of precipitation.

drop test. A type of rough handling test in which the materiel is dropped from specified heights in specified orientation on a specified hard surface. Types of drop tests include edgewise drop, cornerwise drop, and free-fall drop.

drosometer. An instrument used to measure the amount of dew formed on a given surface *(Ref. 1)*.

drought. A period of abnormally dry weather sufficiently prolonged for the lack of water to cause a marked hydrologic imbalance in the affected area.

drowned valley. A valley, the lower part of which has been inundated by the sea as a result of submergence of the land margin *(Ref. 1)*.

drumlin. An elongated, half-egg-shaped hill made up of material deposited beneath glacial ice; it occurs in a previously glaciated region, the long axis lying parallel to the direction of flow of the ice, with the thick, steep end to the north *(Ref. 20)*.

dry adiabat. A line of constant potential temperature on a thermodynamic diagram.

It is intended to represent the lifting of dry air in an adiabatic process.

dry air. Air with relative humidity not exceeding 65 percent.

dry-bulb temperature. The temperature of the air, particularly as measured by the dry-bulb thermometer of a psychrometer.

dry-bulb thermometer. A thermometer with an uncovered bulb, used with a wet-bulb thermometer to determine atmospheric humidity. The two thermometers constitute the essential parts of a psychrometer *(Ref. 15)*.

dry fallout. Sea salt particles that have fallen from the atmosphere to the surface of the earth by gravity.

dry fog. A fog that does not moisten exposed surfaces *(Ref. 3)*.

dry friction damping. *See:* coulomb damping.

dry ice. Carbon dioxide in solid form; it sublimes to a gas at −78.5°C and is used as a refrigerant.

dry lake. *See:* playa.

dry tank. A large tank constructed of metal, usually with a concrete floor. It is sealed and used for long-term storage. Most dry tanks are laid out in long lines to facilitate humidity control. Materiel not destined for use for a number of years are stored therein.

dry wash *or* **wadi.** A broad, dry bed of a stream; a dry stream channel *(Ref. 10)*.

DSMA *Abbr. for* Defense Supply Management Agency.

DSP *Abbr. for* Defense Standardization Program.

ductile. Not brittle, capable of being hammered, drawn, and stretched without fracture.

dummy load. A substitute device employed with radio and radar transmitters and other electronic transmission apparatus which has the impedance and dissipative characteristics of the substituted device but which does not radiate or transmit.

dune. 1: A heap of sand or other material accumulated by wind. The external form may be that of a hill or ridge.

2: A sand wave of approximately triangular cross section (in a vertical plane in the direction of flow) with gentle upstream slope and steep downstream slope, which travels downstream by the movement of the sediment up the upstream slope and the deposition of it on the downstream slope. For types, *see:* barchan, longitudinal dune, sief dune, star dune, transverse dune, whaleback *(Ref. 1)*.

dunnage. Various types of packing material placed around cargo to prevent shifting and damage during transportation.

durometer. An instrument used for measuring the hardness of a substance.

dust. Solid matter consisting of minute particles, smaller than sand particles, and occurring everywhere in the atmosphere; it is often carried large distances by the wind and is constantly being deposited on the surface of the earth. The sources of dust are various: in and near industrial areas, the smoke from factory and domestic chimneys charges the atmosphere with particles of carbon and other substances; in the deserts dust is raised from the ground by the wind; while volcanic dust enters the air during an eruption *(Ref. 20)*.

dust devil. *See:* dust whirl.

dust electrification. The process whereby suspended dust particles acquire electrical charge.

dustfall. Dust that has settled from the atmosphere due to gravity. It is measured as dust weight on a unit area in a unit time (usually 1 mo).

dusting. The breakdown and disintegration of materials into small particles.

duststorm. An unusual, frequently severe weather condition characterized by strong winds and dust-filled air over an extensive area. A thick mass of airborne dust may obscure the atmosphere to the extent that it reduces visibility very considerably, sometimes practically to zero *(Ref. 1)*.

dust test chamber. A chamber for testing material in which exposure to airborne sand and dust can be controlled.

dust whirl; *also* **dust devil.** A rapidly rotating column of air, usually about 100 to 300 ft in height, carrying dust, straw, leaves, or other light material. It has no direct relationship to a dust storm, and usually develops on a calm, hot afternoon with clear skies, mostly in desert regions *(Ref. 15)*.

dyn *Abbr. for* dyne.

dynamic aging. Aging of materials, particu-

larly elastomers, that occurs more rapidly than static aging because the application of dynamic stresses expose fresh surface areas of the material to attack by the environment. It is characterized by cracks caused by the combination of dynamic fatigue and oxidation or ozone attack.

dynamic climatology. The climatology of atmospheric dynamics and thermodynamics; a climatological approach to the study and explanation of atmospheric circulation. Confusion exists regarding the distinction between this and synoptic climatology. Among the comparisons drawn are: (a) dynamic climatology is global while synoptic climatology is regional; (b) dynamic climatology is for the theoretical meteorologist while synoptic climatology is for the forecaster and practical climatologist. Dynamic climatology generalizes from local observations to the energy processes of the entire atmosphere while synoptic climatology particularizes from the atmospheric circulation to local weather *(Ref. 3)*.

dynamic dehumidification. The removal of moisture from the atmosphere by dehumidification machines that use power-driven blowers *(Ref. 1)*.

dynamic excitation. An external vibratory force or other type input applied to a system that causes the system to respond *(Ref. 37)*.

dynamic meteorology. The branch of meteorology that deals with the motions of the atmosphere and their relations to other meteorological elements *(Ref. 15)*.

dynamic pressure. *See:* pressure, dynamic.

dynamic stress. *See:* stress, dynamic.

dynamic unbalance. A condition in rotating machinery in which the total inertia (associated with the center of gravity) with reference to the rotational centerline is nonzero.

dynamic viscosity. *See:* viscosity, dynamic.

dyne. A unit of force that will produce an acceleration of 1 cm s^{-1} if applied to a body with a mass of 1 g *(Ref. 1)*.

E

early fallout. Fallout near the site of an explosion *(Ref. 1)*.

earth. 1: The lithosphere, the solid matter of the planet Earth.

2: The loose or softer material on the surface of the earth as distinguished from rock. *(Ref. 32)*

earthquake. A perceptible trembling to violent shaking of the ground produced by the sudden shift of part of the crust of the earth *(Ref. 1)*. Earthquakes sometimes cause a permanent change of level at the surface, but often the damage done by the shaking provides the only lasting visible effect. They may be produced by a volcanic explosion. Earthquakes are common in most volcanic areas and often precede or accompany eruptions.

earth radiation. *See:* terrestrial radiation.

earth shadow. Any shadows projecting into a hazy atmosphere from mountain peaks at times of sunrise or sunset; not to be confused with the twilight phenomenon of the dark segment which is not truly a shadow effect *(Ref. 3)*.

ease of maintenance. The degree of facility with which equipment can be retained in, or restored to, operation. It is a function of the rapidity with which maintenance operations can be performed to avert malfunctions or correct them if they occur. Ease of maintenance is enhanced by any consideration that will reduce the time and effort necessary to maintain equipment at peak operating efficiency *(Ref. 33)*.

ebb tide; *also* falling tide; ebb current. The movement of a tidal current away from the coast or down an estuary or tidal waterway; the opposite of flood current *(Ref. 3)*.

echo. The signal received by a radar or sonar

set as a result of the reflection of a transmitted radio or sound pulse from objects in the field of scan *(Ref. 12)*.

echo flutter. A rapid succession of reflected pulses resulting from a single initial pulse *(Ref. 1)*.

ecliptic. The great circle in the celestial sphere which is the apparent path of the sun around the earth.

ecology. The interrelationships of living things to one another and to their environment or the study of such interrelationships *(Ref. 9)*.

ecosystem. The interacting system of a biological community and its nonliving environment *(Ref. 9)*.

edaphic. Relating to or determined by conditions in the soil, rather than by climatic factors *(Ref. 2)*.

eddy. A current of air or fluid that runs contrary to the main stream, especially a small vortex of air that runs counter to the main airflow. Eddies tend to form on the lee side of an object *(Ref. 14)*. In electronics, eddy currents exist in conducting masses due to voltages induced by a variation in magnetic flux.

EED *Abbr. for* electroexplosive device.

effective gust velocity. The vertical component of the velocity of a sharp-edged gust that would produce a given acceleration on a particular airplane flown in level flight at the design cruising speed of the aircraft and at a given air density *(Ref. 3)*.

effective precipitation. 1: The portion of the precipitation that produces runoff.

2: A weighted average of current and antecedent precipitation that is "effective" in correlating with runoff.

3: As described by U S Bureau of Reclamation, the part of the precipitation falling on an irrigated area that is effective in meeting the consumptive use requirements. *(Ref. 6)*

effective sound pressure *or* **root-mean-square sound pressure.** The effective sound pressure at a point is the root-mean-square value of the instantaneous sound pressures over a time interval at the point under consideration. In the case of periodic sound pressures, the interval must be an integral number of periods or an interval that is long compared to a period. In the case of nonperiodic sound pressures, the interval should be long enough to make the value obtained essentially independent of small changes in the length of the interval. The term effective sound pressure is frequently shortened to sound pressure *(Ref. 38)*.

effective temperature. 1: The temperature at which motionless, saturated air would induce, in a sedentary worker wearing ordinary indoor clothing, the same sensation of comfort as that induced by the actual conditions of temperature, humidity, and air movement *(Ref. 1)*.

2: With respect to radiation, ascribed to an imperfectly radiating body: the temperature at which a perfect radiator (blackbody) would emit radiation at the same rate. Thus, the effective temperature is always less than the actual temperature *(Ref. 3)*.

effective terrestrial radiation. The difference between the outgoing (positive) terrestrial radiation of the surface of the earth and the downcoming (negative) counterradiation from the atmosphere. It is to be emphasized that this difference is a positive quantity, of the order of several tenths of a langley per minute, at all times of day (except under conditions of low overcast clouds). It typically attains its diurnal maximum during the midday hours when high soil temperatures create high rates of outgoing terrestrial radiation. However, in daylight hours the effective terrestrial radiation is generally much smaller than the insolation, while at night it typically dominates the energy budget of the surface of the earth *(Ref. 1)*.

efflorescence. The process by which substances change to a powder from loss of water of crystallization. In nature, this may result in a white powder or powdery crust on the surface of soils in arid areas.

elasticity. The property of a material by virtue of which it tends to recover automatically its original size and shape after deformation *(Ref. 1)*.

elastomer. Any elastic rubberlike substance, such as natural or synthetic rubber *(Ref. 4)*.

electrical breakdown. The sudden decrease in the electrical resistivity of a material when the applied electric field strength exceeds a certain value.

electric discharge. Flow of electric current

through a gas such that radiation is emitted that is characteristic of the gas and of the intensity of the current.

electric field strength; *also* **electric field, electric intensity, electric field intensity, electric potential gradient, field strength.** The electrical force exerted on a unit positive charge placed at a given point in space. The electric field strength is expressed, in the practical system of electrical units, in terms of volts per centimeter, and is a vector quantity (actually, the magnitude of the electric-field vector). The electric field strength of the atmosphere is commonly referred to as the atmospheric electric field *(Ref. 3)*.

electrochemical cell. A system consisting of cathode, anode, and electrolyte plus those connections necessary for the cell to receive or provide current.

electrochemical corrosion. *See:* **corrosion, electrochemical.**

electrochemical series *or* **electromotive series.** A listing of metals arranged according to their electromotive potential as compared with hydrogen.

electrode. A conductor through which a current enters or leaves an electrolyte, gas, vacuum, or other nonmetallic conductor *(Ref. 4)*.

electroencephalogram. *Medical Electronics.* A graphic record of the changes with time of the surface potential generated on the scalp as a result of neuroelectric activity of the brain.

electroexplosive device. An explosive device that is actuated by an electrical impulse.

electrolysis. The production of chemical changes by passage of current through an electrolyte *(Ref. 4)*.

electrolyte. A nonmetallic conductor of electricity in solid or liquid form in which the charge carriers are ions rather than electrons, as in metals.

electrolytic corrosion. Corrosion caused by electrochemical processes.

electrolytic protection. Protection from electrochemical corrosion by use of the protected material as the cathode in the corrosion cell. If an electromotive force counter to the normal flow of current in a corroding system can be impressed on the system circuit, the tendency for the anodic metal to go into solution is decreased *(Ref. 1)*.

electromagnetic. Pertaining to the combined electric and magnetic fields associated with radiation or with movements of charged particles *(Ref. 1)*.

electromagnetic damping. The reduction of mechanical vibrations by application of electromagnetic forces to the physical components of the vibrating system. Damping forces associated with magnetic hysteresis and eddy currents are examples.

electromagnetic interference. Impairment of the reception of a wanted electromagnetic signal caused by an electromagnetic disturbance; the inhibition of performance in electronic communications, navigation, control, and computing equipment as a result of spurious electromagnetic signals.

electromagnetic line-of-sight. The maximum distance at which direct wave transmission is possible between transmitting and receiving antennas of given height, neglecting propagation anomalies *(Ref. 1)*.

electromagnetic pulse. A sudden, intense discharge of electromagnetic energy. It occurs naturally as a result of lightning discharge and is induced by near-surface nuclear explosions.

electromagnetic radiation. Radiation made up of oscillating electric and magnetic fields and propagated with the speed of light. Includes gamma radiation, X rays, ultraviolet, visible and infrared radiation, and radar and radio waves *(Ref. 5)*.

electromagnetic spectrum. The ordered array and identification of all known electromagnetic radiations, extending from the shortest gamma rays through X rays, ultraviolet radiation, visible radiation, infrared radiation, including microwave and the longer radio wavelengths. The known frequencies of the spectrum range from 0 to 10^{25} Hz.

electromagnetism. 1: Magnetism caused by the flow of an electric current *(Ref. 4)*.
2: A branch of physical science that deals with the relationships between electricity and magnetism.

electromechanical coupling factor. A numerical factor indicating the extent to which

the electrical characteristics of a transducer are modified by a coupled mechanical system, and vice versa *(Ref. 22)*.

electrometeor. A visible or audible manifestation of atmospheric electricity. Electrometeors either correspond to discontinuous electrical discharges (lightning, thunder) or occur as more or less continuous phenomena (St. Elmo's fire, polar aurora) *(Ref. 36)*.

electron affinity. 1: A measure of the ability of an atom or molecule to attract additional electrons.

2: The minimum energy required to remove an electron from a negative ion to produce a neutral atom or molecule.

electronic jamming. The deliberate radiation, reradiation, or reflection of electromagnetic energy with the object of impairing the use of electronic devices, equipment, or systems *(Ref. 5)*.

electronic line of sight. The path traversed by electromagnetic waves that is not subject to reflection or refraction by the atmosphere *(Ref. 5)*.

electronics. The broad field that includes devices, circuits, or systems that use devices wherein electrons move through a vacuum, gas, or semiconductor.

electronic warfare. Military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum and action that retains friendly use of the electromagnetic spectrum.

electron volt. An energy unit equal to the difference in energy between two electrons separated in potential by one volt.

electrophoresis. Migration of charged particles in a liquid as caused by an external electric field.

electrostatics. The branch of science that is concerned with electric phenomena associated with electric charges that are at rest.

elevation. 1: The height to which something is elevated.

2: The angular distance of a celestial object above the horizon.

3: The vertical distance of ground forms, usually measured in feet or meters, above mean sea level (plus elevation) or below mean sea level (minus elevation) *(Ref. 5)*.

elutriation. A technique for determining the size of a particle from its rate of fall by Stokes' law. In elutriation, a dust sample is introduced into an upward-moving fluid stream of controllable velocity. By varying the velocity of the fluid stream, different particle sizes are separated (elutriated), and the sizes can be calculated from the known velocity of the fluid.

eluviation. The movement of dissolved or suspended material within the soil by movement of water when there is an excess of rainfall over evaporation. Horizons that have lost material through eluviation are referred to as eluvial and those that have received material as illuvial. Eluviation may take place downward or sidewise according to the direction of water movement. As used the term refers especially, but not exclusively, to the movement of colloids, whereas leaching refers to the complete removal of material in solution *(Ref. 20)*.

emanometer. An instrument for the measurement of the radon content of the atmosphere. Radon is removed from a sample of air by condensation or adsorption on a surface, and is then placed in an ionization chamber and its activity determined *(Ref. 3)*.

embayed coast. A coast with many projecting headlands, bays, and outlying islands *(Ref. 1)*.

embedment. The process in which vehicles lose traction and the capability to move as a result of miring in soft terrain such as snow, mud, or sand.

embrittlement. An increase in the susceptibility of a metal to fracture under stress caused by the introduction of gas or other foreign atoms, by segregation of brittle constituents, by internal oxidation, by cold, or by certain types of corrosion *(Ref. 1)*.

emissivity. The ratio of the rate of emission of radiant energy in a given wavelength interval from a given surface to the rate of emission of a blackbody at the same temperature in the same wavelength interval when the radiation emitted by the surface is due solely to its temperature (i.e., excluding transmitted radiation, heat generated by chemical or other reactions, etc.) *(Ref. 1)*. The greatest value that an emissivity may have is unity, the least value zero.

emittance. A measure of the total radiant energy given off by a unit area of a surface

in unit time into the surface hemisphere at a given wavelength. Total emissive power refers to emittance at all wavelengths.

EMP *Abbr. for* electromagnetic pulse.

emplacement. A prepared position for weapons or military equipment.

encapsulation. The process of surrounding components with a foam or liquid that subsequently hardens providing protection to the components. Encapsulation provides vibration protection by coupling the system together so that its inertial and stiffness properties are distributed instead of having the components vibrate at their various resonant frequencies. Used especially with electronic equipment to eliminate high frequency resonance and to protect from shock and vibration.

encrustment. The coating of the ground and surface objects with a layer of salt particles during driving windstorms.

end moraine. *See:* terminal moraine.

endothermic. A type of chemical reaction in which heat is absorbed.

endurance limit. *See:* fatigue limit.

endurance test. *See:* test, endurance.

energy dissipater. A material used to dissipate kinetic energy during impact. Paper honeycomb, MIL-H-9884, is the approved energy dissipater for airdrop operations. Paper honeycomb dissipates the kinetic energy by crushing *(Ref. 17)*.

enthalpy. A thermodynamic function of state; a change in enthalpy represents the heat transfer to a system by a reversible isobaric process.

entrainment. The drawing along with as of dust or snow in a wind. In meteorology, the mixing of environmental air into a preexisting organized air current so that the environmental air becomes part of the current; the opposite of detrainment.

entropy. 1: A measure of the unavailable energy in a system, i.e., energy that cannot be converted into another form of energy or is not available to do work.

2: A measure of the degree of mixing of different kinds or sizes of sediments; high entropy approaches an unmixed sediment of one kind *(Ref. 18)*.

envanal. An empirical method of recording data which reflects the performance of equipment and materiel when operated under various worldwide conditions. It is formed from a contraction of the words environment and analysis *(Ref. 1)*.

environment. 1: The totality of natural and induced conditions occurring or encountered at any one time and place *(Ref. 1)*.

2: The integrated total of all stresses that influence the performance capability of man and equipment during transit, in storage (or confinement), or under field operating conditions *(Ref. 39)*. *See also:* artificial environment, induced environment, natural environment, operational environment.

environmental control. A method by which the severity of a damaging environmental stress is reduced to a level tolerable by equipment or personnel *(Ref. 1)*.

environmental damping. The dissipation of energy from a system vibrating in air or in a fluid. The damping force is approximately proportional to the square of the fluid viscosity.

environmental design criteria. Environmental parameters that represent a given degree of severity of conditions existing in nature, in equipment operation, or in storage, which are to be incorporated in the design of equipment *(Ref. 1)*.

environmental element. *See:* environmental factor.

environmental engineering. The branch of engineering concerned with the designing, developing, and testing of equipment or materials to function reliably under all environmental conditions expected during their intended operational, transportation, or storage life *(Ref. 1)*.

environmental factor. One of the components of an environment; often referred to as an environmental element. Environmental factors may be either:

(a) induced, including those conditions resulting from the operation of a structure or item of equipment; i.e., produced by man or his activities; or

(b) natural, including those conditions generated by the forces of nature and whose effects are experienced when the equipment or structure is at rest as well as when it is in operation. The distinction between natural and induced environmental factors cannot always be clearly discerned nor precisely defined; however, for purposes of this hand-

book they have been classified as follows:
(1) Natural factors: terrain, temperature, humidity, pressure, solar radiation, rain, solid precipitation, fog and whiteout, wind, salt, salt fog and salt water, ozone, macrobiological organisms, and microbiological organisms.
(2) Induced factors: atmospheric pollutants; sand and dust; vibration, shock, and acceleration; acoustics; electromagnetic radiation; and nuclear radiation.

environmental field test. A test or program of tests in which an item of materiel is subjected to storage and functional testing in one or more specific environments *(Ref. 1)*.

environmental lapse rate. The rate of decrease of temperature with elevation. The concept may be applied to other atmospheric variables (e.g., lapse rate of density) if these are specified. The environmental lapse rate is determined by the distribution of temperature in the vertical at a given time and place and should be carefully distinguished from the process lapse rate, which applies to an individual air parcel *(Ref. 1)*.

environmental operating conditions. The factors of the environment which singly or in combination have a significant effect upon military operations, and must, therefore, be considered in the design and testing of materiel *(Ref. 39)*.

environmental protection. Research and its application designed to maintain or improve the degree of effective performance of man and equipment under all types of environmental stress *(Ref. 1)*.

environmental research. The systematic study and investigation of any environmental factor or combination of factors for the purpose of discovering basic rules or principles governing their cause and behavior, extending knowledge of their occurrence and distribution, or ascertaining the relation between them and other aspects of the environment, both natural and induced *(Ref. 1)*. *See also:* **research** *and* **applied environmental research.**

environmental resistance features. The characteristics or the properties of an item that protect the item against the effects of an environmental exposure and that prevent internal conditions that might lead to deterioration *(Ref. 1)*.

environmental services. The various combinations of scientific, technical, and advisory activities (including modification processes; i.e., the influence of manmade and natural factors) required to acquire, produce, and supply information on the past, present, and future states of space, atmospheric, oceanographic, and terrestrial surroundings for use in military planning and decision-making processes, or to modify those surroundings to enhance military operations *(Ref. 5)*.

environmental simulation test. *See:* **test, environmental simulation.**

environmental stress. *See:* **stress, environmental.**

environmental test. A test of equipment, supplies, and techniques under a specific set of environmental conditions in which each is intended to be used. Such a test will normally be an integral part of other tests; i.e., engineer design, engineering, and service tests *(Ref. 39)*.

eolian. *See:* **aeolian.**

EPA *Abbr. for* Environmental Protection Agency.

ephemeral lake. *See:* **playa.**

ephemeral stream. A stream channel that carries water only during and immediately after periods of rainfall or snow melt *(Ref. 3)*.

ephemeris. A publication giving the computed places of the celestial bodies for each day of the year, or for other regular intervals *(Ref. 5)*.

Eppley pyrheliometer. A thermoelectric pyrheliometer in which radiation is allowed to fall on two concentric silver rings, the outer covered with magnesium oxide and the inner covered with lampblack. Thermocouples are used to measure the temperature difference between the rings *(Ref. 3)*.

equatorial air. 1: According to some authors, the air of the doldrums or the equatorial trough, to be distinguished somewhat vaguely from the tropical air of the trade-wind zones. Tropical air "becomes" equatorial air when the former enters the equatorial zone and stagnates. There is no significant distinction between the physical

properties of these two types of air in the lower troposphere *(Ref. 3)*.

2: An airmass that invades the Gulf Coast region of the United States from time to time. It has very high temperature and high moisture content. It is usually conditionally and convectively unstable, without a significant inversion or dry layer *(Ref. 18)*.

equatorial forest *or* **tropical rain forest.** The hot, wet, evergreen forest of the equatorial region, where rainfall is very heavy and where there is no dry season; it extends in parts into monsoon areas. Because of the extreme heat and moisture, the growth is dense and luxuriant.

equatorial trough. The quasi-continuous belt of low pressure lying between the subtropical high-pressure belts of the Northern and Southern Hemispheres. This entire region is one of very homogeneous air, probably the most ideally barotropic region of the atmosphere. Yet, humidity is so high that slight variations in stability cause major variations in weather *(Ref. 3)*.

equilibrium. 1: A static or dynamic state of balance between opposing forces.

2: *Thermodynamics.* Any state of a system that would not undergo change if the system were to be isolated. Processes in an isolated system not in equilibrium are irreversible and always in the direction of equilibrium.

3: *Mechanics.* A state in which the vector sum of all forces, i.e., the acceleration vector, is zero. In hydrodynamics, it is usually further required that a steady state exist throughout the atmospheric or fluid model. The equilibrium may be stable or unstable with respect to displacements therefrom. *(Ref. 3)*

equilibrium vapor pressure. The vapor pressure of a system in which two or more phases of a substance coexist in equilibrium. In meteorology the reference is to water unless otherwise specified. If the system consists of moist air in equilibrium with a plane surface of liquid water or ice, the more specialized saturation vapor pressure is usually employed, in which case the vapor pressure is a function of temperature only *(Ref. 1)*.

equilibrium water. The water content of a solid that will remain unchanged by further exposure to air of a given humidity, temperature, and pressure *(Ref. 1)*.

equinox. 1: Either of the two points of intersection of the apparent annual path of the sun and the plane of the Equator of the earth; i.e., a point of intersection of the ecliptic and the celestial Equator.

2: Popularly, the time at which the sun passes directly above the Equator; the "time of the equinox." *(Ref. 3)*

equipment. All articles needed to outfit an individual or an organization. The term refers to clothing, tools, utensils, vehicles, weapons, and other similar items. As to type of authorization, equipment may be divided into special (or project) equipment, equipment prescribed by tables of allowances, and equipment prescribed by tables of organization and equipment *(Ref. 26)*.

equivalent drop height. The height from which a load dropped in free fall would achieve the same impact velocity as that experienced in a parachute drop *(Ref. 17)*.

equivalent temperature. 1: Isobaric equivalent temperature. The temperature that an air parcel would have if all water vapor were condensed out at constant pressure, the latent heat released being used to heat the air.

2: Adiabatic equivalent temperature: the temperature an air parcel would have after: (a) dry-adiabatic expansion until saturated, (b) pseudoadiabatic expansion until all moisture is precipitated out, and (c) dry-adiabatic compression to the initial pressure *(Ref. 3)*.

erg. 1: *Physics.* The work performed by a force of 1 dyn acting through a distance of 1 cm. The erg is the unit of energy or work in the centimeter-gram-second system *(Ref. 15)*.

2: *Geology.* An extensive area in a desert where the surface is loose or almost unconsolidated sand, usually forming high dunes. Sometimes called a sand sea *(Ref. 1)*.

erode. Removal and transport of material from a surface, usually the earth, by wind, water, or other natural agents *(Ref. 2)*.

erosion. 1: *Geology.* The wearing away of the land surface by detachment and transport of soil and rock materials through the action of moving water, wind, or other geological agents *(Ref. 16)*.

2: *Metallurgy*. Destruction of metal or other material by the abrasive action of liquid or gas.

erosion, accelerated. Rapidly occurring erosion (compared to natural processes) due to the activities of man or, rarely, the activities of animals *(Ref. 2)*.

erratic. *A.* large rock fragment transported from a distant source, especially by the action of glacial ice *(Ref. 32)*.

erythema. 1: A reddening of the skin due to capillary congestion. Several forms of erythema can be caused by undue exposure of the human body to weather elements. The most common is sunburn; frostbite is not uncommon nor is windburn; snowburn is common in Alpine regions *(Ref. 3)*.

2: Redness of the skin caused by heat, drugs, ultraviolet rays, or ionizing radiation.

escarpment. A cliff or steep slope of considerable length facing in one general direction. Escarpments are produced by faulting or by erosion; however, the abbreviated form "scarp" is usually limited to cliffs formed by faulting *(Ref. 32)*.

esker. A long, narrow sinuous ridge composed chiefly of irregularly stratified sand and gravel. It was once the bed of a stream flowing beneath or in the ice of a glacier and was left behind when the ice melted *(Ref. 20)*.

estuary. The widened channel at the mouth of a river, in which the influence of the tides is felt. The water in an estuary is normally brackish *(Ref. 1)*. Estuaries are delicate ecosystems; they serve as nurseries, and spawning and feeding grounds for a large group of marine life and provide shelter and food for birds and wildlife *(Ref. 9)*.

ETL *Abbr. for* U S Army Engineer Topographic Laboratories.

evacuation. 1: The process of moving any person who is wounded, injured, or ill to and/or between medical treatment facilities.

2: The clearance of personnel, animals, or materiel from a given locality.

3: The controlled process of collecting, classifying, and shipping unserviceable or abandoned materiel, United States and foreign, to appropriate reclamation, maintenance, technical intelligence, or disposal facilities *(Ref. 5)*.

evaporation. The process by which a substance is changed from the liquid into the vapor state. In hydrology, evaporation is vaporization that takes place at a temperature below the boiling point *(Ref. 6)*.

evaporation pan. A type of atmometer; a pan used in the measurement of the evaporation of water into the atmosphere. The National Weather Service evaporation pan (class-A pan) is a cylindrical container fabricated of galvanized iron or monel metal with a depth of 10 in. and a diameter of 4 ft *(Ref. 1)*.

evaporation, total. The sum of water lost from a given land area during any specific time by transpiration from vegetation and building of plant tissue; by evaporation from water surfaces, moist soil, and snow; and by interception. It has been variously termed evaporation, evaporation from land areas, evapotranspiration, total loss, water losses, and fly off *(Ref. 3)*.

evaporative power. A measure of the degree to which the weather or climate of a region is favorable to the process of evaporation. It is usually considered to be the rate of evaporation, under existing atmospheric conditions, from a surface of water that is chemically pure and has the temperature of the lowest layer of the atmosphere *(Ref. 1)*.

evaporativity. *See:* evaporative power.

evaporimeter. An instrument for measuring the rate of evaporation of water into the atmosphere *(Ref. 15)*.

evaporite. One of the sediments deposited from an aqueous solution as a result of extensive or total evaporation of the solvent.

evapotranspiration. The combined processes by which water is transferred from the surface of the earth to the atmosphere; evaporation of liquid or solid water plus transpiration from plants *(Ref. 1)*.

evergreen. Any of the various needled and broad-leaved trees, shrubs, and herbs that retain their green foliage throughout the year, and that do not shed this foliage until the new leaves have developed *(Ref. 11)*.

exaggeration factor. 1: The factor by which a real-time environment stress level must be multiplied in order to simulate a real-time service life by laboratory test of short duration *(Ref. 22)*.

2: The factor used in short-term environ-

mental testing which specifies the amount by which the level of an environmental factor must be raised in a short duration test to simulate long-term environmental exposure in the service environment.

excitation. The process of applying an external force or other input to a system in such a manner that the system responds in some fashion *(Ref. 22)*.

exfoliation. A weathering process that consists of the peeling off of thin layers of rock from the surface. In hot deserts it is caused by the heating of the rocks by day and their cooling by night, leading to alternate expansion and contraction. The corners of rock masses are broken off, and the surfaces assume a rounded form. The process is often assisted by others, such as the chemical weathering of the outer layers. The term "onion weathering" is sometimes used for exfoliation *(Ref. 20)*.

exosphere. The uppermost layer of the atmosphere, the outer boundary of which is variously estimated to be at 500 to 1,000 km altitude and is the critical layer of escape from the atmosphere into space.

exposure. 1: State of being open to the effects of a certain natural or simulated factor or condition. Natural exposure refers to the subjection of a material to normal service conditions; accelerated exposure refers to subjection to more stringent conditions.
2: *Meteorology.* The physical location of an instrument *(Ref. 3)*.
3: The general surroundings of a site, with special reference to its openness to wind and sunshine *(Ref. 3)*.

external exposure. Exposure to ionizing radiations coming from a source outside the body *(Ref. 1)*.

extinction. The attenuation of light; i.e., the reduction in illuminance of a parallel beam of light as the light passes through a medium wherein absorption and scattering occur *(Ref. 3)*.

extinction coefficient. A measure of the space rate of diminution, or extinction, of any transmitted light; thus, it is the attenuation coefficient applied to visible radiation. The extinction coefficient is identified in a form of Bouguer's law (or Beer's law) *(Ref. 3)*:

$$I = I_o e^{-\sigma x}$$

where

I = illuminance (luminous flux density) at a selected point in space

I_o = source illuminance

x = distance of point from source

σ = the extinction coefficient

extraction parachute. An auxiliary parachute designed to release and extract cargo from aircraft in flight and deploy cargo parachutes *(Ref. 5)*.

extraction system. A system used to withdraw airdrop items from aircraft in flight *(Ref. 17)*.

extraterrestrial radiation. 1: Radiation (electromagnetic and charged particles) originating in space beyond the atmosphere of the earth; e.g., solar radiation and primary cosmic rays.
2: *Meteorology.* The solar electromagnetic radiation received at the outer limits of the atmosphere *(Ref. 1)*.

extreme. *Climatology.* The highest and, in some cases, the lowest value of a climatic element observed during a given period or during a given month or season of that period. If this is the whole period for which observations are available, it is the absolute extreme *(Ref. 3)*.

extremely arid (climate). A climate in which at least 10 mo of the year have no more than 1 day with precipitation of 0.1 in. or more *(Ref. 23)*.

eye of the storm *or* **eye.** *Meteorology.* The roughly circular area of comparatively light winds and fair weather found at the center of a severe tropical cyclone. The winds are generally 10 kt or less; no rain occurs; sometimes blue sky may be seen. Eye diameters vary from 4 to more than 40 mi; common magnitudes seem to be 12 to 25 mi *(Ref. 1)*.

F

F *Abbr. for* farad.

f *Abbr. for* femto 10^{-15}.

FAA *Abbr. for* Federal Aviation Agency.

facility. A physical plant, such as real estate and improvements thereto including buildings and equipment, that provide the means for assisting or making easier the performance of a function.

facsimile. A system of telecommunication for the transmission of fixed images with a view to their reception in a permanent form.

fadeout *or* **radio fadeout;** *also* **Dellinger effect; Mogel-Dellinger effect.** A type of fading in which the received signal strength is reduced to a value below the noise level of the receiver. The most common cause of fadeout is a disturbed ionosphere *(Ref. 3).*

fading. The resultant change or loss in the original color of protective coatings or materials due to exposure to solar radiant energy, heat, chemicals, chemical fumes, or combinations of these *(Ref. 1).*

fahrenheit temperature scale *(Abbr.* F). A temperature scale with the ice point at 32° and the boiling point of water at 212°. Conversion to the centigrade or Celsius temperature scale (C) is accomplished by the formula *(Ref. 3)*: $F = \frac{9}{5} C + 32$.

failure. 1: Any operational or performance degradation, or any irreversible material or structural change, when examined in accordance with specific failure criteria *(Ref. 1).*

2: A detected cessation of ability to perform a specified function or functions, within previously established limits, in the area of interest. It is a malfunction that is beyond adjustment by the operator by means of controls normally accessible to him during the routine operation of the device *(Ref. 33).*

failure, catastrophic. A sudden change in the operating characteristics of some part or parameter resulting in a complete failure of the item; e.g., circuit opens or shorts, or structural failure *(Ref. 33).*

failure, random. Any catastrophic failure whose probability of occurrence is invariant with time and whose occurrence within any given interval of time is, consequently, unpredictable; e.g., O-ring leakage, shorted electron tubes, or wire breakage *(Ref. 33).*

failure, wear out. A failure that occurs as a result of deterioration processes or mechanical wear and whose probability of occurrence increases with time. Wear out failures are those failures that occur generally near the end of life of an item and are usually characterized by chemical or mechanical changes; i.e., those failures that could have been prevented by a replacement policy based on the known wear-out characteristics of the item; e.g., motor brush wear out *(Ref. 33).*

fair-weather route. A road that quickly becomes impassable in adverse weather and that cannot be kept open by maintenance short of major construction.

fallback. The part of the material carried into the air by a surface or subsurface atomic explosion that ultimately drops back to the earth or water at the site of the explosion *(Ref. 14). See:* **fallout.**

falling tide. The portion of the tide cycle between high water and the following low water *(Ref. 3).*

fallout. The process of precipitation to earth of radioactive particulate matter from a nuclear cloud; also applied to the particulate matter itself *(Ref. 5).*

fallout contours. Lines joining points that have the same radiation intensity that define a fallout pattern, represented in terms of roentgens per hour *(Ref. 5).*

fallout pattern. The distribution of fallout

portrayed by fallout contours *(Ref. 5)*.

false horizon. A line resembling the visible horizon but above or below it *(Ref. 40)*.

fan. *See:* alluvial cone.

FAR *Abbr. for* Federal Aviation Regulations.

far-field region. *See:* Fraunhofer region.

fast ice Any type of sea, river, or lake ice attached to the shore (ice foot, ice shelf), beached (short ice), stranded in shallow water, or frozen to the bottom of shallow waters (anchor ice) *(Ref. 3)*.

fatigue. A reaction that takes place in material under repeated cyclic stressing, resulting in a tendency for that material to fail below its static ultimate strength *(Ref. 1)*.

fatigue-decreased performance (FDP). Applied to the reduction in performance of human beings when exposed to vibration. Tracking performance, visual acuity, orientation sensing, speech, and reaction time can all be affected by various amplitudes and frequencies of whole-body vibration.

fatigue life. The number of cycles of stress or stress reversals that can be sustained prior to failure for a stated test condition *(Ref. 1)*.

fatigue limit. The maximum stress below which a material can presumably endure an infinite number of stress cycles. If the stress is not completely reversed, the value of the mean stress, the minimum stress, or the stress ratio should be stated. The fatigue limit of a material is frequently referred to as its endurance limit *(Ref. 1)*.

fault. A fracture in the crust of the earth accompanied by a displacement of one side with respect to the other in a direction parallel to the fracture *(Ref. 10)*.

faulting. Movement along a fault. Faulting is the most usual cause of earthquakes *(Ref. 1)*.

fault-line scarp. A scarp created by erosion from an original scarp that resulted from faulting. It may have the same relief as the original scarp but is usually behind it and much more irregular in outline *(Ref. 32)*.

fault-scarp. A scarp caused by movement along a fault, even though erosion may have greatly scarred the initial topography *(Ref. 32)*.

fauna. 1: The animals of a region, zone, or environment.

2: A list, catalogue, or systematic report with keys or descriptions pertaining to the animals of a specific region, hence arctic fauna, alpine fauna *(Ref. 9)*.

FDP *Abbr. for* fatigue-decreased performance.

Federal Stock Number. A two-part number assigned to each item of supply repetitively used, purchased, stocked, or distributed within the Federal Government. The first part of the number consists of the applicable 4-digit class code number of the Federal Supply Classification (FSC). The second part of the number consists of a series of seven numbers and is known as the Federal Item Identification Number (FIIN). It is a nonsignificant number and is serially number-assigned *(Ref. 26)*.

Federal Supply Classification. A uniform supply classification system designed to serve the commodity classification system needs of supply operations within the Federal Government. It divides the universe of items of supply into broad commodity groups, each Federal Supply Classification group being further subdivided into classes. The Federal Supply Classification utilizes a 4-digit coding structure. The first two digits of the code number identify the group; the second two digits of the code number identify the classes within each group *(Ref. 26)*.

Feret's diameter. A term used in particle sizing by microscope which is the mean of the distances between two tangents on opposite sides of each particle image, the tangents being drawn perpendicular to the direction of traverse.

fetch. 1: The area in which ocean waves are generated by the wind. It is generally delineated by coast lines, fronts, or areas of wind curvature or divergence.

2: The length of the fetch area, measured in the direction of the wind *(Ref. 3)*.

FIDO *Abbr. for* fog investigation and dispersal operation.

field army. Administrative and tactical organization composed of a headquarters, certain organic army troops, service support troops, a variable number of corps, and a variable number of divisions *(Ref. 26)*.

field brightness. *See:* adaptation luminance.

field luminance. *See:* adaptation luminance.

field maintenance. Maintenance authorized

and performed by designated maintenance activities in direct support of using organizations. It is normally limited to replacement of unserviceable parts, subassemblies, or assemblies *(Ref. 5)*.

field moisture capacity. The percentage of water left in an originally saturated soil after free drainage has practically ceased (2 or 3 days are required) *(Ref. 2)*.

field moisture deficiency. The quantity of water that would be required to restore the soil moisture to field moisture capacity *(Ref. 6)*.

field strength meter. An instrument used to measure the electrical field strength of electromagnetic signals in a given location.

field supply. The service authorized and prescribed to be performed by designated mobile, semimobile, and fixed organizations and/or installations in providing initial replacement and replenishment supply support to using units and to collateral field maintenance activities.

FIIN *Abbr. for* Federal Item Identification Number.

filiform corrosion. A form of metallic corrosion (the primary phase in electrolytic corrosion) characterized by a threadlike or filamentlike configuration.

fine-grained soil. A soil of which more than 50 percent of the grains, by weight, will pass a No. 200 sieve (smaller than 0.074 mm in diameter) *(Ref. 41)*.

finish. 1: The quality of a surface as determined by color, brightness, texture, and general surface appearance.

2: Any surface treatment accomplished for the purposes of protecting equipment against environmental depreciation, enhancing appearances, for camouflage purposes, or for identification *(Ref. 1)*.

fiord or **fjord.** A deep, narrow, and steep-walled inlet of the sea formed in most instances by intense glacial erosion of a valley. Most are the direct result of erosion by tongues of ice entering the ocean and moving along the bottom *(Ref. 32)*.

fireball. The luminous sphere of hot gases that forms a few millionths of a second after detonation of a nuclear weapon and immediately starts expanding and cooling *(Ref. 5)*.

firn; *also* **accumulation area, firn field, névé, snow field, surplus area.** In the International Snow Classification, old snow that has lasted through at least one summer; the flakes have changed to grains of spherical shape which may or may not be bonded together. Firn may later become glacial ice *(Ref. 11)*. *See also:* **firn line.**

firn line. The highest level to which the fresh snow on a glacier surface retreats during the melting season. The line separating the accumulation area from the ablation area *(Ref. 6)*. *See also:* **firn.**

firn snow. *See:* **old snow.**

first bottom. The normal flood plain of a stream, subject to frequent or occasional flooding *(Ref. 16)*.

first light. The beginning of morning nautical twilight; i.e., when the center of the morning sun is 12 deg below the horizon *(Ref. 5)*.

first-order climatological station. As defined by the World Meteorological Organization (1956), a meteorological station at which autographic records or hourly readings of atmospheric pressure, temperature, humidity, wind, sunshine, and precipitation are made, together with observations at fixed hours of the amount and form of clouds and notes on the weather *(Ref. 3)*.

fishtail wind. Wind that is constantly changing direction back and forth *(Ref. 12)*.

fissile. Said of a material or substance that can be split or cleaved.

fissure. A cleft or narrow crack resulting from the parting of a material or substance.

fixed echo. A radar echo that is caused by reflection from a fixed object such as a terrain form or building detected by the radar set *(Ref. 12)*.

flagellum. A long whiplike appendage that projects singly or in groups from a cell and is used as the organ of locomotion of many micro-organisms.

flaking. A protective coating failure associated with paints, varnishes, lacquers, and allied formulations. It is characterized by actual detachment of pieces of the coating either from its substratum or from paint previously applied. Flaking is sometimes referred to as scaling and is generally preceded by checking or cracking. Flaking is attributed to loss of adhesion of the coating *(Ref. 1)*.

flame ionization. A method of measuring hydrocarbons present. The hydrocarbons are burned in a hydrogen flame, producing a flow of ions which can be measured electrically. The number of ions produced by a hydrocarbon molecule is proportional to the number of carbon atoms present in the molecule.

flame photometry. A method of determining the concentration of chemical elements based on the measurement of the intensity of specific spectral lines characteristic of the material. These spectral lines result from quantum excitation and decay of elements in the heat of a flame.

flammable-storage warehouse. A storeroom for the storage of flammable material. It is constructed of noncombustible materials and has firewalls with a 4-hr fire resistance rating. Automatic deluge-type sprinklers are installed along with an alarm-reporting system.

flash blindness. Temporary impairment of vision resulting from an intense flash of light. It includes loss of night adaptation and dazzle, and it may be associated with retinal burns *(Ref. 3)*.

flash burn. A burn caused by excessive exposures (of bare skin) to thermal radiation *(Ref. 5)*.

flash flood. A flood that rises and falls quite rapidly with little or no advance warning, usually as the result of intense rainfall over a relatively small area. Other possible causes are ice jams and dam failure *(Ref. 3)*.

flashover. Electric breakdown across the surface of insulators. On exposed power lines in seasonally dry areas, airborne particles collect on insulator surfaces, and, when the first rain occurs, the soluble components of the dust film form a conducting electrolyte, greatly decreasing the resistance across the surface and causing flashover.

flatted cargo. Cargo placed in the bottom of the holds, covered with planks and dunnage, and held for future use. Flatted cargo usually has room left above it for the loading of vehicles which may be moved without interfering with the flatted cargo. Frequently, flatted cargo serves in lieu of ballast. Sometimes called understowed cargo *(Ref. 5)*.

float barograph. A type of recording siphon barometer. The mechanically magnified motion of a float resting on the lower mercury surface is used to record atmospheric pressure on a rotating drum *(Ref. 3)*.

floating base support. A form of logistic support in which supplies, repairs, maintenance and other facilities, and services are provided for operating forces from ships and craft within a harbor or anchorage *(Ref. 5)*.

floating ice *or* drift ice. Any sea ice that has drifted from its place of origin. The term is used in a broad sense to include any area of sea ice, other than fast ice, no matter what form it takes or how disposed *(Ref. 18)*.

flocculate. To aggregate or clump together individual tiny soil particles, especially fine clay, into small groups or granules. The opposite of deflocculate, or disperse *(Ref. 16)*.

floe. A single piece of sea ice, other than fast ice, large or small, described if possible as "light" or "heavy" according to thickness. A vast floe is over 10 km (5.4 nmi) across; a big floe is 1 to 10 km (3,281 ft to 5.4 nmi) across; a medium floe is 200 to 1,000 m (656 to 3,281 ft) across; a small floe is 10 to 200 m (32.8 to 656 ft) across *(Ref. 18)*.

floeberg. A mass of hummocked ice, formed by the piling up of many ice floes by lateral pressure; an extreme form of pressure ice. It may be more than 50 ft high and resemble an iceberg *(Ref. 3)*.

flood. 1: An overflow or inundation that comes from a river or other body of water and causes or threatens damage.

2: Any relatively high streamflow overtopping the natural or artificial banks in any reach of a stream.

3: A relatively high flow as measured by either gage height or discharge quantity *(Ref. 6)*.

flood-frequency curve. 1: A graph showing the number of times per year on the average, plotted as abscissa, that floods of magnitude, indicated by the ordinate, are equal or exceeded.

2: A similar graph but with recurrence intervals of floods plotted as abscissa *(Ref. 6)*.

flood plain. 1: A strip of relatively smooth land bordering a stream, built of sediment carried by the stream and dropped in the slack water beyond the influence of the

swiftest current. It is called a living flood plain if it is overflowed in times of high-water; but a fossil flood plain if it is beyond the reach of the highest flood.

2: The lowland that borders a river, usually dry but subject to flooding.

3: The land outside of a stream channel described by the perimeter of the maximum probable flood *(Ref. 6)*.

flood stage. 1: The gage height of the lowest bank of the reach in which the gage is situated. The term "lowest bank" is, however, not to be taken to mean an unusually low place or break in the natural bank through which the water inundates an unimportant and small area.

2: The stage at which overflow of the natural banks of a stream begins to cause damage in the reach in which the elevation is measured *(Ref. 6)*.

flood wave. A distinct rise in stage culminating in a crest and followed by recession to lower stages *(Ref. 6)*.

flood zone. The land bordering a stream that is subject to floods of about equal frequency; for example, a strip of the flood plain subject to flooding more often than once but not as frequently as twice in a century *(Ref. 6)*.

flora. 1: The vegetation of a region, zone, or environment.

2: A list, catalogue, or systematic report with keys or descriptions pertaining to the plants of a specific region; hence alpine flora, bog flora *(Ref. 11)*.

flotation. 1: The capacity of a vehicle, gun, or trailer to negotiate water obstacles without being in contact with the bottom.

2: The capacity of a vehicle to negotiate soft, unfavorable terrain such as mud, sand, or snow *(Ref. 5)*.

flow breccia. A type of lava flow, usually of silicic composition in which fragments of solidified or partly solidified lava, produced by explosion or flowage, have become welded together or cemented by the still fluid parts of the same flow.

flow-duration curve. A cumulative frequency curve that shows the percentage of time that specified discharges are equaled or exceeded *(Ref. 6)*.

fluid threshold. The windspeed at which sand movement is initiated by wind pressure alone.

flume. A channel, either natural or man-made, that carries water *(Ref. 9)*.

fluorescence. The process whereby a substance emits visible light while being irradiated with some form of energy.

flurry. A brief shower of snow accompanied by a gust of wind, or a sudden, brief wind squall *(Ref. 15)*.

flux; *also* transport. The rate of flow of some quantity, often used in reference to the flow of some form of energy *(Ref. 3)*.

flux density. The flux (rate of flow) of any quantity of, usually, a form of energy, through a unit area of specified surface. (Note that this is not a volumetric density like radiant density.)

flying levels. A line of levels in surveying, to determine approximate elevations to hundredths or tenths of a foot *(Ref. 12)*.

FM *Abbr. for* frequency modulated.

focus. In seismology, the source of a given set of elastic waves. The true center of an earthquake, within which the strain energy is first converted to elastic wave energy *(Ref. 1)*.

foehn. A warm, dry wind that descends the leeward side of mountain ranges. Its characteristics are the result of forced ascent, during which it absorbs the heat of condensation of its moisture, then descent, during which it warms at the dry adiabatic rate. "Chinook" of the northwest United States *(Ref. 13)*.

fog. A hydrometeor consisting of a visible aggregate of minute water droplets suspended in the atmosphere near the surface of the earth. According to international definition, fog reduces visibility below 1 km (0.62 mi). Fog differs from cloud only in that the base of fog is at the surface while clouds are above the surface. When composed of ice crystals, it is termed ice fog *(Ref. 1)*. *See also:* advection fog, ground fog, radiation fog.

fog bank. A fairly well-defined mass of fog observed in the distance, usually at sea.

fog chamber. *See:* chamber, fog.

fogging. The application of a chemical com-

pound, in the form of vapor, to interior surfaces or relatively inaccessible surfaces *(Ref. 12)*.

footcandle. A unit of illuminance or illumination equal to 1 lm ft^{-2}. Full sunlight with zenith sun produces an illuminance of the order of 10,000 fc on a horizontal surface. Full moonlight provides an illuminance of about 0.02 fc. Adequate illumination for steady reading is taken to be about 10 fc; that for close machine work is about 30-40 fc.

foothill. One of the lower subsidiary hills at the foot of a mountain or of higher hills. Commonly used in the plural *(Ref. 10)*.

forb. A nongrasslike herbaceous plant *(Ref. 19)*.

force balance accelerometer. An electromechanical feedback system actuated by a seismic mass.

forced oscillation *or* **forced vibration.** The steady-state oscillation of a system caused by a periodic excitation. (Transient oscillations are not considered.) *(Ref. 8)*.

force factor. In an electromechanical transducer, it is equal to (a) the force required to block the mechanical system divided by the corresponding current in the electrical system; (b) the open circuit voltage in the electrical system divided by the velocity in the mechanical system. Current may be replaced by charge in (a) and velocity by displacement in (b) *(Ref. 22)*.

ford. 1: A place where a stream or other water is commonly passed by man or beast by wading.
2: A place where a road or trail crosses a body of water without a bridge or ferry *(Ref. 10)*.

fordability. *See:* deep fording, shallow fording.

forest limit. *See:* timberline.

forest, mixed. A forest composed of trees of two or more species, usually with at least 20 percent being other than the principal species *(Ref. 19)*.

forest park. An open stand of trees with grasses underneath rather than the underbrush characteristically associated with forests *(Ref. 19)*.

forest, pure. A forest in which 80 percent or more by number of the trees are the same species. In special cases the percentage is reckoned on basal area or volume rather than number of trees *(Ref. 19)*.

forest, second-growth. 1: Forest growth that occurs after removal of the old stand by cutting, fire, or other cause.
2: In lumberman's pariance, the smaller trees left after lumbering or the trees available for a second logging *(Ref. 1)*.

forest type. A descriptive term used to classify a stand of similar composition and development due to certain ecological factors. The term suggests repetition of the same type under similar conditions. A type is temporary if due to passing influences such as logging or fire; permanent if no appreciable change is expected and if the type is due to ecological factors alone; climax if it is the ultimate state of a succession of temporary types *(Ref. 19)*.

fork lift truck. A self-propelled machine for raising and transporting material by means of two or more steel fingers that are inserted under the load and drawn up a vertical guide to the required level.

formation. In botany, one or more plant communities exhibiting a definite structure and physiognomy; a structural or physiognomic unit of vegetation; e.g., a graminoid marsh or a deciduous broadleaf forest *(Ref. 1)*.

fortin-type barometer. A type of cistern barometer. The principal feature of this instrument is that provision is made to increase or decrease the volume of the cistern so that when a pressure change occurs, the level of the cistern can be maintained at the zero of the barometer scale (the ivory point). This is accomplished by the rotation of a screw which operates against the leather lower surface of the cistern *(Ref. 3)*.

forward scatter. The scattering of radiant energy into the hemisphere of space bounded by a plane normal to the direction of the incident radiation and lying on the side toward which the incident radiation was advancing; the opposite of backward scatter *(Ref. 1)*.

forward slope. Any slope that descends towards the enemy *(Ref. 5)*.

fossil fuels. Coal, oil, and natural gas; so-called because they are derived from the remains of ancient plant and animal life *(Ref. 9)*.

F.P. *Abbr. for* frost point.

fracture. 1: The process of breaking a solid material.

2: The cracking or breaking of a mineral across its normal cleavage direction.

fragility. The ability of materiel to withstand shock and vibration, expressed as maximum permissible acceleration *(Ref. 22)*.

fragility rating. A quantitative description of the ability of an item to withstand impact without damage.

frame-twister road. A test road used to impart severe torsional stresses to vehicle structures as the vehicles traverse the road.

Fraunhofer region. The far-field region of an antenna. The region extending from a distance $d = \frac{aL^2}{\lambda}$ from the antenna to infinity, where L = length of antenna and λ = wavelength.

frazil. Discoid and crystalline ice that forms in supercooled water without coagulating into an ice sheet. It is the product of a critical air temperature and water temperature condition with the latter possibly dominated by radiational heat losses. Formation takes place in the more or less quiescent or tranquil flowing reaches of a stream where the critical supercooling may take place and prevail for sufficient time for the individual particle to form rather than for an ice sheet to grow outward from a shore. When the ice reaches a rapids or other area of excessive turbulence, it agglomerates and becomes very noticeable. It also forms in the sea (where it is called lolly ice). It may accumulate as anchor ice on rocks or other obstructions on the bottom of a river *(Ref. 1)*.

free. The condition of the substance within a mixture when it is not chemically combined with the other components of the mixture. For example, iron oxide in soils may be by itself as free iron oxide, or it may be combined with other elements in a mineral *(Ref. 16)*.

free acoustic field. A region which sound propagates by spherical divergence and is directional; characteristic of outdoor measurements.

free air. 1: The portion of the atmosphere undisturbed by objects on the surface of the earth, as by mountains or buildings *(Ref. 14)*.

2: *Meteorology.* The portion of the atmosphere above the planetary boundary layer, in which the effect of the surface friction of the earth on the air motion is negligible, and in which the air is usually treated as an ideal fluid; also called free atmosphere.

3: *Aerodynamics.* Nonturbulent air; air undisturbed by a moving body, as by an airfoil *(Ref. 14)*.

4: In contexts regarding atomic explosions, air sufficiently remote from surfaces or objects that an explosive effect, as blast, is not modified by reflected shock or scattering objects *(Ref. 14)*.

free-air anomaly. The difference between observed gravity and theoretical gravity which has been computed for latitude and corrected for elevation of the station above or below the geoid, by application of the normal rate of change of gravity for change of elevation, as in free-air *(Ref. 5)*.

free air overpressure. The unreflected pressure, in excess of the ambient atmospheric pressure, created in the air by the blast wave from an explosion *(Ref. 5)*.

free drop. The dropping of equipment or supplies from an aircraft without the use of parachutes *(Ref. 5)*.

free fall. A parachute manuever in which the parachute is manually activated at the discretion of the jumper or automatically at a preset altitude *(Ref. 5)*. *See also:* air movement; free drop; high velocity drop.

free field. A wave or potential field in a homogeneous, isotropic medium free from boundaries. In practice, it is a field in which the effects of the boundaries are negligible over the region of interest. The actual pressure impinging on an object (e.g., electroacoustic transducer) placed in an otherwise free sound field will differ from the pressure that would exist at the point with the object removed, unless the acoustic impedance of the object matches the acoustic impedance of the medium *(Ref. 1)*.

free oscillation *or* **free vibration.** Oscillation that occurs after the disturbance or original cause of the oscillation is no longer present *(Ref. 1)*.

freeze-dried. A food preparation process in which the food is quickly frozen and the frozen water subsequently removed by sublimation in a vacuum. It produces a high

quality product that does not require refrigeration.

freeze-thaw cycling. A term primarily applied to foodstuffs in which the materiel is exposed alternately to below-freezing and above-freezing temperatures. Such cycling adversely affects the nutritive and physical characteristics of the foodstuffs.

freezing index. As used by the U S Army Corps of Engineers, the number of degree days (above and below 32°F) between the highest and lowest points on the cumulative degree-days time curve for one freezing season *(Ref. 3)*.

freezing point. The temperature at which a liquid solidifies under any given set of conditions. It may or may not be the same as the melting point or the more rigidly defined true freezing point or (for water) ice point *(Ref. 1)*.

freezing rain. *See:* rain, freezing.

frequency. 1: In general, the number of times a designated phenomenon occurs within a given period. It may be expressed in units of radians per second or of oscillations (cycles) per second. *See:* herts.

2: *Climatology.* The number of times a designated phenomenon occurs within a given period. It may be expressed as occurrence frequency (e.g., number of rainy days per month, number of hours of sunshine per week) or percent frequency (percent of observations) *(Ref. 1)*.

frequency band. *See:* band, frequency

frequency, fundamental. 1: The reciprocal of the fundamental period.

2: The lowest natural frequency. The normal mode of vibration associated with this frequency is known as the fundamental mode *(Ref. 8)*.

frequency, infrared. The range of invisible radiation frequencies, which adjoins the visible red spectrum and extends to microwave radio frequencies. It ranges from below 10^{12} Hz to over 10^{14} Hz *(Ref. 1)*.

frequency modulation. *See:* modulation, frequency.

frequency, natural. The rate at which a freely vibrating body oscillates *(Ref. 1)*.

frequency, resonant. The frequency of excitation at which a body or system in forced vibration has its maximum response *(Ref. 1)*. *See:* resonance.

frequency response. The capability of test or measuring equipment to respond to the various frequency components of an external oscillatory stimulus *(Ref. 1)*.

fresh breeze. In the Beaufort wind scale, a wind whose speed is 17 to 21 kt (19 to 24 mph).

fresnel region. The near-field region of an antenna. The region extending from the antenna to a distance $d = \frac{aL^2}{\lambda}$ where L = length of antenna and λ = wavelength.

fresnel zone. Used to describe the amount of clearance (or obstruction) encountered by an electromagnetic wave. The nth fresnel zone may be defined as a cylindrical surface of revolution having the direct path as its axis, and possessing a contour such that the distance from the transmitting antenna to a point on the surface, plus the distance from this point to the receiving antenna is $n/2$ wavelengths greater than the direct path between transmitter and receiver *(Ref. 1)*.

fretting corrosion. *See:* corrosion, fretting.

friable. A term denoting the ease with which soils crumble *(Ref. 2)*.

friction. The rubbing together of two substances or bodies in contact with each other, or of a body in contact with a gas or fluid, etc.; the resistance to relative motion caused by this contact. Some specific types of friction are *(Ref. 14)*:

(a) *boundary friction.* Friction occurring when rubbing surfaces are separated by a very thin layer of lubricant.

(b) *dry friction.* Friction between solid surfaces without benefit of lubricant.

(c) *fluid friction.* Friction occurring when two bearing surfaces are covered with a lubricating fluid.

(d) *rolling friction.* Friction due to the indentation of the surfaces in rolling contact. It is frequently substituted for sliding friction, but is less than sliding friction. Example: the use of ballbearings.

(e) *skin friction.* (1) *Aerodynamics.* The friction of the air against the outside of a moving aircraft, rocket, or the like, especially at high speeds; the drag of resistance caused by this friction. (2) *Hydrodynamics.* Similarly, the friction of water against the hull of a ship.

(f) *surface friction.* The friction of a liquid

flowing through pipes, caused by rate of flow, pressure, liquid viscosity, etc.

friction layer. *Meteorology.* The lower layer of the troposphere, in which the friction of the air against the surface of the earth affects the movement of the air. The friction layer is considered to be anywhere from 1,500 to 3,000 ft thick. Above this layer lies the free atmosphere *(Ref. 14).*

frigorimeter. An instrument to measure the physiological cooling power in millicalories per square centimeter per minute. It consists of a blackened copper sphere, diameter 7.5 cm, the surface of which is maintained electrically at 36.5°C (97.7°F) against the heat losses due to all meteorological conditions of the ambient air. The temperature 36.5°C corresponds to the constant deep body temperature of man. (An older model was set at 33°C.) *(Ref. 1)*

fringing reef. A coral reef that is attached to the shore with no lagoon or open water between the reef and the land to which it is attached. It is usually built upon a shallow platform extending outward from the shoreline. At time of very low tide, the reef may not be submerged *(Ref. 32).*

front. *Meteorology.* Generally, the interface or transition zone between two airmasses of different density. Since the temperature distribution is the most important regulator of atmospheric density, a front almost invariably separates airmasses of different temperature. Along with the basic density criterion and the common temperature criterion, many other features may distinguish a front, such as a pressure trough, a change in wind direction, a moisture discontinuity, and certain characteristic cloud and precipitation forms *(Ref. 1).*

frontal free-field. Applied to acoustic measurements in which sound signals in a free-field are incident normal to the front at the microphone-transducing surfaces.

frontal moraine. *See:* terminal moraine.

frost. 1: A feathery deposit of minute ice crystals or grains upon a surface or object, formed directly from vapor in the air.

2: The process by which such ice crystals are formed.

3: Any temperature at which frost forms. Frost often forms when the close-lying air is above 0°C (32°F), especially in calm, clear weather when radiation or evaporation reduces a surface temperature to a point of freezing or below *(Ref. 14).*

frost action. In general, cycles of freezing and thawing of water contained in natural or manmade materials. This is especially applied to the disruptive effects of this action. In geology, two basic types of frost action are described: (a) congelifraction, the shattering or splitting of rock material; and (b) congeliturbation, the churning, heaving, and thrusting of soil material *(Ref. 3).*

frost heave; *also* **frost thrusting; frost lifting.** The upward or sideways movement of surface soils, rocks, and vegetation through the expansion of freezing subsurface soil and gravel *(Ref. 11).*

frosting. 1: The accumulation of frost on optical elements such as windshields and lenses, so as to reduce vision.

2: Obscuration of vision through optical elements resulting from surface roughness (sandblasting effect) caused by impingement of small airborne particulate matter.

frost line. The maximum depth of frozen ground during the winter. The term may refer to an individual winter, to the average over a number of years, or to the greatest depth recorded since observations began. The frost line varies with the nature of the soil and the protection afforded by vegetal ground cover and snow cover, as well as with the amount of seasonal cooling *(Ref. 3).*

frost mound; *also* **ice mound; ground ice mound.** A conical mound on a land surface, caused by the freezing of water in the ground. It is a product of frost heaving, but is unusual in that it requires a great concentration of water in a relatively small subsurface volume. Usually, a frost mound is of seasonal duration *(Ref. 3). See also:* pingo.

frost point. The highest temperature at which atmospheric moisture will sublimate in the form of hoarfrost on a cooled polished surface. It is analogous to the dewpoint, applying when the moisture in the atmosphere will not condense above 0°C *(Ref. 3). See also:* dewpoint.

frost-point hygrometer. An instrument for measuring the frost point of the atmosphere. Air under test is passed continuously

across a polished surface whose temperature is adjusted so that a thin deposit of frost is formed which is in equilibrium with the air *(Ref. 3)*.

frost table. *See:* permafrost table.

frost weathering. The mechanical disintegration of earth materials brought about by frost action *(Ref. 1)*.

frozen fog. *See:* ice fog.

frozen muskeg surface. A frozen mixture of decayed vegetable matter and siltlike material that resembles rough, hard ground *(Ref. 1)*.

FSC *Abbr. for* Federal Supply Catalog; Federal Supply Classification.

FSS *Abbr. for* Federal Supply Service.

fuel system icing. A problem occurring frequently during operational exercises with vehicles in arctic climates in which water droplets, occurring as a result of condensation from the vapor or from other sources of contamination, freeze to ice and clog fuel lines, cutting off the supply of fuel to the engine.

fume. Tiny solid particles commonly formed by the condensation of vapors of solid matter *(Ref. 9)*.

fumigant. A pesticide that is burned or evaporated to form a gas or vapor that destroys pests. Fumigants are often used in buildings or greenhouses *(Ref. 9)*.

fungicide. A pesticide chemical that kills fungi or prevents them from causing diseases, usually on plants of economic importance *(Ref. 9)*. *See:* pesticide.

fungus. Any of a major group of parasitic lower plants that lack chlorophyll, including molds, rusts, mildews, smuts, mushrooms, and some bacteria. Because of their inability to synthesize food, fungi are wholly dependent on organic materials for their nutrient supply. This dependence renders fungi capable of degrading almost all materials of an organic origin *(Ref. 1)*.

fungus-resistant coatings. Any of various types of surface coatings applied to materiel to reduce or inhibit the growth of fungi on the materiel surfaces.

funnel cloud. The popular name for tuba, or tornado cloud *(Ref. 3)*.

fusion. 1: The phase transition of a substance passing from the solid to the liquid state; melting. Additional heat at the melting point is required to fuse any substance. This quantity of heat is called the latent heat of fusion *(Ref. 1)*.

2: In nuclear technology, the transformation of nuclei by combining two light nuclei to form a heavier nucleus.

G

G *Abbr. for* giga (10^9).

g *Abbr. for* gram; gravity.

gage. 1: To determine the size, dimensions, or other measurable quantity.

2: An instrument for measuring or testing a parameter.

gage height. The water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term stage although gage height is more appropriate when used with a reading on a gage *(Ref. 6)*.

gage pressure. *See:* pressure, gage.

gage, strain. A device for measuring "strain" which is the deformation produced in a solid as a result of stress *(Ref. 40)*.

gaging station. A particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained *(Ref. 6)*.

gale. 1: In general, and in popular use, an unusually strong wind *(Ref. 3)*.

2: In storm-warning terminology: moderate gale, 28 to 33 kt; fresh gale, 34 to 40 kt; strong gale, 41 to 47 kt; and whole gale, 48 to 55 kt *(Ref. 1)*.

galling. The localized mutual seizure of two metal surfaces during sliding friction accompanied by the removal of metal particles from one or both surfaces *(Ref. 1)*.

galvanic corrosion. *See:* corrosion, galvanic.

galvanometer. An instrument for measuring the magnitude of a small electric current or for detecting the presence or direction of such a current by means of motion of an indicator in a magnetic field *(Ref. 15)*.

gamma ray. 1: Electromagnetic radiation of extremely short wavelengths, emitted by nuclei. The wavelengths of the highest energy gamma rays are shorter than X rays, but there is an overlapping wavelength region where the only distinction is the mode of origin; i.e., the gamma rays are produced by nuclear transitions whereas the X rays are produced by atomic processes. Gamma rays, produced in the atmosphere by interactions of cosmic rays with the nuclei of air molecules, are of some importance to atmospheric electricity because they contribute to the ionization of the atmosphere *(Ref. 1)*.

2: Gamma rays are the most penetrating of the three types of radiation and are best stopped by dense materials such as lead *(Ref. 9)*.

gantry crane. A large bridge crane in which the beam is supported at each end by a trestle that travels on tracks on the ground. Used particularly for heavy loads in port areas.

gap. 1: *Geology.* Any deep notch, ravine, or opening between hills or in a ridge or mountain chain *(Ref. 10)*.

2: Electric gap is the distance separating two electrodes between which a spark or arc is caused to pass.

3: Magnetic gap is the distance across an air gap separating two parts of a magnetic circuit.

gas. The fluid form of a material that can expand indefinitely to fill its container. A form neither liquid or solid, without independent shape or volume.

gas chromatographic-flame ionization detection (GC-FID) method. A reference method for measuring hydrocarbons corrected for methane.

gas thermometer. A thermometer that utilizes the thermal properties of gas. There are two forms of this instrument: (a) a type in which the gas is kept at a constant volume, and pressure is the thermometric property; and (b) a type in which the gas is kept at constant pressure, and volume is the thermometric property. The gas thermometer is the most accurate of all thermometers and is used as the standard instrument for measurement of temperature *(Ref. 3)*.

GC-FID *Abbr. for* gas chromatographic-flame ionization detection.

general cargo. Cargo that is susceptible for loading in general, nonspecialized stowage areas; e.g., boxes, barrels, bales, crates, packages, bundles, and pallets *(Ref. 5)*.

general purpose warehouse. A storage facility constructed with roof, sidewalls, and endwalls. It may be heated or unheated, and it may be provided with loading docks and cantilever-supported canopies. Most Army warehouses are of this type.

general supplies. Intraservice classification applied to ordnance, quartermaster, and transportation supplies. Ordnance general supplies include all ordnance supplies, with the exception of ammunition, required for the maintenance of an organization. Quartermaster general supplies include quartermaster materials and equipment required for housing, feeding, and maintaining a command but excluding fixed installations in buildings, subsistence, fuel, clothing, and individual equipment. Transportation general supplies include shelf items and items not ordinarily subject to special controls *(Ref. 26)*.

genesis, soil. *Pedology.* The mode of origin of the soil, with special reference to the processes responsible for the development of the solum, or true soil, from the unconsolidated parent material *(Ref. 16)*.

gentle breeze. In the Beaufort wind scale, a wind whose speed is from 7 to 10 kt (8 to 12 mi hr^{-1}) *(Ref. 3)*.

geodesy. The investigation of any scientific question concerned with the shape and dimensions of the earth. The term is often used to include both the science, which must depend upon determinations of the figure and size of the earth from direct measurements made on its surface (triangulation, leveling, astronomic, and gravity determinations), and the art, which utilizes

the scientific determinations in a practical way *(Ref. 18)*.

geodetic control. Horizontal position of points on the surface of the earth in the computation of which the curvature has been taken into account *(Ref. 12)*.

geodetic survey. *See:* survey, geodetic.

geographic coordinates. Latitude and longitude; north-south and east-west lines whose intersections are used to locate physical points on a map. The origin for latitude is the Equator and increases north and south to 90 deg. Origin for longitude is the meridian or great circle passing through Greenwich, England, called the Prime Meridian and increasing east and west to 180 deg *(Ref. 12)*.

geography. The subject that describes the surface of the earth, its physical features, climates, products, peoples, and their distribution *(Ref. 20)*.

geoid. A term used to signify the shape of the earth, an oblate spheroid with certain variations *(Ref. 20)*.

geology. The science of the composition, structure, and history of the earth. It includes the study of the materials of which the earth is made, the forces that act upon these materials and the resulting structures, the distribution of the rocks of the crust of the earth, and the history, not only of the earth itself, but also of the plants and animals that inhabited it throughout the different ages.

geomagnetic electrokinetograph. A device for measurement of the lateral component of the speed of an ocean current, by means of two pairs of electrodes towed astern of a ship, and suitable registering apparatus *(Ref. 15)*.

geomagnetism. 1: The magnetic phenomena, collectively considered, exhibited by the earth and its atmosphere.

2: The study of the magnetic field of the earth. *(Ref. 3)*

geomorphology. The study of the physical features of the earth, the arrangement and form of the crust of the earth, and of the relationship between these physical features and the underlying geological structures.

geophysics. The study of the physical processes relating to the structure of the earth, including not only the lithosphere but also the hydrosphere and the atmosphere. It signifies the physics of the earth linking the sciences of physics and geology *(Ref. 20)*.

geopotential. The potential energy of a unit mass relative to sea level, numerically equal to the work that would be done in lifting the unit mass from sea level to the height at which the mass is located; commonly expressed in terms of dynamic height or geopotential height *(Ref. 1)*.

geostrophic. Referring to the balance, in the atmosphere, between the horizontal coriolis forces and the horizontal pressure forces *(Ref. 3)*.

germicide. A chemical or agent that kills micro-organisms such as bacteria and prevents them from causing disease. Such compounds must be registered as pesticides with EPA *(Ref. 9)*.

geyser. A special type of hot spring that ejects intermittent jets of hot water and steam. The ejection of steam and water is caused by the contact of ground water with rock or vapor hot enough to generate steam under conditions that prevent continuous circulation *(Ref. 32)*.

giga-. A numerical prefix denoting one billion; e.g., a gigahertz is one billion cycles per second *(Ref. 4)*.

gilgai. Small irregularities of the soil surface resulting from expansion and contraction with changes in moisture. Since clay can absorb large amounts of water, soils high in clay content produce the most clearly visible gilgai. The irregularities consist of a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel to the direction of the slope *(Ref. 2)*.

girdle. To encircle the stem of a living tree with cuts that completely sever bark and cambium and often are carried well into the outer sapwood, for the purpose of killing the tree by preventing passage of nutrients *(Ref. 1)*.

glacial. 1: Pertaining to the presence, size, composition, or activities of extensive masses of land ice.

2: Pertaining to alterations or distinctive features of terrain resulting from the actions of glaciers *(Ref. 11)*.

glacial drift. *See:* drift, glacial.

glacial till. *See:* till.

glaciation. 1: The alteration of any part of the surface of the earth, either by erosion or deposition, as a result of glacier ice passing over it; the erosive action of glacier ice.
2: Any of several periods of geologic time during which glaciers were more extensive than at present.
3: The geographic distribution of glaciers.
4: The inundation of land by ice. Also called glacierization.
5: The process by which glaciers accumulate, move, and recede. *(Ref. 11)*

glacier. A body of ice (usually with some névé), consisting of recrystallized snow, lying wholly or largely on land, and showing evidence of present or former flow under the influence of gravity *(Ref. 1)*.

glacier iceberg. An iceberg derived from a glacier as distinguished from tabular icebergs derived from shelf ice *(Ref. 18)*. It is usually much smaller than a tabular iceberg and is bluish or greenish in color, with little or no snow covering. It often contains many crevasses *(Ref. 15)*.

glaciofluvial. Pertaining to a stream or streams formed by the meltwater of a glacier or glaciers, or to deposits made by such streams *(Ref. 1)*.

glare. Any hindrance to vision caused by scattering or reflection of light into an observer's line of sight *(Ref. 1)*.

glaze. A coating of ice, generally clear and smooth but usually containing some air pockets, formed on exposed objects by the freezing of a film of supercooled water deposited by rain, drizzle, fog, or possibly condensed from supercooled water vapor. Glaze is denser, harder, and more transparent than either rime or hoarfrost. Its density may be as high as 0.8 or 0.9 g cm^{-3}. Factors that favor glaze formation are large drop size, rapid accretion, slight supercooling, and slow dissipation of heat of fusion *(Ref. 1)*.

gleization. *Pedology.* A general term for all of the processes of soil formation leading to the development under the influence of excessive moistening and lack of oxygen of a neutral gray (gley) soil horizon in the lower part of the solum. The material is ordinarily bluish gray or blue gray, more or less sticky, compact, and often structureless *(Ref. 32)*.

gley soil. *Pedology.* A soil horizon in which waterlogging and lack of oxygen have caused the material to be a neutral gray in color. The term "gleyed" is applied, as in "moderately gleyed soil", to soil horizons with yellow and gray mottling caused by intermittent waterlogging *(Ref. 16)*.

global radiation *or* **global solar radiation** (*formerly* **total radiation**). The total of direct solar radiation and diffuse sky radiation received by a unit horizontal surface. Global radiation is measured by pyranometers *(Ref. 3)*.

glow discharge. Generic term for any gaseous electrical discharge that produces luminosity. Thus, corona discharge and Andes lightning are examples of glow discharges, but point discharge is not. Relatively high electric field strengths are required for glow discharges, since the density of recombining gas atoms and molecules must be high *(Ref. 3)*.

glucose. A natural sugar occurring in fruits and honey, having the formula $C_6H_{12}O_6$.

gneiss. A coarse-grained rock in which bands rich in granular minerals alternate with bands rich in platelike (mica) minerals.

goldbeater's skin hygrometer. A hygrometer using goldbeater's skin as the sensitive element. Variations of the physical dimensions of the skin caused by its hygroscopic character indicate atmospheric relative humidity. (*Note:* Goldbeater's skin is the prepared outside membrane of the large intestine of an ox; it is used in goldbeating to separate the leaves of the metal.) *(Ref. 3)*

gorge. A valley that is more than usually deep and narrow, with steep walls; there is no sharp distinction between a gorge and a canyon. The sides of a small gorge are sometimes nearly vertical.

graben. A block, generally long compared to its width, that has been downthrown along faults relative to the rocks on either side. Compare horst *(Ref. 1)*.

gradation. *Soil Mechanics.* The distribution and size of grains in a soil. It is determined by gradation analysis of soils, or by passing the soil through a series of screens of increasing fineness. The result is usually pre-

sented in the form of a cumulative grain-size curve in which particle sizes are plotted to a logarithmic scale with respect to percentage retained (or passing), by weight of the total sample, plotted to a linear scale *(Ref. 25)*.

grade. 1: *Engineering.* The rate of ascent or descent; deviation from a level surface to an inclined plane; stated: (a) as so many feet per mile, (b) as 1 ft rise or fall in so many of horizontal distance, (c) as so much in 100 ft, or (d) as a percentage of horizontal distance; as a grade of 20 ft per mile, or 1 in 264, or a 10-percent grade.

2: *Geomorphology.* The continuous curve of descent of a stream floor which everywhere is just steep enough to serve the need of the current for its flow and the transportation of its sediment load. It is commonly said that a river is *at grade* when its active downcutting ceases. *(Ref. 1)*

gradeability. Capability of a vehicle to negotiate a slope, either ascending or descending, measured in percent (not in degrees) *(Ref. 12)*.

gradient. 1: Slope expressed as a fraction in which the vertical distance is the numerator and the horizontal distance is the denominator *(Ref. 12)*.

2: Rate of change of temperature or pressure in a given direction; mathematical expression giving the direction and amount of the most rapid rate of decrease of temperature of pressure *(Ref. 12)*.

3: *Meteorology.* The space rate of decrease of a function. The ascendent is the negative of the gradient *(Ref. 1)*.

gram-rad. A unit of total energy absorbed from ionizing radiation. It is the product of the mass of the object irradiated and the energy absorbed per unit mass. As adopted by the International Commission on Radiological Units (ICRU), 1 gram-rad = 100 ergs *(Ref. 1)*.

granite. A very hard natural igneous rock formation of visibly crystalline texture formed essentially of quartz and orthoclase or microcline.

granulation. A form of deterioration in which the material breaks up into small particles.

granule. 1: A small particle or grain.

2: In the Wentworth system of size classification, a granule is a particle 2 to 4 mm in diameter. *(Ref. 32)*

grasslands. The regions of the world where the natural vegetation consists of grass; the rainfall is too light to permit forest growth but is less scanty and irregular than that of the deserts; the grasslands are thus normally situated between the forest belts and the arid regions.

graupel; *also* **soft hail; snow pellets; tapioca snow.** Precipitation consisting of white, opaque, approximately round (sometimes conical) ice particles having a snow-like structure, and about 2 to 5 mm in diameter. Snow pellets are crisp and easily crushed, differing in this respect from snow grains. They rebound when they fall on a hard surface, and they often break up. In most cases, snow pellets fall in shower form, often before or together with snow, and chiefly on occasions when the surface temperature is at or slightly below 0°C (32°F). It is formed as a result of accretion of supercooled droplets collected on what is initially a falling ice crystal *(Ref. 3)*.

gravel. Loose or unconsolidated coarse, granular material, larger than sand grains, resulting from reduction of rock by natural or artificial means. Sizes range from 3/16 in. (No. 4 sieve) to 3 in. in diameter. Coarse gravel ranges from 3 in. to 3/4 in., while fine gravel ranges from 3/4 in. to 3/16 in. *(Ref. 25)*.

gravimetric. Measurement by weight, distinguished from volumetric, which is measurement by volume.

gravitational pressure. *See:* **pressure, hydrostatic.**

gravity. (*Abbr.* g). 1: The gravitational force, as modified by centrifugal force due to rotation, exerted by the earth on bodies at or near its surface, resulting in their having weight.

2: A unit of acceleration equal to the acceleration resulting from the average force of gravity at the surface of the earth. By international agreement this unit is equal to 9.80665 $m\ s^{-1}\ s^{-1}$ *(Ref. 15)*.

gravity anomalies. Deviations between theoretical gravity and actual gravity due to local topographic and geologic conditions, such as the existence of mountains, valleys, oceans, or abnormally high or low density

of the materials near the place of measurement *(Ref. 40)*.

gravity, specific. The ratio of the weight of a substance to that of an equal volume of some other substance at the same or a standard temperature. The usual standard for liquids and solids is chemically pure water at 4°C *(Ref. 15)*.

gravity wave; *also* **gravitational wave.** A wave disturbance in which buoyancy (or reduced gravity) acts as the restoring force on parcels displaced from hydrostatic equilibrium *(Ref. 3)*.

gravity wind. A wind (or component thereof) directed down the slope of an incline and caused by greater air density near the slope than at the same levels some distance horizontally from the slope. This term usually is applied when the density difference is produced by surface cooling along the incline, as in the case of a mountain wind *(Ref. 1)*.

gray-brown podzolic soil. *Pedology.* A zonal great soil group consisting of soils with a thin, moderately dark A1 horizon, a grayish-brown A2 horizon, and a B horizon that contains a high percentage of bases and an appreciable quantity of silicate clay deposited from horizons above. It is formed on relatively young land surfaces, mostly glacial deposits from material relatively rich in calcium, under deciduous forests in humid temperate regions *(Ref. 2)*.

grayout. Transient dimming or haziness of vision caused by temporary reduction of blood circulation to the brain, commonly occurring in pilots during acrobatic maneuvers in which accelerative forces cause pooling of the blood away from the brain.

grazing incidence. In acoustic measurements, the configuration in which the angle between the longitudional axis of the transducer and the direction of travel of the pressure pulse is 90 deg.

great soil group *Pedology.* Any one of several broad groups of soil with fundamental characteristics in common. Examples are chernozem, gray-brown podzolic, and podzol *(Ref. 16)*.

greenhouse effect. The heating effect of the atmosphere upon the earth. Light waves from the sun pass through the air and are absorbed by the earth. The earth then reradiates this energy as heat waves that are absorbed by the air, specifically by carbon dioxide. The air thus behaves like glass in a greenhouse, allowing the passage of light but not of heat. Thus, many scientists theorize that an increase in the atmospheric concentration of CO_2 can eventually cause an increase in the surface temperature of the earth *(Ref. 9)*.

Greenwich mean time. Mean solar time at the meridian of Greenwich, England, used as a basis for standard time throughout the world. Normally expressed in four numerals 0001 through 2400 *(Ref. 5)*.

grid. 1: Two sets of parallel lines intersecting at right angles and forming squares; the grid is superimposed on maps, charts, and other similar representations of the surface of the earth in an accurate and consistent manner to permit identification of ground locations with respect to other locations and the computation of direction and distance to other points.

2: A term used in giving the location of a geographic point by grid coordinates *(Ref. 5)*.

grid north. The northerly or zero direction indicated by the grid datum of directional reference *(Ref. 5)*.

groin. *See:* jetty.

ground. *Electricci.* To connect to a ground, the earth, or other large conducting body to serve as a ground, thus making a complete electrical circuit *(Ref. 4)*.

ground *or* **earth.** 1: The conducting mass of the earth, or a conductor connected to it through a very small impedance.

2: A conductor that is usually considered to have zero electrical potential. The electrical potential of the earth is usually taken to be zero. *(Ref. 8)*

ground clutter. The pattern of radar echoes from fixed ground targets near the radar. This type of clutter tends to hide or confuse the echoes returned from nearby moving or precipitation targets *(Ref. 1)*.

ground cover. All herbaceous plants and low growing shrubs on a specific area, and the organic materials in various stages of decay *(Ref. 11)*.

ground cushion. A cushion of air associated with ground effect *(Ref. 14)*.

ground effect machine. A machine that nor-

mally flies within the zone of the ground effect or ground cushion *(Ref. 5)*.

ground effect phenomenon. The generation of an air cushion artificially so that a vehicle is supported on the air cushion close to the ground but nevertheless riding free, hence utilising this effect to eliminate ground friction. Ground effect machines utilize this phenomenon *(Ref. 12)*.

ground environment. The environment that surrounds and affects a system or a piece of equipment that operates on the ground *(Ref. 40)*.

ground fog. According to United States weather observing practice, a fog that hides less than 0.6 of the sky and does not extend to the base of any clouds that may lie above it *(Ref. 1)*.

ground frost. A freezing condition injurious to vegetation, which is considered to have occurred when a thermometer exposed to the sky at a point just above a grass surface records a minimum temperature (grass temperature) of 30.4° F or below *(Ref. 1)*.

ground ice mound. *See:* frost mound.

ground ice wedge. *See:* ice wedge.

ground moraine. A heterogeneous, unstratified accumulation of earth, sand, gravel, and boulders, deposited by a glacier, ordinarily thin compared with its areal extent and usually with gently irregular topographic expression. Ground moraine is presumed accumulated largely by lodgment beneath the glacier ice but partly also by subsidence from the upper surface as the glacier ice melts or evaporates *(Ref. 32)*. *See:* moraine.

ground visibility. Prevailing horizontal visibility near the surface of the earth as reported by an accredited observer *(Ref. 5)*.

ground water. Water in the ground that is in the zone of saturation, from which wells, springs, and ground-water runoff are supplied *(Ref. 6)*.

ground-water laterite soil. *Pedology.* A great soil group of the intrazonal order and hydromorphic suborder, consisting of soils characterized by hardpans or concretional horizons formed immediately above the water table. These hardpans are rich in iron, aluminum, and sometimes manganese *(Ref. 2)*.

ground-water outflow. The part of the discharge from a drainage basin that occurs through the ground water. The term "underflow" is often used to describe the ground-water outflow that takes place in valley alluvium (instead of the surface channel) and thus is not measured at a gaging station *(Ref. 6)*.

ground-water podzol soil. *Pedology.* A great soil group of the intrazonal order and hydromorphic suborder, consisting of soils with four defined layers. On the surface is an organic mat followed in downward order by a very thin layer of acid humus material, a whitish-gray leached layer, which may be as much as 2 or 3 ft in thickness, and, finally, a brown, or very dark-brown, cemented hardpan layer. It is formed under various types of forest vegetation in cool to tropical, humid climates under conditions of poor drainage *(Ref. 2)*.

ground-water runoff. The part of the runoff that has passed into the ground, has become ground water, and has been discharged into a stream channel as spring or seepage water *(Ref. 6)*.

ground-water table. The top of the saturated zone in which ground water has completely filled the openings between individual soil and rock particles. Most of the ground water occurs within a few hundred feet of the surface of the earth.

ground wave. 1: The portion of a radio wave in proximity to and affected by the ground, being somewhat refracted by the lower atmosphere and diffracted by the surface of the earth. Such a wave travels more or less parallel to the surface of the earth *(Ref. 15)*.

2: A wave formed in the ground by an explosion. It can be of three types: longitudinal wave (compression), transverse wave (shear), and surface wave (similar to a water ripple). It can be induced by direct ground shock (as in a ground or subsurface burst) or by blast transmitted through the air (as in any type of burst) *(Ref. 40)*.

ground zero. The point on the surface of land or water at, or vertically below or above, the center of the burst of a nuclear weapon *(Ref. 5)*.

grus. Deposits resulting from the weathering of the various minerals forming igneous rock. The deposits consist of the accumulation of countless discrete particles on the

surface of the rock, sometimes to a depth of over 1 m *(Ref. 1)*.

GSA *Abbr. for* Government Supply Agency.

gulch. A narrow deep ravine with steep sides formed by a torrent.

Gulf Stream. A warm, well-defined, swift, relatively narrow ocean current originating off Cape Hatteras, N.C., and flowing north to meet the Labrador Current east of the Grand Banks. Sometimes the Florida Current, Gulf Stream, and North Atlantic Current are collectively referred to as the Gulf Stream.

gully. A small ravine or miniature valley, especially one cut by running water, but through which water flows only after a rain. It is smaller than a ravine or valley *(Ref. 15)*.

gust. A sudden brief increase in the speed of the wind. It is of a more transient character than a squall and is followed by a lull or slackening in the windspeed. Generally, winds are least gusty over large water surfaces and most gusty over rough land and near high buildings. According to United States weather observing practice, gusts are reported when the peak windspeed reaches at least 16 kt and the variation in windspeed between the peaks and lulls is at least 9 kt. The duration of a gust is usually less than 20 s *(Ref. 1)*.

gymnosperm. A class of plants that produces seeds without protective covering; e.g., the conifers.

gyroscope, directional. A gyroscopic instrument for indicating direction, containing a free gyroscope which holds its position in azimuth and thus indicates angular deviation from a preset heading *(Ref. 40)*.

H

H *Abbr. for* henry.

h *Abbr. for* hour.

habitat. The sum total of environmental conditions of a specific place that is occupied by an organism, a population, or a community *(Ref. 9)*.

haboob (many variant spellings, including habbub, habub, haboub, hubbob, hubbub). A strong wind and sandstorm or duststorm in the northern and central Sudan, especially around Khartoum, where the average number is about 24 per year. The name comes from the Arabic word habb, meaning "wind". Haboobs are most frequent from May through September, especially in June. Their average duration is 3 hr; they are most severe in April and May when the soil is driest. The average maximum windspeed is over 30 mph. Sand and dust form a dense whirling wall up to 3,000 ft high. Enormous quantities of sand are deposited by these storms *(Ref. 3)*.

hail. Precipitation in the form of small balls or pieces of ice (hailstones), falling either separately or agglomerated into irregular lumps. Hail falls are generally observed during heavy thunderstorms *(Ref. 36)*.

hailstone. A single unit of hail, usually ranging in size from 0.5 to 2 cm, but, rarely, as large as 14 cm. Hailstones may be spheroidal, conical, or generally irregular in shape. The spheroidal stones, the most common form, typically exhibit a layered interior structure resembling an onion, with alternate layers composed of glaze and rime *(Ref. 1)*.

hailstorm. A weather storm in which hail falls to the ground.

hair hygrometer. A hygrometer that measures relative humidity by means of the variation in length of a strand of human hair. The length variation of a properly treated hair is approximately logarithmic between relative humidity limits of 20 to 100 percent. The lag time of the response of the hair increases with decreasing temperatures and becomes virtually infinite at temperatures below −40°C *(Ref. 3)*.

half-bog soil. *Pedology.* A great soil group, of the intrazonal order and hydromorphic suborder consisting of soil with dark-brown or black organic-rich material over grayish and rust-mottled mineral soil. It is usually formed under conditions of poor drainage under forest, sedge, or grass vegetation in cool to tropical humid climates *(Ref. 2).*

half-life. The time required for the activity of a given radioactive species to decrease to half of its initial value due to radioactive decay. The half-life is a characteristic property of each radioactive species and is independent of its amount or condition.

half-residence time. As applied to delayed fallout, it is the time required for the amount of weapon debris deposited in a particular part of the atmosphere, to decrease to half of its initial value *(Ref. 5).*

half thickness. Thickness of absorbing material necessary to reduce by one-half the intensity of radiation that passes through it *(Ref. 5).*

halo. Any one of a class of atmospheric phenomena in which colored or whitish rings or arcs are seen about the sun, moon, or other luminous source. Halos are caused by refraction and reflection by atmospheric ice crystals.

halomorphic soils. *Pedology.* A suborder of the intrazonal soil order formed under imperfect drainage in arid regions. These saline and alkaline soils include the great soil groups solonchak or saline, solonetz, and soloth *(Ref. 2).*

hammada. A desert surface that is either bedrock or bedrock covered only by a very thin veneer of sand or pebbles. The term was originally applied in the Sahara (where it referred to a desert plateau of stones) but is now used for similar desert surfaces in other parts of the world *(Ref. 1).*

handbooks. Reference documents that bring together procedural and technical or design information related to commodities, processes, practices, and services. Handbooks may serve as supplements to specifications or standards to provide general design and engineering data.

handling. The portion of the logistic cycle involving loading, unloading, stock rotation within warehouses, movement within depots, and transfer of materiel between storage and transport vehicles.

harbor. A restricted body of water, an anchorage, or other limited coastal water area and its water approaches from which shipping or boating operations are projected or supported *(Ref. 5).*

hard beach. A portion of a beach especially prepared with a hard surface extending into the water, employed for the purpose of loading or unloading directly into or from landing ships or landing craft *(Ref. 5).*

hardening. A term applied to the process of making materiel more insensitive to some particular environmental factor. Most often applied with respect to transient pressure waves generated by explosions. Also applied when rendering materiel more resistant to nuclear radiation. In this case it is called radiation hardening.

hardness. The ability of a material to resist indentation or scratching. There are many arbitrary scales of hardness. Metals are usually tested by indenting with a hard geometrical object under specific loads using the Brinell, Rockwell, Diamond Pyramid Hardness, or Knoop tests or by a rebound test such as the scleroscope. The relative hardness of a mineral is determined by comparing it with a standard series of materials *(Ref. 32).*

hardpan. A hard impervious layer, composed chiefly of clay, cemented by relatively insoluble materials, that does not become plastic when mixed with water *(Ref. 20).*

hard rime. Mixed glaze and rime produced by alternative periods of drizzle and fog, with a density between those of true rime and glaze.

hardstand. 1: A paved or stabilized area where vehicles are parked.

2: Open ground area having a prepared surface and used for storage of materiel *(Ref. 5).*

hard water. Water in which sufficient mineral salts are dissolved, especially magnesium and calcium salts, so that soap will not lather.

hardwood. Generally, one of the botanical group of trees with broad leaves, in contrast

to the conifers which have needlelike or scalelike leaves. Also wood produced by such trees regardless of texture *(Ref. 19)*.

harmattan (*also spelled* **harmatan, harmetan, hermaitan**). A dry, dust-bearing wind from the northeast or east that blows in West Africa especially from late November until mid-March. It originates in the Sahara as a desert wind and extends southward to about latitude 5 deg N. in January and to latitude 18 deg N. in July *(Ref. 3)*.

harmonic. 1: A sinusoidal quantity having a frequency that is an integral multiple of the frequency of a periodic quantity to which it is related *(Ref. 38)*.

2: A wave or vibration having a frequency that is an integral multiple of the fundamental (lowest) or other reference frequency of vibration of a physical system *(Ref. 1)*.

harmonic response. *See:* **response, harmonic.**

hasty crossing. A crossing of a river or stream using crossing means at hand or readily available without pausing to make elaborate preparations *(Ref. 5)*.

haze. A suspension in the air of extremely small (~0.1 μm), dry particles invisible to the naked eye and sufficiently numerous to give the air an opalescent appearance. If the particles grow in size due to slow condensation, the result is sometimes referred to as damp haze. Haze imparts a yellowish or reddish tinge to distant bright objects or lights seen through it, while dark objects appear bluish. This effect is mainly a result of scattering of light by the haze particles. These particles may have a color of their own which also contributes to the coloration of the landscape *(Ref. 36)*.

headwind. A wind that opposes the intended progress of an exposed, moving object; e.g., rendering an airborne object's airspeed greater than its groundspeed; the opposite of a tailwind *(Ref. 3)*.

heat. A form of energy transferred between systems by virtue of a difference in temperature, and existing only in the process of energy transformation. By the first law of thermodynamics, the heat absorbed by a system may be used by the system to do work or to raise its internal energy *(Ref. 3)*.

heat balance. 1: The equilibrium that exists on the average between the radiation received by the earth and atmosphere from the sun and that emitted by the earth and atmosphere. That the equilibrium does exist in the mean is demonstrated by the observed long-term constancy of the surface temperature of the earth.

2: The equilibrium that is known to exist when all sources of heat gain and loss for a given region or body are accounted for. In general this balance includes advective, evaporative, etc., terms as well as a radiation term. *(Ref. 3)*

heat capacity. The ratio of the heat absorbed (or released) by a system to the corresponding temperature rise (or fall) *(Ref. 1)*.

heat engine. A system that receives energy in the form of heat and that does work. The atmosphere is one such engine.

heat equator. The line that circumscribes the earth and connects all points of highest mean annual temperature for their respective longitudes *(Ref. 1)*.

heath. 1: A tract of open wasteland covered by low shrubs.

2: Plants and shrubs that grow on heaths; especially, an evergreen subshrub of either of two genera having whorls of needlelike leaves and clusters of small flowers.

heat island effect. *See:* **urban heat island circulation.**

heat, latent. The heat released or absorbed per unit mass by a system in a reversible, isobaric-isothermal change of phase. In meteorology, the latent heats of evaporation (or condensation), fusion, and sublimation of water substance are of importance. At 0°C these are, respectively *(Ref. 3)*:

$$L_v = 597.3 \text{ cal g}^{-1}$$
$$L_f = 79.7 \text{ cal g}^{-1}$$
$$L_s = 677.0 \text{ cal g}^{-1}$$

heat resistance. The ability of a material to show little or no deterioration on continuous or intermittent exposure to a predetermined elevated temperature *(Ref. 1)*.

heat, specific. The heat capacity of a system per unit mass; i.e., the ratio of the heat absorbed (or released) by unit mass of the

system to the corresponding temperature rise (or fall) *(Ref. 1)*.

heat transfer. The transfer or exchange of heat by radiation, conduction, or convection in a substance or between the substance and its surroundings. These three processes occur simultaneously in the atmosphere, and it is often difficult to assess their relative contributions.

heat transfer coefficient. 1: A nondimensional number used to characterize heat transfer in fluids; it is the ratio of heat transferred to that which would have been transferred by conduction only.
2: The time rate of heat transfer per unit area per unit temperature difference. *(Ref. 3)*

heat wave. A period of abnormally and uncomfortably hot and usually humid weather. To be a "heat wave", such a period should last at least 1 day, but, conventionally, it lasts from several days to several weeks *(Ref. 3)*.

hedgerow. A linear thicket of bushes, commonly with some trees, left between two fields of cleared land, or planted in order to separate fields; especially common in parts of England and France *(Ref. 1)*.

heliograph. An instrument that records the duration of sunshine and gives a qualitative measure of the amount of sunshine by the action of solar rays upon blueprint paper; a type of sunshine recorder *(Ref. 3)*.

herb. Any flowering plant without a persistent or woody stem above the ground. Herbs include all small seed plants, including grasses *(Ref. 11)*.

herbicide. Any preparation used to kill or inhibit the growth of plants *(Ref. 12)*.

hermetic. Made impervious to air and other fluids by fusion; originally applied to the closing of glass vessels by fusing the ends; and by extension to any mode of airtight closure *(Ref. 1)*.

hertz (*pl.* **hertz** *or* **hertzes**) *(Abbr.* **Hz**). A unit of frequency or a periodic process equal to one cycle per second *(Ref. 1)*.

heterogeneous nucleation. A nucleation process in which foreign particles (dust, other particulates, grain boundaries, foreign materials, etc.) serve as nucleation sites.

hf *Abbr. for* high frequency.

hf (high frequency) band. The portion of the electromagnetic spectrum extending from approximately 2×10^6 to 2×10^7 Hz.

high. *Meteorology.* Synonymous with "area of high pressure" referring to a maximum of atmospheric pressure in two dimensions (closed isobars) in the synoptic surface chart, or a maximum of height (closed contours) in the constant-pressure chart. Since a high is, on the synoptic chart, always associated with anticyclonic circulation, the term is used interchangeably with anticyclone *(Ref. 3)*. *Cf:* low.

high altitude. Conventionally, an altitude above 10,000 m (33,000 ft) *(Ref. 5)*.

high dollar value item. An end item or repair part for which the dollar value of issues from continental United States depots exceeds $10,000 annually *(Ref. 26)*.

highland. A relative term denoting the higher land of a region; it may include mountains, valleys, and plains *(Ref. 10)*.

highland ice. *See:* ice sheet.

high temperature chamber. *See:* chamber, high temperature.

high velocity airdrop. Airdrop without conventional recovery parachutes, usually using small stabilizing parachutes, at a terminal velocity of approximately 70 to 90 ft s^{-1} *(Ref. 17)*. *See also:* low velocity airdrop.

high velocity drop. A drop procedure in which the drop velocity is greater than 30 ft s^{-1} and lower than free drop velocity *(Ref. 5)*.

high volume sampler method. A method for sampling large volumes of air for suspended particulates. A filter is used to entrap the particles. The weight gain of the filter divided by the total airflow through the filter yields the average weight concentration per unit volume.

histogram. A graphical representation of a frequency distribution in which the range of the variable is divided into intervals for which the frequency of occurrence is represented by a column with a height proportional to the occurrence frequency.

hoarfrost (commonly called frost). A deposit of interlocking ice crystals formed by direct sublimation on objects, usually those of small diameter freely exposed to the air, such as tree branches, plant stems, leaf

edges, wires, poles. Also, hoarfrost may form on the skin of an aircraft when a cold aircraft flies into air that is warm and moist or when it passes through air that is supersaturated with water vapor. The deposition of hoarfrost is similar to the process by which dew is formed, except that the temperature of the befrosted object must be below freezing *(Ref. 1)*.

hogback. A long sharp ridge carved from beds dipping at angles greater than 20 deg. The ridge is shaped by differential erosion of a resistant layer or layers of igneous or sedimentary rock so inclined. In a hogback, the two slopes are approximately equal in steepness *(Ref. 32)*.

hologram. A three-dimensional image of an object consisting of recorded optical interference patterns from the object, to be viewed by light passing through it.

homeostasis. The process whereby different elements or groups of elements of an organism or group of organisms coexist as interdependent units in a relatively stable equilibrium.

homogeneous. Having the same character, structure, or composition throughout; essentially alike.

homogeneous nucleation. A nucleation process involving a pure material without foreign particles. Homogeneous nucleation of atmospheric water vapor requires a high degree of supersaturation.

homolographic projection. A mapping technique in which the various portions of the surface of the earth have their proper relative size and shape.

horizon. In general, the apparent or visible junction of the earth and sky, as seen from any specific position. Also called the apparent, visible, or local horizon. A horizontal plane passing through a point of vision or perspective center. The apparent or visible horizon approximates the true horizon only when the point of vision is very close to sea level *(Ref. 5)*.

horizons. The various layers, each being a few inches to a foot or more thick, that comprise a soil *(Ref. 20)*.

horst. A long narrow block of the crust of the earth raised with respect to adjacent portions of the crust, between faults along its side. The term applies to elevated ridges so formed as well as to such structures without visible surface expression *(Ref. 32)*. *Cf:* **graben.**

hot. A colloquial term meaning highly radioactive *(Ref. 9)*.

hot spring. A stream of hot water issuing from the ground, often after being heated by buried lava, and commonly occurring in a volcanic region when eruptions have ceased.

hovercraft. An air transport craft, primarily overwater, that employs the air-cushion effect for buoyancy. It is capable of high speed over water surfaces.

HUF *Abbr. for* hang-up failure.

hum. A low-pitched acoustic noise, consisting of several harmonically related frequencies; originating from magnetically induced mechanical vibrations in power supplies or in apparatus associated with power distribution systems.

human factors. Human psychological and physiological characteristics relative to complex systems and the development and application of principles and procedures for accomplishing optimum man-machine integration and utilization. The term is used in a broad sense to cover all biomedical and psychosocial considerations pertaining to man in the system *(Ref. 33)*.

human fog. *See:* **biofog.**

humidification. A process for increasing the water content of air or other gases *(Ref. 1)*.

humidifier. An apparatus that adds water vapor to the atmosphere, thus increasing its humidity.

humidity. A measure of the water vapor content of air. Three measures of humidity are commonly used, according to the purpose *(Ref. 13)*:

(a) Relative humidity is used in determining whether air is saturated or unsaturated, and the amount of moisture relative to saturation. Air is considered "moist" if its relative humidity is 65 percent or more, "dry" if its humidity is 65 percent or less, and "very dry" if its relative humidity is 50 percent or less.

(b) Mixing ratio is used as a measure of the absolute amount of water vapor available.

(c) Dewpoint, in weather forecasting, is used at the surface only, purely as a matter of convenience, due to its being the only

measure of humidity that is reported It must be compared with the temperature to determine the moistness or dryness of the air and must be compared with the pressure to determine the amount of water vapor available. *See:* absolute humidity, relative humidity, specific humidity, mixing ratio.

humidity chamber. *See:* chamber, humidity.

humidity, critical. The relative humidity above which the atmospheric corrosion rate of a given metal increases sharply *(Ref. 34)*.

humid tropics. Areas in which the average temperature of the coldest month is about 64.4°F and the annual rainfall rate exceeds the annual evaporation rate. These lands are characterized by rainforest, jungle, and savanna vegetation *(Ref. 12)*.

hummock. A low, isolated hill on an otherwise level surface; a rounded or conical hillock *(Ref. 32)*.

humus. The more or less stable fraction of the soil organic matter remaining after the major portion of added plant and animal residues have decomposed. Usually, it is dark colored *(Ref. 1)*.

hurricane. *See:* tropical cyclone.

hurricane-force wind. In the Beaufort wind scale, a wind whose speed is 64 kt (73 mph) or higher *(Ref. 1)*.

hydrated. Combined with water.

hydraulic shaker. *See:* shaker, hydraulic.

hydrocarbons. A vast family of organic compounds containing carbon and hydrogen in various combinations, found especially in fossil fuels. Some hydrocarbon vapors in the atmosphere are major air pollutants, some may be carcinogenic, and others contribute to photochemical smog *(Ref. 9)*.

hydrogen-ion concentration. The acidity or alkalinity of a solution measured in grams of hydrogen ions per milliliter. It is abbreviated as pH, and is expressed in terms of the negative logarithm of the concentration (i.e., pH 7 = 10^{-7} grams of hydrogen per milliliter). A pH of 7 is neutral; numbers below 7 denote increasing acidity with decreasing pH values; numbers above 7 denote increasing alkalinity with increasing pH values *(Ref. 1)*.

hydrograph. A graphical representation of stage or discharge at a point on a stream as a function of time. The most common type, the observed hydrograph, represents river gage readings plotted at time of observation *(Ref. 1)*.

hydrographic chart. A nautical chart showing depths of water, nature of bottom, contours of bottom and coastline, and tides and currents in a given sea or sea and land area *(Ref. 5)*.

hydrographic datum. The plane of reference of soundings, depth curves, and elevations of foreshore and offshore features *(Ref. 12)*.

hydrography. The science that deals with the measurement and description of the physical features of the oceans, seas, lakes, rivers, and their adjoining coastal areas, with particular reference to their use for navigational purposes *(Ref. 5)*.

hydrologic budget. An accounting of the inflow to, outflow from, and storage in, a hydrologic unit, such as a drainage basin, aquifer, soil zone, lake, reservoir, or irrigation project *(Ref. 6)*.

hydrologic cycle. A convenient term to denote the circulation of water from the sea, through the atmosphere, to the land; and thence, with many delays, back to the sea by overland and subterranean routes, and in part by way of the atmosphere; also the many other paths by which water is returned to the atmosphere without reaching the sea *(Ref. 6)*.

hydrologic geometry feature. A channel, stream, pond, lake, or other depression that exhibits a water depth of 25 cm or greater for a total period of at least 1 week of the year *(Ref. 35)*.

hydrology. The study of water, especially in relation to its occurrence in streams, lakes, wells, and snow, including its discovery, uses, control, and conservation; the science that relates to the water of the earth.

hydrolysis. A chemical process in which a compound reacts with the OH^- and H^+ ions of water to form a weak acid, a weak base, or both.

hydrometeor. Any product of condensation or sublimation of atmospheric water vapor, whether formed in the free atmosphere or at the surface of the earth; also, any water particles blown by the wind from the surface of the earth *(Ref. 1)*.

hydromorphic soils. *Pedology.* A suborder of intrazonal soils formed under conditions of

poor drainage in marshes, seepage areas, or flats *(Ref. 2)*.

hydrophilic. Having an attraction for water; i.e., readily wet by water, said of films capable of swelling in water *(Ref. 1)*.

hydrophobic. Having little or no affinity for water. Water repellent or not wet by water *(Ref. 1)*.

hydrophyte. A plant that typically grows in water or in saturated soil. Hydrophytes may be rooted or free floating, submerged, with floating leaves, or with leaves emergent above the water level *(Ref. 1)*.

hydrosphere. The water portion of the earth as distinguished from the solid part, called the lithosphere, and from the gaseous outer envelope, called the atmosphere *(Ref. 3)*.

hydrostatic pressure. *See:* pressure, hydrostatic.

hyetograph. 1: A chart showing rainfall intensity against time.
2: A map showing the areal distribution of rainfall *(Ref. 1)*.

hygrometer. An instrument for measuring the water vapor content of the air. The most common type is a psychrometer, consisting essentially of dry-bulb and wet-bulb thermometers *(Ref. 1)*.

hygrometry. The study that deals with the measurement of the humidity of the atmosphere and other gases *(Ref. 3)*.

hygroscope. An instrument that indicates variation in atmospheric moisture *(Ref. 15)*.

hygroscopic. 1: Pertaining to a marked ability to accelerate the condensation of water vapor.
2: Descriptive of a substance, the physical characteristics of which are appreciably altered by effects of water vapor *(Ref. 1)*.

hygroscopic nuclei. Nuclei that have a marked ability to accelerate the condensation of water vapor.

hygrothermograph. A recording instrument, combining on one record the variation of atmospheric temperature and humidity content as a function of time. The most common hygrothermograph is a hair hygrograph combined with a thermograph *(Ref. 3)*.

hypersonic. Of or pertaining to speeds equal to or in excess of five times the speed of sound *(Ref. 5)*.

hypha. Any of the threadlike parts that comprise the mycelium of a fungus.

hypsometer. 1: An instrument for measuring atmospheric pressure by determining the boiling point of a liquid at the station.
2: An instrument for determining the height of trees or other objects *(Ref. 1)*.

hysteresis. An effect, involving energy loss, found to varying degrees in magnetic, electric, and elastic media when they are subjected to variation by a cyclical applied force. In such media the polarization or stress is not a single-valued function of the applied force, or, stated in another way, the condition of the medium depends on its previous history as well as the instantaneous value of the applied force. Hysteresis may be visualized as resulting from some kind of internal friction *(Ref. 1)*.

hysteresis damping. *See:* solid friction damping.

Hz *Abbr. for* hertz.

i.b. *Abbr. for* inside bark (tree diameter).

I-beam. A structural shape whose cross section resembles the capital letter I.

ICAO *Abbr. for* International Civil Aeronautical Organization.

ICC *Abbr. for* Interstate Commerce Commission.

ice. The solid form of water, in nature formed either by *(Ref. 31)*:

(a) The freezing of water, as in the case of river or sea ice;

(b) The conversion of atmospheric water vapor directly into ice crystals;

(c) The compaction of snow, with or without the motion of a glacier; or

(d) The impregnation of porous snow masses with water which subsequently freezes.

ice age. A geological period in which ice sheets and glaciers covered large areas of the continents, reaching the sea in places and lowering the temperature of the oceans. Also applied specifically to the Pleistocene glacial epoch.

iceberg. A large mass of detached land ice floating in the sea or stranded in shallow water. Irregular icebergs generally calve from glaciers, whereas tabular icebergs and ice islands are usually formed from shelf ice. Icebergs are the largest form of floating glacier ice, bergy bits and growlers being generally the fragments of broken icebergs *(Ref. 18)*.

ice blink. *See:* blink.

ice cake. *See:* cake ice.

icecap. Any ice sheet covering a large portion of a land area; e.g., the Greenland Ice Cap *(Ref. 11)*.

ice cascade *See:* cascade.

ice, clear. Generally, a layer or mass of ice that is relatively transparent because of its homogeneous structure and small number and size of air pockets *(Ref. 1)*.

ice cleats. Sharp teethlike or spiked metal parts attached to the tracks of tracked vehicles to increase traction on ice. Ice cleats are sometimes attached to the tires of wheeled vehicles as well.

ice crystal. Any one of a number of macroscopic crystalline forms in which ice appears, including hexagonal columns, hexagonal platelets, dentritic crystals, ice needles, and combinations of these forms *(Ref. 1)*.

ice field. A relatively uniform unbroken ice floe of great extent; a continuous sheet of ice formed when lumps of ice conjoin *(Ref. 20)*.

ice floe. An extensive mass of floating ice, detached from the main polar ice. Ice floes are smaller than ice fields; their limits of dimension are normally within sight.

ice fog; *also* frozen fog; pogonip. A type of fog, composed of suspended particles of ice, partly ice crystals 20 to 100 μm in diameter but chiefly, tiny ice particles 12 to 20 μm in diameter. The smaller size particles are predominant in dense fog. It occurs at very low temperatures, and usually in clear, calm weather in high latitudes. It is often associated with atmospheric water vapor from manmade sources or activities.

ice foot. Sea ice firmly frozen to the shore at the high-tide line, and unaffected by tide. This type of fast ice is formed by the freezing of sea water during ebb tide and of spray. It is separated from the floating sea ice by a tide crack; in many areas it offers a fairly level, continuous route for surface travel *(Ref. 3)*.

ice frost. Specifically, a thickness of ice that gathers on the outside of a rocket vehicle over surfaces supercooled by liquid gases inside the vehicle. This ice frost is quickly shaken loose and falls to the ground once the vehicle begins its ascent *(Ref. 40)*.

ice island. One of the many large tabular icebergs found in the Arctic Ocean. The area of the largest one known is about 300

mi^2. They are about 150 ft thick overall, and drift with ocean currents rather than with the wind *(Ref. 1)*.

ice jam. 1: An accumulation of broken river ice caught in a narrow channel, frequently producing local floods during a spring breakup.

2: Fields of lake or sea ice thawed loose from the shores in early spring and blown against the shore, sometimes exerting great pressures *(Ref. 3)*.

ice lens. 1: A discontinuous layer of ground ice tapering at its extremities. Ice lenses in soils occur roughly parallel to each other and are commonly in repeated layers.

2: A discontinuous horizontal ice band in firn or snow that tapers at its extremities *(Ref. 11)*.

ice mound. *See:* frost mound.

ice needle. A long, thin ice crystal. Its cross section perpendicular to its long dimension is typically hexagonal *(Ref. 1)*.

ice pellets. Transparent or translucent pellets of ice that are spherical or irregular, rarely conical, and that have a diameter of 5 mm (0.2 in.) or less. Ice pellets form in the atmosphere by the freezing of raindrops or by coating of snow pellets with ice and precipitate as sleet or small hail.

ice point. The true freezing point of water; the temperature at which a mixture of air-saturated pure water and pure ice may exist in equilibrium at a pressure of one standard atmosphere. The ice point is often used as one fiducial point (0°C or 32°F) in establishing a thermometric scale because it is reproduced relatively easily under laboratory conditions. The ice point is frequently called the freezing point, but the latter term should be reserved for reference to the solidification of any kind of liquid under various conditions *(Ref. 3)*.

ice prisms. Unbranched ice crystals, in the form of needles, columns, or plates often so tiny that they seem to be suspended in the air. These crystals may fall from a cloud or from a cloudless sky *(Ref. 36)*.

ice sheet. Any large area of continuous ice overlying a land surface *(Ref. 18)*. It is continental ice or icecap if it is an ice sheet of vast extent, covering and flooding irregularities of a large landmass, or highland ice if it is a comparatively thin ice cover conforming generally to the irregularities of the land *(Ref. 15)*.

ice shelf. 1: A thick ice formation with a fairly level surface, formed along a polar coast and in shallow bays and inlets, where it is fastened to the shore and often reaches bottom. It may grow hundreds of miles out to sea. It is usually an extension of land ice, and the seaward edge floats freely in deep water.

2: More specifically, a level ice formation over 2 m (6.6 ft) above the sea surface that originates from annual accumulations of firn snow layers on bay ice or on the seaward extension of a glacier *(Ref. 18)*.

ice spicule. *See:* ice needle.

ice wedge; *also* ground ice wedge. A vertical sheet of ground ice that tapers downward *(Ref. 11)*.

icing. 1: In general, any deposit or coating of ice on an object, caused by the impingement and freezing of liquid (usually supercooled) hydrometeors.

2: A mass or sheet of ice formed on the ground surface during the winter by successive freezing of sheets of water that may seep from the ground, from a river or from a spring. *(Ref. 1)*

ideal gas or perfect gas. A gas for which the ratio of the product of pressure and volume to temperature is a constant for a given quantity of the gas. An ideal gas has specific heats which are independent of temperature. Most permanent gases including air, closely approximate the behavior of an ideal gas and, since the water vapor content of air rarely exceeds 3 percent, the ideal gas law is universally used in meteorology.

IEC *Abbr. for* International Electrochemical Commission.

IEEE *Abbr. for* Institute of Electrical and Electronic Engineers.

IFR *Abbr. for* instrument flight rules.

igloo. A storage structure for ammunition and explosives. It is constructed of masonry and/or steel with an arched roof which collapses first in the event of an explosion, thereby lessening the damage. Most igloos are partially covered with earth.

igneous meteor. In U.S. weather-observing practice, a visible electrical discharge in the atmosphere. Lightning is the most common

and important type, but types of corona discharge are also included *(Ref. 3)*.

igneous rocks. Rocks formed by solidification of hot mobile rock material (magma) including those formed and cooled at great depths (plutonic rocks), which are crystalline throughout, and those that have poured out on the surface of the earth in the liquid state or have been blown as fragments into the air (volcanic rocks) *(Ref. 1)*.

IGY *Abbr. for* International Geophysical Year.

illuminance. The total luminous flux received on a unit area of a given real or imaginary surface, expressed as lumens per square meter or formerly as footcandle, lux, or phot.

illumination. 1: The process in which light is brought to some surface or object.

2: The illuminance of a material object.

3: In radar, sometimes used for the irradiance of microwave energy on a target. *(Ref. 3)*

illuviation. An accumulation of material in a soil horizon through the deposition either mechanically or chemically of suspended mineral and organic matter originating from horizons above. Since at least part of the fine clay in the B horizons (or subsoils) of many soils has moved into them from the A horizons above, these are called illuvial horizons *(Ref. 16)*.

imbibition. 1: The absorption by a gel of a liquid for which it has an affinity. Imbibition is accompanied by an expansion or swelling of the gel.

2: The process by which plants absorb water from the soil *(Ref. 3)*.

immature soil. *Pedology.* A soil lacking clear individual horizons because of the relatively short time for soil-building forces to act upon the parent material since its deposition or exposure *(Ref. 16)*.

immersion proof. Unless otherwise specified, immersion proof means that an item of equipment when ready for field transport can be submerged for 2 hr in salt or fresh water to a covering depth of 3 ft and be capable of operating at normal effectiveness immediately after being removed from the water *(Ref. 12)*.

impact. Collision of a mass in motion with a second mass which may be either in motion or at rest whereby the velocity of one or both masses is changed. The impact coefficient is the ratio between the difference in velocities of the two masses after impact to the same difference before impact. The coefficient is unity for impact between perfectly elastic bodies and zero for fully inelastic bodies.

impact acceleration. A sudden acceleration caused by impact, as occurs, e.g., in the crash landing of an aircraft or by impact of an automobile with another object.

impact machine. A mechanical shock machine in which the test item is attached to an anvil which is struck by a hammer. It is used to produce a specified mechanical shock on materiel, generally for testing purposes.

impactors. An apparatus for collection and sampling of atmospheric particulate matter whereby the particulates are collected on solid surfaces by impaction using graduated airstream velocities to obtain samples within successive size ranges.

impact pressure. *See:* **pressure, impact.**

impact testing. A type of rough handling test in which materiel is subjected to impulsive loading as a result of a specified mass impacting the material or its package at a specified velocity. Impact tests include incline-impact and pendulum-impact tests.

impairment of operational readiness. A materiel condition wherein environmental effects have produced sufficient deterioration that the materiel can no longer function with 100 percent effectiveness.

impedance. 1: The apparent opposition to the flow of current in an electrical circuit. The ratio of the potential difference between two terminals of the current flow produced by that potential difference.

2: The complex ratio of a forcelike quantity (force, pressure, voltage, temperature, etc.) to a related velocitylike quantity (velocity, volume velocity, current, heat flow, etc.) usually referring to single frequency quantities and to systems wherein properties are independent of the magnitudes of their quantities.

impedance, angular mechanical. The torque per unit angular velocity *(Ref. 22)*.

impedance, driving point. In a mechanical structure, the ratio of the absolute values of

force to velocity when both are measured simultaneously at a point *(Ref. 22)*.

impedance, mechanical. The resistance to motion of a mechanical system expressed as the ratio of a forcelike quantity to a velocitylike quantity when the arguments of the quantities increase linearly with time *(Ref. 22)*.

impedance, transfer. 1: Between two points in a mechanical structure, the force divided by the velocity when force and velocity are measured at different points.

2: At the same point in a mechanical structure, the force divided by the velocity when force and velocity are measured in different directions. *(Ref 22)*

impermeable rocks. Rocks that, being nearly nonporous, do not allow water to soak into them. Collectively, such rock may be pervious owing to joints and fissures.

impervious tent. A tent in which all the pores of the fabric are closed with a material impervious to water. Such tents do not "breathe" as do ordinary canvas or duck fabric tents. They are particularly susceptible to moisture condensation on inner surfaces when occupied in cold weather.

impingement. The process whereby airborne particles strike and stick to the surface of a solid object. For example, the combing of sea-salt particles from the air by bushes and trees.

impingers. Wet or dry samplers for the collection of particles from an airstream wherein collection is accomplished by impingement on a surface.

impulse. The product of the magnitude of a constant force and the time during which the force is applied, or the time integral of a variable force over the period of its application. The impulse equals the change in momentum experienced by a mass.

impulse machine. *See:* **impact machine.**

impulse sound. A nonperiodic variation in atmospheric pressure having a duration of less than 1 s and a peak-to-rms pressure ratio greater than 10 dB.

incandescence. Emission of light due to high temperature. Any other emission of light is called luminescense *(Ref. 15)*.

incendiary. Any chemical agent designed to cause combustion, used especially as a filling for certain bombs, projectiles, bullets, or the like *(Ref. 14)*.

incline impact test. A shock test in which a wheeled dolly is raised along an inclined steel track (with the test specimen in place on the dolly) a prescribed distance up the track and released to impact against a barrier at the foot of the track.

index of refraction. *See:* **refractive index.**

indicator. 1: The part of electronic equipment in which the data are obtained by observation. This is usually in the form of a scope or dial.

2: The part of an instrument from which the reading is made. This may be at the instrument or at a remote location, or both *(Ref. 15)*.

individual equipment. Referring to method of use, signifies personal clothing and equipment for the personal use of the individual *(Ref. 26)*.

induced environment. An environment in which manmade or equipment-made environmental factors predominate or are of primary importance. The environmental factors produced by man's activities are referred to as induced environmental factors.

induced radiation. Radiation produced as a result of exposure to radioactive materials, particularly the capture of neutrons *(Ref. 5)*.

induced radioactivity. *See:* **radioactivity.**

induced stress. *See:* **stress, induced.**

inductance. *Electricity.* The property of an electric circuit that induces an electromotive force into the circuit itself or into a nearby circuit, which force opposes any introduction, change, or discontinuance of the current. Inductance corresponds to inertia in matter. It is the property that causes a lag in time for an applied current to rise to its full value *(Ref. 14)*.

inductive accelerometer. An accelerometer employing a pair of coils that are used to sense the motion of a magnetically coupled mass.

inert. Destitute of power to move itself or actively to resist motion impressed; not having active properties; powerless for a desired effect *(Ref. 1)*.

inertia. The property of matter by which it resists any change in its state of rest or uniform motion in a straight line *(Ref. 15)*.

inertial damping. Production of a damping force directly proportional to the acceleration of the vibrating mass. Its amplitude decay characteristics are logarithmic, making inertial damping suitable for large amplitude vibrations.

infiltration. 1: The flow of a fluid into a substance through pores or small openings. It connotes flow into a substance in contradistinction to the word percolation, which connotes flow through a porous substance *(Ref. 6)*.

2: The entry of water into the soil from above *(Ref. 2)*.

infiltration capacity. The maximum rate at which the soil, when in a given condition, can absorb falling rain or melting snow *(Ref. 6)*.

infrared radiation. Electromagnetic radiation in the wavelength region between visible radiation and microwave radiation; usually considered to begin at 7600 A (0.76 μm) and extending to 1,000 μm (1 mm) *(Ref. 1)*.

infrasonic frequency. Frequencies below the frequency threshold of human hearing, generally those frequencies below 15 Hz.

inherited soil characteristic. Any characteristic of a soil that is due directly to the nature of the material from which it formed, as contrasted to the characteristics that are wholly or partly the result of soil-forming processes acting on parent material. For example, some soils are red because the parent material was red, although the color of most red soils is due to soil-forming processes *(Ref. 16)*.

inhibitor. 1: An agent that slows or interferes with a chemical action.

2: A substance that reduces the rate of corrosion of a metal when added in small amounts to the corrosive environment. *(Ref. 34)*

initial radiation. The nuclear radiation accompanying a nuclear explosion and emitted from the resultant fireball; immediate radiation *(Ref. 5)*.

injection temperature. *See:* temperature surface.

inlet. A small narrow bay or creek; a small body of water leading into a larger; a narrow strip of water running into the land or between islands *(Ref. 10)*.

inner transport area. The area where most of the unloading is accomplished, located as near the beach as conditions permit Normally, the transport group moves into the inner transport area after the probability of enemy interference is reduced *(Ref. 5)*.

in place. 1: Formed or accumulated on the spot. A rock may decay and break down into small particles where it is first exposed in the land surface. It is then said to have weathered in place or *in situ*.

2: As a mass appears in the soil before any disturbance. For example, the deeper part of a profile may be massive and show no signs of structure in place but may break down into lumps of regular size and shape when removed. *(Ref. 16)*

insects. Any of numerous small invertebrate animals having three divisions of the body, three pairs of legs, and, typically, one or two pairs of wings.

inselberg. A small mountain or hill surrounded by more or less level rock surfaces or by debris derived from and overlapping its slopes and rising out of a desert pediment or peneplain *(Ref. 32)*.

insertion loss. The energy loss in a system resulting from the insertion of an additional component or subsystem.

insolation. 1: In general, solar radiation received at the surface of the earth.

2: The rate at which direct solar radiation is incident upon a unit horizontal surface at any point on or above the surface of the earth. *(Ref. 3)*

instantaneously airborne dust. Particles made airborne by artificial means whose settling velocities (90 cm s^{-1}) are greater than the air motions usually encountered. Such particles have diameters exceeding 150 μm.

instantaneous rainfall rate. Total rainfall in 1 min.

instrument shelter. A boxlike structure designed to protect certain meteorological instruments from exposure to direct sunshine, precipitation, and condensation, while at the same time providing adequate ventilation. Instrument shelters are painted

white, have louvred sides, usually a double roof, and are mounted on a stand several feet above the ground with the door side facing poleward *(Ref. 1)*.

insulate. To separate or isolate a conducting body from its surroundings by means of a nonconductor, so as to prevent transfer of electricity, heat, or sound *(Ref. 15)*.

insulation. 1: A nonconductive material usually surrounding or separating two conductive materials. Often called the dielectric in a radio frequency cable.

2: A material having relatively high resistance to flow of electricity, heat, or sound.

insulation resistance. 1: The property of an insulating material that resists electrical current flow through the insulating material when a potential difference is applied *(Ref. 4)*.

2: The measured resistance of the insulation of a device or product. This measurement is taken along the path over which the insulation is intended to be effective *(Ref. 1)*.

integrated logistic support. 1: The pooling of specified resources by nations for use by the same nations as decided by coordinating agency or authority to which the subscribing nations have agreed *(Ref. 5)*.

2: The combination of all phases and elements of logistic supply for a given operation into one coordinated function.

intensity. A measure of the ratio of quantity of energy or number of particles to the area or time over which the measurement is made.

intensity level *or* **sound-energy flux density level.** *See:* sound intensity level.

interaural masking. Masking of acoustic signals that occurs when the signal reaches one ear and noise reaches the other ear simultaneously.

interchangeability. The condition of two or more parts being physically and functionally interchangeable in all possible applications; i.e., when both parts are capable of full, mutual substitution in all directions *(Ref. 33)*.

intercoastal traffic. Sea traffic between Atlantic, Gulf, and Great Lakes continental U S ports and Pacific continental U S ports *(Ref. 5)*.

interface. A surface separating two media across which there is a discontinuity of some property, such as density or velocity, or of some derivative of one of these properties in a direction normal to the interface *(Ref. 18)*.

interference. 1: An environmental effect on materiel or personnel that inhibits optimum performance of material or personnel. Such interference is of three types: (a) optical, (b) electromagnetic (nonoptical), and (c) audio.

2: Extraneous signals, noises, etc., that hinder proper reception, transmission, or recording of the desired signal in electronic equipment *(Ref. 15)*.

3: The mutual effect of two or more meeting waves or vibrations of any kind. Sometimes called wave interference *(Ref. 15)*.

4: The aerodynamic influence of two or more bodies on each other *(Ref. 15)*.

interference, acoustic. The combined action of two waves moving simultaneously through the same region. Two waves of the same frequency, in phase with each other and moving in the same direction, produce reenforcement. Two waves of the same frequency, in phase opposition, and moving in the same direction, produce destructive interference; if further they have equal amplitudes, the result may be a complete annulment *(Ref. 1)*.

interference, optical. The combined action of two light rays. Unless the two paths are of identical optical length, the two beams may not be in phase and can destructively interfere at some points (dark) and constructively interfere at other points (bright). The principle of the conservation of energy applies; therefore, the energy missing in the dark points will be found in the bright points *(Ref. 1)*.

interferometer. An apparatus used to produce and show interference between two or more wave trains coming from the same source, and also to compare wave lengths with observable displacements or reflectors, or other parts, by means of interference fringes. An interferometer is frequently used to obtain quantitative information on flow around bodies in wind tunnels *(Ref. 1)*.

interflow. The water, derived from precipitation, that infiltrates the soil surface and

then moves laterally through the upper layers of soil above the water table until it reaches a stream channel or returns to the surface at some point downslope from its point of infiltration *(Ref. 3)*.

interfluve. 1: The area between two streams or rivers; especially, in upland areas where the streams flow in more or less parallel courses *(Ref. 32)*.

2: The surface area of alluvial cones between dry washes *(Ref. 1)*.

intergranular corrosion. *See:* corrosion, intergranular.

inferior mirage. A spurious image of an object formed below the true position of that object by abnormal refraction conditions along the line of sight; one of the most common of all types of mirage, and the opposite of a superior mirage. The requirement for the appearance of an inferior mirage is a very large lapse rate of temperature in the layer of air containing the line of sight from observer to object. This condition, frequently satisfied during the daytime in air layers close to the surface of the earth in desert regions and over paved highways, leads to a bending of near-horizontal light rays in such a fashion that they become concave upward and create the impression that distant objects lie well below their true position. This type of refraction of horizon sky light may yield the false impression that a body of water lies off toward the horizon, thus deluding travelers in desert regions *(Ref. 3)*.

intermediate maintenance (field). Maintenance that is the responsibility of and performed by designated maintenance activities for direct support of user organizations. Its phases normally consist of calibration, repair, or replacement of damaged or unserviceable parts, components, or assemblies; the emergency manufacture of nonavailable parts; and providing technical assistance to user organizations *(Ref. 5)*.

intermediate scale map. A map, normally of a scale from 1:200,000 to 1:500,000, intended for planning strategic operations, including the movement, concentration, and supply of troops *(Ref. 5)*. *See also:* medium-scale map.

intermittent stream. A stream that flows only part of the time. It may be either an ephemeral stream, which flows for a few hours or days after rain, or a seasonal stream, which flows for several months of the year, as during the rainy season or during the season of snow melt *(Ref. 1)*.

internal friction; *also* viscosity. The molecular property of a fluid that enables it to support tangential stresses for a finite time and thus to resist deformation *(Ref. 3)*.

internal oxidation. *See:* oxidation, internal.

international logistics. The negotiating, planning, and implementation of supporting logistic arrangements between nations, their forces, and agencies. It includes furnishing logistic support (major end items, materiel, and/or services) to, or receiving logistic support from, one or more friendly foreign governments, international organizations, or military forces, with or without reimbursement. It also includes planning and actions related to the intermeshing of a significant element, activity, or component of the military logistic systems or procedures of the United States with those of one or more foreign governments, international organizations, or military forces on a temporary or permanent basis. It includes planning and actions related to the utilization of United States logistics, policies, systems, and/or procedures to meet requirements of one or more foreign governments, international organizations, or forces *(Ref. 5)*.

intertropical convergence zone. The axis, or a portion thereof, of the broad trade wind current of the Tropics. This axis is the dividing line between the southeast trades and the northeast trades (of the Southern and Northern Hemispheres, respectively) *(Ref. 1)*.

intracoastal sealift. Shipping used primarily for the carriage of personnel and/or cargo along a coast or into river ports to support operations within a given area *(Ref. 5)*.

intraocular fluids. The fluids filling the interior of the eyeball.

intrapermafrost water. Ground water within the permafrost *(Ref. 12)*.

intrazonal soil. *Pedology.* Any one of the great groups of soils having more or less well-developed soil characteristics that reflect a dominating influence of some local factor of relief or a parent material over the normal influences of the climate and the

vegetation on the soil-forming processes. Such groups of soils may be geographically associated with two or more of the zonal groups of soils having characteristics dominated by the influence of climate and vegetation *(Ref. 16)*.

intrenched meander. A meander inclosed by valley walls *(Ref. 1)*.

intrusion. The process of mobile rock material flowing into or between other rocks under great pressure. The term generally refers to the invasion of older rocks at depth by molten rock or magma but it is also used to describe the plastic injection of slat domes into overlying rocks *(Ref. 32)*.

intrusive rock. Igneous rock formed by the flow of magma from the depths of the earth, but arrested and cooled before reaching the surface. Shapes of intrusive rocks include tabular or sheetlike dikes and sills, cylindrical necks and larger masses with steep walls and no apparent floor such as stocks and batholiths *(Ref. 32)*.

inundate. To cover with a flood; overflow.

inversion. *Meteorology.* A departure from the usual decrease or increase with altitude of the value of an atmospheric property; also, the layer through which this departure occurs (the "inversion layer"), or the lowest altitude at which the departure is found (the "base of the inversion"). This term almost always means a temperature inversion; however a moisture inversion and precipitation inversion are also defined *(Ref. 3)*.

in vitro. Literally "in glass", normally used to connote or describe something occurring outside a living organism.

in vivo. In the living organism.

ion. 1: In atmospheric electricity, any of several types of electrically charged submicroscopic particles normally found in the atmosphere. Atmospheric ions are of two principal types, small ions and large ions, although a class of intermediate ions has occasionally been reported.

2: In chemistry, atoms or specific groupings of atoms that have gained or lost one or more electrons, as the "chloride ion" or "ammonium ion". Such ions exist in aqueous solutions and in certain crystal structures *(Ref. 3)*.

ionization. The process by which neutral atoms or groups of atoms become electrically charged, either positively or negatively, by the loss or gain of electrons; or the state of a substance whose atoms or groups of atoms have become thus charged *(Ref. 15)*.

ionization chamber. An instrument consisting essentially of a closed chamber or tube of air or gas with two electrodes, used for detecting and measuring nuclear radiation. Radiation passing through an ionization chamber ionizes the air or gas in the chamber, permitting detection and measurement of the radiation by electrical means *(Ref. 14)*.

ionosphere. A layer of ionized air high above the surface of the earth which is important in the transmission of radio signals.

IPS *Abbr. for* International Pyrheliometric Scale.

IR *Abbr. for* infrared.

IR band. The infrared part of the optical spectrum extending from approximately 2×10^{11} to 5×10^{15} Hz. *See also:* **infrared radiation.**

iris. The colored circular disc of the eye perforated by the pupil. It is suspended in the aqueous humor in front of the lens.

irisation. The coloration of ice crystal clouds within about 30 deg of the sun *(Ref. 3)*.

iris diaphragm. A diaphragm used in an optical system to stop light with an aperture constructed so that its diameter may be continuously varied over a considerable range.

irradiance. The radiant flux density. The total radiant flux received on a unit area of a given real or imaginary surface.

irradiation. The exposure of a material to high energy radiation referring both to that producing detrimental effects as well as that employed for desirable modification of properties.

irrigation. The controlled application of water to arable lands to supply water requirements not satisfied by rainfall *(Ref. 6)*.

isallobar. A line of equal change in atmospheric pressure during a specified time interval; an isopleth of pressure tendency *(Ref. 1)*.

ISO *Abbr. for* International Organization for Standardization.

isobar. A line of equal or constant pressure;

an isopleth of pressure. In meteorology, it most often refers to a line drawn through all points of equal atmospheric pressure along a given reference surface, such as a constant-height surface (notably mean sea level on surface charts) *(Ref. 1)*.

isobaric. Of equal or constant pressure, with respect to either space or time. Because isobar is a common meteorological term, "isobaric" can be taken to mean "of isobars", therefore leading to some ambiguity. This latter use should be avoided *(Ref. 3)*.

isogonic line. A line on a map corresponding to points on the surface of the earth having the same magnetic declination.

isohel. A line drawn through geographical points having the same duration of sunshine (or other function of solar radiation) during any specified time period *(Ref. 3)*.

isohyet. A line drawn through geographical points recording equal amounts of precipitation during a given time period or for a particular storm *(Ref. 3)*.

isokinetic sampling. A sampling technique for dust particles in which the air velocity inside the sample probe is equal to the air velocity outside the probe. This type of sampling is usually required when sampling from a laminar flow of dust particles.

isolation. The process by which a system is rendered less sensitive to external excitation. For mechanical systems, vibration isolation is attained by resilient supports or other means of vibration attenuation. In steady-state forced vibration, isolation is expressed quantitatively as the complement of transmissibility *(Ref. 38)*.

isolation efficiency. *See:* transmissibility.

isolator. 1: A device or system to reduce the magnitude of motion transmitted from a vibrating foundation to the equipment or to reduce the magnitude of force transmitted from the equipment to its foundation *(Ref. 22)*.

2: Any device or system for reducing or eliminating interaction between objects or systems.

isomer. One or more substances with the same composition but with different structures and, hence, different properties.

isopleth. 1: A line of equal or constant value of a given quantity, with respect to either space or time *(Ref. 1)*.

2: A line drawn through points on a graph at which a given quantity has the same numerical value (or occurs with the same frequency) as a function of the two coordinate variables *(Ref. 3)*.

3: A straight line along which lie corresponding values of a dependent and independent variable *(Ref. 3)*.

isopycnic. Of equal or constant density, with respect to either space or time *(Ref. 1)*.

isostasy. The state of equilibrium existing between the highlands and the lowlands of the earth, due to the fact that the highlands are made of lighter rock materials than the lowlands.

isotach. Line of equal windspeed.

isotherm. A line of equal or constant temperature *(Ref. 1)*.

isotope. A variation of an element having the same atomic number as the element itself but having a different atomic weight because of a different number of neutrons. Different isotopes of the same element may have different radioactive behavior *(Ref 9)*.

issue. The release of supplies to consuming or using agencies or activities.

isthmus. A narrow strip of land connecting two considerable bodies of land *(Ref. 10)*.

J

J *Abbr. for* joule.

Jacobs-Hochheiser method. A reference sampling method for the measurement of nitrogen dioxide in the atmosphere using a chemical-colorimetric technique.

jamming. Intentional transmission or reradiation of radio signals in such a way as to interfere with reception of desired signals by the intended receiver *(Ref. 15)*.

JAN *Abbr. for* joint Army-Navy.

jerk. A vector that specifies the time rate of change of acceleration with respect to an inertial reference frame. Jerk is the first derivative of the acceleration with respect to time *(Ref. 8)*.

jet stream. A narrow band of high velocity horizontal wind in the upper troposphere or in the stratosphere, usually exceeding speeds of 50 kt. Two jet streams are sometimes distinguished; the polar-front jet stream of the middle to upper latitudes and the subtropical jet stream between latitudes 20 deg and 30 deg.

jetty. A structure, such as a wharf or pier, so located as to influence current or to protect the entrance to a harbor or river. A jetty extending into the sea to protect the coast from erosion is called a groin. A jetty that breaks the force of the sea at any place is called a breakwater. A jetty, wall, or bank, often submerged, built to direct or confine the flow of a river or tidal current is called a training wall. A wall or embankment along a waterfront to resist encroachment of the sea, is called a sea wall *(Ref. 18)*.

Johnson noise. *See:* noise, thermal.

joint. A crack in a mass of rock that has been formed along a plane of weakness.

joint amplitude probability density function. A function in which the probability density is plotted versus x and y. The volume under the joint probability density plot between any two x points and any two y points is equal to the probability that $x(t)$ and $y(t)$ will simultaneously have amplitudes within those ranges of any given time. Total volume under the plot is unity.

jolt test. The application of repeated shocks to equipment *(Ref. 1)*.

jumble test. The application of repeated tumbling to equipment in a box being rotated around its diagonal axis *(Ref. 1)*.

jungle. A dense, tangled second-growth vegetation of grasses, shrubs, small trees, and vines; generally associated with equatorial areas. The term is often used improperly as a synonym for tropical rainforest, which is relatively clear of undergrowth *(Ref. 1)*.

K

K *Abbr. for* **kelvin. Kelvin is the unit of temperature in the absolute or kelvin temperature scale being 1/273.16 of the thermodynamic temperature of the triple point of water. *Also see* kelvin.**

k *Abbr. for* kilo (10^3); cold (air).

kame. A mound, knob, or hillock deposited by stream and glacial action in which one or more sides were in contact with the glacier ice. Kames occur in a variety of shapes, sizes, and compositions and generally consist of poorly sorted, poorly stratified material *(Ref. 32).*

kame terrace. Stratified, transported material deposited by meltwater between glacier ice and adjacent higher ground in the form of a constructional terrace after disappearance of the ice *(Ref. 32).*

kapok. The soft, downy substance obtained from the inside of the seed pods of the silk-cotton tree and used in pillows, mattresses, and life preservers.

karman vortex phenomenon. The excitation into vibration of vertical, long, slender, elastic bodies, such as large space vehicles in prelaunch configuration, by ground winds.

karst region. A limestone region in which most or all of the drainage is by underground channels, the surface being dry and barren. It is characterized by sink holes and uneven topography caused by the unequal dissolution of porous underlying limestone rock *(Ref. 20).*

karst topography. A type of landform characterized by vast numbers of depressions of all sizes, sometimes by great outcrops of fluted limestone ledges, sinks, and other solution passages, almost total lack of surface streams, and large springs in the deeper valleys. Such topography is developed in regions of very water soluble limestone bedrock with type locality being the Karst, a limestone plateau on the eastern coast of the Adriatic Sea *(Ref. 32).*

katabatic wind. Any wind blowing down an incline; the opposite of anabatic wind. If the wind is warm, it is called a foehn; if cold, it may be a fall wind (such as the bora), or a gravity or drainage wind (such as a mountain wind) *(Ref. 1).*

kelvin temperature scale (*Abbr.* K). Same as absolute temperature scale. In the kelvin scale, the freezing point of water is 273.15 K (0° Celsius) and the boiling point of water is 373.15 K (100°C) *(Ref. 1).*

ketone. An organic chemical compound consisting of a CO (carbonyl) group attached to two hydrocarbon radicals.

kettle hole. A depression in glacial drift believed to have originated when an isolated block of ice from a glacier is partly buried by sediments and later melts entirely away. Kettle holes are usually undrained with the larger ones containing lakes and ponds *(Ref. 32).*

***k* factor; *also* multiplication factor.** The ratio of the number of neutrons produced by nuclear fission to the number of neutrons originally present; i.e., the number of neutrons produced in a chain reaction for every neutron absorbed or otherwise lost. In order to obtain a useful controlled reaction, the multiplication factor must be kept at a value of k equal to or slightly greater than one *(Ref. 1).*

kinematic viscosity. *See:* **viscosity, kinematic.**

knot (*Abbr.* kt *or* kn). The unit of speed in the nautical system; one nautical mile per hour. It is equal to 1.1508 statute mi hr^{-1} or 0.5144 m s^{-1} *(Ref. 3).*

konimeter; *also* conimeter. An instrument

for determining the dust content of a sample of air. One form of the instrument consists of a tapered metal tube through which a sample of air is drawn and allowed to impinge upon a glass slide covered with a viscous substance. The caught particles are counted and measured with the aid of a microscope *(Ref. 3)*.

kt *Abbr. for* knot.

kT *Abbr. for* kiloton.

L

l *Abbr. for* liter.

lacustrine. Relating to a lake or lake materials.

lacustrine deposit. Lake-deposited sediments that have been exposed by elevation of the land or lowering of the water level *(Ref. 2)*.

lacustrine terraces. Benches or flats that mark the shore lines of ancient lakes or earlier high-water stages of existing lakes. Nearly horizontal surfaces with relatively steep slopes facing the central portion of the lake characterize this landform *(Ref. 1)*.

lag. 1: That part of the difference between the output of an instrument and its input that is due to the failure of the instrument to respond instantaneously to variations of the input signal. It is a function of the instrument time constant *(Ref. 3)*.

2: The difference in phase between the voltage and the current it produces in an inductive circuit *(Ref. 3)*.

3: Variously defined as time from beginning (or center of mass) of rainfall to peak (or center of mass) of runoff *(Ref. 6)*.

lag coefficient. *See:* relaxation time.

lagoon. A shallow body of water such as a sound, channel, pond, or lake. The term is most frequently applied to such bodies of water that communicate with the sea *(Ref. 32)*.

lake. 1: Any standing body of inland water, generally of considerable size.

2: A pool of a viscous material, such as oil or asphalt. *(Ref. 10)*

lake effect. The modification in weather resulting from the presence of a lake. In the United States, it is often specific to the Great Lakes and is used to describe, for example, the localized excessive snowfall downwind from Lake Erie.

laminar flow. A flow in which the fluid moves smoothly in parallel layers, a nonturbulent flow.

land. The total natural and cultural environment within which production takes place. Land is a broader term than soil. In addition to soil, its attributes include other physical conditions such as mineral deposits and water supply; location in relation to centers of commerce, populations, and other land; the size of the individual tracts or holdings; and existing plant cover, works of improvement, and the like *(Ref. 16)*.

land breeze. *See:* breeze.

landform. The physical expression of the land surface *(Ref. 42)*.

land locomotion mechanics. An engineering discipline that integrates parameters of soil mechanics, vibration response, and vehicle geometry into analytical systems for the design of off-road automotive vehicles possessing optimum performance, ride, and handling characteristics *(Ref. 1)*.

landscape. The sum total of the characteristics that distinguish a certain kind of area on the surface of the earth and give it a distinguishing pattern in contrast to other kinds of areas. Any one kind of soil is said to have a characteristic natural landscape, and under different uses it has one or more characteristic cultural landscapes *(Ref. 16)*.

landscape type. A region throughout which a specific assemblage of environmental factor classes occurs and throughout which factor classes are related to each other in a similar way *(Ref. 35)*.

landslide. The downward movement of a large mass of earth or rocks from a mountain or cliff. It is often caused by rainwater soaking into the soil and other material on a steep slope; their weight is much increased, and they become more mobile. A landslide may be caused by an earthquake or on the seacoast by the undermining action of the sea *(Ref. 20)*.

lane. A clear route through an obstacle. A single lane is normally 8 m wide and suitably marked; a double lane is 16 m wide *(Ref. 12)*.

langley. A unit of solar radiation equal to 1 gcal cm^{-2} *(Ref. 1)*. It is named in honor of the American scientist, Samuel P. Langley, 1834-1906, who made many contributions to the knowledge of solar radiation.

lapse. A decrease from a higher to lower state or value.

lapse rate. The decrease of an atmospheric variable with height, the variable being temperature, unless otherwise specified *(Ref. 1)*.

large-lot storage. A quantity of material that will require four or more pallet columns stored to maximum height. Usually accepted as stock stored in carload or greater quantities *(Ref. 5)*. *See also:* storage.

large-scale map. A map having a scale of 1:75,000 or larger *(Ref. 5)*.

lashing. The fastening or securing of a load to its carrier to prevent shifting during transit *(Ref. 5)*.

latent heat. *See:* heat, latent.

lateral mirage. A very rare type of mirage in which the apparent position of an object appears displaced to one side of its true position. As in any mirage, an anomalous atmospheric density gradient is required for its production, but in the lateral mirage the isopycnic surfaces (surfaces of constant density) must be nearly vertical. The latter condition is almost never satisfied in the free atmosphere, but may exist in the immediate vicinity of strongly heated walls or cliffs. If the observer's eye is sufficiently close to such a heated vertical surface, he may see a lateral mirage *(Ref. 3)*.

lateral obstacle. An insurmountable terrain feature or combination of such features that forces a vehicle to deviate laterally from a desired path *(Ref. 35)*.

lateritic soil. A suborder of zonal soils of warm, temperate, and tropical regions that include the yellow podzolic, red podzolic, and yellowish-brown lateritic and that are residual products of rock containing iron oxide and aluminum hydroxide.

latitude. In geography, angular distance north or south from the Equator measured through 90 deg. In astronomy, angular distance of a celestial body from the plane in which the earth moves around the sun.

lava. Fluid rock, such as that which issues from a volcano or a fissure in the surface of the earth; also the same material solidified by cooling *(Ref. 10)*.

lava flow. A stream of molten lava that has flowed over a part of the surface of the earth. If it spreads out over a large area, it is called a lava bed or a lava field. Lava flows or lava beds may be nearly smooth and level, or they may be extremely rough *(Ref. 21)*.

layer principle. A technique of clothing design that utilizes the principle that two or more thicknesses of clothing, with intervening air space, provide greater insulation than the same thickness of clothing of the same material in a single layer *(Ref. 11)*.

leaching. The process by which water, percolating downward in the soil or moving across the surface of the soil, chemically removes soluble minerals from one place and deposits them elsewhere.

lead. A long narrow passage through pack ice, navigable by a surface vessel and usually large enough to allow a submarine to surface in or through it *(Ref. 31)*.

leader *or* leader streamer. The streamer that initiates the first phase of each stroke of a lightning discharge. Like all streamers, it is a channel of very high ion density that propagates through the air by the continual establishment of an electron avalanche ahead of its tip. Of the recognized types of leader, the stepped leader initiates the very first stroke and establishes the channel for all subsequent streamers of a lightning discharge. The dart leader initiates each

subsequent stroke. It is postulated that a pilot streamer precedes the stepped leader *(Ref. 3)*.

leakage current. The electric current that flows or "leaks" along the surface or through the body of an insulator.

lee. A place or location sheltered from the wind. In nautical usage, the side of a ship farthest from the side from which the wind blows.

leeward. The direction toward which the wind blows.

length of record. The period during which observations have been maintained at a meteorological station, and which serves as the frame of reference for climatic data at that station. The standard length of record for the purpose of a normal has been fixed by the World Meteorological Organization as 30 yr, which is a fair practical average for the length of a homogeneous record desirable for most of the meteorological elements *(Ref. 1)*.

levee. An embankment along the shore of a river or the arm of the sea. Artificial levees are built to protect property from flooding during high water. Natural levees are built by a river in times of flood by deposition of material upon the banks and are relatively low and wide *(Ref. 32)*.

level of free convection. The level at which a parcel of air lifted dry-adiabatically thereafter would first become warmer than its surroundings, in a conditionally unstable atmosphere. Found at the pressure level where the mean wet-bulb temperature of the moist layer, raised along a pseudoadiabat, first intersects the sounding.

lf *Abbr. for* low frequency.

lf band. The low frequency portion of the electromagnetic spectrum extending from approximately 10^4 to 2×10^5 Hz.

LGP *Abbr. for* low ground pressure.

liana. A woody climbing plant with ground roots *(Ref. 1)*.

lichen. Any plant of the class Lichenes varying in size, form, and color but always having a compound structure consisting of an alga and fungus. A lichen is an air plant that lacks roots, stems, branches, leaves, and flowers; it reproduces by spores or through fragmentation. It is usually found attached to rocks, soil, wood, or bark *(Ref. 11)*.

life, average. The mean value for a normal distribution of lives. Generally applied to mechanical failures resulting from wear *(Ref. 33)*.

life cycle (materiel). The events occurring between procurement and expenditure or disposal. It consists of two phases:
(a) transportation and storage necessary to give time and place utility to materiel,
(b) operational use.

life cycle (system). A system life cycle consists of five phases which describe the status of a system from its original concept to its eventual realization as operational hardware. The five phases are: (a) concept formulation, (b) contract definition, (c) development, (d) production, (e) operation.

life, service. The acceptable period of time when an item can remain in storage and in tactical readiness with authorized organizational and field maintenance being performed that does not affect its operability for the intended tactical use *(Ref. 33)*.

life, shelf. The acceptable period of time during which an item can remain in storage without affecting its operability for the intended tactical use *(Ref. 33)*.

life, useful. The total operating time between being issued and being worn out *(Ref. 33)*.

lift-on/lift-off transport. A combination of motor and water transport in which semitrailers are transported to a port by tractors, lifted on board ships by cranes, transported by water to another port, offloaded from the ship by cranes, and then delivered by highway to their destinations.

light breeze. In the Beaufort wind scale, a wind whose speed is from 1 to 3 kt.

lightfastness. Ability of a color or colored material to withstand exposure to radiant energy without change from the original condition *(Ref. 1)*.

lightning. A luminous atmospheric manifestation accompanying a sudden electrical discharge which takes place from or inside a cloud or, less often, from high structures on the ground or from mountains *(Ref. 36)*.

lightning arrester. 1: Any device designed to

carry to the ground (to "ground") the short-duration surge currents that appear on power lines and telephone or telegraph lines during severe thunderstorms *(Ref. 3)*.

2: A device designed to protect apparatus from high transient voltage. It is connected usually between the electric conductors of a network and ground.

light sensitizers. Components that react to sunlight and act as initiators of photochemical reactions. Some relatively widespread light sensitizers include ozone, nitrogen dioxide, and peroxides.

lime pan. A dry lake having a surface of solid or particulate calcium carbonate deposited from solution by the evaporation of water originally or periodically in the basin *(Ref. 2)*.

limestone. A bedded sedimentary deposit consisting chiefly of calcium carbonate which yields lime when burned. (In a broader sense the term has been used for combinations or mixtures with magnesium carbonate in which the proportion of calcium carbonate is less than one-half.) *(Ref. 1)*

limited-production-type item. An item under development, commercially available, or available from other Government agencies for which an operational requirement exists and for which no other existing item is substitutable; the item appears to fulfill an approved materiel requirement or other Military Department approved requirements, and to be promising enough operationally to warrant initiating procurement and/or production for service issue prior to completion of development and/or test or adoption as a standard item *(Ref. 5)*.

limited standard item. An item of supply determined by standardization action as authorized for procurement only to support in-Service military materiel requirements *(Ref. 5)*.

limnology. The study of the physical, chemical, meteorological, and biological aspects of fresh waters *(Ref. 9)*.

line map. *See:* planimetric map.

linear acceleration. Acceleration along a straight line, usually expressed in units of ft s^{-2} or m s^{-2}. A frequently used unit of measure is the acceleration due to gravity g whose standard value is 32.1740 ft s^{-2}.

line-of-sight. A line in which visibility is unimpaired by obstacles. Microwave transmission is limited to line-of-sight by the curvature of the earth, because of the straight-line propagation of microwave energy.

liquid-in-glass thermometer. A thermometer in which the thermally sensitive element is a liquid contained in a graduated glass envelope. The indication of such a thermometer depends upon the difference between the coefficients of thermal expansion of the liquid and the glass. Mercury and alcohol are liquids commonly used in meteorological thermometers *(Ref. 3)*.

liquid limit. *Soil Mechanics.* A measure of soil consistency (*See:* Atterberg limits) defined as the water content, expressed as a percentage of the weight of the oven-dried soil, at the boundary between the liquid and plastic states *(Ref. 32)*.

liquid water content. The amount of liquid water in a given volume of air.

lithometeor. A meteor consisting of an ensemble of particles most of which are solid and nonaqueous. The particles are more or less suspended in the air or lifted by the wind from the ground. The lithometeors, which have more or less the character of suspensions in the atmosphere, are haze, dust haze, and smoke; they consist of very small dust particles, of sea-salt particles, or of combustion products (e.g., from forest fires) *(Ref. 36)*.

lithosols. Azonal soils having an incomplete solum or no clearly expressed soil morphology and consisting of freshly and imperfectly weathered rock or rock fragments *(Ref. 2)*.

lithosphere. The outer, solid portion of the earth; the crust of the earth; usually used in contexts wherein the lithosphere is said to make contact with the atmosphere and the hydrosphere *(Ref. 3)*.

littoral; *also* littoral benthal. *Oceanography.* The benthic zone between high and low water marks. According to some authorities, the benthonic zone between the shore and water depths of approximately 100 fathoms (200 m). Littoral benthal is subdivided into the eulittoral and the sublittoral. The usage and interpretation of

this term vary widely in the literature *(Ref. 18)*.

live room. A room characterized by an unusually small amount of sound absorption, or stated conversely, a room that has an appreciable reverberation time *(Ref. 1)*.

lm *Abbr. for* lumen.

load factor. The factor by which the weight of a piece of equipment is multiplied to determine the steady-state acceleration level to be applied through the equipment center-of-gravity, the value and direction of the factor being specified for the vehicle structure location at which the item of equipment is to be installed *(Ref. 1)*.

load range. For a shock and vibration isolator, or an isolating interface material, the range of static load or unit load that the isolator or material is designed to support *(Ref. 1)*.

loaded height. For a shock or vibration isolator or mounting base, the specified or measured distance from its vehicle installation interface to a specified point on the equipment side of the resilient medium, when a specified percent of the rated load is applied *(Ref. 1)*.

loam. The U S Department of Agriculture textural class name for soil having a moderate amount of sand, silt, and clay. Loam soils contain 7 to 27 percent of clay, 28 to 50 percent of silt, and less than 52 percent of sand *(Ref. 16)*.

loamy sand. The U S Department of Agriculture textural class name for soil containing more than 70 percent sand and less than 15 percent clay, and less than 85 percent sand at 0 percent clay and more than 10 percent clay at 0 percent silt *(Ref. 1)*.

local procurement. The process of obtaining personnel, services, supplies, and equipment from local or indigenous sources *(Ref. 5)*.

local relief. The difference in elevation between the highest and lowest points in a limited area. In terrain studies, the area of usually 1 mi^2 *(Ref. 42)*.

local speed of sound. The velocity of propagation of acoustic waves over a small region as determined by the conditions there. It is principally a function of temperature *(Ref. 1)*.

local winds. Winds that, over a small area, differ from those that would be appropriate to the general pressure distribution, or that possess some other peculiarity *(Ref. 1)*.

locus. A set of lines, points, etc., satisfying given conditions.

loess. Geological deposit of relatively uniform, fine material, mostly silt, presumably transported by wind. Many unlike kinds of soil in the United States having developed from loess blown out of alluvial valleys and from other deposits during periods of aridity *(Ref. 16)*.

logarithmic decrement. In shock and vibration terminology, the natural logarithm of the ratio of any two successive amplitudes of like sign in the decay of a single-frequency oscillation *(Ref. 1)*.

logistical support. Maintenance and supply support to be provided at organization, field, and depot levels. Logistical support is influenced by the degree of unitization or modularization, ruggedness, cost and test points, test equipment, tactical employment, and transportation requirements *(Ref. 33)*.

logistics. 1: The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, the aspects of military operations that deal with *(Ref. 5)*:

(a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel,

(b) movement, evacuation, and hospitalization of personnel,

(c) acquisition or construction, maintenance, operation, and disposition of facilities,

(d) acquisition or furnishing of services.

2: For purposes of this handbook, a more limited definition of logistics is employed. The logistic cycle is defined as beginning at the point of procurement and extending to the time of issue of materiel to operating personnel; hence, it consists of procurement, packaging, transport, storage, and issue.

logistic cycle. The events or operations that materiel encounters between the time of manufacture and time of use by the using agency. The logistic cycle, as defined here-

in, consists of three basic operations: (a) handling, (b) transportation, and (c) storage.

logistic materiel classes. Methods of classifying Army materiel for management purposes. Examples of classification criteria include: (a) cost, (b) class of supply, and (c) importance of item.

logistic support (medical). Medical care, treatment, hospitalization, evacuation, furnishing of medical services, supplies, materiel, and adjuncts thereto *(Ref. 5)*.

lolly ice. *See:* frazil.

longitude. A measure of angular distance on the surface of the earth from the Greenwich meridian or a prime meridian numbered in degrees up to 180 deg in either direction (east or west).

longitudinal dunes. Long, narrow ridges of sand, whose longitudinal axes are parallel to the direction of the prevailing winds. They are wider and steeper on the windward side and taper to a point on the leeward side. Characteristically, they form behind topographic obstacles in areas where the wind is strong and varies little in direction, and where sand is plentiful *(Ref. 32)*.

longitudinal obstacle. A surmountable terrain feature (e.g., tall, thick grass) that inhibits the movement of a surface vehicle by forcing it to slow down as the feature is negotiated *(Ref. 35)*.

longitudinal wave. *See:* wave, longitudinal.

longshore current. The resultant current produced by waves being deflected at an angle by the shore. In this case the current runs roughly parallel to the shoreline. The longshore current is capable of carrying a certain amount of material depending upon its velocity and the particle size of the material; however, any obstruction, such as a submarine rock ridge or a land point cutting across the path of the current will cause loss of velocity and consequent loss of carrying power *(Ref. 18)*.

loop antenna. An antenna consisting of a conducting coil, of any convenient cross section (generally circular), that emits and receives radio energy. The principal lobe of the radiation pattern is wide and is in the direction perpendicular to the plane of the loop. Its primary application in radio meteorology is for the detection of such low frequency radio waves as are in sferics and in certain radio direction-finding equipment *(Ref. 3)*.

loose ice. *See:* broken ice.

Loschmidt number. The number of molecules in 1 cm^3 of an ideal gas at 0°C and 1 atmosphere, equal to 2.687×10^{19}.

loudness. A rating scale of auditory evoked response, in terms of which sounds may be ordered on a scale extending from soft to loud. Loudness is primarily a function of the sound pressure of the stimulus, but also depends on the frequency and wave form of the stimulus *(Ref. 38)*.

loudness contour. A curve of sound pressure level versus frequency required to produce a given loudness sensation for the typical listener *(Ref. 38)*.

low. An "area of low pressure", referring to a minimum of atmospheric pressure in two dimensions (closed isobars) on a constant-height chart or a minimum of height (closed contours) on a constant-pressure chart. Since a low is, on a synoptic chart, always associated with cyclonic circulation, the term is used interchangeably with cyclone *(Ref. 3)*.

low temperature chamber. *See:* chamber, low temperature.

low velocity airdrop. The delivery of personnel, supplies, or equipment from aircraft in flight, utilizing sufficient parachute retardation to prevent injury or damage upon ground impact. The nominal terminal velocity of low velocity airdrop is 28.5 ft s^{-1} *(Ref. 17)*. *See also:* high velocity airdrop.

lumen. A unit of luminous flux. The lumen is equal to the luminous flux radiated into a unit solid angle (steradian) by a uniform point source having a luminous intensity of one candela. It is the SI unit for luminous flux.

luminance. The total luminous flux produced by light from a source falling on a unit surface area normal to the direction of propagation of the light at the center of the unit surface area divided by the solid angle subtended by the source at the receiving surface. The intervening medium between the light source and the receiving surface is assumed to be transparent *(Ref. 3)*.

luminescence. Emission of light other than

incandescence. Emission as a result of and only during absorption of radiation from some other source is called fluorescence *(Ref. 15)*.

luminosity. *See:* luminous efficiency.

luminous efficiency; *also* luminosity. For a given wavelength of visible radiation, the ratio of the flux that is effectively sensed by the human eye to the flux that is intrinsic in the radiation *(Ref. 1)*.

luminous meteor. According to U.S. weather observing practice, any one of a number of atmospheric phenomena that appear as luminous patterns in the sky. This includes halos, coronas, rainbows, aurorae, and their many variations *(Ref. 3)*.

lunar tide. The portion of a tide due to the tide-producing force of the moon *(Ref. 3)*.

lux. A photometric unit of illuminance or illumination equal to 1 lm m^{-2}.

LWC *Abbr. for* liquid water content.

lx *Abbr. for* lux.

lyophilize. Rapid freezing and subsequent rapid dehydration under a vacuum. The term is most frequently used in biology and medicine. Popularly called freeze-drying.

lysimeter. An instrument to determine (a) losses from a soil column due to percolation and leaching under prescribed conditions, or (b) gains and losses from a soil column *(Ref. 2)*.

lyze. Produce or undergo decomposition, disintegration, or dissolution (as of cells).

M

M *Abbr. for* mega (10^6).

m *Abbr. for* milli (10^{-3}); meter; maritime (air).

Mach number. The ratio of the speed of an object to the speed of sound in the undisturbed medium in which the object is moving. At 0°C and a pressure of 1 atm, the speed of sound in air is about 34,400 cm s^{-1}.

machine-generated duststorms. Manmade duststorms on a localized scale caused by helicopters at low altitudes and vehicular passage. Duststorms of a local nature in which the dust is made airborne by operation or passage of materiel.

mackerel sky. An area of sky with a formation of rounded and isolated cirrocumulus or altocumulus clouds resembling the pattern of scales on the back of a mackerel *(Ref. 15)*.

macroclimatology. The study of macroclimate; the general large-scale climate of a large area or country, as distinguished from the mesoclimate and microclimate *(Ref. 3)*.

maggot. The soft-bodied larva of many species of two-winged flies.

magma. Molten material from deep within the earth that, when it moves through the outer shell of the earth and hardens, forms igneous rocks.

magnesite. A mineral consisting of magnesium carbonate derived from the action of carbonated waters on magnesium-rich rocks.

magnetic declination. *See:* magnetic variation.

magnetic field. Any space or region in which magnetic forces are present, as in the magnetic field of the earth, or in or about a magnet, or in or about an electric current *(Ref. 40)*.

magnetic storm. A worldwide disturbance of the magnetic field of the earth. Magnetic storms are frequently characterized by a sudden onset, in which the magnetic field undergoes marked changes in the course of an hour or less, followed by a very gradual return to normalcy, which may take several days. Magnetic storms are caused by solar disturbances, although the exact nature of the link between the solar and terrestrial disturbances is not understood. They are more frequent during years of high sunspot activity. Sometimes a magnetic storm can

be linked to a particular solar disturbance. In these cases, the time between solar flare and onset of the magnetic storm is about 1 or 2 days, suggesting that the disturbance is carried to the earth by a cloud of particles thrown out by the sun *(Ref. 3)*.

magnetic variation; *also* **magnetic declination.** The angular difference between magnetic north and true north, as in the "magnetic variation of X is 5 deg east". Magnetic variation is preferred over magnetic declination to avoid confusion with declination as used in astronomy *(Ref. 14)*.

magnetometer. An instrument that measures the magnetic field intensity of the earth.

main supply route. The route or routes designated within an area of operations upon which the bulk of traffic flows in support of military operations *(Ref. 5)*.

maintainability. A built-in characteristic of design and installation which imparts to the system or end item an inherent ability to be maintained *(Ref. 33)*.

maintenance. 1: All action taken to retain materiel in a serviceable condition or to restore it to serviceability. It includes inspection, testing, servicing, classification as to serviceability, repair, rebuilding, and reclamation.

2: All supply and repair action taken to keep a force in condition to carry out its mission.

3: The routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be continuously utilized at its original or designed capacity and efficiency for its intended purpose *(Ref. 5)*.

maintenance, depot. Maintenance required for major overhauling or complete rebuilding of parts, subassemblies, assemblies, or end items. Such maintenance is intended to augment stocks of serviceable equipment or to support lower levels of maintenance by use of more extensive shop equipment and personnel of higher technical skill than available in organizational or field maintenance activities *(Ref. 33)*.

maintenance engineering. The application of techniques, engineering skills, and effort organized to insure that the design and development of weapons, systems, and equipment provide adequately for effective and economical maintenance *(Ref. 33)*.

maintenance, field. The maintenance authorized and performed by designated maintenance activities in direct support of using organizations. This category will normally be limited to maintenance consisting of replacement of unserviceable parts, subassemblies, or assemblies *(Ref. 33)*.

maintenance, periodic. Maintenance performed on equipment on the basis of hours of operation or calendar time elapsed since last inspection *(Ref. 33)*.

maintenance, preventive. The systematic care, servicing, and inspection of equipment and facilities for the purpose of maintaining them in serviceable condition and detecting and correcting incipient failures *(Ref. 33)*.

maintenance status. 1: A nonoperating condition, deliberately imposed, with adequate personnel to maintain and preserve installations, materiel, and facilities in such a condition that they may be readily restored to operable condition in a minimum time by the assignment of additional personnel and without extensive repair or overhaul.

2: The condition of materiel that is, in fact, or is administratively classified as, unserviceable, pending completion of required servicing or repairs *(Ref. 5)*.

malfunction. A general term used to denote the failure of a product to give satisfactory performance. It need not constitute a failure if readjustment of operator controls can restore an acceptable operating condition *(Ref. 33)*.

malfunction drop. A drop in which the air delivery equipment does not perform as intended; typical are the complete or partial failure of a parachute to achieve proper opening and descent or contents falling free of pack or platform load *(Ref. 17)*.

management system. An integrated group of procedures, methods, policies, practices, and personnel used by a commander or other supervisor in planning, organizing, directing, coordinating, and controlling an organization *(Ref. 26)*.

mangrove. One of a group of halophytic evergreen broadleaf trees and shrubs of tropical and subtropical coasts, typically growing in muddy areas, such as lagoons and estuaries, that are submerged

perennially or at high tide by brackish or salty water. Many species of mangrove have prop roots or root knees above the ground *(Ref. 1)*.

man movable. Items that can be towed, rolled, or skidded for short distances by an individual without mechanical assistance but that are of such size, weight, or configuration as to preclude being carried. Upper weight limit is approximately 425 lb per individual.

manometer. An instrument for measuring differences of pressure. The weight of a column of liquid enclosed in a tube is balanced by the pressure applied at its opposite ends, and the pressure difference is computed from the hydrostatic equation. A mercury barometer is a type of manometer *(Ref. 1)*.

man portable. Items that are designed to be carried as a component part of individual, crew served, or team equipment of the dismounted soldier in conjunction with his assigned duties. Upper weight limit is approximately 30 lb per individual.

mantle rock. The unconsolidated weathered material that has accumulated on the surface of the earth *(Ref. 20)*.

man transportable. Items that are usually transported on wheeled, tracked, or air vehicles but have integral provisions to allow periodic handling by one or more individuals for limited distances (100-500 m). Upper weight limit is approximately 65 lb per individual.

map. A drawing depicting selected features of some portion of the surface of the earth, of which there are many types. One type of map is the chart which gives those details required by navigators.

map chart. A representation of a land/sea area, using the characteristics of a map to represent the land area and the characteristics of a chart to represent the sea area, with such special characteristics as to make the map chart most useful in military operations, particularly amphibious operations *(Ref. 5)*.

maquis. *See:* chaparral.

marginal sea ice zone. The band of sea ice from the ice edge to 75 mi inside pack ice under which any submarine can operate with a minimum of special sonar equipment. (Upward-beamed echo sounders are sufficient to allow surfacing in lakes.) *(Ref. 31)*

marigraph. *See:* tide gage.

marine borer. Any of two general groups of marine organisms (crustaceans and molluscan borers) that attack submerged or floating wood structures in salt or brackish waters *(Ref. 19)*.

maritime air. A type of air whose characteristics are developed over an extensive water surface and that therefore has the basic maritime quality of high moisture content in at least its lower levels *(Ref. 3)*.

marl. A mixture of clay and calcium carbonate, although the term is loosely applied to a wide variety of rocks and soils. Some of the marls are marine deposits while others are of fresh-water origin *(Ref. 20)*.

marsh. 1: In general, any area of continuously saturated or spongy ground having poor drainage, hence synonymous with swamp. 2: *Botany.* An open, treeless, meadowlike or tussocky, salt or fresh-water tract of wet or spongy land, usually with occasional open, shallow pools of water, and with a vegetation of more or less dense, erect, aquatic, or amphibious plants including cattails, grasses, sedges, reeds, rushes, or other succulent herbs *(Ref. 11)*.

marshalling. 1: The process by which units participating in an amphibious or airborne operation group together, assemble when feasible, or move to temporary camps in the vicinity of embarkation points, complete the preparations for combat, and prepare for loading.

2: The process of assembling, holding, and organizing supplies and/or equipment, especially vehicles of transportation, for onward movement *(Ref. 5)*.

Martin's diameter. A term used in particle sizing by microscope, which is the mean of the lengths of segments of parallel lines that bisect each particle in the sample being examined into equal areas.

Marvin sunshine recorder. A sunshine recorder of the type in which the time scale is supplied by a chronograph. It consists of two bulbs, one blackened, which communicate through a glass tube of small diameter. The tube is partially filled with mercury

and contains two electrical contacts. When the instrument is exposed to sunshine, the air in the blackened bulb is warmed more than that in the clear bulb. The warmed air expands and forces the mercury through the connecting tube to a point where the electrical contacts are shorted by the mercury, completing the electrical circuit to the pen on the chronograph *(Ref. 3)*.

mass. The property of a body that is a measure of its inertia, which is commonly taken as a measure of the amount of material contained in the body, which gives the body weight in a gravitational field, and which is one of the fundamental quantities upon which all physical measurements are based, the others being length and time.

mass divergence. A measure of the rate of net flux of mass out of a unit volume of a system *(Ref. 3)*.

mass movement. A general term for a variety of processes by which large masses of earth material are moved by gravity either slowly or quickly from one place to another. The rapid translocation of material in avalanches, landslides, and related events is one phase of mass movement but the slower, less noticeable actions of earth flowage, soil-creep, and solifluction probably accomplish greater effects *(Ref. 1)*.

material handling. The movement of materials (raw materials, scrap, semifinished, and finished) to, through, and from productive processes; in warehouses and storage; and in receiving and shipping areas *(Ref. 5)*.

materiel. All items necessary for the equipment, maintenance, operation, and support of military activities without distinction as to their application for administrative or combat purposes; excluding ships and naval aircraft *(Ref. 26)*.

materiel degradation. Damage to or deterioration of materiel that impairs its performance. Two general types of processes are responsible for degradation, (a) mechanical and (b) chemical.

materiel life cycle. *See:* life cycle.

materiel pipeline. The quantity of an item required in the worldwide supply system to maintain an uninterrupted replacement flow *(Ref. 5)*.

materiel readiness. The availability of materiel required by a military organization to support its wartime activities or contingencies, disaster relief (flood, earthquake, etc.), or other emergencies *(Ref. 5)*.

materiel requirements. The quantities of items of equipment and supplies necessary to equip; to provide a materiel pipeline; and to sustain a service, formation, organization, or unit in the fulfillment of its purposes or tasks during a specified period *(Ref. 5)*.

mature soil. A soil in near equilibrium with its environment. Mature soils have well-developed soil horizons whose characteristics are produced by the natural processes of soil formation.

maximum thermometer. A thermometer in which the mercury, or the indicator used for registering temperature, remains at the highest point reached since its last setting *(Ref. 12)*.

maximum water-holding capacity. The average moisture content, under equilibrium conditions, of a disturbed sample of soil, 1 cm high, saturated at its base by contact with a water table *(Ref. 2)*.

Maxwell's equations *or* **Maxwell's laws.** The fundamental equations of macroscopic electromagnetic field theory obeyed by all physical electric and magnetic fields *(Ref. 24)*.

meadow. A low, level tract of grassland usually near a lake or stream.

mean. Usually taken as the arithmetic mean; i.e., the quotient of the sum of a set of values divided by the number of values in the set. In severe-weather forecasting, the mean is usually estimated by eye (e.g., the mean dewpoint of the moist layer is normally the dewpoint in the middle of the moist layer, assuming a linear dewpoint lapse rate).

mean annual range of temperature. The difference between the absolute maximum and minimum temperatures for a year, averaged over a given number of years *(Ref. 1)*.

mean daily maximum (minimum) temperature. Average of the maximum (minimum) temperatures for each day within a given period, usually a month, over a period of years *(Ref. 1)*.

meander. One of a series of somewhat

regular winding or looping bends in a stream *(Ref. 10)*.

mean deviation. A measure of dispersion of a data sample with respect to a reference value; obtained by dividing the sum of the absolute differences between each point and the reference point by the number of points.

mean hourly temperature. Average of the daily temperatures at a given hour for an indicated period, generally a month, averaged over a period of years *(Ref. 1)*.

mean monthly cloudiness. Average of the mean cloud cover of each day within a month, averaged over a period of years *(Ref. 1)*.

mean monthly dewpoint. Average of the mean dewpoints of each day (generally computed from observations taken at equal time periods of 6 hr or less apart) within a month, averaged over a period of years *(Ref. 1)*.

mean monthly maximum (minimum) temperature. The highest (lowest) temperature for a month, averaged over a period of years *(Ref. 1)*.

mean monthly relative humidity. Average of the mean relative humidities for each day of the month, averaged over a period of years *(Ref. 1)*.

mean monthly temperature. Average of the mean temperatures of each day within a month, averaged over a period of years. Some weather services require that a prescribed length of record be available before "mean" is used *(Ref. 1)*.

mean precipitable water. The mean of the depths of liquid water that would be obtained if all the water vapor above a unit area of the surface of the earth were condensed over the period for which the mean is quoted.

mean radiant temperature. The temperature at which an object gives out as much radiation as it receives from its surroundings. In a room it is approximately the mean temperature of the walls, floor, and ceiling *(Ref. 3)*.

mean sea level. The average height of the surface of the sea for all stages of the tide, used as a reference for elevations *(Ref. 5)*.

mean solar day. The duration of one rotation of the earth on its axis, with respect to the mean sun. The length of the mean solar day is 24 hr of mean solar time for 24 hr 03 min 56.555 s of mean sidereal time. A mean solar day beginning at midnight is called a civil day; and one beginning at noon, 12 hr later, is called an astronomical day *(Ref. 15)*.

mechanical-acoustical coupling. The interconnection of mechanical and acoustical elements. An example would be the production of noise by mechanical vibration of a gear casing *(Ref. 1)*.

mechanical analysis. *See:* **particle-size analysis.**

mechanical hearing protectors. Devices to attenuate acoustic energy reaching the ear from the ambient atmosphere. There are four types: (a) earplugs, (b) semi-inserts; (c) earmuffs, and (d) helmets.

mechanical impedance. *See:* **impedance, mechanical.**

mechanical mobility. *See:* **mobility, mechanical.**

mechanical shock. Sudden changes of excitation that develop significant internal forces in a system. Mechanical shock exists when an applied force is suddenly changed so as to excite mechanical transients in a system *(Ref. 8)*.

mechanical turbulence. The erratic movement of air caused by local obstructions such as buildings *(Ref. 9)*.

mechanical vibration. An oscillation in which the oscillatory quantity is a mechanical parameter such as force, stress, displacement, velocity, or acceleration *(Ref. 37)*.

mechanical weathering. The weathering of rock by physical forces without chemical change *(Ref. 20)*.

mechanoreceptors. Receptors distributed throughout the body that sense vibratory forces and displacements acting on the body.

median-middle. The middle value in an ordered set of values below and above which there are an equal number of values.

medium dollar value item. An end item or repair part for which the dollar value of issues from continental United States

depots are greater than $1,000 but do not exceed $10,000 annually *(Ref. 26)*.

medium-lot storage. Generally defined as a quantity of material that will require one to three pallet stacks, stored to maximum height. Thus the term refers to relatively small lots as distinguished from definitely large or small lots *(Ref. 5)*.

medium-scale map. A map having a scale larger than 1:600,000 and smaller than 1:75,000 *(Ref. 5)*.

mel. A subjective unit of pitch defined in terms of a single harmonic frequency of 1,000 Hz that is 40 dB above the listener's threshold. Such a signal is then defined to produce a pitch of 1,000 mel, and the pitch of any sound judged by the listener to be *n* times that of a 1 mel tone is *n* mel.

melting point. The temperature at which a solid substance undergoes fusion; i.e., melts, changes from solid to liquid form. The melting point of a substance should be considered a property of its crystalline form only *(Ref. 1)*.

meniscus. The upper surface of a column of liquid. The curvature of this surface is dependent upon the cross-sectional area of the liquid and the relative ability of the liquid to wet the walls of the enclosure. In the case of a mercury column enclosed in a glass container, the surface is convex, since mercury does not wet glass *(Ref. 3)*.

MER *Abbr. for* multiple ejection rack.

mercury barometer *or* **mercurial barometer.** A glass instrument, employing mercury in its vertical column, that is used to measure atmospheric pressure *(Ref. 1)*.

mesa. A flat-topped mountain bounded on at least one side by a steep cliff; a plateau terminating on one or more sides in a steep cliff; a tableland *(Ref. 10)*.

mesoclimatology. The study of mesoclimates: the climatology of relatively small areas that may not be climatically representative of the general region. The data used in mesoclimatology are mostly standard observations. The size of the area involved is rather indefinite and may include topographic or landscape features from a few acres to a few square miles, such as a small valley, a forest clearing, a beach, or a village site *(Ref. 3)*.

mesoscale. The scale of atmospheric motions having characteristic dimensions too small to remain readily identifiable on the macroscale synoptic maps. Results of mesoanalysis reveal systems that have definite order, pattern, and chronological continuity such as mesohighs and mesolows.

mesosphere. The portion of the atmosphere between approximately 20 and 75 km *(Ref. 3)*.

metabolism. The interchange of materials between living organisms and their environment by which the organism grows and energy is secured for vital processes.

metal fatigue. A weakening in the strength of a metal caused by repeated or fluctuating stresses *(Ref. 14)*.

metamorphic rocks. One of the three great groups of rocks. Metamorphic rocks are formed from original igneous or sedimentary rocks through alterations produced by pressure, heat, or the infiltration of other materials at depths below the surface zones of weathering and cementation *(Ref. 1)*.

metamorphism. 1: A change in form.

2: The process by which rocks are changed from preexisting forms by mineralogical textural and structural changes within the original mass.

3: The process by which snow loses its original crystalline form after being deposited on the surface of the earth. Four types of metamorphism contribute to the transformation of snow as follows:

(a) *Destructive metamorphism*, in which the original crystalline shapes are lost by sublimation and surface diffusion and an aggregate of rounded or subangular particles results.

(b) *Constructive metamorphism*, in which a process of grain growth occurs, depending chiefly on the transfer of material by evaporation and condensation.

(c) *Melt metamorphism*, resulting from rise of temperature to the melting point and percolation of surface melt water. Crystals become rounded and are covered by a water film. Surface tension effects tend to make water accumulate at intergrain contact, leading to formation of strong bonds and composite grains on refreezing.

(d) *Pressure metamorphism*, the mechanical

densification of snow by steady compression or compaction. It is achieved by a rearrangement of the individual grains to permit closer packing and eventually actual deformation of the grains and their bonds.

meteor. 1: Commonly, the streak of light observed when a meteoroid (a body from space) enters the atmosphere of the earth. 2: *Meteorology.* A phenomenon observed in the atmosphere or on the surface of the earth, which consists of a precipitation, a suspension, or a deposit of aqueous or nonaqueous liquid or solid particles, or a phenomenon of the nature of an optical or electrical manifestation *(Ref. 36). See also* hydrometeor.

meteorite. The portion of a relatively large body from space (a meteoroid) that survives its passage through the atmosphere and reaches the surface of the earth *(Ref. 1).*

meteorological check point. Arbitrarily selected point for which meteorological corrections are determined as a timesaving expedient. These corrections are applied to any target located within transfer limits of the meteorological check point *(Ref. 12).*

meteorological data. Meteorological facts pertaining to the atmosphere, such as wind, temperature, air density, and other phenomena that affect military operations *(Ref. 5).*

meteorological visibility. The greatest distance at which a black object of suitable dimensions can be seen and recognized against the horizon sky or, in the case of night observations, could be seen and recognized if the general illumination were raised to normal daylight levels.

meteorology. The study dealing with the phenomena of the atmosphere. This includes not only the physics, chemistry, and dynamics of the atmosphere, but also is extended to include many of the direct effects of the atmosphere upon the surface of the earth, the oceans, and life in general. The goals often ascribed to meteorology are the complete understanding, accurate prediction, and artificial control of atmospheric phenomena *(Ref. 1).*

methane. A colorless, nonpoisonous, and flammable gaseous hydrocarbon. Methane, CH_4, is emitted by marshes and by dumps undergoing anaerobic decomposition *(Ref. 9).*

mf *Abbr. for* medium frequency.

mho. An electrical unit of conductivity, being the conductivity of a body with the resistance of 1 Ω *(Ref. 4).*

mi *Abbr. for* mile.

microbar. A unit of pressure equal to 1 dyn cm^{-2}. It is frequently used to measure air pressure, especially in acoustics, and is equal to 0.1 N m^{-2}.

microbiological deterioration. Physical destruction or functional disturbance of materials or equipment caused by the biochemical action of microbiological agents such as fungi and bacteria *(Ref. 1).*

microclimate. The fine climatic structure of the air space that extends from the very surface of the earth to a height where the effects of the immediate character of the underlying surface no longer can be distinguished from the general local climate (mesoclimate or macroclimate) *(Ref. 1).*

microclimatology. The study of microclimate. It includes the study of profiles of temperature, moisture, and wind in the lowest stratum of air, the effect of the vegetation and of shelterbelts, and the effect of towns and buildings in modifying the macroclimate *(Ref. 1).*

micrometeorology. The portion of the science of meteorology that deals with the observation and explanation of the smallest-scale physical and dynamic occurrences within the atmosphere. So far, studies in this field are confined to the surface boundary layer of the atmosphere; that is, from the surface of the earth to an altitude where the effects of the immediate underlying surface upon air motion and composition become negligible *(Ref. 1).*

micrometry. The process of measuring dimensions of very small objects by means of enlarged visual images from microscopes and precisely controllable indexes in the visual field.

microphone. A transducer used to convert audio sound pressure into an electrical signal.

microrelief. Small-scaled differences in relief, such as small mounts, swales, or pits that are a few feet across and have differences in elevation of a few inches to around 3 ft that

are significant to soil-forming processes, to growth of plants, or to preparing the soil for cultivation *(Ref. 16)*.

microscope. An optical instrument consisting of a combination of lenses for producing enlarged images of small objects.

microwave. A very short radio wave, usually but not precisely defined as having a wavelength in the range of 0.01 to 100 cm.

microwave band. The portion of the electromagnetic spectrum extending from approximately 3×10^8 to 3×10^{12} Hs.

Mie scattering. Scattering of light in the atmosphere by particles with diameters in the range 0.1 to 5.0 μm. Scattering is asymmetric and is a complicated function of the angle of observation, particle size, and light wavelength.

mildew. A fungous growth that is white and superficial and that can occur on any organic matter. It may be unsightly but does not usually cause severe degradation of the substrate material.

Military Airlift Command. The single manager operating agency for designated airlift service. Also referred to as MAC *(Ref. 5)*.

military geographic documentation. Military geographic information that has been evaluated, processed, summarized, and published *(Ref. 5)*.

military geographic information. Comprises the information concerning physical aspects, resources, and artificial features that is necessary for planning and operations *(Ref. 5)*.

military geography. The specialized field of geography dealing with natural and manmade physical features that may affect the planning and conduct of military operations *(Ref. 5)*.

military land transportation resources. All military-owned transportation resources designated for common-user, over the ground, point-to-point use *(Ref. 5)*.

military standard transportation and movement procedures. Uniform and standard transportation data, documentation, and control procedures applicable to all cargo movements in the Department of Defense transportation system. Also referred to as MILSTAMP *(Ref. 5)*.

military traffic. Department of Defense personnel, mail, and cargo to be, or being transported *(Ref. 5)*.

Military Traffic Management and Terminal Service. The single manager operating agency for military traffic, land transporation, and common-user ocean terminals. Also referred to as MTMTS *(Ref. 5)*.

milky weather. *See:* whiteout.

milvan. Military-owned demountable container, conforming to United States and international standards, operated in a centrally controlled fleet for movement of military cargo *(Ref. 5)*.

milvan chassis. The compatible chassis to which the milvan is attached by coupling the lower four standard corner fittings of the container to compatible mounting blocks in the chassis, to permit road movement *(Ref. 5)*.

mineral. A natural inorganic substance with fairly definite chemical composition and with distinctive physical characteristics such as crystal form, hardness, color, luster, and type of fracture *(Ref. 20)*.

mineralization. 1: *Geology.* The process by which a body of rock becomes (a) a mass of economic value, (b) a mass of potential economic value, or (c) masses of rock that are related to (a) and (b) in origin. It usually results from a change in composition or structure of the original rock *(Ref. 32)*.

2: *Pedology.* The conversion of material from an organic to an inorganic form as a result of microbial decomposition *(Ref. 2)*.

mineralize. 1: To convert a metal into a metal oxide.

2: To convert organic matter into inorganic matter (mineral). Petrified wood is an example.

minimum essential equipment. The part of authorized allowances of Army equipment, clothing, and supplies needed to preserve the integrity of a unit during movement without regard to the performance of its combat or service mission. Items common within this category will normally be carried by, or will accompany troops to the port and will be placed aboard the same

ships with the troops. As used in movement directives, minimum essential equipment refers to specific items of both organizational and individual clothing and equipment *(Ref. 5)*.

minimum thermometer. A thermometer that automatically registers the lowest temperature occurring since its last setting *(Ref. 15)*.

minor secondary item. An item that has not been classified as a principal or major secondary item *(Ref. 26)*.

mirage. A refraction phenomenon wherein an image of some object is made to appear displaced from its true position. Simple mirages may be any one of three types, the inferior mirage, the superior mirage, or the lateral mirage, depending, respectively, on whether the spurious image appears below, above, or to one side of the true position of the object *(Ref. 1)*.

mire. 1: A small muddy marsh or bog.
2: Wet spongy earth.
3: Soft deep mud. *(Ref. 10)*

miscibility. The ability of two or more substances to mix completely forming one homogeneous phase.

mission reliability. The probability that, under stated conditions, a system or equipment will operate in the mode for which it was designed (i.e., with no malfunctions) for the duration of a mission, given that it was operating in this mode at the beginning of the mission *(Ref. 33)*.

mist. 1: According to international definition: a hydrometeor consisting of an aggregate of microscopic and more-or-less hygroscopic water droplets suspended in the atmosphere. It produces, generally, a thin grayish veil over the landscape. It reduces visibility to a lesser extent than fog. Relative humidity with mist is often less than 95 percent. Mist is intermediate in all respects between haze and fog.
2: In popular usage in the United States, same as drizzle. *(Ref. 1)*

mixing ratio. In a system of moist air, the dimensionless ratio of the mass of water vapor to the mass of dry air. For many purposes, the mixing ratio may be approximated by the specific humidity *(Ref. 1)*.

mo *Abbr. for* month.

mobility. 1: A quality or capability of military forces that permits them to move from place to place while retaining the ability to fulfill their primary mission *(Ref. 5)*.
2: The drift velocity of a charged particle in a unit electric field.

mobility degradation (impairment). An environmental effect on materiel or personnel that inhibits movement. It occurs as a result of embedment, trapping, loss of traction, abrupt terrain barriers, and water barriers.

mobility, mechanical. The reciprocal of mechanical impedance.

mock fog. A simulation of true fog by atmospheric refraction *(Ref. 15)*.

mockup. A mass used to simulate a piece of equipment, having certain properties or characteristics of the equipment but differing considerably from the equipment in other key characteristics.

model atmosphere. Any theoretical representation of the atmosphere, particularly of vertical temperature distribution *(Ref. 3)*.

mode of transport. The various modes used for a movement. For each mode there are several means of transport *(Ref. 5)*:
(a) inland surface transportation (rail, road, and inland waterway),
(b) sea transport (coastal and ocean),
(c) air transportation,
(d) pipelines.

mode of vibration. A characteristic motion pattern of a vibrating system in which the motion of every particle is simple harmonic with the same frequency *(Ref. 22)*.

mode of vibration, normal. An uncoupled mode of vibration; i.e., one that can exist independently of other vibration modes of a system *(Ref. 22)*.

mode, resonant. A vibration mode in which maximum system response to excitation occurs. A change in excitation frequency from the resonant frequency results in a reduced system response *(Ref. 22)*.

modes, coupled. Modes of vibration in which energy transfer from one mode to another can occur. Such modes affect one another; they do not occur independently of each other *(Ref. 22)*.

mode, uncoupled. *See:* mode of vibration, normal.

modified rhyme test. A speech intelligibility test consisting of 300 words in 50 groups of 6 words each.

modulation. 1: The modification of the amplitude, frequency, or phase of a carrier wave in accordance with the character of a signal.

2: The variation of some parameter that characterizes a periodic oscillation. *(Ref. 22)*

modulation, amplitude. A type of modulation in which the amplitude of a continuous carrier wave is varied in accordance with properties of a second, or modulating, wave *(Ref. 3)*.

modulation, frequency. A type of modulation in which the frequency of a continuous carrier wave is varied in accordance with the properties of a second (modulating) wave *(Ref. 1)*.

modulation, phase. A type of modulation in which the phase of the carrier wave is varied in accordance with the properties of a second, or modulating, wave *(Ref. 1)*.

modulus of elasticity. The ratio of stress to strain in an elastic material *(Ref. 4)*.

Mohs' scale. A scale of hardness applied to minerals. Values range from 1 (talc) to 10 (diamond).

moist adiabat. *See:* **saturation adiabat.**

moisture. The total water vapor content of the atmosphere or the total water substance (gas, liquid, or solid) in a volume of air.

moisture content. *Soil Mechanics.* The water content of a soil expressed as a percentage of the dry weight of the soil. The weight of the water is determined by differential weighings before and after oven-drying a sample *(Ref. 25)*.

moisture equivalent. The percent, by weight, of water remaining in an originally saturated soil sample 1 cm thick after being subjected to a centrifugal force of 1,000 g for 30 min *(Ref. 2)*.

moistureproof. Able to resist transmission of water vapor *(Ref. 1)*.

molar concentration. The number of moles of a substance per unit volume.

mole. A unit of mass numerically equal to the molecular weight of the substance; a gram-mole or a gram molecular weight.

molecular absorption. Extraction of energy from a sound wave propagating in still, homogeneous air. The phenomenon is related to the relaxation behavior of gas molecules. It is a function of frequency, temperature, and humidity.

moment. The product of a quantity and a distance to some significant point associated with the quantity. The two principal moments are the statical moment and the moment of inertia.

monaural masking. Masking of acoustic signals that occurs when the signal and noise reach the ear at the same time.

monitoring. 1: The act of detecting the presence of radiation and the measurement thereof with radiation measuring instruments *(Ref. 5)*.

2: The act of observing and recording laboratory and field environment test conditions, test specimen responses, and performance parameters.

monolayer. A surface layer or film whose thickness is one molecule.

monomer. A term denoting a single property or ingredient. A molecule of low molecular weight used as a starting material for polymerization to produce molecules of larger molecular weight, called polymers *(Ref. 4)*.

monsoon. A name for seasonal winds (derived from Arabic *mausim*, a season). It was first applied to the winds over the Arabian Sea, which blow for 6 mo from northeast and for 6 mo from southwest, but it has been extended to similar winds in other parts of the world. The primary cause is the much greater annual variation of temperature over large land areas compared with neighboring ocean surfaces, causing an excess of pressure over the continents in winter and a deficit in summer, but other factors such as the relief features of the land have a considerable effect. In India the term is popularly applied chiefly to the southwest monsoon and, by extension, to the rains that it brings *(Ref. 1)*.

monsoon forest. Partially or wholly deciduous forest in a tropical region where rainy seasons alternate with long dry seasons, the trees being more-or-less leafless during the dry season. Monsoon forests are rich in woody vinelike plants, but the trees are not as large as in rainforests *(Ref. 1)*.

moraine. Any accumulation of loose material deposited by a glacier *(Ref. 10)*.

morass. A swamp, marsh, or bog having rank vegetation and muddy or offensive appearance *(Ref. 10)*.

mosaic. An assembly of overlapping photographs that have been matched to form a continuous photographic representation of a portion of the surface of the earth *(Ref. 5)*.

moss. A bryophytic plant having a small green leafy, often tufted stem bearing sex organs at its tip. Mosses grow in velvetlike clusters on rocks, trees, moist ground, etc.

motion response. *See:* response, motion.

motion sickness. Physiologically disturbing effects produced in human beings as a result of whole body motion, generally accompanied by nausea.

mottled. *Pedology.* Soil horizons irregularly marked with spots of color. A common cause of mottling is imperfect or impeded drainage although other causes, such as soil development from an unevenly weathered rock and different kinds of minerals, may cause mottling *(Ref. 16)*.

mountain. A landmass reaching comparatively high altitude and having most of its surface in slope and of greater altitude than its surroundings.

mountain and valley winds. A system of diurnal winds along the axis of a valley, blowing uphill and upvalley by day, and downhill and downvalley by night; they prevail mostly in calm, clear weather. The upvalley component or valley wind is due to the temperature difference between the air heated over the slopes and that at the same height in the free air. The downvalley component or mountain wind at night is due to nocturnal cooling and is somewhat weaker, up to 9 mi h^{-1} *(Ref. 1)*.

mountain breeze. *See:* breeze.

mounting base. A mounting system for the support of a piece of equipment and for its protection against shock and vibration. It consists of hardware and fastening devices for attachment to the piece of equipment and to the vehicle structure, and resilient members and media, if used *(Ref. 1)*.

mouth. The place of discharge of a stream into the ocean or entrance to a bay from the ocean *(Ref. 18)*.

MRT *Abbr. for* modified rhyme test.

muck. Highly decomposed organic soil material developed from peat. Generally, muck has a higher mineral or ash content than peat and is decomposed to the point that the original plant parts cannot be identified *(Ref. 16)*.

mud. A slimy, sticky mixture of water and finely divided particles of a solid such as dirt, having little or no plasticity *(Ref. 15)*.

mudflow. A well-mixed mass of water and alluvium that, because of its high viscosity and low fluidity as compared with water, moves at a much slower rate, usually piling up and spreading over the fan like a sheet of wet mortar or concrete *(Ref. 6)*.

mud lime slurry course. *See:* wallow course.

mull. *Pedology.* A humus-rich layer of forested soils consisting of mixed organic and mineral matter. A mull blends into the upper mineral layers without an abrupt change in soil characteristics *(Ref. 16)*.

multifactor analysis. As used in this handbook, the analysis of the interdependencies and effects on materiel of more than two environmental factors occurring simultaneously or near simultaneously.

multiple degree-of-freedom system. In shock and vibration terminology, a system requiring more than one independent coordinate to define the system configuration at any specific time.

Munson test course. An extensive network of automotive test courses laid out at Aberdeen Proving Ground, Md. Each of the test courses has been engineered based on a specific requirement for test operation. The course covers the following: amphibious lands, rolling hills, mud, slopes (30 deg left and right), washboard, straightaway, imbedded rock, fording, wave course, soil dynamometer, cobblestone, bowl, staggered bump, corduroy, loose rock, shell hole, bridging device, vertical wall, gravel road, turning circles, slope grade of 5, 10, 15, 20, 30, 40, 50, and 60 percent, and Belgian block *(Ref. 1)*.

muskeg. 1: A swamp or bog in an undrained or poorly drained area of alluvium or glacial till, or, more especially, in a rocky basin filled with water-saturated muck, decayed vegetal matter, and sphagnum moss

incapable of sustaining much weight. The surface is commonly hummocky.

2: Organic terrain that consists of two physical strata, an upper layer of living vegetal cover frequently referred to as the "mat" and a sublayer of peat. Underlying the peat is a mineral soil or rock. The overall depth of the muskeg may vary from a few feet up to more than 30 ft.

mutation. The process of changing. In biology, it refers to a sudden variation in some inherited characteristic rather than a slow, gradual change.

mutual capacitance. Capacitance between two conductors when all other conductors, including ground, are connected together and then regarded as an ignored ground *(Ref. 4)*.

MWDP *Abbr. for* Mutual Weapons Development Program.

myriapod (many legged). A former group (Myriapoda) of arthropods with long, multisegmented bodies, each segment of which bears one or more pairs of jointed legs.

N

N *Abbr. for* newton; North.

n *Abbr. for* nano (10^{-9}).

nadir. The point on the celestial sphere directly beneath the observer and directly opposite the zenith *(Ref. 40)*.

Nansen bottle. A device used by oceanographers to obtain subsurface water samples.

narrow(s) *(usually used in the plural).* 1: The contracted part of a stream, lake, or sea.

2: A strait connecting two bodies of water. *(Ref. 10)*

NASA *Abbr. for* National Aeronautics and Space Administration.

NASTRAN *Abbr. for* NASA Structural Analysis.

NATO *Abbr. for* North Atlantic Treaty Organization.

natural aging. The change with time of material exposed in the natural environment *(Ref. 1)*.

natural environment. The part of the total environment that comprises the complex of conditions found in nature. The term is loosely used for an environment dominated by natural environmental factors *(Ref. 1)*.

natural frequency. The lowest frequency of oscillation for a system as determined by its components.

natural landscape. *See:* landscape.

natural scavenging. In air pollution terminology, the natural processes that tend to exhaust or remove pollutants from the atmosphere.

nautical mile. A measure of distance approximately equal to 1 min of arc on the surface of the earth. The United States has adopted the International Nautical Mile equal to 1,852 m or 6,076.11549 ft *(Ref. 5)*. It is equivalent to 1.1508 statute miles.

nautical twilight (morning and evening). The period during which the sun travels from a position 12 deg below the horizon to its position at sunrise; the period during which the sun travels from its position at sunset to a position 12 deg below the horizon. This is a period when general outlines may be visible, although the horizon probably cannot be distinguished *(Ref. 12)*.

NBS *Abbr. for* National Bureau of Standards.

NDIR *Abbr. for* nondispersive infrared.

near-field region. *See:* Fresnel region.

neck. 1: A narrow strip of land connecting two larger land areas or a narrow body of water between two larger bodies of water *(Ref. 32)*.

2: The narrow band of water flowing swiftly seaward through the surf *(Ref. 18)*.

needle; *also* ice spicule. A long, thin ice

crystal whose cross section perpendicular to its long dimension is typically hexagonal. Ice needles are not identical in form or genesis to hexagonal columns, for the former form by sublimation at temperatures of about −5° to −8°C, while the latter are formed by sublimation at substantially lower temperatures, usually −15° to −20°C *(Ref. 3)*.

neoprene. Synthetic rubber made by the polymerization of 2-chloro-1,3-butadiene. Vulcanized neoprenes are outstanding in their resistance to environmental deterioration.

nephelometer. A photometric instrument for determining the amount of light transmitted (or scattered) by a suspension of particles.

net radiation. Net flux of downward and upward total (solar, terrestrial surface, and atmospheric) radiation; net flux of all radiations.

net solar radiation. Net flux of downward and upward solar radiation.

net terrestrial radiation. Net flux of atmospheric and terrestrial surface radiation.

nettle. 1: Any of a genus of plants (*Urtica*), chiefly coarse herbs, armed with stinging hairs.

2: Loosely, any prickly or stinging plant. *(Ref. 1)*

net weight. Weight of a ground vehicle without fuel, engine oil, coolant, operating personnel, cargo, or on-vehicle materiel *(Ref. 5)*.

neutral density filter. An optical filter that reduces the intensity of light passing through it without changing the relative spectral distribution of the energy.

neutralize. 1: To make harmless anything contaminated with a chemical agent *(Ref. 12)*.

2: More generally, to destroy the effectiveness of.

neutral soil. *Pedology.* A soil that is neither significantly acid nor alkaline. Strictly, a neutral soil has pH of 7.0; in practice, a neutral soil has a pH between 6.6 and 7.3 *(Ref. 16)*.

neutron. A subatomic particle with no electric charge, and with a mass slightly more than the mass of the proton. Protons and neutrons comprise atomic nuclei, and they are both classed as nucleons *(Ref. 3)*.

neutron induced activity. Radioactivity induced in the ground or an object as a result of direct irradiation by neutrons *(Ref. 5)*.

névé *See:* **firn.**

new snow. *See:* **snow, new.**

newton (*Abbr.* N). A unit of force in the International System of Units (SI); a force that, when applied to a body having a mass of 1 kg, gives the body an acceleration of 1 m s^{-2}. One newton is equivalent to 10^5 dyn *(Ref. 1)*.

Newton's second law. An expression relating force, mass, and acceleration expressed as: $F = mA$.

NIF *Abbr. for* nose-in failure.

nitric oxide (NO). A gas formed in great part from atmospheric nitrogen and oxygen when combustion takes place under high temperature and high pressure, as in internal combustion engines. NO is not itself a pollutant; however, in the ambient air, it converts to nitrogen dioxide, a major contributor to photochemical smog *(Ref. 9)*.

nitrogen dioxide (NO_2). A compound produced by the oxidation of nitric oxide in the atmosphere; a major contributor to photochemical smog *(Ref. 9)*.

nitrogen dioxide photolytic cycle. A reaction occurring in the atmosphere in which atmospheric nitric oxide, nitrogen dioxide, and oxygen during daylight hours undergo a series of reactions resulting in the cyclic formation and decomposition of nitrogen dioxide.

nivation. Erosion behind and peripheral to a snowbank, caused by frost action, mass movement, transport by melt water, or other related processes. Nivation is most noticeable behind summer snowbanks when nightly freezing alternates with daytime melting *(Ref. 11)*.

nmi *Abbr. for* nautical mile.

node. In an oscillating system, a point (or line or surface) marked by absolute or relative absence of oscillatory motion. Nodes may be considered to be produced by the interference of two waves moving in opposite directions with the same speed,

and are often observed on the surface of a liquid in wave motion or in the passage of sound waves in a cylinder *(Ref. 3)*.

noise. Any undesired signal. By extension, noise is any unwanted disturbance within a useful frequency band that interferes with the desired signal *(Ref. 38)*.

noise, ambient. The noise associated with a particular environment. It consists of a composite of all sounds reaching the point from many sources near and far *(Ref. 38)*.

noise, audible. *See:* audible sound.

noise, background. The cumulative total of the contributions of all sources of interference in a system used for the production, detection, measurement, or recording of a signal. Ambient noise detected, measured, or recorded with the signal becomes part of the background noise *(Ref. 38)*.

noise level. 1: The total intensity of noise from all sources present at a given point. It imposes a limit below which signals cannot normally be distinguished from noise.
2: For airborne sound, the noise level is generally the weighted sound pressure level; the weighting must be indicated. *(Ref. 38)*

noise, random. An oscillation whose instantaneous magnitude is not specified for any given instant of time. The instantaneous magnitudes of a random noise are specified only by probability distribution functions given the fraction of the total time that the magnitude, or some sequence of magnitudes, lies within a specified range *(Ref. 1)*.

noise, thermal; *also* **Johnson noise.** 1: Random noise in a circuit, associated with the thermodynamic interchange of energy necessary to maintain thermal equilibrium between the circuit and its surroundings.
2: The noise produced by thermal agitation of charges in a conductor. *(Ref. 1)*

noise, white. A noise whose spectrum density (or spectrum level) is substantially independent of frequency over a specified range. White noise need not be random *(Ref. 1)*.

nonaural effects. When applied to sound, nonaural effects are the physical and physiological effects on personnel produced by high intensity sound other than that transmitted through the ears or hearing, and the effects of sound on materiel.

nondestructive test. *See:* test, nondestructive.

nondispersive infrared (NDIR) method. A reference method for measuring carbon monoxide concentration in the atmosphere. It is based on the absorption of infrared energy by carbon monoxide.

nonweapons operations. Operations that do not involve combat weapons or normally direct contact with the enemy such as engineering, medical, logistics, and transportation.

normal. *Climatology.* An average based on a standardized period of record; e.g. a 30-yr normal *(Ref. 1)*.

normal acceleration. In curvilinear motion, normal acceleration is the component of the total acceleration taken in a direction perpendicular to the velocity, directed toward the center of curvature of the path of motion.

normal distribution. The statistical distribution of a quantity x with the probability density function given as

$$p(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-(x-\mu)^2/(2\sigma^2)\right]$$

where

$p(x)$ = probability density function
μ = mean of distribution
σ = standard deviation.

normal impact. Striking of a projectile against a surface that is perpendicular to the line of flight of the projectile *(Ref. 12)*.

normal mode of vibration. *See:* mode of vibration, normal.

normal soil. *Pedology.* A soil having a profile in near equilibrium with its environment; developed under good but not excessive drainage from parent material of mixed mineral, physical, and chemical composition. In its characteristics it expresses the full effects of the forces of climate and living matter *(Ref. 16)*.

normal water. Sea water whose chlorinity has been adjusted to 19.381 °/₀₀, used as a primary standard in the determination of chlorinity.

northern operations. Operations which take place in both the Arctic and subarctic. The terms "cold weather operations", "operations in the northern latitudes", and "northern operations" are all synonymous and for purposes of definition are combined under the all-inclusive term "northern operations" *(Ref. 12)*.

nuclear airburst. The explosion of a nuclear weapon in the air, at a height greater than the maximum radius of the fireball *(Ref. 5)*.

nuclear cloud. An all-inclusive term for the volume of hot gases, smoke, dust, and other particulate matter from the nuclear bomb itself and from its environment, which is carried aloft in conjunction with the rise of the fireball produced by the detonation of the nuclear weapon *(Ref. 5)*.

nuclear surface burst. An explosion of a nuclear weapon at the surface of land or water; or above the surface, at a height less than the maximum radius of the fireball *(Ref. 5)*.

nuclear underground burst. The explosion of a nuclear weapon in which the center of the detonation lies at a point beneath the surface of the ground *(Ref. 5)*.

nuclear underwater burst. The explosion of a nuclear weapon in which the center of the detonation lies at a point beneath the surface of the water *(Ref. 5)*.

nuclear yields. The energy released in the detonation of a nuclear weapon, measured in terms of the kilotons or megatons of trinitrotoluene (TNT) required to produce the same energy release. Yields are categorized as *(Ref. 1)*:
(a) Very low–less than 1 kT
(b) Low–1 to 10 kT
(c) Medium–10 to 50 kT
(d) High–50 to 500 kT
(e) Very high–over 500 kT

nucleation. Any process by which the phase change of a substance to a more condensed state (condensation, sublimation, freezing) is initiated at certain loci (*See:* **nucleus**) within the less condensed state *(Ref. 3)*.

nucleus. 1: An agent of nucleation.
2: In physical meteorology, a particle of any nature upon which, or the locus at which, molecules of water or ice accumulate as a result of a phase change to a more condensed state *(Ref. 3)*.
3: In nuclear technology, the positively charged core of an atom, with practically the whole mass of the atom but occupying only a minute part of its volume *(Ref. 1)*.

nunatak. In glacial geology, an isolated hill or peak that projects through the surface of a glacier, or that was formerly surrounded but not covered by glacial ice *(Ref. 11)*.

nymph. Any of various immature insects; especially a larva of an insect with incomplete metamorphosis.

O

oasis. An isolated area within a desert, with ground water at or near the surface, resulting in a fertile or green spot, varying in size from a small grove of palms to an area of over 100 mi^2 *(Ref. 10)*.

o.b. *Abbr. for* outside bark (tree diameter).

obscuration; *also* obscured sky cover. 1: In U S weather observing practice, the designation for the sky cover when the sky is completely hidden by surface-based obscuring phenomena. It is encoded "X" in aviation weather observations; it always constitutes a ceiling the height of which is the value of vertical visibility into the obscuring phenomenon.
2: A surface-based obscuring phenomenon. *(Ref. 3)*

obstacle. A definable environmental feature that inhibits the movement of a vehicle *(Ref. 35)*.

occluded front. A composite of two fronts, formed as a cold front overtakes a warm front or quasi-stationary front. This is a common process in the late stages of

wave-cyclone development but is not limited to occurrence within a wave cyclone *(Ref. 1)*.

ocean current. A movement of ocean water characterized by regularity, either of a cyclic nature, or more commonly as a continuous stream flowing along a definable path *(Ref. 1)*.

ocean manifest. A detailed listing of the entire cargo loaded into any one ship showing all pertinent data that will readily identify such cargo and where and how the cargo is stowed *(Ref. 5)*.

oceanography. 1: The study of the sea, embracing and integrating all knowledge pertaining to the physical boundaries of the sea, the chemistry and physics of sea water, and marine biology.

2: In strict usage, oceanography is the description of the marine environment, whereas oceanology is the study of the oceans and related sciences *(Ref. 18)*.

oceanology. *See:* **oceanography.**

octave. The range of frequencies between two oscillations related by a basic frequency ratio of two, generally applied to audio oscillations.

off-road. Away from terrain specifically improved for vehicle use *(Ref. 35)*.

offshore bar. The narrow ridge of sand deposited parallel to the shore in shallow water. Its accumulation is due to the deposition of sand in the breaker zone *(Ref. 1)*.

off-the-shelf items. Items regularly stocked by commercial organizations to supply normal demands, either principal, secondary, or repair items.

OH *Abbr. for* organic clay of high plasticity.

oil dilution. Contamination of engine crankcase oil with foreign liquids. It can be a severe problem in arctic climates. The two main dilutants are water and fuel. Water accumulates as a result of condensation and fuel dilution occurs most rapidly in cold temperatures when fuel mixtures are rich at engine idling speeds.

oil resistance. The ability of a material to withstand degradation by oil. Such degradation is usually characterized by swelling, softening, and lowering of mechanical properties *(Ref. 1)*.

okta. A unit of cloud cover corresponding to one-eighth of the sky being covered.

OL *Abbr. for* organic clay of low plasticity.

old snow; *also* firn snow. Deposited snow in which the original crystalline forms are no longer recognizable, such as firn and spring snow *(Ref. 3)*.

olfactory. Of or pertaining to the function of smelling.

oligotrophic lakes. Deep lakes that have a low supply of nutrients and thus contain little organic matter. Such lakes are characterized by high water transparency and high dissolved oxygen *(Ref. 9)*.

olivine. A rock-forming mineral consisting of solid solutions of Mg_2SiO_4 and Fe_2SiO_4.

omnidirectional microphone. A microphone whose response to a sound pressure wave is uniform, regardless of the direction of incidence of the sound pressure wave on the microphone.

omnivorous. Eating of both animal and vegetable food.

on berth. Said of a ship when it is properly moored to a quay, wharf, jetty, pier, or buoy or when it is at anchor and available for loading or discharging passengers and cargo *(Ref. 5)*.

open air slab. A drained, hard-surfaced area used for the storage of materiel requiring no protection from ambient atmospheric climatic factors.

open ice. *See:* **broken ice.**

open improved storage space. Open area that has been graded and hard surfaced or prepared with topping of some suitable material so as to permit effective material handling and storage operations *(Ref. 5)*.

open storage. Storage in an area exposed to the extremes of the local, natural environment.

open unimproved wet space. The water area specifically allotted to and usable for storage of floating equipment *(Ref. 5)*.

operability. The condition of being capable of or ready for operation.

operating level of supply. The quantities of materiel required to sustain operations in

the interval between requisitions or the arrival of successive shipments. These quantities should be based on the established replenishment period (monthly, quarterly, etc.) *(Ref. 5)*.

operating time. The time during which a system or equipment is operating in a manner acceptable to the operator, although unsatisfactory operation (or failure) is sometimes the result of the judgment of the maintenance man *(Ref. 33)*.

operation. A military action or the carrying out of a strategic, tactical, service, training, or administrative military mission; the process of carrying on combat, including movement, supply, attack, defense, and maneuvers needed to gain the objectives of any battle or campaign *(Ref. 5)*.

operational characteristics. The characteristics that pertain primarily to the functions to be performed by equipment, either alone or in conjunction with other equipment; e.g., for electronic equipment, operational characteristics include such items as frequency coverage, channeling, type of modulation, and character of emission *(Ref. 5)*.

operational environment. As pertains to the military, it is a composite of the conditions, circumstances, and influences that affect the employment of military forces and that bear on the decisions of the commander *(Ref. 5)*.

operationally ready. 1: As applied to a unit, ship, or weapon system. Capable of performing the missions or functions for which organized or designed. Incorporates both equipment readiness and personnel readiness.

2: As applied to equipment. Available and in condition for serving the functions for which designed.

3: As applied to personnel. Available and qualified to perform assigned missions or functions. *(Ref. 5)*

operational maintenance. Maintenance that is performed without interrupting the satisfactory operation of the item *(Ref. 33)*.

operational readiness. 1: The probability that, at any point in time, a system or equipment is either operating satisfactorily or ready to be placed in operation on demand when used under stated conditions, including stated allowable warning time. Thus, total calendar time is the basis for computation of operational readiness *(Ref. 33)*.

2: The capability of a unit, ship, weapon system, or equipment to perform the missions or functions for which it is organized or designed. May be used in a general sense or to express a level or degree of readiness *(Ref. 5)*.

operational storage. The portion of materiel life cycle when materiel has been issued to the user but is not actually being used.

operations (operational) environment. 1: A composite of the conditions, circumstances, and influences that affect the employment of military forces and bear on the decisions of the commander *(Ref. 5)*.

2: Within this handbook the operational phase of the materiel life cycle is defined as those conditions, circumstances, and influences that affect materiel during the period of time from issue to a user organization until expenditure or exposure.

optical density. For filter tape used in atmospheric particulate sampling, optical density is defined as the ratio of the optical intensity transmitted through clean filter paper to the intensity transmitted through the filter paper and collected particulates.

optical interference. Reduction of visibility affecting human vision, signaling, and communications employing optical wavelengths. Interference occurs primarily as a result of particulate matter in the atmosphere, darkness, and physical barriers such as vegetation and high relief terrain.

optical pickup. A vibration-measuring instrument in which a beam of light, deflected or reflected by the vibrating body, is used to sense the vibration. There are a variety of optical pickups, and their primary advantage is that they do not load the structure under observation.

optical spectrum. The portion of the electromagnetic spectrum extending from approximately 2×10^{11} to 5×10^{17} Hz, including infrared, visible, and ultraviolet radiation.

order. 1: *Pedology*. The highest category in soil classification. The three *orders* are zonal, intrazonal, and azonal soils.

2: A category in the classification of plants

and animals, ranking below the *class* and above the *family*.

ordnance. Explosives, chemicals, pyrotechnic and similar stores; e.g., bombs, guns and ammunition, flares, smoke, and napalm *(Ref. 5)*.

organic soil. *Pedology*. A general term applied to a soil or to a soil horizon that consists primarily of organic matter, such as peat soils and muck soils *(Ref. 16)*.

orographic. Of, pertaining to, or (frequently in meteorology) caused by mountains *(Ref. 3)*.

orographic precipitation. Precipitation that results from the lifting of moist air over an orographic barrier such as a mountain range. Strictly, the amount so designated should not include the part of the precipitation that would be expected from the dynamics of the associated weather disturbance, were the disturbance over flat terrain *(Ref. 1)*.

orthoclase. A mineral ($KAlSi_3O_8$) of monoclinic structure.

oscillation. The change in amplitude of a signal, displacement, or other quantity in which the amplitude is alternately greater and smaller than a fixed reference. Such variations are generally specified with respect to time.

oscillation, stable. An oscillation that is either damped (i.e., continually decreasing in amplitude) or steady-state (i.e., maintains constant amplitude) *(Ref. 1)*.

oscillation, unstable. Any oscillation that is not stable; i.e., an erratic, intermittent, non-self-sustaining oscillation, or one that grows in magnitude until it breaks down *(Ref. 1)*.

oscillator. The general term for an electrical device that generates alternating currents or voltages. The oscillator is classified according to the frequency of the generated signal *(Ref. 3)*.

oscillograph. A device for graphically recording or indicating oscillations or changes in an electric current *(Ref. 15)*.

oscilloscope. An instrument for producing a visual representation of oscillations or changes in an electric current. The face of the cathode ray tube used for this representation is called a scope or screen *(Ref. 15)*.

osmosis. 1: The tendency of a fluid to pass through a semipermeable membrane typically separating a solvent and a solution so as to tend to equalize their concentrations; especially the passage of solvent in distinction from the passage of solute.
2: Diffusion of fluids through a membrane separating two solutions.

outbound traffic. Traffic originating in continental United States destined for overseas or overseas traffic moving in a general direction away from continental United States *(Ref. 5)*.

outcrop. The bare, exposed part of a body of rock that appears at the surface of the ground. It is also applied to areas where the rock formation occurs next beneath the soil, even though it is not exposed *(Ref. 32)*.

outlet. 1: The lower end of a lake or pond.
2: The point at which a lake or pond discharges into the stream that drains it. *(Ref. 10)*

outwash. 1: Stratified accumulation of water-deposited glacial drift (*See:* drift, glacial). The material is laid down by the meltwater streams issuing from the face of the glacier ice. Usually laid out in nearly level plains.
2: Sometimes used to mean any water-deposited material carried and laid down by streams. *(Ref. 21)*

outwash fan. *See:* outwash plain.

outwash plain; *also* outwash apron; outwash fan. A broad deposit of detrital material sloping gently away from a glacial terminus or terminal moraine. An outwash plain may merge downstream with the valley train *(Ref. 11)*.

overcast. A condition of the sky in which the sky cover is 95 percent or more and at least a portion of this is due to clouds as opposed to surface-based obscuring phenomena.

overland flow. The flow of rainwater or snowmelt over the land surface toward stream channels. After it enters a stream, it becomes runoff *(Ref. 6)*.

overpackaging. The use of more (quantita-

tive or qualitative) preservation, packaging, or packing materials than is necessary to protect an item adequately. This term should not be confused with overpacking *(Ref. 12)*.

overpacking. Repacking of containers or items into a more substantial and suitable container to withstand handling and transportation hazards, or the addition of packing materials such as steel strapping, waterproof caseliners, and fiberboard sleeves onto fiberboard boxes to render the existing container less susceptible to damage or pilferage during handling, transportation, and storage *(Ref. 12)*.

overpressure. The pressure resulting from the blast wave of an explosion. It is referred to as "positive" when it exceeds atmospheric pressure and "negative" during the passage of the wave when resulting pressures are less than atmospheric pressure *(Ref. 5)*.

overseas. All locations, including Alaska and Hawaii, outside the continental United States *(Ref. 5)*.

overvoltage. The application of an electrical voltage higher than that recommended. Some components are very sensitive to overvoltage and fail quickly with small overvoltages.

overvoltage protectors. Any of a variety of devices employed to protect sensitive equipment from exposure to voltages that are greater than specified values.

oxbow. 1: A river bend shaped like an oxbow with only a neck of land left between two parts of the stream.
2: The crescent-shaped lake remaining in the abandoned channel after a river has formed a cutoff and the ends of the original bend have been filled. Also called oxbow lake. *(Ref. 10)*

oxidant. Any oxygen-containing substance that reacts chemically to produce new oxygen-containing substances. Atmospheric oxidants are the primary contributors to photochemical smog.

oxidation. A chemical reaction in which oxygen unites or combines with other elements. Organic matter is oxidized by the action of aerobic bacteria; thus oxidation is used in waste water treatment to break down organic wastes *(Ref. 9)*.

oxidation, internal. The precipitation of one or more oxides of alloying elements beneath the external surface of an alloy as a result of oxygen diffusing into the alloy from an external source *(Ref. 1)*.

ozone. A form of molecular oxygen, each molecule consisting of three atoms. Ozone has a characteristically pungent odor and is a colorless, toxic gas. It is formed by electrical discharge in air but in the upper atmosphere is believed to be produced by the effect of ultraviolet radiation from the sun on oxygen.

ozonizer. An apparatus that converts ordinary oxygen into ozone (as by passing high-voltage electric discharge through flowing oxygen or air).

ozonosphere. The portion of the upper atmosphere in which there are significant amounts of ozone, occurring at altitudes of from 10 to 50 km.

P

P *Abbr. for* polar (air or region).

p *Abbr. for* pico (10^{-12}).

packaged petroleum. Petroleum products (generally lubricants, greases, and specialty items) normally packaged by a manufacturer and procured, stored, transported, and issued in containers having a fill capacity of 55 gal or less *(Ref. 26)*.

packaging. Application or use of appropriate wrappings, cushioning, interior containers, and complete identification marking, up to but not including the exterior shipping container *(Ref. 12)*.

pack ice. Any area of sea ice other than fast ice composed of a heterogeneous mixture of size and age types. Pack ice is usually in motion and is often referred to as drift ice. The concentration of pack ice can be of any degree *(Ref. 31)*. Pack ice is formed on the surface of the sea when the ice-field is broken up by winds and waves, and the blocks of ice have drifted from their original position. They are termed "close pack" if they are not. Most pack ice gradually melts and disappears in warm weather.

packing. Application or use of exterior shipping containers and assembling of items or packages therein, together with necessary blocking, bracing, or cushioning, weatherproofing exterior, strapping, and marking of shipping containers *(Ref. 12)*.

pahoehoe. Solidified lava that is characterised by a smooth, billowy, or ropy surface having a skin of glass a fraction of an inch to several inches thick. Pahoehoe is distinguished from the aa type of lava by its smooth surface *(Ref. 1)*.

pallet. A flat base for combining stores or carrying a single item to form a unit load for handling, transportation, and storage by materials handling equipment *(Ref. 5)*.

palletized. A quantity of any items, packaged or unpackaged, that is arranged on a pallet in a specified manner and securely strapped or fastened thereto so that the whole is handled as a unit *(Ref. 17)*.

pallograph. An instrument for detecting and measuring low frequency vibrations *(Ref. 22)*.

PAN. Peroxyacetyl nitrate, a pollutant created by the action of sunlight on hydrocarbons and nitrogen oxides in the air. PAN is an integral part of photochemical smog *(Ref. 9)*.

pancake ice. Pieces of newly formed ice, usually approximately circular, with raised rims and from 1 to 6 ft in diameter *(Ref. 31)*.

parabolic flight path. An aircraft maneuver used to obtain short periods of weightlessness for the purpose of simulating a zero-g environment.

para drag drop. Ultra low level airdrop technique using the drag of an arrester parachute to extract and halt airdrop loads *(Ref. 5)*.

paradrop. Delivery by parachute of personnel or cargo from an aircraft in flight *(Ref. 5)*.

paraglider. A flexible, delta-shaped wing that is made by suspending a flexible membrane between a rigid keel and each of two rigid leading edges *(Ref. 17)*.

parallax. The change in apparent position of a nearby object compared with more remote reference objects when viewed from different positions.

pararosaniline method. A reference method for the determination of sulfur dioxide in the atmosphere.

parhelion. One of the bright-colored spots commonly called "sun dogs" which appear about 22 deg above and below the sun due to refraction of sunlight by minute ice crystals in the air.

partial node. The point, line, or surface in a

standing wave resonant system where some characteristic of the wave field has a nonzero minimum amplitude *(Ref. 23)*.

partial pressure. *See:* pressure, partial.

particle area diameter. The diameter of a sphere having the same cross-sectional area as the particle.

particle area diameter (projected). The diameter of a circle having the same area as the projected area of the particle.

particle area-length diameter. The diameter obtained by dividing the projected area of the particle by the measured particle diameter.

particle diameter. The measured diameter of a sphere or particle in one direction.

particle size. In a dust sample, particle size refers to the mean diameter of the particles in the sample; also called Stokes' diameter.

particle-size analysis. *Soil Mechanics.* Determination of the various amounts of the different separates in a soil sample, usually by sedimentation, sieving, micrometry, or combinations of these methods. Formerly termed mechanical analysis *(Ref. 1)*.

particle volume (mass) diameter. The diameter of a sphere having the same density and volume (or mass) as the particle.

particle volume-surface diameter. The diameter of a particle obtained by dividing the volume of a particle by its surface area.

particulate matter. Finely divided solid or liquid particles in the air, including dust, smoke, fumes, mist, spray, and fog *(Ref. 9)*.

parting. 1: *Metallurgy.* The selective corrosion of one or more components of a solid solution alloy *(Ref. 34)*.

2: *Geology.* A thin layer of different composition separating two larger masses of similar composition. It can be depositional in nature, as shale in a coal seam; or intrusive as in a joint or fissure *(Ref. 32)*.

pass. 1: A break in a mountain range, permitting easier passage from one side of the range to the other. Also called col *(Ref. 15)*.

2: A narrow connecting channel between two bodies of water; also the inlet through a barrier reef atoll or sand bar or a navigable channel at the mouth of a river *(Ref. 18)*.

passenger mile. One passenger transported 1 mi. For air and ocean transport, use nautical miles; for rail, highway, and inland waterway transport in the continental United States, use statute miles *(Ref. 5)*.

passive. Used to describe metals or alloys that substantially resist corrosion in an environment where thermodynamically there is a large free energy decrease associated with transformation from a metal to appropriate corrosion products *(Ref. 34)*.

passive vibration isolation device. Devices consisting of a variety of springs and dashpots that are used to attenuate vibration in assemblies and systems.

patina. 1: A thin green or greenish-blue film or coating on the surface of copper and bronze caused by long exposure to the atmosphere. The film is a basic sulfate sometimes containing small amounts of carbonate or chloride *(Ref. 34)*.

2: Same as desert varnish.

patterned ground. A collective term for ground suface patterns resulting from frost action; the surface expression of soil structures. It is common but not exclusive to permafrost regions; it includes a large group of soil forms that have distinct linear or polygonal elements in ground plan *(Ref. 1)*.

paulin. A sheetlike piece of fabric or plastic used to cover materiel during open storage, use, or transport. It is used to reduce or prevent materiel exposure to falling precipitation and to some extent exposure to wind.

PB *Abbr. for* phonetically balanced.

peak level. The maximum instantaneous value of a parameter occurring during a specified time interval *(Ref. 38)*.

peak pressure level. When considering impulse noise or blast, the highest pressure level reached.

peak overpressure. The maximum value of overpressure at a given location, which is generally experienced at the instant the shock (or blast) wave reaches that location *(Ref. 5)*. *See also:* shock wave.

peat. An acid, dark-colored, soft, usually coarsely fibrous, unconsolidated soil with a 96 to 99 percent content of partly decomposed, somewhat carbonated plant material accumulated under conditions of excessive moisture *(Ref. 1)*.

peat bog. An area of soft, wet, spongy ground, consisting chiefly of decayed or

decaying moss and other vegetable matter, where peat is formed *(Ref. 1). See also:* swamp.

peat soil. Soil containing more than 50 percent organic matter *(Ref. 2). See also:* peat; muck.

pebble. A small stone worn smooth by the action of water, ice, sand, etc., or any stone between 4 and 64 mm (about 0.16 to 2.5 in.) in diameter *(Ref. 15).*

pedalfer. One of the two types into which soils are sometimes classified; it is roughly equivalent to "soil of a humid region", and is rich in iron and clay. The pedalfers are divided into podzolic and lateritic soils *(Ref. 20).*

pedestal rock. Rock supported by a relatively slender column or pedestal; usually, the cap rock is a harder material and the supporting material underneath is softer so that the support is eroded away leaving a large rock on a slender column *(Ref. 32).*

pediment. A gently inclined erosion surface of low relief typically developed in arid or semiarid regions at the foot of a receding mountain slope. The pediment may be bare or mantled by a thin layer of alluvium which is in transit to the adjoining basin. Some pediments resemble alluvial ones in outward form *(Ref. 1).*

pedocal. A soil with a well-developed calcium carbonate or, more rarely, some other carbonate horizon *(Ref. 32).*

pedology. The science of the study of soils.

pendulum impact test. A shock test in which the test item is placed on a carrier that can swing through an arc to impact against a solid barrier.

peneplain. A rolling area that has experienced a long period of erosion during which mountains were generally worn down to form relatively flat terrain.

penetrometer. A pointed device that indicates the amount of resistance encountered when it is forced into a material such as snow or soil *(Ref. 3).*

penumbra. The area (as in an eclipse), between the perfect shadow and the full light, that receives partial illumination. *See also:* umbra.

percolation. The movement, under hydrostatic pressure, of water through the interstices of a rock or soil, except the movement through large openings such as caves *(Ref. 6).*

pereletok. An isolated layer of frozen ground between the thawed part of the active layer and a talik, usually lasting only a season or two and formed whenever, owing to excessive winter cold or to subnormal summer temperatures, the summer thaw does not completely melt the active layer *(Ref. 12).*

perennially frozen ground. *See:* permafrost.

perfect gas. *See:* ideal gas.

pergelisol. *See:* permafrost.

periclase. A mineral consisting largely of magnesium oxide.

perihelion. The point on the orbit of the earth that is nearest to the sun.

period. 1: The time interval needed to complete a cycle.
2: The smallest increment of the independent variable for which the function repeats itself.

periodic maintenance. *See:* maintenance, periodic.

periodic vibration. An oscillation having a waveform that is repeated at certain equal increments of the independent time variable *(Ref. 37).*

perishable cargo. Cargo requiring refrigeration, such as meat, fruit, fresh vegetables, and medical department biologicals *(Ref. 5).*

perishable items. Food items that require controlled conditions of temperature and/or humidity during transportation and storage *(Ref. 26).*

permafrost; *also* perennially frozen ground, pergelisol. 1: Permanently frozen ground. 2: A thickness of soil, superficial deposit, or bedrock of variable depth beneath the surface of the earth in which below-freezing temperature has existed continuously for a long time *(Ref. 11).*

permafrost island. An area of perennially frozen ground surrounded by unfrozen ground *(Ref. 11).*

permafrost, passive. Ground perennially frozen under climatic conditions colder than those now present, which will not refreeze as permanently frozen ground when once disturbed *(Ref. 11).*

permafrost table. The surface that represents

the upper boundary of perennially frozen ground. Sometimes called frost table *(Ref. 11)*.

permafrost zone. The aggregate of regions in which permafrost occurs *(Ref. 11)*.

permanent airborne dust. Particles less than 2 μm in diameter whose settling velocities are small compared to normal atmospheric motions. Settling times of 9 to 90 yr have been estimated for particles of 1-μm diameter.

permanent threshold shift. A reduction of the sensitivity of human hearing that is not temporary.

permeable. Open to passage or penetration; used especially of a substance that allows the passage of fluids.

permeability. The material property that permits fluids and gases to pass through. The standard coefficient of permeability used in the hydrologic work of the U S Geological Survey is defined as the rate of flow of water at 60°F, in gallons per day, through a cross section of 1 ft^2, under a hydraulic gradient of 100 percent *(Ref. 32)*.

permeation tube. Sources of known gas concentration used in calibration of sulfur dioxide and nitrogen dioxide monitors. One type uses Teflon tubes containing pure sulfur dioxide or nitrogen dioxide which diffuse slowly through the wall of the tube and into the surrounding air at a slow rate.

permittivity. A property of a dielectric that determines the force between two charges in the dielectric; as given by Coulomb's law

$$F = q_1 \, q_2 \, /(\epsilon r^2)$$

ϵ = permittivity
q_1, q_2 = electric charges
r = distance between charges
F = force acting between charges

persistent pesticides. Pesticides that will be present in the environment for longer than one growing season or 1 yr after application *(Ref. 9)*.

personnel. The individuals required in either a military or civilian capacity to accomplish the assigned mission *(Ref. 5)*.

Peru sunshine recorder. A sunshine recorder of the type in which the time scale is supplied by the motion of the sun. The instrument, which is pointed at the celestial pole, consists of a hemispherical mirror mounted externally on the optical axis of a camera. The lens of the camera forms an image of the sun which is reflected by the hemispherical mirror so that as the sun moves across the sky, the image traces an arc of a circle on the photographic paper *(Ref. 3)*.

pesticide. A chemical agent used to control pests. This includes insecticides for use against harmful insects; herbicides for weed control; fungicides for control of plant diseases; rodenticides for killing rats, mice, etc.; and germicides used in disinfectant products, algaecides, slimicides, etc. Some pesticides can contaminate water, air, or soil, and can accumulate in man, animals, and the environment, particularly if they are misused. Certain of these chemicals have been shown to interfere with the reproductive processes of predatory birds and possibly other animals *(Ref. 9)*.

Peter snow. Snow consisting of relatively uniform fine particles formed by disaggregation of aged snow with a rotary type snow plow known as a Peter snow miller and having predictable mechanical properties.

petri dish. A small shallow container with a loosely fitting overlapping cover used especially for culturing bacteria.

petroleum. An oily, liquid solution of hydrocarbons that, when fractionally distilled, yields paraffin, kerosene, fuel oil, gasoline, etc. *(Ref. 5)*.

petroleum, oils, and lubricants (*Abbr.* POL). A broad term that includes all petroleum and associated products used by the Armed Forces *(Ref. 5)*.

petrology. The study of the composition, structure, and history of the rocks forming the lithosphere or crust of the earth and their mineral structure.

pH. A numerical designation of relative acidity and alkalinity. Technically, pH is the common logarithm of the reciprocal of the hydrogen-ion concentration of a solution. pH is represented on a scale of 0 to 15. A pH of 7.0 indicates precise neutrality, higher values indicate increasing alkalinity, and lower values indicate increasing acidity *(Ref. 16)*. *See:* hydrogen ion concentration.

phase. 1: A measure of the stage of progress

in the cycle of any periodic motion, usually expressed as a phase angle, one complete cycle representing phase angle of 360 deg; e.g., a phase angle of 90 deg indicates that the cycle is one-quarter completed.

2: In a propagating sine wave (simple harmonic wave), points of equal phase are separated by a distance of one wavelength *(Ref. 1)*.

phase diagram. A graph showing the condition of equilibrium between various phases of a substance or between different substances.

phase modulation. *See:* modulation, phase.

phase shift. A change in phase of a voltage or current after passing through a circuit or cable *(Ref. 4)*.

phase speed. *See:* wave velocity.

phon. A unit of loudness which is a measure with reference to the sound pressure level of a pure tone of 1,000 Hz judged by the listener to be of equal loudness. If the median sound pressure level is n dB above the reference level of 2×10^{-5} N m^{-2}, the loudness is equal to n phon. The loudness of a jet aircraft engine is about 140 phon whereas that of a steam locomotive is about 100 phon.

phonetically balanced monosyllabic word intelligibility test. A test of speech intelligibility consisting of 20 lists of 50 phonetically balanced words each.

phosphorescence. Emission of light without sensible heat, particularly as a result of but continuing after absorption of radiation from some other source *(Ref. 15)*.

phot. A photometric unit of illuminance or illumination equal to 1 lm cm^{-2}.

photochemical oxidants. Atmospheric pollutants formed by irradiation of the oxides of nitrogen and hydrocarbons in the air with sunlight. Primary components of photochemical smog *(Ref. 9)*.

photochemical smog. Air pollution associated with oxidants rather than with sulfur oxides, particulates, etc. Produces necrosis, chlorosis, and growth alternations in plants and is an eye and respiratory irritant in human beings *(Ref. 9)*.

photogrammetry. 1: The art, science, or process of making maps and scale drawings from photographs, especially of making maps from aerial photographs.

2: The process of making precise measurements by the use of photography. *(Ref. 14)*

photographic barograph. A mercury barometer arranged so that the position of the upper or lower meniscus may be measured photographically. In one design the image of the meniscus is formed on a rotating drum covered with sensitized paper so that a continuous record is obtained of pressure as a function of time *(Ref. 3)*.

photolysis. Decomposition or dissociation caused by exposure to light.

photomap. A reproduction of a photograph or photomosaic upon which the grid lines, marginal data, contours, place names, boundaries, and other data may be added *(Ref. 5)*.

photon. The elementary quantity, or "quantum" of radiant energy. It is regarded as a discrete quantity having a mass equal to $h\nu/c^2$, where h = Planck's constant, ν = the frequency of the radiation, and c = the speed of light in a vacuum. The photon is never at rest, has no electric charge, and has no magnetic moment, but does have a "spin moment". The energy of a photon (the unit "quantum" of energy) is equal to $h\nu$ *(Ref. 3)*.

photosphere. The intensely bright portion of the sun visible to the unaided eye. It is a shell a few hundred miles in thickness marking the boundary between the dense interior gases of the sun and the more diffuse cooler gases in the outer portions of the sun. The photosphere is the portion of the solar atmosphere that emits the continuous radiation upon which the Fraunhofer lines are superimposed *(Ref. 3)*.

photosynthesis. The formation of chemical compounds by exposure to light, sometimes including the near infrared or near ultraviolet; especially the formation of carbohydrates from carbon dioxide and a source of hydrogen (as water) in the chlorophyll-containing cells of green plants exposed to light.

phototactic. Relating to or exhibiting phototaxis; i.e., responding to light as a stimulus.

phycomycetes. A diverse group of fungi that includes mildew, potato blight, and bread mold.

physical adsorption. *See:* **van der Waals' adsorption.**

physical climatology. The major branch of climatology, which deals with the explanation of climate, rather than with presentation of it (climatography) *(Ref. 3).*

physical meteorology. The branch of meteorology that deals with optical, electrical, acoustical, and the thermodynamic phenomena of the atmosphere, its chemical composition, the laws of radiation, and the explanation of clouds and precipitation *(Ref. 1).*

physiography. The study of the physical features of the earth, their causes, and their relation to one another. It is primarily an attempt to reveal the complex interrelationships between the origin (and therefore material composition) of surface features and the causes of surface alteration (erosion, weather, crustal upheaval, etc.).

phytometer. An apparatus to measure the amount of water transferred to the atmosphere by a plant *(Ref. 3).*

pibal *or* pibal observation. Contraction for pilot-ballon observation *(Ref. 3).*

pickle. 1: To loosen or remove corrosion products such as scale and tarnish from a metal *(Ref. 1).*

2: A solution or process used to loosen or remove corrosion products such as scale and tarnish from a metal *(Ref. 34).*

piecewise-linear sweep. A type of frequency sweep in vibration cycling tests in which the vibration frequency range is swept at a number of constant sweep rates, used when available equipment cannot provide a continuously variable or programmable sweep rate. The piecewise-linear sweeps are chosen to approximate a logarithmic sweep.

piezoelectric accelerometer. An accelerometer in which piezoelectric crystals are subjected to forces generated by the response of an internal mass to acceleration. The change in electrical characteristics of the piezoelectric crystals in response to bending or compression, provides an analog electrical output proportional to acceleration.

piezoelectric shaker. *See:* **shaker, piezoelectric.**

piggy-back transport. A combination of rail and motor transport in which semitrailers are loaded and sealed at point-of-origin, moved by highway to a railway, placed on rail cars, transported by rail, off-loaded, coupled to towing vehicles, and delivered to their destinations by highway.

pilot balloon. A small balloon whose ascent is followed by a theodolite in order to obtain data for the computation of the speed and direction of winds in the upper air *(Ref. 3).*

pilot streamer. The first stage in cloud-to-earth lightning discharge. The velocity of propagation is about 1.5×10^5 $m\ s^{-1}$.

pingo. A form of frost mound; specifically, a large mound of ice covered with soil. Pingos are not uncommonly 100 ft or more in height, and are persistent, prominent landscape features. The crust may be broken which allows mud to ooze out during a thaw *(Ref. 11).*

pin-holing. A film defect characterized by the presence of tiny holes. The term is rather generally applied to holes caused by solvent bubbling, moisture, other volatile products, or the presence of extraneous particles in the applied film *(Ref. 1).*

pitch. 1: The attribute of auditory sensation by which sounds are ordered on a scale extending from low to high. Pitch depends primarily upon the frequency of the sound stimulus, but the sound pressure and waveform of the stimulus also affect a perceived pitch *(Ref. 38).*

2: Oscillation of a missile, airplane, or ship about a lateral axis; e.g., the alternate rising and falling of the bow and stern of a ship *(Ref. 40).*

pitot pressure. *See:* **pressure, dynamic.**

pitot tube. An instrument for measuring the relative speed of a fluid. In one arrangement it consists of a concentric pipe arrangement in which the inner pipe is open at one end and the outer pipe is perforated and closed at both ends; each pipe is connected to a manometer. The unit is operated with the open end pointing upstream, so that the inner pipe measures the total pressure and the outer pipe measures the static pressure. The difference in these pressures, the dynamic pressure, is proportional to the square of the fluid speed *(Ref. 3). See also:* **pressure, dynamic.**

pitot-tube anemometer. A pressure-tube anemometer, consisting of a pitot tube mounted on the windward end of a wind vane and a suitable manometer to measure the developed pressure and calibrated in units of windspeed *(Ref. 3)*.

pitting factor. The ratio of the depth of the deepest corrosion pit to the average penetration as calculated from weight loss *(Ref. 34)*.

plagioclase. A common rock-forming mineral of the feldspar group, which consists of $NaAlSi_3O_8$ and $CaAl_2Si_2O_8$ in a complete range of mixtures.

plain. A comparatively flat, smooth, and level tract unbroken by hills, mountains, or valleys *(Ref. 32)*.

Planck's constant. A constant, usually designated h, equal to 6.626×10^{-34} J s. It scales the energy of electromagnetic radiation of frequency ν such that the radiation appears only in quanta $n h\nu$, n being an integer *(Ref. 3)*.

Planck's radiation law. An expression for the variation of monochromatic emittance (emissive power) as a function of wavelength of blackbody radiation at a given temperature; it is the most fundamental of the radiation laws. Mathematically, Planck's law is

$$E\lambda = \frac{c_1 \lambda^{-5}}{\exp\left[c_2/(\lambda T)\right]-1}$$

where $E\lambda$ = the emittance of blackbody radiation of wavelength λ per unit wavelength per unit area of blackbody surface at temperature T; c_1 and c_2 are universal constants *(Ref. 3)*.

plane polarization. *See:* polarization.

planetary boundary layer; *also* **friction layer; atmospheric boundary layer.** The layer of the atmosphere from the surface of the earth to the geostrophic wind level, including, therefore, the surface boundary layer and the Ekman layer. Above this layer lies the free atmosphere *(Ref. 3)*.

plane-wave tube. A type of acoustical testing facility in which impingement of acoustic energy upon a test specimen is inherently undirectional *(Ref. 1)*.

planimetric map. A map representing only the horizontal position of features. Sometimes called a line map *(Ref. 5)*.

plankton. The passively floating or weakly swimming animal and plant life of a body of water; most are very small *(Ref. 1)*.

planosol. *Pedology.* An intrazonal group of soils with eluviated surface horizons underlain by claypans or fragipans, developed on nearly flat or gently sloping uplands in humid or subhumid climates *(Ref. 16)*.

plant growth regulator. A chemical antiplant agent that regulates or inhibits plant growth *(Ref. 12)*.

plant nutrient. Any element taken in by a plant, essential to its growth, and used by it in elaboration of its food and tissue *(Ref. 16)*.

plasma. An electrically conducting gas in which the number of positive ions is equal to the number of electrons and negative ions so that neutrality exists.

plastic. Any of a variety of nonmetals containing an organic substance of high molecular weight. They are produced from organic compounds by polymerization, can be molded into various shapes, and are solid in final form.

plasticity. The property of a material that enables it to undergo permanent deformation without appreciable volume change or elastic rebound and without rupture *(Ref. 20)*.

plasticity index. The difference in the water content of a soil between its liquid limit and at its plastic limit. Clayey soils, for example, have higher plasticity indexes than nonclay soils, because they remain plastic over a wider range of water content *(Ref. 1)*.

plasticizer. A chemical agent added in compounding plastics to make them softer and more flexible *(Ref. 4)*.

plastic limit. *Soil Mechanics.* One of the measures of soil consistency (*See:* **Atterberg limits**). The lowest moisture content, expressed as a percentage of the weight of the oven-dried soil, at which the soil can be rolled into threads 1/8 in. in diameter without the thread breaking into pieces *(Ref. 1)*.

plastic range. The stress range in which a

material will not fail when subjected to the action of a force but will not recover completely, so that a permanent deformation results when the force is removed *(Ref. 5)*.

plastic zone. The region beyond the rupture zone associated with crater formation resulting from an explosion in which there is no visible rupture but in which the soil is permanently deformed and compressed to a high density *(Ref. 5)*. *See also:* rupture zone.

plateau. 1: A level on which little or no change takes place; a representation of this on a graph. Used especially of trends, materiel requirements, learning processes, etc. *(Ref. 14)*.

2: A tableland or flat-topped area of considerable extent elevated above surrounding country on at least one side. A plateau is larger and more extensive than a mesa but the two cannot be strictly separated. The surface may be fairly smooth but not necessarily so, large mountain masses may rise above it, and deep canyons may be cut into it *(Ref. 1)*.

platform. A metal or wooden skid designed to hold bulk supplies and heavy equipment for airdrop *(Ref. 17)*.

platform drop. The airdrop of loaded platforms from rear-loading aircraft with roller conveyors *(Ref. 5)*. *See also:* platform.

platy soil structure. Soil aggregates with thin vertical axes and long horizontal axes. Flat, tabular; a three-dimensional object that has one dimension much smaller than the other two *(Ref. 16)*.

playa; *also* dry lake. The flat or nearly flat, low part of an enclosed basin or temporary lake without outlet. Includes dry, moist, crystal body, compound, lime pan, and artificial playas *(Ref. 1)*.

playa lake. A very shallow lake occupying a playa, usually temporary in nature *(Ref. 32)*.

pleistocene. The latest epoch in the geological time scale that includes all of postpliocene time. It is sometimes called the Ice Age.

plucking; *also* quarrying. The process by which rock fragments are detached from bedrock by the movement of glacial ice *(Ref. 11)*.

plutonic. Originating or situated deep within the earth.

plutonic rocks. *See:* igneous rocks.

podsol. *Pedology.* A zonal group of soils having surface organic mats and thin, organic-mineral horizons above gray leached horizons that rest upon illuvial dark-brown horizons developed under coniferous or mixed forests or under heath vegetation in a cool-temperate, moist climate *(Ref. 16)*.

podzolization. *Pedology.* The process by which soils are depleted of bases, become more acid, and develop leached surface layers from which clay has been removed *(Ref. 16)*.

pogonip. Same as ice fog; an American Indian word applied particularly to ice fogs occurring in the mountain valleys of western United States *(Ref. 3)*.

poise. The unit of dynamic viscosity equal to 1 g cm^{-1} s^{-1} or 0.1 N s m^{-2}. The dynamic viscosity of water at 20°C is 1.002 centipoise while that of gases is in the micropoise range.

polar air (*Abbr.* P). In the Bergeron system of airmass classification, air typical of the subpolar high pressure areas; thus a polar airmass usually originates farther south than an arctic airmass *(Ref. 11)*.

polar blackout. *See:* arctic blackout.

polar ice. Extremely heavy sea ice up to 10 ft or more thick and of more than one winter's growth. Heavily hummocked, it may ultimately be reduced by weathering to a more-or-less even surface *(Ref. 31)*.

polarization. The state of electromagnetic radiation when transverse vibrations take place in some regular manner; e.g., all in one plane, in a circle, in an ellipse, or in some other definite curve. Radiation may become polarized because of the nature of its emitting source, as is the case with many types of radar antennas, or because of some processes to which it is subjected after leaving its source, such as that resulting from the scattering of solar radiation as it passes through the atmosphere of the earth *(Ref. 3)*.

polar regions. Those parts of the surface of the earth that have an average temperature

of the warmest month of less than 32°F *(Ref. 12)*.

polder. Land reclaimed from the sea or other body of water by the construction of an embankment to restrain the water *(Ref. 15)*.

polyethylene. One of a variety of crystalline lightweight thermoplastics. It has good insulating properties and is resistant to chemicals and moisture.

polygonal soil. More or less regular sided ground surface patterns created by frost action, by thawing, or ground ice wedges, or both. A widespread phenomenon over the permafrost area, indicating poor drainage *(Ref. 12)*.

polymer. A material having molecules of high molecular weight, formed by polymerization of lower molecular weight molecules *(Ref. 4)*.

polymerization. A chemical reaction in which two or more like molecules combine to form a larger molecule whose molecular weight is a multiple of the original but whose physical properties are different.

polynya. Any enclosed sea water area in pack ice, other than a lead, not large enough to be called open water. In summer it may be referred to as a lake; in winter with a covering of relatively thin ice, it may be called an ice skylite *(Ref. 31)*.

pond. A relatively small body of water, usually surrounded on all sides by land. A larger body of water is called a lake *(Ref. 15)*.

pondage. Small-scale storage at a waterpower plant to equalize daily or weekly fluctuations in riverflow or to permit irregular, hourly use of the water for power generation to accord with fluctuations in load *(Ref. 6)*.

pool. 1: To maintain and control a supply of resources or personnel upon which other activities may draw. The primary purpose of a pool is to promote maximum efficiency of use of the pooled resources or personnel; e.g., a petroleum pool, a labor and equipment pool.

2: Any combination of resources that serve a common purpose *(Ref. 5)*.

3: Any enclosed, relatively small sea area in pack ice or drift ice other than a lead or a land *(Ref. 18)*.

4: A small body of water, usually smaller than a pond, especially one that is quite deep. One left by an ebb tide is called a tide pool *(Ref. 15)*.

5: A small and comparatively still, deep part of a larger body of water such as a river or harbor *(Ref. 15)*.

port. A place at which ships may discharge or receive their cargoes. It includes any port accessible to ships on the seacoast, navigable rivers, or inland waterways. The term "ports" should not be used in conjunction with air facilities that are designated as aerial ports, airports, etc. *(Ref. 5)*.

port capacity. The estimated capacity of a port or an anchorage to clear cargo in 24 hr, usually expressed in tons *(Ref. 5)*.

potential evapotranspiration. Water loss that will occur if at no time there is a deficiency of water in the soil for use of vegetation *(Ref. 6)*.

potential gradient. In general, the local space rate of change of any potential, as the gravitational potential gradient or the velocity potential gradient. In atmospheric electricity, the electric potential gradient (electric field strength) of the atmosphere is commonly referred to as the atmospheric electric field *(Ref. 3)*.

potential natural water loss. The water loss during years when the annual precipitation greatly exceeds the average water loss. It represents the approximate upper limit to water loss under the type and density of vegetation native to a basin, actual conditions of moisture supply, and other basin characteristics, whereas potential evapotranspiration represents the hypothetical condition of no deficiency of water in the soil at any time for use of the type and density of vegetation that would develop *(Ref. 6)*.

potential temperature. The temperature that a parcel of dry air would have if brought adiabatically from its initial state to a pressure of 1,000 mb.

porosity, soil. The degree to which the soil mass is permeated with pores or cavities. Porosity can be generally expressed as a percentage of the whole volume of a soil horizon that is unoccupied by solid particles *(Ref. 16)*.

potentiometer. An instrument for measuring differences in electric potential. Essentially, this instrument balances the unknown voltage against a variable known voltage. Potentiometers are frequently used in conjunction with thermocouples for measuring temperature *(Ref. 1).*

potentiometer accelerometer. Consists of a mass-spring-damper system and a potentiometer circuit. During operation, the mass displacement, which is coupled to the potentiometer, causes the potentiometer resistance to change, thus producing an electrical output signal. Primarily used for low frequencies and accelerations.

pothole. A hole formed in the beds of rivers by the grinding action of stones or gravel whirled around by water in a particular spot *(Ref. 32).*

potometer. *See:* phytometer.

potting. The sealing of a cable termination or other component with a liquid that thermosets into an elastomer or solid compound to exclude moisture *(Ref. 4).*

pounding. The impact of waves on a ship when all parts of the ship bottom are in the water. *Compare:* slamming.

powder snow. *See:* snow, powder.

power density spectrum (vibration). A graphical presentation of values of power density displayed as a function of frequency. It represents the distribution of vibration energy with frequency *(Ref. 37).*

power factor. The ratio of the power to the effective values of the electromotive force multiplied by the effective value of current, in volts and amperes, respectively. The cosine of the angle between voltage applied and the current resulting *(Ref. 4).*

power spectral density. The limit of the mean-square value in a given rectangular bandwidth divided by the bandwidth, as the bandwidth approaches zero *(Ref. 1).*

power spectral density level. The level at a specified frequency of the part of a particular signal in a band that is 1 Hz wide and centered at the frequency of measurement. The level is expressed in decibels *(Ref. 22).*

prairie soils. *Pedology.* A zonal great soil group of soils formed in temperate to cool-temperate, humid regions under tall grass vegetation *(Ref. 2).*

precipitable water. The depth of liquid water that would be obtained if all the water vapor above a unit area of the surface of the earth were condensed.

precipitation. 1: Any or all of the forms of water particles, whether liquid or solid, that fall from the atmosphere and reach the ground. Precipitation includes drizzle, graupel, rain, snow, ice crystals, ice pellets, and hail.

2: The amount, usually expressed in inches of liquid water depth, of the water substance that has fallen at a given point over a specified period of time *(Ref. 1). See also:* hydrometeor.

precipitation attenuation. The decrease in flux of a "parallel beam" of radiation caused by the effect (mainly absorption and scattering) of precipitation in the atmosphere.

precipitation current. The downward transport of electric charge that occurs in precipitation.

precipitation effectiveness. In general, the actual efficacy of precipitation in plant growth. The dependence of the effect of precipitation on temperature or evaporation has been expressed in many ways, such as Köppen's formulas for defining desert climate and Thornthwaite's precipitation effectiveness index *(Ref. 1).*

precipitation inversion *or* **rainfall inversion.** As found in some mountain areas, a decrease in precipitation with increasing elevation of ground above sea level. In the lowest few thousand feet, the precipitation increases with height until the zone of maximum precipitation is reached, above which the inversion is found *(Ref. 3).*

precipitation static. Radio interference (static) to aircraft communication caused by corona discharge from radio antennas or other protuberances on aircraft flying through clouds containing ice particles *(Ref. 1).*

preservation, cyclic. The representation, repackaging, or repacking of material in store on which previously applied

protective measures have subsequently matured or deteriorated to a state where renewal of protection is necessary *(Ref. 1)*.

pressure. 1: A type of stress characterized by uniformity in all directions. In dynamics, it is the part of the stress tensor that is independent of viscosity and depends only upon the molecular motion appropriate to the local temperature and density. It is a scalar quantity expressed in units of force per unit area *(Ref. 1)*.

2: In meteorology, commonly used for atmospheric pressure *(Ref. 3)*.

pressure, absolute. The pressure referred to that of a perfect vacuum. It is the sum of the gage pressure and atmospheric pressure *(Ref. 1)*.

pressure altitude. 1: The altitude, in the standard atmosphere at which a given pressure will be observed. It is the indicated altitude of a pressure altimeter at an altimeter setting of 29.92 in. Hg (1,013.2 mb); therefore, it is the indicated altitude above the 1,013.2 mb constant-pressure surface *(Ref. 3)*.

2: The simulated altitude condition created in an altitude chamber by changing (usually by lowering) the pressure in the chamber *(Ref. 7)*.

pressure, dynamic. The difference between static and pitot pressure due to relative motion of fluid when compressibility of the fluid is not considered. Pitot pressure is the pressure at the open end of a pitot tube *(Ref. 15)*.

pressure envelope duration; ***also*** **B-duration.** In impulse noise and blast, the total time that the envelope of pressure fluctuations (positive and negative) is within 20 dB of the peak pressure level.

pressure front. *See:* **shock front.**

pressure, gage. The pressure above atmospheric (barometric) pressure *(Ref. 1)*.

pressure gradient; ***also*** **barometric gradient** ***(Meteorology)***. The rate of decrease (gradient) with displacement of pressure in space at a fixed time. The term is sometimes used loosely to denote simply the magnitude of the gradient of the pressure field but is properly a vector quantity *(Ref. 3)*.

pressure, hydrostatic *or* **gravitational pressure.** The pressure in a fluid in hydrostatic equilibrium; i.e., the pressure at a point due solely to the weight of fluid above *(Ref. 1)*.

pressure, impact. The pressure exerted when one object strikes another, consisting of pressure derived from both static pressure and dynamic pressure *(Ref. 14)*.

pressure, partial. The pressure exerted by one constituent of a mixed gas. The sum of the partial pressures of each constituent of the mixture equals the total gas pressure *(Ref. 1)*.

pressure, recovered. The pressure actually obtained when the static pressure is increased by the conversion of a portion of the kinetic energy in the stream of gas to pressure energy. The maximum recovered pressure would be stagnation pressure were it not for losses in the conversion process *(Ref. 1)*.

pressure, reflected. The pressure from an explosion, which is reflected back from a solid object or surface, rather than dissipated in the air. Said especially of an airburst bomb *(Ref. 14)*.

pressure, saturation. The pressure at a given temperature where vapor and liquid, or vapor and solid, can exist in stable equilibrium *(Ref. 1)*.

pressure spectrum level. The effective sound pressure level for the sound energy contained within a bank 1 Hz wide, centered at the specified frequency. Ordinarily, this has significance only for sound having a continuous distribution of energy within the frequency range under consideration. The reference pressure should be explicity stated *(Ref. 1)*.

pressure, stagnation. The static pressure that could be realized if the flow could isentropically be brought to rest. It depends upon the static pressure, the Mach number, and the kind of gas. At low Mach numbers, it approaches the sum of the static pressure and the incompressible velocity head, but is increasingly greater than this sum at higher Mach numbers *(Ref. 1)*.

pressure, static. 1: The pressure exerted upon an object by air or other fluid as a result of its own molecular activity as a function of its density and temperature, no gain being due to outside work *(Ref. 14)*.

2: *Acoustics.* The air pressure present at a

point in the absence of sound waves *(Ref. 38)*.

pressure tendency *or* **barometric tendency.** The character and amount of atmospheric pressure change for a 3-hr or other specified period ending at the time of observation *(Ref. 1)*.

pressure, total. The resultant of all components of pressure acting at a point. In relation to a pitot tube, the expression may be used at the equivalent of pitot pressure *(Ref. 15)*.

pressure tube anemometer. An anemometer that derives windspeed from measurements of the dynamic wind pressures. Wind blowing into a tube develops a pressure greater than the static pressure, while wind blowing across a tube develops a pressure less than the static. This pressure difference, which is proportional to the square of the windspeed, is measured by a suitable manometer *(Ref. 3)*.

pressure, velocity. 1: The pressure capable of causing an equivalent velocity in a moving fluid if applied to move the same fluid through an orifice so that all pressure energy expended is converted into kinetic energy.

2: *See:* pressure, dynamic.

3: *See:* wind pressure *(Ref. 1)*.

pressure wave duration; *also* **A-duration.** In impulse noise and blast, the time required for the initial or principal pressure wave to rise to its positive peak and return momentarily to ambient.

pressurization. The act or process of exposing a space to greater than ambient pressure.

prevailing wind direction. The wind direction most frequently observed during a given period. The periods most frequently used are the observational day, month, season, and year *(Ref. 1)*.

preventive maintenance. *See:* maintenance, preventive.

prime mover. A vehicle, including heavy construction equipment, possessing military characteristics, designed primarily for towing heavy, wheeled weapons, and frequently providing facilities for the transportation of the crew of, and ammunition for, the weapon *(Ref. 5)*.

principal items. Materiel items, the supply of which is, or is about to be, increasingly active. A high value item or an item whose procurement will be difficult due to long lead time, shortage of strategic materials, or difficulty of manufacture.

probability forecast. A forecast of the probability of occurrence of one or more of a mutually exclusive set of weather contingencies, as distinguished from a series of categorical statements *(Ref. 3)*.

process lapse rate. The rate of decrease of the temperature of an air parcel as it is lifted *(Ref. 3)*.

procurement. The process of obtaining personnel, services, supplies, and equipment *(Ref. 5)*.

profile. A geometric representation of a terrain surface as an elevation-distance curve *(Ref. 35)*.

program cam. In a process-control system wherein a controlled parameter (e.g., dry-bulb or wet-bulb temperature) must be varied in a periodic manner at specified rates between specified limits, a cam rotated at a constant speed and shaped such that the cam follower causes the controlled parameter to vary in accordance with the specified program *(Ref. 1)*.

propagation. The traveling of a radio wave, pressure wave, electric current, or the like through or along a medium; the act of sending such waves or forces through or along a medium *(Ref. 14)*.

propeller blade passage frequency. In propeller-driven aircraft or ships, the frequency at which a propeller blade passes a given reference point, equal to the revolution rate of the propeller multiplied by the number of blades on the propeller.

protein. Any of numerous naturally occurring complex combinations of amino acids containing carbon, hydrogen, nitrogen, oxygen, frequently sulfur, occasionally phosphorus, iron, or other elements. They are essential constituents of all living cells, being synthesized from raw materials by plants but assimilated as separate amino acids by animals.

protozoa. A phylum or subkingdom of one-celled animals that belong to the lowest division of the animal kingdom.

provisioning. The process of determining the range and quantity of items (i.e., repair

parts, special tools, test equipment, and support equipment) required to support and maintain an end item of material for an initial period of service. Its phases include the identification of items of supply, the establishment of data for catalog, technical manual, and allowance table preparation, and the preparation of instruction to assure delivery of necessary support items with related end articles *(Ref. 26)*.

PSD *Abbr. for* power spectral density.

pseudoadiabat. On a thermodynamic diagram, a line representing an expansion of an air parcel as it is lifted and the condensed water precipitates from it. In practice, approximate computations are employed, and the resulting lines represent, ambiguously, pseudoadiabats and saturation adiabats *(Ref. 3)*.

psychrometer. An instrument for measuring the water vapor content of air. It is a type of hygrometer with two thermometers, one a wet-bulb and the other a dry-bulb *(Ref. 1)*.

psychrometric chart. A nomograph for graphically obtaining relative humidity, absolute humidity, and dewpoint from wet- and dry-bulb thermometer readings *(Ref. 3)*.

PTS *Abbr. for* permanent threshold shift.

pulse. A variation of a quantity whose value is normally constant (often zero), the variation being characterized by a rise and a decay. A common example is a very short burst of electromagnetic energy *(Ref. 15)*.

pulsed radar. *See:* radar, pulsed.

pulse duration. In radar, measurement of pulse transmission time in microseconds; i.e., the time that the radar's transmitter is energized during each cycle. Also called pulse length and pulse width *(Ref. 5)*.

pulse repetition frequency. In radar, the number of pulses that occur each second. Not to be confused with transmission frequency, which is determined by the rate at which cycles are repeated within the transmitted pulse *(Ref. 5)*.

pulse rise time. Generally, the time from the beginning of a pulse until it has risen to some specified fraction of its maximum value.

pumice. A general name for highly siliceous igneous glasses that are so extremely light and frothy that they will float on water. The open spaces are minute vesicles formed originally by the expulsion of water vapor or other gas from highly heated lava *(Ref. 1)*.

pupa. The stage in an insect's development between the larval and adult forms. In most cases pupae are immobile and often encased in a shell or cocoon.

putty gage. A type of step gage that provides an indication of peak acceleration. It consists of a number of spring-loaded masses whose motion results in the indentation of a puttylike material *(Ref. 22)*.

P wave; *also* compression wave; longitudinal wave; pressure wave. A seismic body wave, advancing by alternating compressions and rarefactions in an elastic medium. It is the type of wave that carries sound *(Ref. 1)*.

pycnometer. A standard container used to determine the density of liquids or solids.

pyranometer. An instrument for measuring radiation from sun or sky by its heating action upon two blackened metallic strips as compared with the electric current that produces the same heating effect.

pyrheliometer. General term for the class of instruments that measures the intensity of direct solar radiation. The instrument consists of a radiation-sensing element enclosed in a casing that is closed except for a small aperture, through which the direct solar rays enter, and a recorder unit *(Ref. 1)*.

pyrolysis. Decomposition produced by heat.

Q

QPL *Abbr. for* Qualified Products List.

quadrangle. A unit area that is standardized as to form and orientation for the purpose of systematic mapping. It is bounded on the east and west by lines of longitude (meridians) and on the north and south by lines of latitude (parallels) *(Ref. 1)*.

quagmire. A saturated area with a surface of soft mud, or, at best, a surface providing a shaky and precarious footing *(Ref. 11)*.

quaking bog. 1: A peat deposit so wet and unconsolidated that the surface oscillates with the impact of a person walking on it. 2: A late vegetational stage in the filling of a lake or pond by encroaching, floating mats of plants, and plant debris. *(Ref. 11)*

Q (quality factor). 1: A measure of the sharpness of resonance, or frequency selectivity, of a resonant vibratory system having a single degree of freedom either mechanical or electrical. *(Ref. 8)*

2: A figure of merit of an energy storage system equal to

$$2\pi\left[\frac{\text{average energy stored}}{\text{energy dissipated per half cycle}}\right]$$

quality of snow. *See:* snow, quality of.

quaquaversal. Inclined downward from a central point in all azimuthal directions, as in a dome *(Ref. 32)*.

quarrying. *See:* plucking.

quartz. Crystalline silica. In its most common form, it is colorless and transparent, but it takes a large variety of forms of varying degrees of opaqueness and color. It is the most common solid mineral *(Ref. 15)*.

quartzite. A hard, compact, light-colored rock metamorphosed from sandstone.

quench. To cool rapidly.

quicksand. Submerged, saturated sand with low bearing power. Heavy objects easily sink in such sand. The inability of the sand to support much weight may be due to seepage pressure of water percolating through the sand in an upward direction or to inherent instability of the structure of the sand, unaided by seepage pressure *(Ref. 32)*.

quicktrans. Long-term contract airlift service within the continental United States for the movement of cargo in support of the logistic system for the military Services (primarily the Navy and Marine Corps) and Department of Defense agencies *(Ref. 5)*.

quintile. The values obtained when a frequency distribution is divided into 10 sets each containing an equal number of observations and the value of the observation separating sets is obtained.

Q wave; *also* long wave. 1: A transverse wave propagated along the boundary of two elastic media, both of which have rigidity; i.e., both media must be capable of propagating transverse waves.

2: *Seismology.* A surface seismic wave in which the particles of an elastic medium vibrate transverse to the direction of travel of the wave with no vertical component. *(Ref. 18)*

R

R *Abbr. for* **rankine** *and* **reaumur (temperature scales).**

rabal. *Meteorology.* 1: A method of determining windspeeds and directions at various heights, in which the height data are obtained from radiosonde observations and the speed from visual tracking of the balloon *(Ref. 1).*

2: Determination of varying atmospheric conditions by use of a radiosonde balloon. Rabals are reports obtained in this manner *(Ref. 12).*

race. An aqueduct or channel for conducting water to or from the place where it performs work.

racking. The application of lateral loading at top corner fittings against a restraining force in the opposite direction from the bottom corner fittings. Racking is one means of restraining materiel on rail cars or within transport vehicles to prevent relative motion between the materiel and the surface to which it is attached.

rad. Unit of absorbed dose of radiation. It represents the absorption of 10^{-2} J of nuclear (or ionizing) radiation per gram of the absorbing material or tissue *(Ref. 5).*

radar. Radio detection and ranging equipment that determines the distance and usually the direction of objects by transmission and return of electromagnetic energy *(Ref. 5).*

radar, pulsed. A type of radar, designed to facilitate range measurement, in which the transmitted energy is emitted in periodic short pulses. The distance to any target causing a detectable echo can be determined by measuring one-half the time interval between transmitted pulse and received echo and multiplying this number by the speed of light. This is the most common type of radar *(Ref. 3).*

radar reflectivity. In general, the measure of the efficiency of a radar target in intercepting and returning radio energy. It depends upon the size, shape, aspect, and dielectric properties at the surface of the target *(Ref. 3).*

radarsonde. A system in which radar techniques are used to determine the range, elevation, and azimuth of a radar target carried aloft by a radiosonde balloon *(Ref. 1).*

radiac. A term devised to designate various types of radiological measuring instruments or equipment. This term is derived from the words radioactivity detection, indication, and computation, and is normally used as an adjective *(Ref. 5).*

radiac dosimeter. An instrument used to measure the ionizing radiation absorbed by that instrument *(Ref. 5).*

radiant-energy thermometer. *See:* **radiation thermometer** *(Ref. 1).*

radiant intensity. The radiant power (flux) per unit solid angle emitted by a source of electromagnetic energy *(Ref. 1).*

radiation. *See:* **electromagnetic radiation.**

radiational cooling. *Meteorology.* The cooling of the surface of the earth and adjacent air, accomplished (mainly at night), by loss of heat due to terrestrial surface radiation *(Ref. 3).*

radiation damage. Temporary or permanent damage to materiel caused by high energy nuclear, cosmic, gamma, and X-ray radiation.

radiation dose. The total amount of ionizing radiation absorbed by material or tissues, commonly expressed in rads *(Ref. 5).*

radiation dose rate. The radiation dose (dosage) absorbed per unit of time *(Ref. 5).*

radiation fog. A major type of fog, produced over a land area when radiational cooling reduces the air temperature to or below its dewpoint. Thus, a strict radiation fog is a nighttime occurrence, although it may begin to form by evening twilight and often

does not dissipate until after sunrise. Factors favoring the formation of radiation fog are (a) a shallow surface layer of relatively moist air beneath a dry layer and clear skies, and (b) little or no surface winds *(Ref. 3)*.

radiation hardening. Any of a number of complex and usually expensive techniques for rendering material capable of withstanding the radiation produced by nearby nuclear explosions. Operation of the materiel during exposure is not normally required.

radiation intensity (*Abbr.* RI). 1: The radiation dose rate at a given time and place. It may be used with a figure to denote the radiation intensity at a given number of hours after a nuclear burst; e.g., RI3 is the radiation intensity 3 hr after the time of burst *(Ref. 5)*.

2: Commonly, but inaccurately, used as a synonym for the flux density (power per unit area) of a beam of radiation or particles *(Ref. 1)*.

radiation scattering. The diversion of radiation (thermal, electromagnetic, or nuclear) from its original path as a result of interactions or collisions with atoms, molecules, or larger particles in the atmosphere or other media between the source of radiation (e.g., a nuclear explosion) and a point at some distance away. As a result of scattering, radiation (especially gamma rays and neutrons) will be received at such point from many directions instead of only from the direction of the source *(Ref. 5)*.

radiation shield. A device used on certain types of instruments to prevent unwanted radiation from biasing the measurement of a quantity. The radiation shield for a thermometer, for example, usually consists of a short length of brightly polished metal tubing which encloses the thermosensitive element. The tubing is usually perforated or opened at the bottom to allow for proper ventilation and is sometimes artificially ventilated. *(Ref. 3)*.

radiation sickness. Illness resulting from excessive exposure to ionizing radiation. The earliest symptoms are nausea, vomiting, and diarrhea, which may be followed by loss of hair, hemorrhage, inflammation of the mouth and throat, and general loss of energy. Severe radiation exposures can lead to death. *(Ref. 5)*

radiation thermometer *or* **radiation pyrometer.** An instrument in which the radiant energy from an object or source is used to measure its temperature. The radiant energy within a definite solid angle impinges upon a suitable detector (a thermocouple, thermopile, or bolometer responsive to the heating effect of the radiant power, or a photosensitive device) whose output is connected to a sensitive electric instrument *(Ref. 3)*.

radioactive fallout. The eventual descent to the surface of the earth of radioactive matter placed in the atmosphere by an atomic or thermonuclear explosion *(Ref. 1)*.

radioactive fallout plot. Areas plotted on a map that outline when and where radioactive fallout is likely to be observed *(Ref. 3)*.

radioactivity. Spontaneous emission of nuclear radiation (charged particles, neutrons, and gamma rays) as a result of disintegration of a nucleus. Some natural elements are radioactive; e.g., radium and uranium. Induced radioactivity can be produced in other elements by various processes (popularly called nuclear bombardment) which create artificial isotopes of the natural element *(Ref. 1)*.

radio blackout. *See:* blackout.

radio frequency (*Abbr.* rf). The frequency of the electromagnetic wave used for radio communication covering the spectrum region from about 10^4 to 10^{11} Hz.

radiography. Photography using X-ray radiation or the gamma rays of radioactive substances.

radiological survey. A directed effort to determine the distribution and dose rates of radiation in an area *(Ref. 5)*.

radiometer. Any of a variety of instruments used to measure thermal radiant energy or the energy of electromagnetic radiation at wavelengths longer than visible radiation; i.e., infrared, microwave, and radio wave regions *(Ref. 1)*. *See also:* actinometer.

radiometry. The science of measurement of radiant energy, especially of radiant energy in the portion of the total electromagnetic

spectrum at wavelengths longer than visible radiation. Radiometry is to be distinguished from the closely related subject of photometry, the latter being specifically concerned with the quantitative response to visible radiation of the human eye *(Ref. 3)*.

radiosonde. An instrument package carried aloft by a free, unmanned balloon and equipped with elements for measuring temperature, pressure, and relative humidity and automatically transmitting the measurements by radio *(Ref. 15)*.

rail capacity. The maximum number of trains that can be planned to move in both directions over a specified section of track in a 24-hr period *(Ref. 5)*.

railcar impact test. A shock test in which the test item is placed on a railcar which is impacted at a specified speed into a stationary railcar.

railcar simulator. A vibration testing machine that simulates the vibration environment applied to materiel by railcars during railcar operations.

railway end-loading ramp. A sloping platform situated at the end of a track and rising to the level of the floor of the railcars (wagons) used to facilitate loading and unloading of cargo.

rain. Precipitation of liquid water particles, either in the form of drops of more than 0.5 mm (0.02 in.) diameter or of smaller widely scattered drops *(Ref. 36)*. *See also:* raindrop.

rainbow. A group of concentric arcs with colors ranging from violet to red, produced on a "screen" of water drops (raindrops, droplets of drizzle or fog) in the atmosphere by light from the sun or moon. This phenomenon is mainly due to refraction and reflection of light *(Ref. 36)*.

raindrop. A drop of water of diameter greater than 0.5 mm falling through the atmosphere. In careful usage, falling drops with diameters lying in the interval 0.2 to 0.5 mm are called drizzle drops rather than raindrops *(Ref. 3)*.

rainfall excess. The volume of rainfall available for direct runoff. It is equal to the total rainfall minus that which is delayed by various processes, such as absorption in the soil, from immediate runoff *(Ref. 6)*.

rainfall frequency. The number of times, during a specified period of years, that precipitation of a certain magnitude or greater occurs or can be expected to occur at a station *(Ref. 1)*.

rainfall intensity. The amount of rain that falls in a given time.

rainfall inversion. *See:* precipitation inversion.

rainforest. A forest that grows in a region of heavy annual precipitation generally characterized by lofty broad-leaved evergreen trees forming a continuous canopy *(Ref. 1)*.

rain, freezing. Rain that falls in liquid form but freezes upon impact to form a coating of glaze upon the ground and on exposed objects. When encountered by an aircraft in flight, freezing rain can cause a dangerous accretion of clear icing. Freezing rain frequently occurs as a transition condition between episodes of rain and ice pellets *(Ref. 1)*.

rain gage. An instrument designed to measure the amount of rain that has fallen. Rain gages are classified according to their operations in the following manner: (a) recording rain gage, (b) nonrecording rain gage, and (c) rain-intensity gage *(Ref. 3)*.

rainout. Radioactive material in the atmosphere brought to the surface of the earth by precipitation *(Ref. 5)*.

rain shadow. The region, on the lee side of a mountain or mountain range, where the precipitation is noticeably less than on the windward side *(Ref. 1)*.

raised beach. A beach that has been raised by earth movement to form a narrow coastal plain; it is often bounded by inland cliffs.

Raman effect. A phenomenon appearing in the scattering of light wherein extra spectrum lines appear in the vicinity of each prominent line of the incident light, the displacement of the extra lines being dependent on the scattering substance.

ram hardness number. A number derived from a rammsonde that is indicative of the physical (mechanical) properties of bulk snow. It is also known as the ram number.

rammsonde. A device, also called a penetrometer, that indicates the physical properties of bulk snow, by measuring the depth of penetration of a conical-tipped

tube as a result of the application of a known force.

random motion. The motion of molecules, atoms, or ions (or other extremely small particles) resulting from incessant random collisions within a fluid. Also called Brownian movement. *(Ref. 1)*

random noise. *See:* noise, random.

random vibration. An aperiodic vibration whose amplitude-time characteristics are not repetitive.

rankine temperature scale (*Abbr.* R). A temperature scale with the degree of the fahrenheit temperature scale and the zero point of the kelvin temperature scale. The ice point is thus 491.67° R and the boiling point of water is 671.67° R *(Ref. 1)*.

raob. An observation of temperature, pressure, and relative humidity, obtained by means of a radiosonde. The name raob is derived from the words radiosonde observation *(Ref. 15)*.

rapid. A portion of a stream in swift, disturbed motion, but without cascade or waterfall. Usually used in the plural *(Ref. 15)*.

rate of descent. The vertical velocity, in feet per second, of a descending object *(Ref. 17)*.

rate of recovery (cushioning materials). The time required for a cushioning material to return to its original shape following deformation.

ravine. A depression worn out by running water, larger than a gully and smaller than a valley; a small gorge or canyon, the sides of which have comparatively uniform steep slopes *(Ref. 10)*.

rawin. A method of observation of winds aloft that employs electronic rather than optical means.

rawinsonde. A balloon-borne device for the measurement of temperature, pressure, humidity, and winds aloft. It is differentiated from a radiosonde in that winds aloft are measured by electronic methods rather than optical.

Rayleigh scattering. Any scattering process produced by spherical particles whose radii are smaller than about one-tenth the wavelength of the scattered radiation. In Rayleigh scattering, the scattering coefficient varies inversely with the fourth power of the wavelength, a relation known as Rayleigh's law. For particles not larger than the Rayleigh limit, there is complete symmetry of scattering about a plane normal to the direction of the incident radiation, so that the forward scatter equals the backward scatter *(Ref. 3)*.

Rayleigh wave. 1: A two-dimensional barotropic disturbance in a fluid having one or more discontinuities in the vorticity profile.

2: A wave propagated along the surface of a semi-infinite elastic solid, and bearing certain analogies to a surface gravity wave in a fluid. *(Ref. 3)*

RCI *Abbr. for* rating cone index.

RCMP *Abbr. for* Royal Canadian Mounted Police.

RDTE *Abbr. for* research, development, test and evaluation.

reach. 1: An arm of the sea extending into the land.

2: A straight section of restricted waterway of considerable extent; may be similar to a narrows, except much longer in extent *(Ref. 18)*.

reactance. The part of the impedance of an alternating current circuit that is due to capacitance or inductance *(Ref. 4)*.

reaction shaker. *See:* shaker, reaction.

reaumur temperature scale (*Abbr.* R). A temperature scale with the ice point of water at zero degrees and the boiling point at 80 deg at a pressure of one atmosphere *(Ref. 3)*.

receipt. The process of accepting supplies into the military supply system.

recessional moraine. A deposit of glacial drift laid down during the retreat of a glacier.

reconnaissance. An exploratory or preliminary survey to gather information.

recovered pressure. *See:* pressure, recovered.

rectilinear. Moving in or forming a straight line; bounded, formed, or characterized by straight lines.

recurring demand. A request made periodically or anticipated to be repetitive by an authorized requisitioner for materiel for consumption or use or for stock replenishment *(Ref. 5)*.

red earth. A high red clay content soil of the humid tropics. It is highly leached and

usually has deep profiles low in silica and high in sesquioxides *(Ref. 2)*.

reducing agent. A chemical that lowers the state of oxidation of other chemicals.

redundancy. The existence of more than one means for accomplishing a given task, where all means must fail before there is an overall failure to the system. Parallel redundancy applies to systems where both means are working at the same time to accomplish the task and either of the systems is capable of handling the job itself in case of failure of the other system. Series or standby redundancy applies to a system where there is an alternate means of accomplishing the task that is switched in by a malfunction-sensing device when the primary system fails *(Ref. 33)*.

reed gage (Frahm's reeds). An instrument that measures the frequency at which an object is vibrating *(Ref. 1)*.

reef. A rocky or coral elevation at or near enough to the surface of the sea to be a danger to surface vessels. A barrier reef roughly parallels land but is some distance offshore with deeper water intervening; a fringing reef is closely attached to a shore *(Ref. 15)*.

reefer. 1: A refrigerator.

2: A motor vehicle, railroad freight car, ship, aircraft, or other conveyance, so constructed and insulated as to protect commodities from either heat or cold *(Ref. 5)*.

reflected pressure. *See:* **pressure, reflected.**

reflected solar radiation *or* **reflected global radiation.** Solar radiation reflected by the surface of the earth and diffused by the atmospheric layer between the ground and the point of observation.

reflection. The return or change in the direction of travel of particles, radiant energy, sound waves, etc., that impinge on a surface but do not enter the substance providing the reflecting surface *(Ref. 15)*.

reflection, diffuse. Any reflection process in which the reflected radiation is sent out in many directions usually bearing no simple relationship to the angle of incidence *(Ref. 1)*.

reflection interval, radar. The time interval between the transmission of a radar pulse or wave and the reception of the reflected wave at the point of transmission *(Ref. 14)*.

reflectivity. A measure of the fraction of radiation reflected by a given surface; defined as the ratio of the energy reflected to the total that is incident upon that surface. The reflectivity of any given substance is, in general, a variable that is strongly dependent upon the wavelength of the radiation in question. The reflectivity of a given surface for a specified broad spectral range, such as the visible spectrum or the solar spectrum, is referred to as the albedo *(Ref. 3)*.

refraction. The process in which the direction of energy propagation is changed as the result of a change in density within the propagating medium, or as the energy passes through the interface representing a discontinuity between two media *(Ref. 18)*.

refraction, acoustic. The change in direction of sound propagation due to spatial variation in the speed of sound in the medium *(Ref. 38)*.

refraction of water waves. 1: The process by which the direction of a wave moving in shallow water at an angle to the contours is changed. That part of the wave advancing in shallower water moves more slowly than the other part still advancing in deeper water, causing the wave crest to bend toward alignment with the underwater contours.

2: The bending of wave crests by currents. *(Ref. 18)*

refractive index *or* **index of refraction.** A measure of the amount of bending experienced by a ray as it passes from one medium to another. The refractive index of a material is defined as the ratio of the velocity of an electromagnetic wave in a vacuum to that in the material.

refractometer. An instrument for the measurement of the refractive index of substances.

refrigerated warehouse. A storehouse outwardly resembling a general purpose warehouse but having refrigeration equipment and insulation to maintain the interior at low temperatures. Most have two areas: a chill space in which the temperature can be controlled between 32° and 50°F and a freeze space in which the temperature can be controlled below 32°F.

reg. An extensive, nearly level area in a desert with a smooth floor consisting of a layer of stones too large to be moved by the wind. The "desert pavement" of stones is commonly only one stone thick and may overlie loose, unconsolidated material *(Ref. 1)*.

regelation. A twofold process in which a localized region on the surface of a piece of ice melts when pressure is applied to that region and then refreezes when the pressure is reduced *(Ref. 1)*.

regimen of a stream. The system or order characteristic of a stream; i.e., its habits with respect to velocity and volume, form of and changes in channel, capacity to transport sediment, and amount of material supplied for transportation *(Ref. 6)*.

region, polar. *See:* polar regions.

regional boundaries. Lines that delineate geographical areas of the world for broad planning purposes *(Ref. 5)*.

regolith. The unconsolidated mantle of weathered rock and soil material on the surface of the earth; the loose earth materials above solid rock. Only the upper part of this, modified by organisms and other soil-building forces, is regarded by soil scientists as soil *(Ref. 16)*.

regosol. *Pedology.* Any one of an azonal group of soils that have undergone little or no pedological development, lack clear-cut soil morphology, and consist mainly of unconsolidated material such as sand or silt *(Ref. 11)*.

rehabilitation. The action performed in restoring an installation to authorized design standards *(Ref. 5)*.

relative humidity. 1: The ratio, expressed in percent, of the amount of water vapor in a given volume of air to the amount the volume of air would contain if saturated at the same temperature *(Ref. 43)*.

2: The ratio, expressed in percent, of the actual partial pressure of the water vapor in a given mixture of air and water vapor to the saturation pressure of pure water at the same temperature *(Ref. 7)*.

relaxation time. In general, the time interval required for a system exposed to some discontinuous change of environment to undergo the fraction $(1 - e^{-1})$, or about 63 percent, of the total change of state that it would exhibit after a period of indefinite length. Occasionally, the fraction 9/10th is used in place of $(1 - e^{-1})$, so contexts must always be checked, to be certain of the definition employed in a given case. The relaxation time of an instrument is commonly called its time constant or lag coefficient *(Ref. 1)*.

reliability. The probability, expressed as a percentage, of a device performing without failure a specified function under given conditions for a specified period of time. For a system with independent components, the overall reliability is based on the product of the individual reliabilities; e.g., three independent components with a 90 percent reliability each will have an overall reliability of 0.9 × 0.9 × 0.9 or 72.9 percent. Similarly, 100 components with a 99 percent reliability each will have an overall reliability of only 36.6 percent *(Ref. 33)*.

relief. *Topography.* Popularly, the height of hills and mountains on the landscape. In technical usage, the depth that valleys are cut into the prevailing upper surface.

rem (roentgen equivalent mammal). One rem is the quantity of ionizing radiation of any type that, when absorbed by man or other mammal, produces a physiological effect equivalent to that produced by the absorption of 1 roentgen of X-ray or gamma radiation *(Ref. 5)*.

rendzina. A great soil group that consists of soils with brown or black surface horizons that crumble easily, underlain by light gray to pale yellow calcareous material. It is developed from soft, highly calcareous parent material under grass vegetation or mixed grasses and forest in humid and semiarid climates *(Ref. 2)*.

repair items. All essential elements, materials, components, assemblies, or subassemblies required for maintenance and repair.

replacement demand. A demand representing replacement of items consumed or worn out *(Ref. 5)*.

replacement factor. The estimated percentage of equipment or repair parts in use that will require replacement during a given period due to wearing out beyond repair, enemy action, abandonment, pilferage, and other causes except catastrophes *(Ref. 5)*.

required supply rate (ammunition). The amount of ammunition expressed in terms of rounds per weapon per day for ammunition items fired by weapons, and in terms of other units of measure per day for bulk allotment and other items, estimated to be required to sustain operations of any designated force without restriction for a specified period *(Ref. 5)*.

requisition. An authoritative demand or request, especially for personnel, supplies, or services authorized but not made available without specific request; to make such a demand or request *(Ref. 5)*.

research. All effort directed toward increased knowledge of natural phenomena and environment and toward the solution of problems in all fields of science. This includes basic and applied research *(Ref. 5)*.

reserve supplies; *also* **reserves.** Supplies accumulated in excess of immediate needs for the purpose of insuring continuity of an adequate supply *(Ref. 5)*.

residual contamination. Contamination that remains after steps have been taken to remove it. These steps may consist of nothing more than allowing the contamination to decay normally *(Ref. 5)*.

residual material. *Geology.* Unconsolidated and partly weathered material presumed to have developed from the same kind of rock as that on which it lies. The term residual can be applied correctly only to the material from which soils are formed *(Ref. 2)*.

residual moisture. Moisture held in materials or surfaces, such as building, framework, packaging materials, cordage, and painted surfaces, after the materials are in equilibrium with the relative humidity maintained in the storehouse *(Ref. 1)*.

residual radiation. Nuclear radiation caused by fallout, radioactive material dispersed artificially, or irradiation that results from a nuclear explosion and persists longer than 1 min after burst *(Ref. 5)*.

residual spectrum. *Shock and Vibration.* The response occurring after shock input.

resilience. The ability of a material to sustain a series of deformations and return to its original shape and thickness after each deformation.

resistance. The property of an electric circuit that determines, for a given current, the rate at which electric energy is converted into heat, and has a value such that the current squared multiplied by the resistance gives the power converted *(Ref. 4)*.

resistance thermometer. A type of electrical thermometer in which the thermal element is a substance whose electrical resistance varies with the temperature *(Ref. 1)*.

resolution. 1: The ability to separate, or process of separating, closely related forms or entities, or the degree to which they can be discriminated.

2: *Optics.* The smallest distance that a magnifying instrument is able to separate or the smallest change in wavelength that a spectrometer can differentiate.

3: In radar, the minimum angular separation at the antenna at which two targets can be distinguished (a function of beamwidth); and/or the minimum range at which two targets at the same azimuth can be separated (equal to one-half the pulse length) *(Ref. 3)*.

resonance. 1: In general, a term applied to a variety of phenomena, all of which involve an abnormally large response of a system to a relatively small stimulus which has the same, or very nearly the same, frequency (or vibration period) as the natural frequency (or free vibration period) of the system.

2: The phenomenon of amplification of a free wave or oscillation of a system by a forced wave or oscillation of exactly equal period. The forced wave may arise from an impressed force upon the system or from a boundary condition. The growth of the resonant amplitude is characteristically linear in time *(Ref. 3)*.

3: The condition that exists in a body or system undergoing forced vibration if any change, however small, in the frequency of excitation causes a decrease in the response of the body or system *(Ref. 1)*.

resonance test. Vibration tests, consisting of a frequency sweep across a specified frequency spectrum to identify resonant frequencies of the test item.

resonant dwell. A condition of sustained vibration at an applied frequency equal to a resonant frequency of a test specimen *(Ref. 1)*.

resonant mode. *See:* **mode, resonant.**

respiration. The process by which a living organism takes up air, removes the oxygen, distributes and utilizes it in oxidation, and then removes the gaseous waste products, especially carbon dioxide.

response. The motion (or other output) produced by an excitation (stimulus) under specified conditions. Modifying phrases must be prefixed to respond to indicate what kinds of input and output are being utilized. The response characteristic, often presented graphically, is the response as a function of some independent variable such as frequency of direction. It is customary to assume that other characteristics of the input are held constant *(Ref. 38)*.

response, harmonic. Resonant response of a vibrating system at a frequency that is a multiple of the excitation frequency *(Ref. 22)*.

response, motion. A quantity expressed as the ratio of the product of the displacement amplitude of an isolated system and the static stiffness of the isolator to the excitation force amplitude *(Ref. 22)*.

response, subharmonic. The response of a resonant mechanical system at a frequency that is a submultiple of the excitation frequency *(Ref. 38)*.

restricted air cargo. Cargo that is not highly dangerous under normal conditions, but that possesses certain qualities that require extra precautions in packing and handling for air transport *(Ref. 5)*.

resultant wind. *Climatology.* The vectorial average of all wind directions and speeds for a given level at a given place for a certain period, as a month *(Ref. 1)*.

resupply. The act of replenishing stocks in order to maintain required levels of supply *(Ref. 26)*.

retina. The light-sensing portion of the eye.

retrofit action. Action taken to modify in-service equipment *(Ref. 5)*.

reverberant chamber. *See:* **chamber, reverberant.**

reverberation. The persistence of sound in an enclosed space, caused by multiple reflections after the sound source has stopped *(Ref. 1)*.

reverberation time. The time required for a steady-state mean-square sound pressure level to decrease 60 dB after the source is stopped *(Ref. 38)*.

reverse slope. 1: Any slope that descends away from a given point of reference.
2: In military usage, a slope that descends away from the enemy. *(Ref. 12)*

reversing current. A tidal current that flows alternately in approximately opposite directions, with periods of slack water at each reversal *(Ref. 1)*.

Reynolds number. The nondimensional ratio of the inertial force to the viscous force in fluid motion,

$$Re = \frac{LU}{\nu}$$

where

Re = Reynolds number
L = characteristic length
ν = kinematic viscosity
U = characteristic velocity.

The Reynolds number is of great importance in the theory of hydrodynamic stability and the origin of turbulence *(Ref. 3)*.

rf *Abbr. for* radio frequency.

rf current heating. The heating of material as a result of current flow induced by radiofrequency fields.

rheology. The study of the flow of materials, particularly plastic flow of solids and the flow of non-Newtonian liquids.

RI *Abbr. for* remolding index; radiation intensity.

ria. A long narrow arm of the ocean extending inland at more or less right angles and narrowing gradually inland *(Ref. 32)*.

ridge. 1: A long, narrow, and usually sharp-crested land form that may be more or less independent or a part of a large mountain or hill.
2: *Meteorology.* An elongated area of relatively high atmospheric pressure, almost always associated with and most clearly

identified as an area of maximum anticyclonic curvature of wind flow *(Ref. 1)*.

riffle. A rapid in a stream *(Ref. 6)*.

rift valley. A valley lying between two relatively parallel faults *(Ref. 20)*.

rime. A white or milky and opaque granular deposit of ice formed by the rapid freezing of supercooled water drops as they impinge upon an exposed object. Hard rime is deposited chiefly on vertical surfaces by a supercooled fog and is more compact and amorphous than soft rime, and may build out into the wind as glazed cones or feathers. Soft rime is a coating of fine rime deposited chiefly on vertical surfaces, especially on points and edges of objects *(Ref. 1)*.

Ringelmann chart. A series of illustrations ranging from light gray to black used to measure the opacity of smoke emitted from stacks and other sources. The shades of gray simulate various smoke densities and are assigned numbers ranging from one to five. Ringelmann No. 1 is equivalent to 20 percent dense; No. 5 is 100 percent dense. Ringelmann charts are used in the setting and enforcement of emission standards *(Ref. 9)*.

riparian. Pertaining to the banks of a stream *(Ref. 6)*.

rip-rap. Protective work on the sloping bank of a river or canal, generally consisting of stones, either arranged or left in their "as-dumped" configuration *(Ref. 1)*.

rise time. Usually, the time required for a pulse to increase from 10 percent of its final value to 90 percent of its final value. Rise time is less frequently measured between the 5 and 95 percent points or other points. Rise time is used to specify the transient response of an instrument, and is similar to the time constant *(Ref. 3)*.

river basin. The total area drained by a river and its tributaries *(Ref. 3)*.

riverine area. An inland or coastal area comprising both land and water, characterized by limited land lines of communication, with extensive water surface and/or inland waterways that provide natural routes for surface transportation and communications *(Ref. 5)*.

river line. Any tactical line marked by a stream *(Ref. 12)*.

river wash. Coarse-textured, bare, stream-deposited material that is exposed during low water and subject to shifting during normal high water *(Ref. 2)*.

rms *Abbr. for* root mean square.

RNA *Abbr. for* ribonucleic acid.

road capacity. The maximum traffic flow obtainable on a given roadway, using all available lanes, usually expressed in vehicles per hour or vehicles per day *(Ref. 5)*.

road net. The system of roads available within a particular locality or area *(Ref. 5)*.

road shocks. Shocks induced in moving road vehicle structures as a result of surface characteristics of the road surface.

road vehicle noise. Vibration induced in road vehicles while moving. Such vibrations arise from (a) vehicle engine, transmission, and accessories, (b) road excitation, and (c) air buffeting.

rock. 1: *Civil Engineering.* Firm and coherent or consolidated earth material that cannot normally be excavated by manual methods alone *(Ref. 1)*.

2: One of the solid materials of which the crust of the earth is mainly composed, being made of an aggregate of minerals. The many different kinds of rocks in the crust are divided into three major classes: (a) igneous, (b) sedimentary, and (c) metamorphic.

Rockwell hardness. *See:* hardness.

rodenticide. A chemical or agent used to destroy or prevent damage by rats or other rodent pests *(Ref. 9)*. *See also:* pesticide.

rodents. An animal belonging to the order of mammals having large, incisor teeth adapted for gnawing or nibbling. Members include rats, mice, squirrels, beavers, muskrats, etc.

roentgen. The unit of measure of the total quantity of X-ray or gamma ray radiation absorbed in air. This is technically defined as the amount of X-ray or gamma ray radiation that, as a result of ionization, will produce in 1 cm^3 of dry air at standard conditions of temperature and pressure, ionization equal to one electrostatic unit (esu) of electricity of either sign *(Ref. 12)*.

rolling friction. *See:* friction.

rolling ground or land. Any undulating land surface; a succession of low hills giving a wave effect to the surface. A land surface

much varied by small hills and valleys *(Ref. 10)*.

roll-on/roll-off transport. A combination of water and motor transport in which semitrailers are towed onto specially constructed ships, transported to another port, coupled to tractors while still aboard ship, and then transported by highway to their destination.

room constant. A value equal to the product of the average absorption coefficient of the room and the total internal area of the room divided by the quantity one minus the average absorption coefficient *(Ref. 1)*.

root mean square. The effective value of an alternating periodic voltage or current. It is the square root of the mean of the squares of instantaneous values taken over a complete cycle.

rosin. A yellow noncrystalline resin produced as a residue on distillation of turpentine and used in varnishes, paper sizing, soldering flux, etc.

rot. The decomposition of organic substances by micro-organisms, commonly fungi and bacteria *(Ref. 1)*.

rotary motion. *See:* **circular motion.**

rotor unbalance. One of the primary sources of vibration in high-speed rotating machinery in which the center of mass does not coincide with the center of rotation of the rotor.

rotten ice; *also* spring sludge. Floating ice or fast ice in an advanced stage of disintegration, characterized by honeycomb structure, weak bonding between crystals, or the presence of meltwater or sea water between grains *(Ref. 11)*.

rough broken land. Land with very steep hills and numerous intermittent drainage channels usually covered with vegetation *(Ref. 2)*.

rough handling tests. Various types of tests included in specifications to determine the ability of materiel to withstand the handling stresses incurred in the logistic cycle. Two such standard tests are impact and drop tests.

rough-road simulator. Any of various machines designed to simulate the vibration characteristics produced by vehicular transit of rough roads; e.g., a unit with rotatable drums having detachable road profiles or bumps that are interfaced with the wheels of the test vehicle.

route classification. Classification assigned to a route using factors of minimum width, worst route type, least bridge, raft or culvert military load classification, and obstructions to traffic flow *(Ref. 5)*.

rubber dunnage. Inflatable bladders that are placed around cargo and then inflated to specified air pressure. They are used to prevent shifting and damage to cargo.

rubble. 1: An unconsolidated accumulation of angular, rough rock fragments coarser than sand, broken from larger masses either by natural forces or artificially by quarrying or blasting *(Ref. 1)*.
2: *See:* **brash.**

rubble land. Land areas with 90 percent or more of the surface covered with stones and boulders *(Ref. 1)*.

run-in (rail). The process by which the actual length of a train is shortened during deceleration. It occurs because of the slack in the intercar couplers.

runoff. The portion of rainfall, melted snow, or irrigation water that flows across ground surface and is returned to streams *(Ref. 9)*.

runoff cycle. The part of the hydrologic cycle undergone by water between the time it reaches the land as precipitation and its subsequent evapotranspiration or discharge through stream channels *(Ref. 3)*.

run-out (rail). The process by which the actual length of a train is increased on acceleration. It occurs because of the slack in the intercar couplers.

rupture zone. The region immediately adjacent to the crater boundary in which the stresses produced by the explosion have exceeded the ultimate strength of the medium. It is characterized by the appearance of numerous radial cracks of various sizes *(Ref. 5)*. *See also:* **plastic zone.**

rust. The reddish brown coating formed on iron or steel when chemically attacked by moist air. It is composed of ferric oxide (Fe_2O_3) and ferric hydroxide [$Fe(OH)_3$]. Continued rusting can lead to deterioration of the structural properties of iron and steel.

rust inhibitor. *See:* **inhibitor.**

rutile. A mineral composed primarily of titanium dioxide.

S

S *Abbr. for* South.

s *Abbr. for* second (time).

sabin. A unit used in measuring or expressing the capability of a surface to absorb sound, equivalent to 1 ft^2 of a perfectly absorptive surface *(Ref. 14)*.

saddle. A low point on a ridge or crestline, often at the upper ends of valleys, extending from it in opposite directions; a ridge connecting two higher elevations *(Ref. 10)*.

safe burst height. The height of burst at or above which the level of fallout, or damage to ground installations is at a predetermined level acceptable to the military commander *(Ref. 5)*.

safety level of supply. The quantity of materiel, in addition to the operating level of supply, required to be on hand to permit continuous operations in the event of minor interruption of normal replenishment or unpredictable fluctuations in demand *(Ref. 5)*.

sag and swell topography. The undulating topography characteristic of sheets of till; the till usually is thick enough to completely obliterate all traces of former topography. Postglacial drainage is controlled by the surface configuration of the till *(Ref. 32)*.

St. Elmo's fire. A luminous discharge of electricity from pointed objects such as the masts and yardarms of ships, lightning rods, steeples, occurring when there is an electric field strength near the surface of 1,000 V cm^{-1} arising from atmospheric electrical currents; e.g., precipitation current. Same as corona discharge.

saline soil. A soil with sufficient soluble nonalkali salts to interfere with plant growth; formerly applied to any soil containing sufficient soluble salts to interfere with plant growth *(Ref. 2)*.

salinity. A measure of the quantity of dissolved salts in sea water. It is formally defined as the total amount of dissolved solids in sea water in parts per thousand by weight when all the carbonate has been converted to oxide, the bromide and iodide to chloride, and all organic matter is completely oxidized. These qualifications result from the chemical difficulty in drying the salts in sea water. In practice, salinity is not determined directly but is computed from chlorinity, electrical conductivity, refractive index, or some other property whose relationship to salinity is well established *(Ref. 18)*.

salinometer. An instrument for determining the salinity of a liquid. In its most common form, it consists of a hydrometer graduated to indicate the percentage of salt in the solution *(Ref. 15)*.

salt. 1: A compound formed by replacing a hydrogen atom in an acid with a metal or electropositive radical.

2: Sodium chloride (NaCl), common salt used for seasoning and preserving foods.

saltation. 1: The movement of soil and mineral particles by intermittent leaps from the ground when the particles are being moved by wind or water *(Ref. 16)*.

2: A form of snow transport in which particles bound along the surface in a more or less elliptical trajectory. Windspeeds of 10 to 20 mph are seemingly required to maintain saltation *(Ref. 3)*.

salt fog. 1: A hydrometeor consisting of a visible aggregate of water droplets, many of which contain sea salts in significant amounts and which are suspended in the atmosphere at the surface of the earth.

2: An atomized saline solution of specified concentration, recirculated within an enclosure containing a test specimen and used to determine the corrosion resistance of the specimen *(Ref. 1)*.

salt haze. A haze created by the presence of

finely divided particles of sea salt in the air, usually derived from the evaporation of sea spray *(Ref. 15)*.

salt lake. A lake, situated usually in an arid region, in which the evaporation exceeds the amount of water entering through precipitation and inflow, so that the water becomes extremely salty.

salt marsh. Flat, poorly drained coastal swamps that are flooded by most high tides *(Ref. 18)*.

salt pan. 1: A seawater pool, from which water is evaporated, primarily by solar heating, to obtain the salt residue left behind *(Ref. 15)*.

2: Any undrained natural depression in which water gathers and leaves a deposit of salt on evaporation *(Ref. 32)*.

salt spray chamber. *See:* **chamber, salt spray.**

salvage. 1: Property that has some value in excess of its basic material content but which is in such condition that it has no reasonable prospect of use for any purpose as a unit and its repair or rehabilitation for use as a unit is clearly impractical.

2: The saving or rescuing of condemned, discarded, or abandoned property, and of materials contained therein for reuse, refabrication, or scrapping. *(Ref. 5)*

sand. 1: *Soil Mechanics.* In the Unified Soil Classification System, defined as a soil that contains more than 50 percent particles greater than 0.074 mm and more than 50 percent of that fraction less than 4.76 mm. Types are identified as SW (well-graded sand), SP (poorly graded sand), SM (silty sand), and SC (clayey sand).

2: Individual rock or mineral fragments in soils having diameters ranging from 0.5 mm to 2.0 mm. Usually sand grains consist chiefly of quartz, but they may be of any mineral composition *(Ref. 16)*.

3: *Pedology.* The U S Department of Agriculture textural class name of any soil that contains 85 percent or more of sand and not more than 10 percent of clay *(Ref. 16)*.

sandbar. A ridge of sand built up to the surface or near the surface of a river or along a beach by the action of the currents or waves *(Ref. 32)*.

sand dune. A mound, ridge, or hill of sand piled up by the wind on the shore or in a desert *(Ref. 15)*. *See also:* **dune.**

sands, dry. Sandy deposits, with low water-holding capacity, in which there has been no clear development of soil characteristics since deposition *(Ref. 16)*.

sand snow. Snow that has fallen at very cold temperatures (of the order of −25°C). A surface cover of this snow has the consistency of dust or light dry sand *(Ref. 3)*.

sandstone. A consolidated rock composed of sand grains cemented together. The size range and composition of the constituents are the same as for sand, and the particles may be rounded or angular *(Ref. 1)*.

sandstorm. A strong wind carrying sand through the air, the diameter of most of the particles ranging from 0.08 to 1 mm. In contrast to a duststorm, the sand particles are mostly confined to the lowest 10 ft, and rarely rise more than 50 ft above the ground *(Ref. 1)*.

sandy clay. Soil of the U S Department of Agriculture textural class containing 35 percent or more of clay and 45 percent or more of sand *(Ref. 16)*.

sandy clay loam. Soil of the U S Department of Agriculture textural class containing 20 to 35 percent clay, less than 28 percent silt, and 45 percent or more of sand *(Ref. 16)*.

sandy loam. Soil of the U S Department of Agriculture textural class that contains either 20 percent clay or less, and the percentage of silt plus twice the percentage of clay exceeds 30, and 50 percent or more sand; or less than 7 percent clay, less than 50 percent silt, and between 43 percent and 52 percent sand *(Ref. 1)*.

sapling. A young tree, 3 ft over in height and less than 4 in. in diameter *(Ref. 1)*.

saprophyte. A plant that lives on dead or decaying organic matter; e.g., some fungi and bacteria.

sastrugi. Wavelike ridges of hard snow formed on a level surface, often having a steep wall with an overhanging crest on the windward and a long, even slope on the lee side. Their axes are perpendicular to the direction of the wind causing them *(Ref. 1)*.

saturated air. Moist air in a state of

equilibrium with a plane surface of pure water or ice at the same temperature and pressure; i.e., air whose vapor pressure is the saturation vapor pressure: its relative humidity is 100 percent *(Ref. 3)*.

saturation. 1: The condition or state of something holding something else to its fullest capacity *(Ref. 1)*.

2: *Meteorology.* The condition in which the partial pressure of any atmospheric constituent (usually water vapor) is equal to the maximum possible under the existing environmental conditions *(Ref. 1)*. *See also:* supersaturation.

3: *Chemistry.* Impregnation of one substance with another until no more can be received; combination of two substances until they neutralize each other.

4: The degree of purity of a color, as measured by the absence of an admixture of white light.

saturation adiabat *or* **moist adiabat.** Commonly used for pseudoadiabat or whatever curve appears on an adiabatic chart to indicate the lapse rate with upward motion of saturated air.

saturation deficit. 1: The difference between the actual vapor pressure and the saturation vapor pressure at the existing temperature *(Ref. 3)*.

2: The additional amount of water vapor needed to produce saturation at the current temperature and pressure, expressed in g m^{-3} *(Ref. 1)*.

saturation of desiccant. The condition of a desiccant that exists when it has absorbed sufficient moisture to be in equilibrium with saturated (100 percent relative humidity) air. This condition is never attained in proper dehumidification machine operation *(Ref. 1)*.

saturation, percentage of. The ratio of the actual weight of water present in a given weight of air to the weight of water that would be present in the same weight of air at saturation (100 percent relative humidity) expressed as a percentage *(Ref. 1)*.

saturation vapor pressure. The vapor pressure of a system, at a given temperature, wherein the vapor of a substance is in equilibrium with a plane surface of the pure liquid or solid phase of that substance; i.e., the vapor pressure of a system that has attained saturation but not supersaturation *(Ref. 1)*.

savanna. The tropical region that borders the equatorial forest in each hemisphere and lies between the latter and the hot deserts; the natural vegetation is mainly grass with scattered trees, for there are distinct wet and dry seasons; the lack of rainfall during the dry season prevents the growth of forests except in particularly moist places.

sawtooth wave. A periodic wave the amplitude of which varies linearly with time between a minimum and maximum value but the time interval to increase from minimum to maximum is not equal to the time interval to decrease from maximum to minimum *(Ref. 1)*.

Sc *Abbr. for* stratocumulus cloud.

scale. 1: Adherent layers of corrosion products on a metal surface formed at high temperatures.

2: The ratio between the distance on a map or chart and the corresponding distance on the surface of the earth *(Ref. 12)*.

scale factor. Value by which an actual ground distance is multiplied in order to compensate for map distortion when determining the ground distance as represented on a map *(Ref. 12)*.

scarp. An escarpment, cliff, or steep slope of some extent along the margin of a plateau, mesa, terrace, or bench *(Ref. 10)*.

scattered ice. Ice that covers from 0.1 to 0.5 of the observed sea surface *(Ref. 31)*.

scattering. *Meteorology.* The process by which air molecules and particles suspended in the atmosphere diffuse radiation by reflecting it in different directions; the diffusive effects of changes in the refractive index of air layers are sometimes included in the term scattering. Energy is not absorbed, but the direction, and hence the spatial distribution, of the radiation is changed by scattering *(Ref. 1)*.

scheduled maintenance. Periodic prescribed inspection and/or servicing of equipment accomplished on a calendar, mileage, or hours of operation basis *(Ref. 5)*.

scheduled supply. A system whereby any unit (user or supplier) is furnished some or all of its supply requirements by a previously planned schedule that specifies

items, quantities, time, and place of delivery *(Ref. 26)*.

schist. A crystalline metamorphic rock that has closely spaced foliation and tends to split readily into thin flakes or slabs. There is complete gradation between slates and schists on the one hand and schists and gneisses on the other *(Ref. 1)*.

schlieren. A phenomenon resulting from disturbances of the air in the path of a light beam which changes the index of refraction of the air and thus modifies the light beam.

scintillation. Rapid variation in apparent position, brightness, or color of a light source when viewed through the atmosphere and arising from anomalous refraction in small air parcels.

scintillation count. A count of the total number of light flashes produced in a phosphor by a given ionizing event *(Ref. 1)*.

SCN *Abbr. for* Specification Change Notice.

scoria. Rough, cinderlike, more or less vesicular lava thrown out by an explosive eruption or appearing on a lava stream. The expansion and escape of enclosed gases produce the typical structure. The term is usually restricted to basaltic or closely allied lavas *(Ref. 1)*.

scree. A heap of rock waste at the base of a cliff or a sheet of coarse debris mantling a mountain slope. Compare talus which is an accumulation of debris at the base of a cliff while scree also includes loose material on slopes without cliffs.

scrub. A dense mass of low-growing evergreen plants, about 4 to 6 ft high, with occasional taller trees. It is usually found in regions that have insufficient rainfall or soil too poor for forest growth.

scrub forest. In general, any area partially or completely covered with crowded bushes or stunted trees. More specifically:

(a) the marginal forest on wind-exposed locations and on high elevations, composed of short, wind-trained trees or low shrubs forming a transitional zone along the upper timberline *(Ref. 11)*, and

(b) the tropical or subtropical (Mediterranean climate) forests associated with subhumid or semiarid climatic conditions *(Ref. 1)*.

scrubber. A device for removing unwanted constituents or pollutants from an airstream by contact with a liquid, usually water.

sea breeze. *See:* breeze.

sea fog. A type of advection fog formed when air that has been lying over a warm water surface is transported over a colder water surface, resulting in cooling of the lower layer of air below its dewpoint *(Ref. 3)*.

sea ice. Any form of ice at sea that has originated from the freezing of sea water *(Ref. 31)*.

sea-level pressure. The atmospheric pressure at mean sea level, either directly measured or, most commonly, empirically determined from the observed station pressure *(Ref. 1)*.

sea-salt. The total salts derived from sea water or salt lake water. Salt obtained by the evaporation of sea water.

sea-salt particles. Particles of marine origin primarily composed of chloride, sodium, and sulfate. They occur in the atmosphere as crystals or liquid droplets depending on the relative humidity of the air and range in size from about 0.1 to 20 μm radius or even greater or, in weight, from 10^{-14} to 10^{-8} g or greater. The relative chemical composition of these particles may or may not be the same as sea water. Larger particles usually contain sodium and chloride in approximately the same proportion as sea water, but in small particles, sulfate is present in greater proportion than in the sea.

season cracking. Crackings caused by corrosion and internal stress. Stress corrosion cracking of brass is called season cracking *(Ref. 34)*.

sea state; *also* state of the sea; sea. A description of the properties of the wind-generated waves on the surface of the sea *(Ref. 3)*.

seavan. Commercial or Government-owned (or leased) shipping containers that are moved via ocean transportation without bogey wheels attached; i.e., lifted on and off the ship *(Ref. 5)*.

sea wall. *See:* jetty.

secondary front. A front that may form within a baroclinic cold airmass which itself is separated from a warm airmass by a primary frontal system. The most common

type is the secondary cold front *(Ref. 3)*.

secondary items. All supplies other than principal items except repair parts, clothing, and subsistence; characterized by short lead time, low value, and ease of procurement.

secondary road. A road supplementing a main road, usually wide enough and suitable for two-way all-weather traffic at moderate or slow speeds *(Ref. 5)*.

secondary water terminal. A coastal area with no facility for placing deep draft ships alongside a wharf. Secondary water terminals are established on beaches that desirably are adjacent to rail lines and/or a good coastal highway. At secondary water terminals, shipping is unloaded at anchorages located from 1 to 5 mi offshore, and the cargo and personnel unloaded are landed in the terminal area by ship-to-shore lighters *(Ref. 5)*.

sedge. Any of a family of tufted grasslike marsh plants differing from the related grasses in that they have no joints in the stems.

sediment. 1: Material carried in suspension by water; or deposits of water-borne materials *(Ref. 3)*.

2: Solid material in suspension that is being transported or has been moved from its site of origin by air, water, or ice.

sedimentary rock. Rocks composed of sediment: mechanical, chemical, or organic. They are formed through the agency of water, wind, glacial ice, or organisms and are deposited at the surface of the earth at ordinary temperatures *(Ref. 1)*. A characteristic feature of sedimentary deposits is a layered or stratified structure. Most sedimentary beds as deposited lie flat or nearly flat.

sedimentation. A technique for collecting particles from an airstream which depends on natural settling from the airstream. The settling of solid particles from a liquid or gas.

sedimentation method. A method of particle size analysis based on the terminal settling velocity at which particles fall under gravity through the sedimentation medium.

sediment discharge. 1: The rate at which dry weight of sediment passes a section of a stream.

2: The quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time. *(Ref. 6)*

seep. 1: A surface area from which a fluid such as water or oil oozes from the earth in small quantities *(Ref. 32)*.

2: To appear or disappear, as water or other liquid, from a poorly defined area of the surface of the earth *(Ref. 1)*.

seepage. Water or other liquid that has oozed or seeped through porous material. Also, the amount of such material expressed in terms of volume *(Ref. 1)*.

seismic focus. The place below the surface of the earth where an earthquake originates and from which the vibrations spread in all directions; it is usually several miles beneath the surface.

seismic sea wave. *See:* tsunami.

seismic waves. Stress waves produced in the earth that originate from the rupture of stressed rock in the interior of the earth.

seismograph. An instrument used to measure and record earthquake vibrations and other earth tremors *(Ref. 3)*.

seismology. A geophysical science involving the study of earthquakes and measurement of the elastic properties of the earth.

selective herbicide. A pesticide intended to kill only types of plants, especially broad-leafed weeds, and not harm other plants such as farm crops or lawn grasses. The leading herbicide in the United States is 2,4-D.

self-induced vibration. *See:* vibration, self-induced.

semiarid. Moderately arid. Specifically defined climatically as a climate in which for 6 to 9 mo of the year no more than 3 days per month occur with 0.1 in. or more of precipitation *(Ref. 23)*.

semidiurnal tide. The type of tide having two high waters and two low waters each tidal day, with small inequalities between successive high and successive low water heights and durations. It is the most common type of tide throughout the world *(Ref. 18)*.

sensible heat. Same as enthalpy; used in meteorology in contrast to latent heat *(Ref. 3)*.

sensible temperature. *See:* **average indoor temperature.**

sensitivity. *Soil Mechanics.* The effect of remolding on the consistency of a clay. The degree of sensitivity is influenced by water content and clay composition *(Ref. 32).*

sensor. 1: A technical means to extend man's natural senses; an equipment that detects and indicates terrain configuration, the presence of military targets, and other natural and manmade objects and activities by means of energy emitted or reflected by such targets or objects. The energy may be nuclear, electromagnetic, including the visible and invisible portions of the spectrum, chemical, biological, thermal, or mechanical, including sound, blast, and earth vibration *(Ref. 5).*

2: A device that responds to physical stimulus and transmits a resulting impulse.

sensorineural hearing loss. A reduction or loss of hearing in which the sensor (i.e., the cochlea) or the auditory nerve is defective.

serac. A sharp ridge or pinnacle of ice among the crevasses of a glacier *(Ref. 15).*

series. *Cartography.* A collection of sheets having the same scale and cartographic specifications collectively identified by the producing agency *(Ref. 12).*

serviceability. The design, configuration, and installation features that minimize periodic or preventive maintenance requirements, including the use of special tools, support equipment, skills, and manpower, and enhance the ease of performance of such maintenance, including inspection and servicing, with a minimum expenditure of time and material in its planned environment *(Ref. 33).*

service life. *See:* **life, service.**

service test. A test of an item, system, or technique conducted under simulated or actual operational conditions to determine whether the specified military requirements or characteristics are satisfied *(Ref. 5).*

servicing. The performance of acts required to keep an item of equipment in operating condition, such as lubricating, fueling, oiling, and cleaning. This does not include periodic replacement of parts or any corrective maintenance tasks *(Ref. 33).*

setback. Rearward movement of free moving parts in a projectile when it is fired. This movement, and the setback force that causes it, is used to promote events that participate in the arming and eventual functioning of the fuze.

settled snow. Fallen snow that has lost all traces of its original crystalline structure and has reformed into grains that are not usually bonded together; a type of old snow *(Ref. 11).*

settling velocity. The rate at which particles fall in still air.

severe weather threat (SWEAT) index. An empirically derived index used to specify and predict areas of potentially severe convective weather.

sferics. The study of atmospherics (the radiofrequency electromagnetic radiations originating, principally, in the irregular surges of charge in thunderstorm lightning discharges) especially from a meteorological point of view. It involves techniques of locating and tracking atmospherics sources and evaluating received signals (waveform, frequency, etc.) in terms of source *(Ref. 3).*

shaker, direct drive. A vibration machine in which a rotating eccentric or cam drives a positive linkage connection that forces a displacement between the base and table of the machine *(Ref. 22).*

shaker, electrodynamic. A vibration machine in which a table and armature assembly with a signal current driver coil is caused to move in the annular air gap of a base assembly forming the magnetic circuit of a direct current field coil. Control of the table motion is achieved by control of the field coil current *(Ref. 22).*

shaker, electromagnetic. A vibration machine in which a laminated iron armature assembly attached to the table is moved by magnetic attraction and repulsion from the poles of a laminated iron electromagnet core upon which a control signal current coil is wound, the latter assembly being the base of the machine. By controlling the signal applied to the base coil, controlled motion of the table can be achieved *(Ref. 22).*

shaker, hydraulic. A vibration machine in which a high-pressure flow of fluid from a pump is employed to produce a reciprocating motion of a table. An electrohydraulic valve responds to excitation signals to deliver the high

pressure fluid alternatively to opposite sides of an actuator piston to which the table is mounted *(Ref. 22)*.

shaker, piezoelectric. A vibration machine in which motion of the shaker table is achieved by the change in length of a stack of piezoelectric or ferroelectric ceramic crystals, when an excitation voltage is applied to the electric terminals of the crystals *(Ref. 22)*.

shaker, reaction. A type of vibration machine consisting of a softly suspended table to which is attached one or more unbalanced rotating masses. Vibration is induced by the unbalanced force reaction of the table, without force reaction against the machine base *(Ref. 1)*.

shale. A general term for lithified muds, clays, and silts that are fissile and break along planes parallel to the original bedding. A typical shale is so fine grained as to appear homogeneous to the unaided eye *(Ref. 1)*.

shallow fording. The ability of a self-propelled gun or ground vehicle equipped with built-in waterproofing, with its wheels or tracks in contact with the ground, to negotiate a water obstacle without the use of a special waterproofing kit *(Ref. 5)*. *See also:* deep fording; flotation.

shear. *Meteorology.* The variation of a vector field along a given direction in space. Most frequently applied in meteorology to wind shear which is defined as the local variation of the wind vector or any of its components in a given direction *(Ref. 3)*.

shear crack. A crack in sea ice caused by two different, simultaneous forces acting in parallel but opposite directions on adjacent portions of the ice. The sheared parts undergo a displacement parallel to the plane of the crack *(Ref. 18)*.

shear stress. *Geology.* An action or stress, resulting from applied forces, that causes or tends to cause two contiguous parts of a body to slide relative to each other in a direction parallel to their plane of contact. The term is often used synonymously with couple and may be employed to describe the sliding of rocks past each other along fractures *(Ref. 1)*.

shear wave. *See:* wave, shear.

shed. Structures with roofs but no permanent side or endwalls. They are used for storage of materiel requiring maximum ventilation or for materiel not requiring complete protection from the weather.

sheet. 1: *Cartography.* An individual map or chart, either complete in itself or part of a series *(Ref. 12)*.

2: *Geology.* An extensive bed of eruptive rock intruded between or overlying other rock strata.

sheet ice. Ice formed in a thin, smooth layer over a water surface *(Ref. 15)*.

shelf life. *See:* life, shelf.

shell ice. *See:* cat ice.

shelterbelt. A belt of trees or shrubs arranged as protection against strong winds; a type of windbreak. The trees may be specially planted or left standing when the original forest is cut *(Ref. 1)*.

sheltered storage. Storage in ventilated or unventilated, heated or unheated buildings, shelters, and closures designed to protect material from inclement weather.

shelter temperature. *See:* temperature, surface.

shield. In cables, the metallic layer applied over the dielectric, or group of dielectrics, composed of woven, braided, or served wires, foil wrap, or tubular metallic construction, to prevent electrostatic or electromagnetic interference between the enclosed wires and external fields *(Ref. 4)*.

shielding. 1: Material of suitable thickness and physical characteristics used to protect personnel from radiation during the manufacture, handling, and transportation of fissionable and radioactive materials *(Ref. 5)*.

2: Obstructions that tend to protect personnel or materials from the effect of a nuclear explosion *(Ref. 5)*.

3: Metallic foils, screens, or meshes used to exclude electromagnetic radiation (interference) from sensitive components or units.

shimmer. *See:* atmospheric boil.

shingle. Small, rounded, waterworn stones. Shingle is similar to gravel, but with the average size of stones generally larger, especially so called if they are flat stones *(Ref. 15)*.

shipping time. The time elapsing between the shipment of materiel by the supplying

activity and receipt of materiel by the requiring activity *(Ref. 5)*.

shoal. A submerged ridge, bank, or bar consisting of or covered by unconsolidated sediments (mud, sand, or gravel) which is at or near enough to the water surface to constitute a danger to navigation. If composed of rock or coral, it is called a reef *(Ref. 18)*.

shock. *See:* mechanical shock; temperature shock.

shock front. The boundary between the pressure disturbance created by an explosion (in air, water, or earth) and the ambient atmosphere, water, or earth *(Ref. 5)*.

shock isolator. A resilient support employed to protect a system from applied shock motion.

shock machine. A device for subjecting a system to controlled and reproducible mechanical shock *(Ref. 8)*.

shock motion. Any motion causing, or resulting from, a shock excitation *(Ref. 8)*.

shock pulse. A form of shock excitation characterized by a rise and decay of acceleration in a relatively short period of time. The major values of accelerations for a shock pulse are in one direction *(Ref. 8)*.

shock pulse duration. The time required for the excitation quantity represented by the shock pulse to rise from and decay to specified fractions of the maximum magnitude of the shock pulse *(Ref. 37)*.

shock pulse rise time. The interval of time required for the leading edge of the pulse to rise from some specified small fraction to some specified larger fraction of the maximum magnitude of the shock pulse *(Ref. 37)*.

shock (shock excitation). An abrupt force imposed on a system resulting in excitation of vibrations in the system which may continue for some time subsequent to the shock.

shock spectrum *or* shock response spectrum. An approximate expression of the maximum responses (displacement, velocity, or acceleration) of an assembly of single-degree-of-freedom systems to a shock excitation. The responses are expressed as a function of the natural frequencies of the systems. A shock spectrum exists for every shock excitation, whether service-induced or applied in the laboratory *(Ref. 8)*.

shock tube. A test device consisting of a controlled-atmosphere tube in which a shock wave is used as a driving force to produce a high Mach number of very short duration (order of milliseconds). The shock tube is of interest in environments other than high-speed propulsion since the shock wave causes a tremendous increase in the temperature of the gas.

shock, velocity. A mechanical shock resulting from a sudden nonoscillary change in velocity *(Ref. 8)*.

shock wave. 1: The continuously propagated pressure pulse formed by the blast from an explosion in air by the air blast, underwater by the water blast, and underground by the earth blast *(Ref. 5)*.

2: A pressure disturbance, which is received by the ear as a noise or clap *(Ref. 7)*.

shore. The land bordering any body of water *(Ref. 10)*.

shore line. The boundary line between a body of water and the land. The shore line shown on charts generally approximates the mean high water line. The instantaneous line marking the junction of water and land, or the height of water along the hull of a vessel, is called water line *(Ref. 1)*.

shoring. Lumber, planking, or similar material used for weight spreading, load support, and protection in the packing of materiel in vehicles or containers for transit *(Ref. 17)*.

short supply. An item is in short supply when the total of stock on hand and anticipated receipts during a given period is less than the total estimated demand during that period *(Ref. 5)*.

shower. Precipitation from a convective cloud. Showers are characterized by the suddenness with which they start and stop, by rapid changes of intensity, and usually by rapid changes in the appearance of the sky *(Ref. 1)*.

shrinkage limit. *Soil Mechanics.* The moisture content, expressed as a percentage of the weight of the oven-dried soil, at which a reduction in the amount of water will not cause a decrease in the volume of the soil mass, but at which an increase in

the amount of water will cause an increase in the volume of the soil mass *(Ref. 1)*.

shrub. A perennial plant that differs from a perennial herb in having persistent and woody stems; it differs from a tree in having low stature and a habit of branching from the base *(Ref. 1)*.

SI *Abbr. for* International System of Units.

sidereal. Of or relating to the stars. A sidereal day is the time for one complete revolution of the earth measured with respect to a fixed star. Its duration is 23 hr, 56 min, 0.0906 s of mean solar time.

sief dune. A longitudinal dune of great height and length. In cross section it has a knife-edge crest, one side of which is rounded and the other side of which falls abruptly as a collapsing front facing normal to the axis of the dune. The side on which the front occurs depends on the side to which the wind has temporarily veered out of its prevailing direction *(Ref. 1)*.

sierozem. *Pedology.* A zonal great soil group with pale grayish "A" horizons blending into calcareous material at a depth of 1 ft or less. It is formed in temperate to cool, arid climates under a vegetation of desert plants, short grass, and scattered brush *(Ref. 2)*.

sieve. A pan with wire meshes used to separate particles larger than a certain size (sieve aperture) from those smaller. By using a series of sieves with different sieve apertures, particles can be separated into a series of particle size ranges.

signature. The visible, identifying characteristics of a weapon or vehicle caused by operating in a specific environment. For example, the dust cloud caused by back blast of a recoilless rifle or the dust generated by an armored column in the desert *(Ref. 1)*.

silica. Silicon dioxide (SiO_2) that occurs naturally in three crystalline modifications as quartz, tridymite, and cristobalite, in amorphous and hydrated forms (as opal), and in less pure forms (as sand, diatomite, tripoli). It is used in making glass, ceramic products, and refractories; in producing elemental silicon, its alloys, and compounds; and as an abrasive, absorbent, and filler.

silica gel. A highly porous form of silica having great surface area that gives it the ability to absorb large percentages of water vapor. Hence, it is a good desiccant, drier, or dehydrating agent *(Ref. 1)*.

sill. A flat sheetlike body of igneous rock injected while molten between existing strata; also similar flat-bedded strata of sandstone or other hard rock.

silt. 1: *Soil Mechanics.* The Unified Soil Classification System defines silt as a fine-grained soil possessing low plasticity in relation to the liquid limit. Types are identified as ML (inorganic silt of low plasticity), OL (organic silt of low plasticity), and MH (inorganic silt with liquid limit greater than 50).

2: Individual mineral particles of soil that range in diameter between 0.002 mm, and 0.02 mm *(Ref. 16)*.

3: *Pedology.* Soil of the U S Department of Agriculture textural class containing 80 percent or more of silt and less than 12 percent of clay *(Ref. 16)*.

4: Sediments deposited from water in which the individual grains are approximately the size of silt *(Ref. 16)*.

silt loam. Soil of the U S Department of Agriculture textural class having (a) 50 percent or more of silt and 12 to 27 percent of clay or (b) 50 to 80 percent of silt and less than 12 percent of clay *(Ref. 16)*.

silty clay. Soil of the U S Department of Agriculture textural class having 40 percent or more of clay and less than 20 percent of sand *(Ref. 16)*.

silty clay loam. Soil of the U S Department of Agriculture textural class having 27 to 40 percent of clay and less than 20 percent of sand *(Ref. 16)*.

silverfish. Any of various small wingless insects found in dark, damp places that thrive on starch and sugars and are sometimes injurious to sized papers or starched clothes.

simple harmonic motion. A motion in which displacement is a sinusoidal function of time *(Ref. 22)*.

simple harmonic vibration. A vibration whose motion can be described by a sine or cosine function.

simple tone *or* **pure tone.** 1: A sound wave

having instantaneous sound pressure that is a simple sinusoidal function of time *(Ref. 38)*.

2: A sound sensation characterized by its singleness of pitch *(Ref. 38)*.

3: A sound wave with a single sinusoidal frequency.

simulated altitude. A set of air conditions maintained within a room or chamber that duplicates certain of the conditions, commonly pressure and temperature, that usually occur at some given altitude *(Ref. 7)*.

simulated service test. *See:* test, simulated service.

single-degree-of-freedom system. In shock and vibration terminology, a system whose configuration can be defined at any specific time by only one coordinate *(Ref. 22)*.

single department purchase. A method of purchase whereby one department buys particular commodities for another department or departments *(Ref. 5)*.

single manager. A Military Department or Agency designated by the Secretary of Defense to be responsible for management of specified commodities or common service activities on a Department of Defense-wide basis *(Ref. 5)*.

sink *or* **sinkhole.** A depression that has subsurface drainage only, through natural holes and caverns in limestone or by seepage into a lower table *(Ref. 10)*.

sinkage. The depth of soil-penetration required to achieve equilibrium between vehicle forces and soil forces; loosely, the depth of the rut made by a vehicle operating off the road *(Ref. 1)*.

sinusoid. The curve in rectangular coordinates whose ordinates are proportional to the sines of angles that are proportional to the abscissas.

site. An area, considered as to its ecological factors with reference to capacity to produce forests or other vegetation; the combination of biotic, climatic, and soil conditions of an area *(Ref. 19)*.

skimming. The diversion of water from a stream or conduit by a shallow overflow used to avoid diversion of sand, silt, or other debris carried as bottom load *(Ref. 6)*.

skin friction. *See:* friction.

skirt fog. The cloud of steam and water that surrounds the engines of a missile being launched from a wet emplacement *(Ref. 40)*.

sky radiation. *See:* diffuse sky radiation.

sky temperature. The effective temperature of the sky, used in determining the heat lost from the surface of the earth by radiation to the sky *(Ref. 43)*.

slack ice. *See:* broken ice.

slamming. In rough seas the bow of a ship may leave the water surface and then fall or impact with the water. This process is called slamming. *Compare:* pounding.

sleet. A term sometimes used for ice pellets, a mixture of precipitating rain and snow, or glaze.

slime. Soft, fine, oozy mud or other substance of similar consistency *(Ref. 18)*.

sling psychrometer. A psychrometer in which the wet- and dry-bulb thermometers are mounted on a frame connected to a handle at one end by means of a bearing or a length of chain. Thus, the psychrometer may be whirled by hand in order to provide the necessary ventilation *(Ref. 3)*.

slip table. An auxiliary assembly used for horizontal vibration testing, consisting of a table coupled to a vibration exciter and a large stationary mass, the table being supported on the mass by a hydrostatic film of lubricating oil *(Ref. 1)*.

slippage ratio. The ratio that expresses the linear velocity of advance of an automotive vehicle as a fraction or percentage of the peripheral linear velocity of its wheels, tracks, or other tractive devices *(Ref. 1)*.

slipperiness. A soil condition of deficient traction capacity in a thin surface layer of a soil that is otherwise trafficable *(Ref. 1)*.

slope. The inclined surface of a hill, mountain, plateau, plain, or any part of the surface of the earth; the angle at which such surfaces deviate from the horizontal *(Ref. 10)*. A slope of 45 deg is a slope of 1 on 1, or 100 percent.

sludge. 1: Spongy whitish ice lumps a few centimeters across. They consist of slush, snow slush, and sometimes spongy ice lumps formed on the bottom of a shallow sea and emerging at the surface.

2: An accumulation of ice crystals that remain separate or only slightly frozen

together. It forms a thin layer and gives the sea surface a grayish or leaden-tinted color. With light winds no ripples appear on the surface *(Ref. 18)*.

3: A mixture of oil and solid particulate generated during internal combustion engine operation.

slush. Snow or ice on the ground that has been reduced to a soft watery mixture by rain, warm temperature, or chemical treatment *(Ref. 3)*.

slushing compound. A protective coating applied to metal surfaces to provide temporary protection from corrosion. Such coating may be a nondrying oil, grease, or other organic compound *(Ref. 34)*.

small hail. Snow pellets encased in a thin layer of ice formed by accretion of droplets on the snow pellet or by melting and refreezing of the surface of the pellet *(Ref. 3)*.

small-lot storage. Generally considered to be a quantity of less than one pallet stack, stacked to maximum storage height. Thus, the term refers to a lot consisting of from one container to two or more pallet loads, but is not of sufficient quantity to form a complete pallet column *(Ref. 5)*. *See also:* storage.

small-scale map. A map having a scale smaller than 1:600,000 *(Ref. 5)*.

smog. 1: A natural fog contaminated by industrial or other pollutants, often occurring over urban areas during the prevalence of temperature inversions.

2: Visible air pollution particularly as associated with oxidants.

smoke. Foreign particulate matter in the atmosphere resulting from combustion processes; a type of lithometeor. When smoke is widely dispersed throughout an area, the disk of the sun at sunrise and sunset appears very red, and during the daytime it has a reddish tinge *(Ref. 1)*.

smoke agent. A substance that through its chemical or physical properties produces a screening or signal smoke *(Ref. 12)*.

smoke, arctic. *See:* steam fog.

smoke blanket. Dense concentration of smoke established over and around friendly areas to protect them from visual air observation and visual precision bombing attack or established over enemy areas to protect attacking aircraft from air defense fire *(Ref. 12)*.

smoothing. The process of eliminating insignificant or unimportant irregularities in isolines of a parameter analyzed on a map or diagram (usually done by eye in ordinary weather analyses). In severe-weather forecasting, irregularities are of the greatest importance; smoothing is minimized.

snag. 1: A standing dead tree or portion thereof taller than 20 ft from which the leaves and most of the branches have fallen. If less than 20 ft, properly termed a stub *(Ref. 19)*.

2: A tree stump or log submerged under water.

snow. Precipitation composed of white or translucent ice crystals, chiefly in complex branched hexagonal form and often agglomerated into snowflakes *(Ref. 1)*. *See also:* hydrometeor.

snow accumulation *or* **snow depth.** The actual depth of snow on the ground at any instant during a storm, or after any single snowstorm or series of storms *(Ref. 3)*.

snow blindness. Impaired vision or temporary blindness caused by sunlight reflected from snow surfaces. Ultraviolet radiation in the solar spectrum is the prime cause. Symptoms of snow blindness are a gritty sensation under the eyelids, excessive watering, and double vision. First aid is to place the casualty in the dark or bandage the eyes; application of cool compresses alleviates pain. Most cases will recover in 18 hr without medical treatment *(Ref. 3)*.

snow blink. *See:* blink.

snow concrete. Snow that has been compressed at low temperatures and that sets into a tough substance of considerably greater strength than uncompressed snow *(Ref. 11)*.

snow course. An established line, usually from several hundred feet to as much as a mile long, traversing representative terrain in a mountainous region of appreciable snow accumulation. Along this course, instruments (such as snow stakes, radioactive snow gages) are installed, and/or

core samples of the snow cover are periodically taken and averaged to obtain a measure of its water equivalent *(Ref. 3)*.

snow cover. 1: The areal extent of snow-covered ground, usually expressed as percent of total area in a given region.
2: In general, a layer of snow on the ground surface.
3: The depth of snow on the ground, usually expressed in inches or centimeters *(Ref. 3)*

snow crystal. Dendritic, tabular, columnar crystals formed in the free air. Crystals may fall as single snowflakes or may be agglomerated during fallout.

snow density. The ratio between the volume of melt water derived from a sample of snow and the initial volume of the sample. This is numerically equal to the specific gravity of the snow *(Ref. 6)*. *See also:* water equivalent of snow.

snow depth. *See:* snow accumulation.

snowdrift. Snow deposited behind or in front of obstacles or irregularities of the surface, or collected in heaps by eddies in the wind *(Ref. 1)*.

snowfall. The rate at which snow falls. In surface weather observations, this is usually expressed as inches of snow depth per 6-hr period *(Ref. 3)*.

snow fences. Various types of fencelike structures installed to control the drifting of snow.

snowfield. 1: Generally, an extensive area of snow-covered ground or ice, relatively smooth and uniform in appearance and composition. This term is often used to describe such an area in otherwise coarse, mountainous, or glacial terrain *(Ref. 3)*.
2: *See:* firn.

snowflake. An ice crystal or, much more commonly, an aggregation of many crystals that falls from a cloud. Simple snowflakes (single crystals) exhibit beautiful variety of form, but the symmetrical shapes reproduced so often in photomicrographs are not actually found frequently in snowflakes *(Ref. 1)*.

snowgage. An instrument for measuring the vertical depth of snow *(Ref. 1)*.

snow grains. Precipitation in the form of very small, white opaque particles of ice; the solid equivalent of drizzle. They resemble snow pellets in external appearance, but are more flattened and elongated and generally have diameters of less than 1 mm; they neither shatter nor bounce when they hit a hard surface *(Ref. 1)*.

snow, hard packed. Snow that has been packed by vehicular or other traffic or possibly by the forces of nature *(Ref. 1)*.

snow line. In general, the outer boundary of a snow-covered area. It has at least two specific applications *(Ref. 3)*:
(a) The actual lower limit of the snow cap on high terrain at any given time,
(b) The ever-changing equatorward limit of snow cover, particularly in the Northern Hemisphere winter.

snow, new. Snow made up of crystals that retain all or most of their dendritic structure *(Ref. 1)*.

snow, old. Snow made up of roughly unidimensional, or spherical, grains. It usually includes the various kinds of crusts *(Ref. 1)*.

snow pellets. *See:* graupel.

snow, powder. A dry snow composed of crystals or grains that lie loosely; e.g., new powder snow, settling powder snow, and settled powder snow *(Ref. 1)*.

snow, quality of. The amount of ice in a snow sample expressed as a percent of the weight of the sample *(Ref. 3)*.

snow sampler. A hollow tube for collecting a sample of snow *in situ*.

snow, settled. Snow that has lost all traces of dendritic structure. It is generally the early stage of old snow, and its grains are smaller than those of old snow *(Ref. 1)*.

snow, spring. *See:* spring snow.

snow survey. The process of determining depth and water content of snow at representative points; for example, along a snow course. Snow surveys are usually made for hydrologic or water supply forecasting *(Ref. 1)*.

snow, wet. Snow that is moist, uncompacted, and that will easily pack or adhere to equipment *(Ref. 1)*.

snubber. A cushion applied to one of two nonresilient members of a shock and vibration isolator or mounting that undergo relative motion. It is designed to prevent nonresilient impact *(Ref. 1)*.

soak. The exposure of equipment to a given temperature for a period of time long enough for the temperature of the equipment to reach that of the environment in which the equipment is to be operated *(Ref. 14)*.

soft hail. *See:* graupel.

soft rime. *See:* rime.

softwood. Generally, one of the botanical group of trees with, in most cases, needle or scalelike leaves, such as the conifers. Also the wood produced by such trees *(Ref. 19)*.

soil. The unconsolidated (as opposed to bed rock) mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants. Soil is derived from bed rock and organic sources by a wide range of factors including the nature of the parent material, climate, macro- and micro-organisms, and topography, all acting over a relatively long period of time *(Ref. 2)*.

soil air. The portion of the soil not occupied by solid particles or liquids; the gaseous phase of the soil *(Ref. 2)*.

soil association. *Pedology.* 1: A group of systematically defined taxonomic soil units occurring together in an individual and characteristic pattern over a geographic region.

2: A mapping unit used on general soil maps, in which two or more soil units occurring together in a characteristic pattern are combined *(Ref. 2)*.

soil bin. A laboratory container in which various soils and soil-vehicle relationships can be investigated under controlled conditions; analogous to wind tunnels or naval towing tanks in aircraft and ship practice *(Ref. 1)*.

soil category. A specific defined element or unit of the soil classification system. Soils are grouped on the basis of their characteristics *(Ref. 2)*.

soil characteristic. A feature of a soil that can be seen and/or measured in the field or in the laboratory on soil samples. Examples include soil slope and stoniness as well as the texture, structure, color, and chemical composition of soil horizons *(Ref. 16)*.

soil creep. The imperceptibly slow downward movement of soil or rock under a shear stress that is less than that required to produce shear failure. Seasonal creep in response to freezing and thawing, thermal expansion, or changes in water content occurs in the upper layers of ground *(Ref. 32)*.

soil failure model. A mathematical equation describing the stress and strain states developed in natural soils, or laboratory soil simulating materials, when subjected to various external loadings that exceed the failure strength *(Ref. 1)*.

soil family. *Pedology.* An intermediate category between the great soil group and soil series *(Ref. 2)*.

soil flow. *See:* solifluction.

soil formation factors. The natural factors occurring during and causing soil formation. The factors can be grouped into five major categories: (a) parent rock, (b) climate, (c) organisms, (d) topography, and (e) time *(Ref. 2)*.

soil genesis. *See:* genesis, soil.

soil horizon. *Pedology.* A layer of soil approximately parallel to the land surface, but differing from adjacent genetically related layers in any of a variety of physical, chemical, and biological properties such as color, structure, texture, consistency, kinds and numbers of organisms present, degree of acidity or alkalinity. *(Ref. 2). See also:* ABC soil.

soil moisture. Water diffused in the soil, the upper part of the zone of aeration from which water is discharged by the transpiration of plants or by soil evaporation *(Ref. 6)*.

soil morphology. The constitution of the soil including the texture, structure, consistency, color, and other physical, chemical, and biological properties of the various soil horizons that make up the soil profile *(Ref. 16)*.

soil phase. *Pedology.* The subdivision of a soil type or other classificational soil unit having variations in characteristics not significant to the classification of the soil in its natural landscape but significant to the use and management of the soil. Examples of the variations recognized by phases of soil types include differences in slope, stoniness, and thickness because of accelerated erosion *(Ref. 16)*.

soil porosity. *See:* **porosity, soil.**

soil reaction. An indication of the acidity or alkalinity of a soil, usually expressed as a pH value. Soils range from extremely acid, with a pH < 4.5 to very strong alkaline, with a pH > 9.1. Intermediate classifications are: very strongly acid, 4.5-5.0; strongly acid, 5.1-5.5; moderately acid, 5.6-6.0; slightly acid, 6.1-6.5; neutral, 6.6-7.3; slightly alkaline, 7.4-7.8; moderately alkaline, 7.9-8.4; and strongly alkaline, 8.5-9.0 *(Ref. 2).* *See:* **hydrogen ion concentration; pH.**

soil series. A group of soils, developed from a particular type of parent material, having similar profiles except for the texture of the surface soil *(Ref. 20).*

soil shear strength. The maximum resistance of a soil to shearing stresses *(Ref. 5).*

soil, stabilized. Soil hardened by addition of a binder such as cement *(Ref. 12).*

soil structure. The arrangement of primary soil particles and their state of aggregation into a soil mass.

soil texture. The relative proportions of the various size groups of individual soil grains in a mass of soil. Specifically, in the U S Department of Agriculture classification system, it refers to the proportions of sand, silt, and clay *(Ref. 16).*

soil tractionability. The capacity of a soil to provide traction for nontracked military vehicles *(Ref. 14).*

soil trafficability. The capacity of a soil to withstand traffic, especially the traffic of military vehicles *(Ref. 14).*

soil type. A term used in the classification of soils. It is the principal unit used in soil mapping as well as other soil studies. Soils of a given type are alike in all characteristics including texture *(Ref. 20).*

soil values. A set of empirically determined mathematical parameters which describes the measured horizontal and vertical stress-deformation curves of natural soils or laboratory soil simulating materials *(Ref. 1).*

solar constant. The power per unit area received from the sun outside the atmosphere of the earth on a surface normal to the direction of the sun at the mean distance of the earth from the sun; solar irradiance prior to attenuation by the atmosphere *(Ref. 1).*

solarimeter. A pyrheliometer for direct reading of solar radiation intensity from sun and sky.

solarization. An active effect of sunlight or ultraviolet upon glass which results in a reduction of transparency, and sometimes permanent coloration. A reversal or gradation sequence in a dense photographic image as a result of great overexposure *(Ref. 1).*

solar noise. Electromagnetic radiation from the atmosphere of the sun at radio frequencies *(Ref. 40).*

solar radiation. The total electromagnetic radiation emitted by the sun. To a first approximation, the sun radiates as a black body at a temperature of about 5,700 K; hence about 99.9 percent of its energy output falls within the wavelength interval from 0.15 to 4.0 μm, with peak intensity near 0.47 μm. About one-half of the total energy in the solar beam is contained within the visible spectrum from 0.4 to 0.7 μm, and most of the other half lies in the near infrared, a small additional portion lying in the ultraviolet *(Ref. 3).*

solar radiation chamber. *See:* **chamber, solar radiation.**

solar spectrum. 1: The relative power or flux density of solar radiation per unit wavelength (or frequency) interval as a function of wavelength (or frequency) *(Ref. 1).*
2: The part of the electromagnetic spectrum occupied by the wavelengths of solar radiation *(Ref. 3).*

solid elastomer isolator. A vibration isolator in which a solid elastomer is placed, either in compression or in shear, between a vibration source and the component to be protected.

solid friction damping. The damping that occurs in all mechanical vibrating systems that have restoring forces derived from elastic elements such as springs. It is presumed to arise from slight relative displacements between adjacent crystals or minute elements of the spring material; often referred to as internal friction.

solifluction; *also* soil flow. The slow downslope flow or creep of saturated soil, often initiated and augmented by frost action in high latitudes and at high elevations. Also called soil flow *(Ref. 1)*.

solonchak. *Pedology*. A great soil group of the intrazonal order and halomorphic suborder, consisting of soils with gray, thin, salty crust on the surface, and with fine granular mulch immediately below being underlain with grayish, friable, salty soil; formed under subhumid to arid, hot or cool climate, under conditions of poor drainage *(Ref. 1)*.

solonetz. *Pedology*. A great soil group of the intrazonal order and halomorphic suborder, consisting of soils with a very thin, friable, surface soil underlain by a dark, hard columnar layer usually highly alkaline *(Ref. 2)*.

soloth. *Pedology*. A great soil group of the intrazonal order and halomorphic suborder having a gray, leached surface horizon, which rests upon a fine-textured, brown or dark-brown horizon, developed under grass or shrub vegetation, mostly in a subhumid or semiarid climate *(Ref. 21)*.

solstice. Two points on the ecliptic at which the distance from the celestial equator is greatest. The summer solstice is reached by the sun on June 22 and the winter solstice is reached on December 22.

solum (*pl.* **sola**). The upper and most weathered part of the soil profile; the "A" and "B" horizons *(Ref. 2)*.

sonar. A sonic device used primarily for the detection and location of underwater objects. (This term is derived from the words "sound navigation and ranging".) *(Ref. 5)*.

sone. A unit of loudness equivalent to a loudness 40 dB above a listener's threshold as produced by a 1,000 Hz pure tone *(Ref. 38)*.

sonic. Of or pertaining to sound or the speed of sound *(Ref. 5)*.

sonic altimeter. An absolute altimeter that determines height above the terrain by measuring the time interval between transmission of a sound and the return of its echo *(Ref. 15)*.

sonic boom. A noise caused by a shock wave that emanates from an aircraft or other object traveling at or above the speed of sound *(Ref. 7)*.

sonic thermometer. A thermometer based upon the principle that the velocity of a sound wave is a function of the temperature of the medium through which it passes. The velocity of a sound wave also depends upon the velocity of the medium through which it passes; therefore, this quantity must be known *(Ref. 1)*.

sonne photograph. Continuous strip photography. A photograph of a strip of terrain in which the image remains unbroken throughout its entire length, being produced by a moving film passing an aperture of extremely narrow width and synchronized with the speed of the aircraft *(Ref. 12)*.

soot. Agglomerations of tar-impregnated carbon particles that form when carbonaceous material undergoes incomplete combustion *(Ref. 9)*.

sorption. Process of taking up and holding gas, liquid, or solid particles by absorption (internal solution) and/or by adsorption (surface adhesion); specifically, the action of activated charcoal and chemical agent vapors *(Ref. 12)*.

sound. 1: An oscillation in pressure, stress, particle displacement, particle velocity, etc., in an elastic medium, or the superposition of such propagated oscillations.

2: An auditory sensation evoked by a sound oscillation *(Ref. 38)*.

sound absorption. The reduction in sound energy caused by its conversion to some other energy form, usually heat, as the sound energy transverses a medium or impacts a surface *(Ref. 38)*.

sound attenuation. The diminution of sound; for instance, pressure or velocity, from one point to another due to spherical propagation, reflection, or dissipation *(Ref. 1)*.

sounding. 1: In geophysics, any penetration of the natural environment for scientific observation.

2: *Meteorology*. Same as upper-air observation. However, a common connotation is that of a single complete radiosonde observation.

3. The measurement of the depth of water beneath a vessel *(Ref. 3)*.

sound intensity *or* **sound-energy flux density** *or* **sound-power density.** The average rate of sound energy transmitted in a specified direction through a unit area normal to the direction of propagation *(Ref. 38).*

sound intensity level. As measured in decibels, 10 times the logarithm to the base 10 of the ratio of the intensity of a sound to a reference intensity. The reference intensity must be known. In discussing sound measurements made with pressure or velocity microphones, especially in enclosures involving normal modes of vibration or in sound fields containing standing waves, caution should be observed in using the terms "intensity" and "intensity level".

sound level. A weighted sound pressure level, obtained by the use of metering characteristics and the weightings A, B, or C specified in American Standard Sound Level Meters for Measurement of Noise and Other Sounds *(Ref. 1).*

sound-level meter. An instrument that measures the sound pressure. The sound-level meter response is altered by weighting networks to match the frequency response of the human ear.

sound power level. Expressed in decibels, it is 10 times the logarithm to the base 10 of the ratio of the power of the measured signal to a stated reference power signal.

sound pressure level. In decibels, 20 times the logarithm to the base 10 of the ratio of the pressure of a sound to the reference pressure. The reference pressure must be indicated *(Ref. 1).*

sound source, simple. An isotropic sound radiator; i.e., one that radiates sound uniformly in all directions under free-field conditions *(Ref. 38).*

sound wave. A mechanical disturbance advancing with finite velocity through an elastic medium and consisting of longitudinal displacements of the ultimate particles of the medium; i.e., consisting of compressional and rarefactional displacements parallel to the direction of advance of the disturbance; a longitudinal wave *(Ref. 1).*

sound waves, interference of. *See:* wave interference.

source region, airmass. An extensive area of the surface of the earth over which bodies of air frequently remain for a sufficient time to acquire characteristic temperature and moisture properties imparted by that surface *(Ref. 1).*

space charge. Any net electrical charge that exists in a given region of space. In atmospheric electricity, space charge refers to a preponderance of either negative or positive ions within any given portion of the atmosphere *(Ref. 1).*

spall. A rock chip or fragment broken off from a larger mass. Such fragments can be the result of natural forces or man-induced forces. The thin curved pieces split off by exfoliation are examples *(Ref. 32).*

spalling. The chipping or fragmenting of a surface or surface coating usually caused either by heating of base material and surface coating that have different coefficients of thermal expansion or by differential heating of homogeneous material *(Ref. 34). See also:* exfoliation.

spatial dendrite *or* **spatial dendritic crystal.** A complex ice crystal with fernlike arms that extend in many directions (spatially) from a central nucleus. Its form is roughly spherical *(Ref. 3).*

special cargo. Cargo that requires special handling or protection, such as pyrotechnics, detonators, watches, and precision instruments *(Ref. 5). See also:* cargo.

species. The smallest taxonomic category made up of a number of individual organisms that resemble each other within established limits of variance.

specific heat. *See:* heat, specific.

specific gravity. The ratio of the density of a substance to the density of water, usually at 4°C.

specific humidity. In a system of moist air, the (dimensionless) ratio of the mass of water vapor to the total mass of the system. The specific humidity may be approximated by the mixing ratio for many purposes *(Ref. 1).*

specific surface. The surface area of a substance per unit volume often applied to adsorbents as a measure of capacity.

spectral energy distribution. The distribution of power as a function of wavelength or frequency of a radiating body.

spectrography. The photography of spectra.

spectrophotometer. A photometer that

measures the intensity of radiation as a function of the frequency (or wavelength) of the radiation. In one design, radiation enters the spectrophotometer through a slit and is dispersed by means of a prism. A bolometer having a fixed aperture scans the dispersed radiation so that the intensity over a narrow wave band is obtained as a function of frequency *(Ref. 3)*.

spectrum. 1: A continuous range of components, usually wide in extent, in which the frequencies have some specified common characteristic; e.g., audiofrequency spectrum *(Ref. 38)*.

2: The relative energy, power, or flux density per unit frequency (or wavelength) interval as a function of frequency (or wavelength).

3: A graphical representation of any distribution function *(Ref. 1)*.

spectrum analyzer. An instrument, basically a sophisticated filter, that displays an amplitude versus frequency plot indicating the relative spectral content of a complex waveform.

spectrum, solar. *See:* solar spectrum.

specular reflection. Reflection as from a mirror in which the reflected radiation is not diffused. Irregularities on the reflecting surface must be small compared to wavelength of the radiation.

speech interference level. The average, in decibels, of the sound pressure levels of a noise in the octave bands of frequency 300-600, 600-1200, 1200-2400, and 2400-4800 Hz *(Ref. 1)*.

speed of light. The speed of propagation of electromagnetic radiation through a "perfect vacuum". It is a universal dimensional constant equal to 2.997925×10^8 m s^{-1} *(Ref. 3)*.

speed of sound. The speed at which sound travels in a given medium under specified conditions. The speed of sound at sea level in the United States Standard Atmosphere, 1962, and the atmosphere adopted by the International Civil Aeronautics Organization is 340.294 m s^{-1} 1116.45 ft s^{-1} (15°C, 760 mm Hg, and atmospheric density of 1.225 kg m^{-3}) *(Ref. 1)*.

spillover. The part of orographic precipitation that is carried along by the wind so that it reaches the ground in the nominal rain shadow on the lee side of the barrier *(Ref. 3)*.

spit. A small point of land or narrow shoal projecting into a body of water from the shore *(Ref. 10)*.

SPL *Abbr. for* sound pressure level.

spontaneous freezing point. The temperature level at which all supercooled water droplets in the atmosphere change to an ice phase and become ice crystals. The temperature level is about −40°C (−40°F) although it may occur at higher temperatures in polluted air. Sometimes called the spontaneous nucleation point.

sporadic permafrost. One or more deposits of perennially frozen ground surrounded by ground that is not perennially frozen. Sporadic permafrost occurs along the southern limits of regions where summer frost conditions are usual *(Ref. 11)*.

spore. A primitive usually unicellular reproductive body produced by plants and some invertebrates. Spores are highly resistant to stress and can give rise to a new adult individual immediately or after a long period of dormancy.

spout. A phenomenon consisting of an often violent whirlwind, revealed by the presence of a cloud column or inverted cloud cone (funnel cloud), protruding from the base of a cumulonimbus, and of a "bush" composed of water droplets raised from the surface of the sea or of dust, sand or litter, raised from the ground *(Ref. 36)*. Spout includes both tornado and waterspout.

spray. An ensemble of water droplets torn by the wind from the surface of an extensive body of water, generally from the crests of waves, and carried up a short distance into the air *(Ref. 36)*.

spring. A place where water issues naturally from the rock or soil upon the land or into a body of surface water *(Ref. 10)*.

spring sludge. *See:* rotten ice.

spring snow; *also* **corn snow.** A coarse, granular, wet snow, resembling finely chopped ice, generally found in the spring *(Ref. 11)*.

spurious signals. In radio communications, unwanted signals received along with the desired signal. They reduce intelligibility and if of sufficient magnitude can completely mask the desired signal.

squall. 1: A strong wind characterized by a sudden onset, a duration of the order of minutes, and a rather sudden decrease in speed.

2: A severe local storm considered as a whole; i.e., winds, cloud mass, precipitation (if any), thunder, and lightning *(Ref. 1)*.

squall line. Any nonfrontal line or narrow band of active thunderstorms (with or without squalls); a mature instability line *(Ref. 1)*.

St *Abbr. for* stratus cloud.

stability index. An indication of the local static stability of a layer of air *(Ref. 3)*.

stabilized soil. *See:* soil, stabilized.

stable oscillation. *See:* oscillation, stable.

stack. An isolated mass of rock, generally of height greater than its width or length, standing in the ocean. Stacks are the remains of landmasses that have been subject to the erosive and quarrying action of the waves *(Ref. 32)*.

stage. The height of a water surface above an established datum plane *(Ref. 6)*.

stage-capacity curve. A graph showing the relation between the surface elevation of the water in a reservoir, usually plotted as ordinate, against the volume below that elevation, plotted as abscissa *(Ref. 6)*.

stage-discharge curve *or* **rating curve.** A graph showing the relation between the gage height, usually plotted as ordinate, and the amount of water flowing in a channel, expressed as volume per unit of time, plotted as abscissa *(Ref. 6)*.

stagnation pressure. *See:* pressure, stagnation.

stagnation temperature. The temperature created on the leading edges of an aircraft or spacecraft traveling through the atmosphere. Refers to the air molecules on the leading edges of the craft which do not participate in airflow *(Ref. 40)*.

stain. A discoloration of wood caused by fungus or chemical agencies. This includes blue stain, iron-tannate stain, mineral stain, weather stain, wound stain, etc. *(Ref. 1)*.

staling reaction. A form of deterioration of foodstuffs that results in an undesirable change in the texture. Breads are especially susceptible.

standard artillery atmosphere. A set of values describing atmospheric conditions on which ballistic computations are based, namely: no wind; a surface temperature of 15°C, a surface pressure of 1,000 mb; a surface relative humidity of 78 percent; and a lapse rate that yields a prescribed density-altitude relation *(Ref. 3)*.

standard artillery zone. A vertical subdivision of the standard artillery atmosphere; it may be considered a layer of air of prescribed thickness and altitude *(Ref. 3)*.

standard atmosphere. *See:* atmosphere, standard.

standardization. The process of establishing by common agreement engineering criteria, terms, principles, practices, materials, items, processes, equipments, parts, subassemblies, and assemblies to achieve the greatest practicable uniformity of items of supply and engineering practices; to insure the minimum feasible variety of such items and practices; and to effect optimum interchangeability of equipment parts and components *(Ref. 33)*.

standardize. To reduce to, or compare with, a standard; to calibrate. In the environmental field, the verification process by whatever steps are necessary, to assure that all investigators in a given field are performing in a similar manner and will produce similar results *(Ref. 1)*.

standard pressure. *Meteorology.* The arbitrarily selected atmospheric pressure of 1,000 mb to which adiabatic processes are referred for definitions of potential temperature, equivalent potential temperature, etc. Other pressures may be used as standard for specific purposes *(Ref. 3)*.

standard temperature. 1: *Physics.* Usually the ice point (0°C); less frequently, the temperature of maximum water density (4°C).

2: *Meteorology.* No generally accepted meaning, except that it may refer to the temperature at zero pressure-altitude in the standard atmosphere (15°C) *(Ref. 3)*.

standard temperature and pressure. *Physics.* A phase used to indicate a temperature of 0°C and a pressure of one standard atmosphere *(Ref. 3)*.

standard warehouse. *See:* general purpose warehouse.

standing wave. A periodic wave (time-wise) having a fixed amplitude distribution in

space. A standing wave can be considered to be the result of interference of progressive waves of the same frequency and kind *(Ref. 8)*.

standing-wave resonant system. 1: A resonant system terminating at a node.
2: A traveling-wave transmission system terminated by a reflecting element in such manner that some characteristic of the reflected wave field will be in phase with that of the transmitted wave field at a resonant frequency, resulting in standing maxima and minima *(Ref. 1)*.

star dune. An eolian deposit normally composed of a large peak from which four or more ridges radiate *(Ref. 1)*.

state-of-the-ground code. A standardized surface synoptic observation that describes the condition of the ground surface. Basically, the states-of-the-ground are recognized as dry, moist, wet, frozen, and ice or snow covered. The system has been used by the World Meteorological Organization since its creation in 1950 and by its predecessor, the International Meteorological Organization, since 1923 *(Ref. 1)*.

static dehumidification. The dehumidification of a space accomplished by placing a predetermined quantity of desiccant in a space to take up the moisture contained therein without forced air circulation through the desiccant *(Ref. 1)*.

static electricity. A negative or positive charge of electricity that an object accumulates, which charge creates a spark when the object comes near another object to which it may transmit its charge, or from which it may receive a charge *(Ref. 14)*.

static pressure. *See:* pressure, static.

static stress. *See:* stress, static.

static unbalance. A condition in rotating machinery in which the rotor center of gravity is eccentric to the rotor centerline of rotation.

stationary vibration. The type of vibration for which properties (such as mean magnitude, rms amplitude, spectral density) are independent of time *(Ref. 37)*.

station elevation. The vertical distance above mean sea level that is adopted as the reference datum level for all current measurements of atmospheric pressure at the station *(Ref. 3)*.

station pressure. The atmospheric pressure computed for the level of the station elevation. This may or may not be the same as either the climatological station-pressure or the actual pressure, the difference being attributable to the difference in reference elevations. Station pressure usually is the base value from which sea-level pressure and altimeter setting are determined *(Ref. 3)*.

steady-state sound. A periodic or random variation in atmospheric pressure with a time duration greater than 1 s.

steam fog *or* **arctic fog.** Fog formed when water vapor is added to air that is much colder than the vapor source; most commonly, when very cold air drifts across relatively warm water *(Ref. 1)*.

Stefan-Boltzmann law *or* **Stefan's law.** One of the radiation laws which states that the amount of energy radiated per unit time from a unit surface area of an ideal blackbody is proportional to the fourth power of the absolute temperature of the blackbody. The law is written *(Ref. 3)*:

$$E = \sigma T^4$$

where

E = emittance of the blackbody
σ = Stefan-Boltzmann constant
T = absolute temperature of the blackbody.

step gage. An instrument that indicates that motion or other measured parameter of a specified magnitude has been reached or exceeded. The amount by which that magnitude has been exceeded cannot be determined by a step gage *(Ref. 22)*.

steppe. A term of Russian origin for a level or rolling, treeless land, where temperature ranges usually are extreme *(Ref. 11)*.

stereocomparagraph. Stereoscopic instrument used for the preparation of topographic maps to determine ground elevations by measuring the displacement of their images on photographs *(Ref. 12)*.

stereophotogrammetry. Photogrammetry, with the aid of stereoscopic equipment and methods *(Ref. 12)*.

stereoplanigraph. A very accurate stereoscopic photogrammetric mapping instrument with mechanical drafting attachment,

capable of providing a stereoscopic picture from overlapping photographs, regardless of angle at which they were taken *(Ref. 12)*.

stereoscopic. Of or relating to the perception of objects in three dimensions.

sterilization. 1: The act or process of destroying all living organisms on an object or in an area. Methods include heat, chemicals, and radiation exposure.

2: A procedure by which a human being or other organism is made incapable of reproduction.

stevenson screen. A type of instrument shelter. The shelter is a wooden box painted white with double louvered sides and mounted on a stand 4 ft above the ground. In addition to the dry- and wet-bulb thermometers, it usually contains maximum and minimum thermometers *(Ref. 3)*.

stickiness. The ability of soils to cling to and build up on the running gear of vehicles *(Ref. 1)*.

stiffness. The quotient of the change in force divided by the corresponding deflection produced in an elastic element by that force *(Ref. 22)*.

stock accounting. The establishment and maintenance of formal records of material in stock reflecting such information as quantities, values, condition, or other information as required *(Ref. 26)*.

stockage objective. The maximum quantities of materiel to be maintained on hand to sustain current operations. It will consist of the sum of stocks represented by the operating level and the safety level *(Ref. 5)*.

stock control. Process of maintaining data on the quantity, location, and condition of supplies and equipment due-in, on-hand, and due-out, to determine quantities of materiel and equipment available and/or required for issue and to facilitate distribution and management of materiel *(Ref. 5)*.

stock coordination. A supply management function exercised usually at department level that controls the assignment of materiel cognizance for items or categories of material to inventory managers.

stockpile-to-target sequence. 1: The order of events involved in removing a nuclear weapon from storage, and assembling, testing, transporting, and delivering it on the target.

2: A document that defines the logistical and employment concepts and related physical environments involved in the delivery of a nuclear weapon from the stockpile to the target. It may also define the logistical flow involved in moving nuclear weapons to and from the stockpile for quality assurance testing, modification and retrofit, and the recycling of limited life components *(Ref. 5)*.

Stoke's diameter. The diameter that a spherical particle would have if it were falling at the same terminal velocity as an observed particle.

Stoke's law. A relation that gives the terminal velocity reached by a spherical particle falling freely under gravity in a viscous medium.

STOL. *Abbr. for* short takeoff and landing.

STOL aircraft. A specially designed aircraft for operation from very small landing fields; specifically, short take-off and landing aircraft.

stone. A solid rock fragment either greater than 10 in. in diameter if rounded or greater than 15 in. in any one dimension if flat *(Ref. 2)*.

storage. 1: Water artificially impounded in surface or underground reservoirs, for future use. The term regulation refers to the action of this storage in modifying streamflow *(Ref. 6)*.

2: Water naturally detained in a drainage basin, such as ground water, channel storage, and depression storage *(Ref. 6)*.

3: *Logistics.* The process of holding and caring for supplies prior to issue.

storage (memory). 1: Pertaining to a device in which data can be stored and from which it can be obtained at a later time. The means of storing data may be chemical, electrical, or mechanical.

2: A device consisting of electronic, electrostatic, electrical, hardware, or other elements into which data may be entered, and from which data may be obtained as desired.

3: The erasable storage in any given computer. Synonymous with memory.

storage time. Time during which a system or equipment is presumed to be in operable

condition, but is being held for use (i.e., as a spare) *(Ref. 33)*.

storm. 1: Any disturbed state of the atmosphere, especially as affecting the surface of the earth and strongly implying destructive or otherwise unpleasant weather *(Ref. 1)*.

2: In the Beaufort wind scale, a wind whose speed is 56 to 63 kt (64 to 72 mph) *(Ref. 3)*.

storm center. The area of lowest atmospheric pressure of a cyclone. This is a more general expression than eye of the storm, which refers only to the center of a well-developed tropical cyclone, in which there is a tendency of the skies to clear *(Ref. 15)*.

storm track. The path followed by a center of low atmospheric pressure *(Ref. 3)*.

straddle carry truck. A vehicle that straddles a stack or load of material, lifts it with adjustable arms, and moves it or loads it onto trucks or other vehicles.

strain. The elongation or shortening per unit of original length of a body under tension or compression, or the distortion in angle between two planes in a body under shear stress *(Ref. 32)*.

strain gage. *See:* gage, strain.

strain gage accelerometer. A typical accelerometer in which a mass is affixed to a resistance wire strain gage. As the assembly is subjected to acceleration, the force exerted by the mass on the strain gage changes, thereby causing a change in resistance of the strain gage.

strait. A relatively narrow body of water connecting two larger bodies *(Ref. 10)*.

strand line. Driftwood scattered along a river bank or a sea coast which indicates the flood level or high tide mark *(Ref. 11)*.

strapping. 1: An operation by which supply containers, such as cartons or boxes, are reinforced by bands, metal straps, or wire placed at specified intervals around them, drawn taut, and then sealed or clamped by a machine.

2: Measurement of storage tanks and calculation of volume to provide tables for conversion of depth of product in linear units of measurement to volume of contents *(Ref. 5)*.

stratification. The characteristic structural feature of sedimentary rocks in beds, layers, strata, laminae, lenses, wedges, and other essentially tabular units *(Ref. 1)*.

stratocumulus (*Abbr.* Sc). A principal cloud type (cloud genus), predominantly stratiform, in the form of a gray or whitish layer or patch, that nearly always has dark parts and is nonfibrous. Its elements are tesselated, rounded, roll-shaped, or undulatory *(Ref. 1)*.

stratosphere; *also* **lower stratosphere.** 1: The atmospheric shell above the troposphere and below the mesosphere. It extends, therefore, from the tropopause to the height where the temperature begins to increase in the 20- to 25-km region.

2: The atmospheric shell extending upward from the tropopause to the base of the thermosphere; that is, to the minimum temperature level at about 70 to 80 km.

3: Popularly and erroneously, all of the atmosphere above the troposphere *(Ref. 3)*.

stratum. A more or less distinct layer of rock, occurring as one of a series of strata in the crust of the earth. Rock strata vary in thickness from a fraction of an inch to several feet and normally are horizontal.

stratus (*Abbr.* St). A principal cloud type (cloud genus) in the form of a gray layer with a rather uniform base. Stratus does not usually produce precipitation, but when it does occur it is in the form of minute particles, such as drizzle *(Ref. 1)*.

stray current corrosion. *See:* corrosion, stray current.

stream. 1: A course of water flowing between approximately parallel banks, such as a river.

2: A long narrow area of drift ice, usually consisting of small fragments detached from the main belt and drifting under the influence of wind or current.

3: A steady flow of a fluid, small solid particles, or radiant energy *(Ref. 15)*.

stream channel. The bed where a natural stream of water runs; the trench or depression washed in the surface of the earth by running water; a wash arroyo, or coulee *(Ref. 10)*.

streamer. A sinuous channel with a high density of ions which, in a lightning

discharge, propagates itself through the air by an electron avalanche just ahead of the advancing tip.

streamflow. The discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. Streamflow may be applied to discharge whether or not it is affected by diversion or regulation *(Ref. 6)*.

stream gaging. The process and art of measuring the depths, areas, velocities, and rates of flow in natural or artificial channels *(Ref. 6)*.

streamline. A curve whose direction at every point coincides with the instantaneous direction of the wind. Not to be confused with paths or trajectories. Streamlines show the synoptic pattern of the wind direction, which is usually similar to but not identical with the pressure pattern *(Ref. 13)*.

streamline flow. A steady flow of fluid past a body in which the fluid remains smooth and relatively unchanged, as in laminar flow *(Ref. 14)*.

stream order. A method of numbering streams as part of a drainage basin network. The smallest unbranched mapped tributary is called first order, the stream receiving the tributary is called second order, and so on *(Ref. 6)*.

stress. 1: In general, a resultant condition of applied force.

2: *Mechanics.* (a) A condition existent in a body when its internal structure or surfaces resist a force that produces or tends to produce deformation in the body. (b) Molecular resistance to change in shape or size. *(Ref. 14)*

stress, allowable. The permissible maximum stress used in the design of a structure or component which takes into account efficiency in the use of material and uncertainties in expected conditions of service, in properties of the material, and in stress analysis *(Ref. 1)*.

stress, climatic. The stresses that are components of the climatic phase of the environment, such as temperature, moisture, solar radiation, atmospheric pressure, wind, and rain. *(Ref. 1)*.

stress corrosion. *See:* corrosion, stress.

stress corrosion cracking. A form of failure in which corrosion and stress occurring in concert cause cracking of the material *(Ref. 34)*.

stress, dynamic. Stress induced in an elastic element by the dynamic deflection applied to it *(Ref. 1)*.

stress endurance limit. The value of alternating stress, repetitively applied to an elastic element, below which the element is not expected to experience fatigue failure after an infinite (or extremely large) number of stress reversals *(Ref. 1)*.

stress, environmental. The component force of an environment. (Temperature, humidity, solar radiation, etc., are environmental stresses.) *(Ref. 1)*

stress, induced. A stress that is a component of the manmade phase of the environment, such as acceleration, shock, and vibration *(Ref. 1)*.

stress, static. Stress induced in an elastic element by the static deflection applied to it *(Ref. 1)*.

striation. A groove in soil or bedrock made by a glacier. Striations indicate the direction of the glacial movement.

strike. The direction of a line formed by the intersection of a geologic structure with a horizontal plane. It is at right angles to the dip *(Ref. 32)*.

stroke. *Meteorology.* The luminous path of electrical energy flow in a lightning discharge.

structural damping. A type of vibration control that involves the modification of the elastic properties of the mechanical structure of the material involved.

structure of the atmosphere. Vertical distribution of the magnitudes of temperature, humidity, and stability of a representative air column or parts thereof.

subarctic. 1: A region of variable width immediately south of the Arctic. Within this area the mean temperature of the warmest 4-mo period is less than 50°F.

2: The land areas that extend south from the northern limit of forest to the northern limit of the developed transportation net are considered operationally to be subarctic. Although treeless, such coastal areas as the Aleutians are subarctic rather than arctic. *(Ref. 12)*

subscale formation. The precipitation of oxides of alloying elements beneath the external surface of an alloy. It occurs as a result of oxygen diffusion through the external surface of the alloy *(Ref. 34)*.

subharmonic response. *See:* response, subharmonic.

sublimation. The transition of a substance from the solid phase directly to the vapor phase, or vice versa, without passing through an intermediate liquid phase *(Ref. 1)*.

sublimation nucleus. Any particle upon which an ice crystal may grow by the process of sublimation *(Ref. 1)*.

subsidence. 1: *Meteorology.* A descending motion of air in the atmosphere, usually with the implication that the condition extends over a rather broad area *(Ref. 3)*.

2: *Geology.* A large area of the crust of the earth that has been displaced downward with respect to the surrounding areas *(Ref. 32)*.

3: *Soil Mechanics.* A settling of surface soils, particularly unconsolidated materials, either by the introduction of moisture into upper layers and resulting lubrication, or by removal of moisture (either by pumping or lowering the water table) from lower strata, leaving voids filled by weight of the overburden *(Ref. 1)*.

subsistence. Food for, and provisions to be used in, feeding military personnel and animals *(Ref. 26)*.

subsoil. *Pedology.* The "B" horizons of soils with distinct profiles. In soils with weak profile development, the subsoil can be defined as the soil below the plowed soil (or its equivalent of surface soil), in which roots normally grow *(Ref. 16)*.

subsonic. Of or pertaining to speeds less than the speed of sound *(Ref. 5)*.

substitute transport-type vehicle. A wheeled vehicle designed to perform, within certain limitations, the same military function as military transport vehicles, but not requiring all the special characteristics thereof. They are developed from civilian designs by addition of certain features, or from military designs by deletion of certain features *(Ref. 5)*.

subsurface runoff. The part of precipitation that infiltrates the surface soil, and moves toward the streams as ephemeral, shallow, perched ground water above the main ground-water level *(Ref. 6)*.

subsurface water. Water in liquid, solid, or gaseous state below the surface of the earth *(Ref. 32)*. *See also:* ground water; soil air.

subterranean stream. A body of water flowing through a very large interstice, such as a cave or cavern, or a group of large communicating interstices *(Ref. 32)*.

subtropical high. One of the semipermanent anticyclones of the subtropical high-pressure belt. They appear as centers of action on mean charts of surface pressure. They lie over oceans and are best developed in the summer season *(Ref. 3)*.

succession. The replacement of one plant community by another *(Ref. 1)*.

sugar snow. *See:* depth hoar.

sulfur dioxide (SO_2). A heavy pungent, colorless gas formed primarily by the combustion of fossil fuels. SO_2 damages the respiratory tract as well as vegetation and materials and is considered a major air pollutant *(Ref. 9)*.

summit. The highest point of any undulating land, as of a rolling plain; a mountain. The apex, the top, or the highest point of any landform *(Ref. 10)*.

sunburn. A superficial inflammation of the skin caused by solar rays. This form of erythema occurs when histamine is formed from histidin as the result of a photochemical reaction under the influence of ultraviolet radiation, mostly in wavelengths below 3,200 Å. Histamine acts as an irritant, which causes greater blood flow through the skin capillaries. The reddening is followed by tanning, which protects the deeper layers of the skin by absorbing irritating portions of the radiation *(Ref. 3)*.

sunscald. 1: Localized injury to bark and cambium of a plant often resulting in wounds. It is caused by a sudden increase in exposure of a stem to intense sunshine and high temperatures.

2: A blanching of surface tissues of leaves caused by sudden exposure to hot sun. *(Ref. 19)*

sunset. 1: The phenomenon of the daily

disappearance of the sun below the western horizon as a result of the rotation of the earth.

2: Contraction for the "time of sunset"; this is defined in National Weather Service practice as that instant when the upper limb of the sun just disappears below the sea level horizon *(Ref. 3)*.

sunshine. Direct radiation from the sun, as opposed to the shading of a location by clouds or by other obstructions *(Ref. 1)*.

sunshine recorder. An instrument that records the duration but not the intensity of sunshine at a given location.

supercool. To cool below the freezing point without solidification *(Ref. 1)*.

supercooled cloud. A cloud composed of supercooled liquid water drops. The importance of such clouds lies in their unstable compositions, since natural or artificial addition of ice crystals or other nuclei will initiate the rapid phase change to a mixed cloud or to an ice crystal cloud *(Ref. 1)*.

supercooled droplets. Droplets that remain in the water phase at temperatures lower than 0°C (32°F). They can remain in the water phase at temperatures as low as −40°C (−40°F). *See also:* spontaneous freezing point.

supercooled fog. Liquid water droplets suspended in the atmosphere at temperatures below 0°C (32°F).

supercooled warm rain. Rain caused by growth of water droplets cooled to at least −5°C (23°F) without changing into ice crystals.

supersaturation. *Meteorology.* The condition existing in a given portion of the atmosphere when the relative humidity is greater than 100 percent; i.e., when it contains more water vapor than is needed to produce saturation with respect to a plane surface of pure water or pure ice *(Ref. 1)*.

supersonic. Of or pertaining to speed in excess of the speed of sound *(Ref. 5)*.

supplies. All items necessary for the equipment, maintenance, and operation of a military command, including food, clothing, equipment, arms, ammunition, fuel, materials, and machinery of all kinds. For planning and administrative purposes, supplies are divided as noted in the classes that follow:

(a) Class I. Subsistence including gratuitous health and welfare items. Subclassification for Class I are: A—Air (inflight rations); R—Refrigerated subsistence; S—Nonrefrigerated subsistence (less combat rations); C—Combat rations (including gratuitous health and welfare items).

(b) Class II. Clothing, individual equipment, tentage, organizational tool sets and tool kits, hand tools, administrative, and housekeeping supplies and equipment. Subclassifications for Class II are: B—Ground support materiel (includes power generators and construction, barrier, bridging, fire fighting, petroleum, and mapping equipment); E—General supplies; F—Clothing and textiles; M—Weapons; and T—Industrial supplies (includes bearings, block and tackle, cable, chain, wire rope, screws, bolts, studs, steel rods, plates, and bars).

(c) Class III. Petroleum, oils, and lubricants: Petroleum fuels, lubricants, hydraulic and insulating oils, preservatives, liquid and compressed gases, bulk chemical products, coolants, deicing and antifreeze compounds, together with components and additives of such products, and coal. Subclassifications for Class III are: A—Air; and W—Ground (surface).

(d) Class IV. Construction: Construction materials to include installed equipment, and all fortification/barrier materials. (No subclassifications.)

(e) Class V. Ammunition: Ammunition of all types (including chemical, biological, radiological, and special weapons), bombs, explosives, mines, fuzes, detonators, pyrotechnics, missiles, rockets, propellants, and other associated items. Subclassifications for Class V are: A—Air; and W—Ground.

(f) Class VI. Personal Demand Items (Nonmilitary Sales Items). (No subclassifications.)

(g) Class VII. Major End Items: An end product or group of end products that is ready for its intended use; e.g., launchers, tanks, mobile machine ships, vehicles. Subclassifications for Class VII are: A—Air; B—Ground support materiel (includes power generators and construction, barrier, bridging, fire fighting, petroleum, and map-

ping equipment); D—Administrative vehicles (commercial vehicles utilized in administrative motor pools); G—Electronics; K—Tactical vehicles; L—Missiles; M—Weapons; and N—Special weapons.

(h) Class VIII. Medical Material including Medical Peculiar Repair Parts. (No subclassifications.)

(i) Class IX. Repair Parts and components to include kits, assemblies, and subassemblies, reparable and nonreparable, required for maintenance support of all equipment. Subclassifications for Class IX are the same as Class VII with addition of T—Industrial supplies (includes bearings, block and tackle, cable, chain, wire rope, screws, bolts, studs, steel rods, plates, and bars).

(j) Class X. Materiel to Support Nonmilitary Programs; e.g., Agricultural and Economic Development, Not included in Classes I-IX. *(Ref. 5) See also:* stores.

supply. The procurement, distribution, maintenance while in storage, and salvage of supplies, including the determination of kind and quantity of supplies.

(a) producer phase. The phase of military supply that extends from determination of procurement schedules to acceptance of finished supplies by the military Services.

(b) consumer phase. The phase of military supply that extends from receipt of finished supplies by the military Services through issue for use or consumption *(Ref. 5)*.

supply control. The process by which an item of supply is controlled within the supply system, including requisitioning, receipt, storage, stock control, shipment, disposition, identification, and accounting *(Ref. 5)*.

supply point. Any point where supplies are issued in detail *(Ref. 5)*.

suprapermafrost layer. Thickness of ground above the permafrost, consisting of active layer, talik, and also the pereletok, wherever present *(Ref. 12)*.

suprapermafrost water. Ground water above the permafrost table *(Ref. 11)*.

surface friction. *See:* friction.

surface geometry. The three-dimensional configuration of the terrain surface *(Ref. 35)*.

surface hoar. Ice crystals with a fernlike structure formed directly on a snow surface by sublimation.

surface inversion. A temperature inversion based on the surface of the earth; i.e., an increase of temperature with height beginning at the ground level. This condition is due primarily to greater radiative loss of heat at and near the surface than at levels above *(Ref. 3)*.

surface resistivity *or* **sheet resistance.** Of a material, the ratio of the potential gradient parallel to the current along its surface to the current per unit width of the surface, usually expressed in ohms. Surface resistivity of a material is numerically equal to the resistance between two electrodes forming opposite sides of a square on the surface of the material, the square size being immaterial *(Ref. 4)*.

surface runoff. The part of the runoff that travels over the soil surface to the nearest stream channel. It is also defined as that part of the runoff of a drainage basin that has not passed beneath the surface since precipitation *(Ref. 6)*.

surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 in. in thickness *(Ref. 16)*.

surface storage. The part of precipitation retained temporarily at the ground surface as interception or depression storage so that it does not appear as infiltration or surface runoff either during the rainfall or shortly thereafter *(Ref. 3)*.

surface temperature. *See:* temperature, surface.

surface tension; *also* surface energy; surface free energy; capillary forces; interfacial tension. A phenomenon peculiar to the surface of liquids, caused by an attraction towards the interior of the liquid acting on the liquid molecules in or near the surface in such a way to reduce the surface area. An actual tension results. It is proper to speak of the "surface energy" of solids, but not their "surface tension".

surface water. Water on the surface of the earth *(Ref. 6)*.

surface wave propagation. 1: A form of propagation for electromagnetic waves at frequencies less than 30 MHz in which the waves tend to travel along the interface

between the surface of the earth and the upper atmosphere.

2: A mode of elastic vibration of a solid such that the energy of the elastic wave is concentrated at the surface with little or no bulk vibrations.

surge. A relatively sudden and vigorous movement, of an airmass, or an airmass property, in some particular direction. Also used for pressure increases not explained by the more usual meteorological pattern.

survey, geodetic. A survey that takes into consideration the size and shape of the earth; implies a reference spheroid that represents the geoid and the horizontal and vertical control datums *(Ref. 12)*.

survey meter. A portable instrument, such as a Geiger counter or ionization chamber, used to detect nuclear radiation and to measure the dose rate *(Ref. 12)*.

survey, plane. A survey in which the effect of the curvature of the earth is almost entirely neglected, and computations of the relative positions of the stations are made using the principles of plane geometry and trigonometry *(Ref. 12)*.

swale. A slight depression in generally level land, usually covered with a rank growth of grass and often marshy *(Ref. 21)*.

swamp. 1: In general, any area of continuously saturated or spongy ground having poor drainage.

2: *Botany.* An area of continuously saturated ground, supporting large aquatic plants having submerged or floating leafy shoots, often dominated by shrubs and trees *(Ref. 11)*.

Specifically, a swamp is a tract of low-lying land that is saturated with moisture and usually overgrown with the vegetation; it differs from a marsh in that it is not ordinarily covered with water, and from a bog in that the latter consists largely of decaying vegetation.

S-wave; *also* secondary wave; shear wave; transverse wave. A transverse body wave that travels through the interior of an elastic medium. Originally applied to earthquake seismology where it was the second (hence: S) type of wave to arrive at a recording station *(Ref. 1)*.

sway space. The total space occupied by all parts of a resiliently supported body during all of its possible translational and rotational elastic excursions from its static or quiescent position *(Ref. 1)*.

sweat. Condensed water vapor on a relatively cold surface, similar to dew. The term "dew" usually refers to condensed vapor on natural objects such as leaves and grass when they are cooled during the night, while sweat refers more specifically to condensed vapor on a manmade object, such as a pipe or an instrument, at any time *(Ref. 15)*.

sweep. An increase or decrease of applied vibration test frequency between two frequency limits, the rate of change of frequency being a particular function of time or frequency *(Ref. 1)*.

sweep rate. In vibration testing, (a) The rate of change of applied frequency, expressed as a function of time or frequency: (b) The instantaneous value of the rate of change at a particular time or frequency *(Ref. 1)*.

swell; *also* rise. 1: Ocean waves that have traveled out of their generating area. Swell characteristically exhibits a more regular and longer period and has flatter crests than waves within their fetch.

2: A long, broad elevation that rises gently and generally smoothly from the sea floor *(Ref. 18)*.

swell-and-swale. Topography consisting of gently, well-rounded hills alternating with corresponding subdued depressions. Such topography is characteristic of the ground moraines of continental glaciers *(Ref. 32)*.

swelling. The expansion of porous material caused by the sorption of swelling liquids, such as water, when the liquid content of the material is below the saturation point for the liquid sorbed *(Ref. 1)*.

swept random vibration. *See:* vibration, swept random.

swimming capability. As applied to vehicles, the ability of a vehicle to negotiate water obstacles by propelling itself across, without being in contact with the bottom *(Ref. 12)*.

symbolic form. Conventions of arrangement used by international agreement for transmitting weather information in order to conserve time and expense *(Ref. 12)*.

syncline. A trough or fold of stratified rock

in which the beds incline downward toward each other from either side.

synergism. The cooperative action of separate substances so that the total effect is greater than the sum of the effects of the substances acting independently *(Ref. 9)*.

synoptic. In general, pertaining to or affording an overall view. In meteorology, this term has become somewhat specialized in referring to the use of meteorological data obtained simultaneously over a wide area for the purpose of presenting a comprehensive and nearly instantaneous picture of the state of the atmosphere. Thus, to a meteorologist, synoptic takes on the additional connotation of simultaneity *(Ref. 3)*.

synoptic climatology. The study and analysis of climate in terms of synoptic weather information principally in the form of synoptic charts. The information thus obtained gives the climate of a given locality in a given synoptic situation, rather than the usual climatic parameters which represent averages over all synoptic conditions *(Ref. 1)*.

synoptic meteorology. The study and analysis of synoptic weather information (synoptic charts, synoptic weather observations) *(Ref. 3)*.

synoptic weather chart. A chart of any extended portion of the surface of the earth on which are delineated the weather conditions at different points observed at the same moment of actual time *(Ref. 12)*.

system effectiveness. The probability that a system can successfully meet an operational demand within a given time when operated under specified conditions *(Ref. 33)*.

systemic pesticide. A pesticide chemical that is carried to other parts of a plant or animal after it is ingested or taken up from the soil or body surface *(Ref. 9)*.

T

T *Abbr. for* tera (10^{12}); Tropical (air or region).

tableland. A flat or undulating elevated area; a plateau or mesa *(Ref. 10)*.

table, water. *See:* water table.

tabular iceberg *or* **shelf berg.** A mass of ice, with a flat tablelike surface and an upper portion formed of stratified snow or firn, which has calved from an ice shelf *(Ref. 11)*.

TACOM *Abbr. for* U S Army Tank-Automotive Command.

tactical air transport operations. The carriage of passengers and cargo within a theater by means of *(Ref. 5)*:

(a) Airborne operations: (1) parachute assault; (2) helicopter-borne assault; and (3) air landing.

(b) Air logistic support.

(c) Special missions.

(d) Aeromedical evacuation missions.

tactical locality. An area of terrain that, because of its location or features, possesses a tactical significance in the particular circumstances existing at a particular time *(Ref. 5)*.

taiga. A term of Russian origin for the circumboreal or circumpolar forest belt of the Northern Hemisphere. The predominant trees of the taiga are conifers, principally pine, fir, spruce, and larch; hardwood species also occur, as birch, aspen, and alder *(Ref. 11)*.

talik. A Russian term applied to permanently unfrozen ground in regions of permafrost. It usually applies to a layer that lies above the permafrost, but below the active layer *(Ref. 12)*.

talus. A collection of fallen disintegrated material that has formed a slope at the foot of a steeper declivity *(Ref. 10)*.

tamarack. Any of several American larches; especially the American or black larch found in cool swamps or uplands of Canada, Alaska, and the northern United States.

tangential acceleration. In curvilinear motion, tangential acceleration is the component of the total acceleration taken in the direction of the velocity tangent to the path of motion.

tangential adfreezing strength. The resistance to the force required to shear off an object that is frozen to the ground, and to overcome the friction along the plane of contact between the ground and the object *(Ref. 11)*.

tape sampler method. A technique for sampling particulates for periods of less than 24 hr; not a reference method.

tapioca snow. *See:* graupel.

tarn. A small mountain lake or pool *(Ref. 10)*.

tarnish. Discoloration of metallic surfaces by corrosion products that result in an adherent film covering the metal surface *(Ref. 34)*.

tarpaulin. A term loosely used to refer to any of a variety of cloth or plastic sheets, either waterproof or not, that are used to cover items, and to provide some protection from precipitation, sand, dust, etc. Originally, canvas waterproofed by impregnation with tar.

taxonomy. The science of scientific classification, especially of animals and plants.

TDSP *Abbr. for* Office of Technical Data and Standardization Policy.

technical supply operations. Operations performed by supply units or technical supply elements of supply and maintenance units in acquiring, accounting for, storing, and issuing Class II and IV items needed by supported units and maintenance activities *(Ref. 5)*.

tectonic force. A force originating within the interior of the earth, resulting from the expansion, contraction, or the transfer of

molten matter, involving both the deformation of the crust of the earth and the movement of molten material from one place to another.

telemeter. The measuring, transmitting, receiving, and indicating apparatus for obtaining the value of a quantity at a distance. The radiosonde system is a meteorological example of a telemeter *(Ref. 3)*.

telemetry. The science concerned with measuring a quantity or quantities; transmitting the results to a distant station; and interpreting, indicating, or recording the quantities measured *(Ref. 7)*.

telephotometer *or* **transmissometer;** *also* **transmittance meter; hazemeter.** An instrument for measuring the extinction coefficient of the atmosphere and for the determination of visual range. When specifically used to measure the transmissivity of the intervening atmosphere (or other medium), it is usually called a transmissometer *(Ref. 3)*.

temperate climate. Very generally, the climate of the "middle" latitudes; the variable climate between the extremes of tropical climate and polar climate. This term has no precise meaning and cannot be used to delimit a particular range of climatic conditions *(Ref. 1)*.

temperate rainforest. A type of forest that exists in cool but generally frost-free regions of heavy annual precipitation *(Ref. 1)*.

temperature chamber. *See:* chamber, temperature.

temperature coefficient of resistivity. A measure of the rate of change of electrical resistivity with temperature.

temperature gradient. The change in temperature per unit distance between one point and another.

temperature inversion. A layer of air in which temperature increases with altitude. The principal characteristic of an inversion layer is its marked static stability, so that very little turbulent exchange can occur within it *(Ref. 1)*.

temperature, mean radiant. The temperature at which an object gives out as much radiation as it receives from its surroundings *(Ref. 1)*.

temperature shock. 1: A sudden, severe change in the temperature of a piece of equipment.

2: An environmental test intended to simulate the effect of such a change. *(Ref. 1)*

temperature, surface. 1: *Meteorology.* The temperature of the air near the surface of the earth, almost invariably determined by a thermometer in an instrument shelter. Also called shelter temperature.

2: *Oceanography.* The temperature of the layer of sea water nearest the atmosphere. It is generally determined either as bucket temperature or injection temperature. *(Ref. 3)*

temporarily airborne dust. Particles made airborne by artificial means or by natural winds, whose settling velocities are sufficiently low that they can remain airborne for a considerable time. Such particles have sizes between 2 and 150 μm and settling velocities from 2 to 90 cm s^{-1}.

temporary threshold shift (*Abbr.* TTS). A temporary loss of sensitivity to sound of the human ear.

tensile strength. A term denoting the greatest longitudinal tensile stress a substance can bear without tearing apart or rupturing *(Ref. 4)*.

tensile stress. Force, per unit cross-sectional area, applied to elongate a material *(Ref. 4)*.

tension set. The condition when a plastic material shows permanent deformation caused by stress, after the stress is removed *(Ref. 4)*.

TER *Abbr. for* triple ejection rack.

terminal moraine; *also* **end moraine; frontal moraine.** A rampart of drift, predominantly till, deposited at the terminus of a glacier *(Ref. 11)*.

terminal operations. The reception, processing, and staging of passengers; the receipt, transit storage, and marshalling of cargo; the loading and unloading of ships or aircraft; and the manifesting and forwarding of cargo and passengers to destination *(Ref. 5)*.

terminal velocity. Hypothetical maximum

speed a body could attain along a specified path under given conditions of weight and thrust if moving through an unlimited distance in air of specified uniform density *(Ref. 5)*.

termites. Any of numerous white or pale-colored soft-bodied social insects (order Isoptera) that live in colonies. They are found in the Temperate Zones and the Tropics and are very destructive to wooden structures, especially those in contact with the ground.

terrace. 1: A berm, or discontinuous segments of a berm, in a valley at some height above the flood plain, representing a former abandoned flood plain of the stream *(Ref. 6)*.

2: A relatively narrow plain or bench on the side of a slope terminating in a short declivity; a plain, natural or artificial, from which the surface descends on one side and ascends on the other *(Ref. 10)*.

terrain. An area considered as to its extent, and manmade and natural features in relation to its use for military operations *(Ref. 42)*.

terrain analysis. The process of interpreting a geographical area to determine the effect of the natural and manmade features on military operations. This includes the influence of weather and climate on those features *(Ref. 42)*.

terrain analyzer. A mobile instrument developed by the Land Locomotion Laboratory for rapid measurement and automatic reduction of soil strength and terrain profile data, consisting of a mounting vehicle, a bevameter, a gyro-referenced two-point profile follower, and electronic components.

terrain estimate. The portion of an analysis of the area of operations that concerns the description of the terrain, the military aspects of the terrain, and the effects of the characteristics of terrain on enemy and friendly courses of action, including their influence on the response to nuclear weapon effects *(Ref. 42)*.

terrain evaluation. The valuation and interpretation of an area of probable military operations to determine the effect of the terrain on the lines of action open to opposing forces in this area *(Ref. 12)*.

terrain factor. A specific attribute of the terrain that can be described in quantitative terms *(Ref. 35)*.

terrain intelligence. Processed information on the military significance of natural and manmade characteristics of an area *(Ref. 5)*.

terrain profile. A geometric representation of the surface of the earth as an amplitude-distance curve *(Ref. 1)*.

terrain study. An analysis and interpretation of natural and manmade features of an area, their effects on military operations, and the effects of weather and climate on those features *(Ref. 5)*.

terrain trafficability. The ability of terrain to support the passage of vehicles *(Ref. 35)*.

terrain type. A region throughout which a specified assemblage of terrain factors occurs *(Ref. 35)*.

terrestrial climates. All the climates observed to occur on or near (within the atmosphere) the surface of the earth.

terrestrial environment. The land area of the earth, including its manmade and natural surface and subsurface features, and its interfaces and interactions with the atmosphere and the oceans *(Ref. 5)*.

terrestrial radiation *or* earth radiation. The total infrared radiation emitted from the surface of the earth; to be carefully distinguished from effective terrestrial radiation, atmospheric radiation, and insolation *(Ref. 3)*.

terrestrial scintillation. *See:* atmospheric boil.

terrestrial surface radiation. Radiation emitted by the surface of the earth.

tessellated. Having a checkered or mottled appearance.

test, accelerated. A test designed to shorten testing time by increasing the severity of the test. This includes what might be termed "aggravated" testing where the limits are extended so as to introduce a greater degree of severity *(Ref. 1)*.

test, destructive. 1: A test in which materiel or equipment is subjected to environmental conditions that are inherently damage-producing or destructive.

2: A test in which materiel or equipment is intentionally damaged to determine its damage or fatigue resistance. *(Ref. 1)*

test, endurance. A dynamic fatigue test (e.g.,

vibration test) usually conducted at accelerated stress levels *(Ref. 1)*.

test, environmental field. A test in which a piece of equipment or an entire system is exposed or operated under natural environmental conditions *(Ref. 1)*.

test, environmental simulation. A test in which a piece of equipment or an entire system is exposed or operated under simulated service conditions, usually in a laboratory *(Ref. 1)*.

test, nondestructive. 1: A test in which materiel or equipment is subjected to environmental conditions that are inherently nondamaging or nondestructive. 2: A test in which materiel or equipment is subjected to inherently damage-producing conditions, but the stress levels or exposure times are intentionally reduced to prevent equipment damage or destruction *(Ref. 1)*.

test, simulated service. A controlled test, usually conducted in a laboratory, designed to produce results having a meaningful relationship to those produced in service under natural environmental conditions *(Ref. 1)*.

textural class. *Pedology.* Kinds of soil material according to the proportions of sand, silt, and clay. The principal U S Department of Agriculture textural classes in soil, in increasing order of the amount of silt and clay, are as follows: sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay *(Ref. 16)*.

thalweg. *Geology.* 1: The line following the lowest part of a valley, whether under water or not.

2: The line of continuous maximum descent from any point on a land surface, or that line cutting all contours at right angles *(Ref. 1)*.

thaw. A weather condition occurring when the temperature rises above the freezing point and ice and snow melt *(Ref. 11)*.

thawing index. The number of degree days (above and below 32°F) between the lowest and highest points on the cumulative degree days-time curve for one thawing season. It is used as a measure of the combined duration and magnitude of above-freezing temperatures occurring during any given thawing season *(Ref. 11)*.

theater. The geographical area outside continental United States for which a commander of a unified or specified command has been assigned military responsibility *(Ref. 5)*.

theodolite. An optical instrument that consists of a sighting telescope mounted so that it is free to rotate around horizontal and vertical axes, and graduated scales so that the angles of rotation may be measured. The telescope is usually fitted with a right-angle prism so that the observer continues to look horizontally into the eyepiece, whatever the variation of the elevation angle. In meteorology, the theodolite is used principally to observe the motion of a pilot balloon *(Ref. 3)*.

theoretical gravity. The value of gravity at the surface of the earth if the earth were a perfect sphere with no variation in mass to induce anomalies *(Ref. 40)*.

thermal. A relatively small-scale, rising current of air produced when the atmosphere is heated enough locally by the surface of the earth to produce absolute instability in its lowest layers. For example, glider pilots seek out and ride "thermals", showing how strong and persistent the thermal updraft may be *(Ref. 1)*.

thermal aging. Exposure to a given thermal condition or a programmed series of conditions for prescribed periods of time *(Ref. 4)*.

thermal alloying. The act of uniting two different metals to make one common metal by the use of heat *(Ref. 4)*.

thermal barrier. 1: A popular term for flight speed limitations imposed by aerodynamic heating. Also called the heat-barrier *(Ref. 7)*.

2: An insulation wall, layer, blanket, enclosure, or heat exchanger designed to protect equipment from the effects of high temperatures *(Ref. 1)*.

thermal breakdown. The physical or chemical degradation of material to the point of failure as a result of exposure to thermal energy.

thermal conductivity. An intrinsic physical property of a substance, describing its ability to conduct heat as a consequence of molecular motion *(Ref. 1)*.

thermal deterioration. Impairment of physi-

cal properties due to effects of high or very low temperatures *(Ref. 1)*.

thermal efficiency. *Climatology*. An expression of the effectiveness of temperature in determining the rate of plant growth, assuming sufficient moisture *(Ref. 1)*.

thermal expansion. The expansion of a material when subjected to heat *(Ref. 4)*.

thermal exposure. 1: The total normal component of thermal radiation striking a given surface throughout the course of a detonation; expressed in the units: calories per square centimeter *(Ref. 12)*.

2: The total incident thermal energy to which materiel or personnel are exposed over a specified time period.

thermal heating. Aerodynamic heating produced by supersonic and hypersonic travel through the atmosphere; transfer of heat from a laminar or turbulent flow around the nose of a reentry body as it loses kinetic energy *(Ref. 40)*.

thermal instability. 1: The instability resulting in free convection in a fluid heated at a boundary.

2: *Meteorology*. The instability of a body of air with respect to its temperature distribution. *(Ref. 1)*

thermal load. 1: The sum of the thermal energy generated in or received by a component or assembly.

2: Stresses imposed upon a missile structure because of expansion or contraction (or both) of certain structural elements by aerodynamic heating during flight and reentry, by exposure to the heat of a rocket flame, or by cooling effects of liquid oxygen in the oxidizer system *(Ref. 40)*.

thermal noise. *See:* noise, thermal.

thermal pollution. Degradation of water quality by the introduction of a heated effluent; primarily a result of the discharge of cooling waters from industrial processes, particularly from electrical power generation. Even small deviations from normal water temperatures can affect aquatic life. Thermal pollution usually can be controlled by cooling towers *(Ref. 9)*.

thermal radiation. 1: The heat and light produced by a nuclear explosion.

2: Electromagnetic radiations emitted from a heat or light source as a consequence of its temperature; it consists essentially of ultraviolet, visible, and infrared radiations. *(Ref. 5)*

thermal rating. 1: The maximum or minimum temperature at which a material will perform its function without undue degradation *(Ref. 4)*.

2: The maximum power dissipation that a component can absorb without exceeding its rated temperature.

thermal shock. *See:* temperature shock.

thermal stacking. The process by which a low level input of energy to an electroexplosive device gradually raises the temperature to the initiation temperature.

thermistor. A device whose electrical resistance varies markedly and monotonically with temperature and that possesses a negative temperature coefficient of resistivity. The thermistors used in meteorology are composed of solid semiconducting materials whose resistance decreases about 4 percent per deg C of temperature increase. They are constructed in a variety of sizes, and may be obtained with thermal time-constants of a millisecond or less. Meteorological applications include thermometers, anemometers, and bolometers. *(Ref. 3)*

thermocouple. A temperature-sensing element that converts thermal energy directly into electrical energy. In its basic form, it consists of two dissimilar metallic electrical conductors connected in a closed loop. One pair of junctions form a thermocouple, several pairs form a thermopile *(Ref. 1)*.

thermodynamics. The branch of physics that deals with heat and its use and with the associated statistics of molecular motion.

thermogram. The record of a thermograph *(Ref. 3)*.

thermograph. 1: A self-recording thermometer. The thermometric element is most commonly either a bimetallic strip or a bourdon tube filled with a liquid. *(Ref. 1)*

2: A graphic display of the temperature distribution of a surface.

thermokarst. Karst-like topographic features produced by the melting of ground ice and the subsequent settling or caving of ground, characterized by an uneven topography with short ravines, sink holes, funnels, and caverns similar to those produced in a limestone terrain by the solvent action of water *(Ref. 12)*.

thermometer. An instrument for measuring temperature by utilizing the variation of the physical properties of substances according to their thermal states *(Ref. 1)*.

thermometer, maximum. *See:* **maximum thermometer.**

thermometer, minimum. *See:* **minimum thermometer.**

thermometer, sonic. *See:* **sonic thermometer.**

thermopile. A transducer for converting thermal energy directly into electrical energy. It is composed of pairs of thermocouples that are connected either in series or in parallel. The output voltage of *n*-pairs of series-connected thermocouples is *n*-times the voltage developed by a single pair, while the current developed by *n*-pairs of parallel-connected thermocouples is *n*-times the current developed by a single pair. Thermopiles are used in thermoelectric radiation instruments when the output of a single pair of thermocouples is not large enough *(Ref. 3)*.

thermoplastic. Becoming soft or capable of being molded when hot and hardening again when cooled.

thermosetting. The act of a material changing from a liquid, paste, or plastic form to an elastomeric or rigid form, due to the application of heat *(Ref. 4)*.

thin natural screen. Natural growth left in front of entrenchments and emplacements to aid in concealing them *(Ref. 12)*.

threshold of audibility. The sensitivity of human hearing at a particular test frequency.

threshold contrast. The smallest contrast of luminance that is perceptible to the human eye under specified conditions of target visual angle and adaptation luminance.

thunder. The sound emitted by rapidly expanding gases along the channel of a lightning discharge *(Ref. 1)*.

thunderhead. A popular term for the incus ("anvil") of a cumulonimbus cloud; or, less appropriately, the upper portion of a swelling cumulus, or the entire cumulonimbus *(Ref. 3)*.

thunderstorm. A cumulonimbus cloud that produces thunder and/or lightning, sometimes hail, gusts, and tornadoes; set off by convergence, frontal activity, orographic life, or surface convection *(Ref. 13)*.

tidal current. The alternating horizontal movement of water associated with the rise and fall of the tide caused by the astronomical tide-producing forces. In relatively open locations, the direction of tidal currents rotates continuously through 360 deg diurnally or semidiurnally. In coastal regions, the nature of tidal currents is determined by local topography as well *(Ref. 18)*.

tidal flat. A marsh or sandy or muddy coastal flatland that is covered and uncovered by the rise and fall of the tide *(Ref. 18)*.

tidal marsh. Any marsh or flatland, the surface of which is wetted by a tidal flow *(Ref. 10)*.

tidal wave. *See:* **tsunami.**

tide. The periodic rising and falling of the oceans and atmosphere. It results from the tide-producing forces of the moon and sun acting upon the rotating earth. This disturbance actually propagates as a wave through the atmosphere and through the surface layer of the oceans *(Ref. 18)*.

tide gage. A device for measuring the height of ocean tide. It may be simply a graduated staff in a sheltered location where visual observations can be made at any desired time, or it may consist of an elaborate recording instrument (sometimes called marigraph) making a continuous graphic record of tide height against time. Such an instrument is usually actuated by a float in a pipe communicating with the sea through a small hole that filters out the shorter waves *(Ref. 18)*.

tide pool. *See:* **pool.**

tie-down diagram. A drawing indicating the prescribed method of securing a particular item of cargo within a specified type of vehicle *(Ref. 5)*.

tie-down point pattern. The pattern of tie-down points within a vehicle *(Ref. 5)*.

till. Unsorted and unstratified rock fragments ranging in size from clay to boulders, deposited directly by a glacier. Sometimes called boulder clay or glacial till *(Ref. 11)*.

till plain. Relatively level area of ground moraine consisting of till *(Ref. 1)*.

timberline; *also* tree line; forest limit. 1: The upper limit of erect trees in mountainous regions.

2: The northern limit of erect trees in the Arctic. *(Ref. 11)*

time constant. *See:* **relaxation time.**

tolerance dose. The amount of radiation that may be received by an individual within a specified period with negligible results *(Ref. 5)*.

tombolo. A sandbar built by the sea, tying an island to the mainland *(Ref. 10)*.

tone. A sound wave characterized by definite frequency relationships as opposed to noise that has no definite frequencies.

topographic map. A map that presents the vertical position of features in measurable form as well as their horizontal positions *(Ref. 5)*. *See also:* **map.**

topographic plot. Representation, by means of contour lines, of the ground relief of an area shown in a stereoscopic model *(Ref. 12)*.

topography. The physical features, both natural and manmade, of the surface of the earth. In terrain analysis the following categories of topographical features are considered: relief, drainage, surface materials, vegetation, special physical phenomena, and manmade (cultural) features *(Ref. 42)*.

topsoil. The uppermost layer of the soil (the surface soil).

tornado. Any destructive wind gust or whirl associated with a pendant funnel or tubular cloud of very limited horizontal extent (when over water, a waterspout) *(Ref. 13)*. *See also:* **spout.**

torr. A unit for measurement of a state of vacuum, defined as 1/760th of a standard atmosphere; a torr is very nearly equal to a millimeter of mercury *(Ref. 1)*.

torsiograph. A type of vibrograph designed for the measurement of torsional vibration *(Ref. 1)*.

total materiel assets. The total quantity of an item available in the military system worldwide and all funded procurement of the item with adjustments to provide for transfers out of or into the inventory through the appropriation and procurement lead-time periods. It includes peacetime force material assets and mobilization reserve stock *(Ref. 5)*.

total pressure. *See:* **pressure, total.**

total totals index. The sum of the vertical and cross total indexes.

toughness. The ability of material to absorb energy during plastic deformation *(Ref. 1)*.

tourmaline. A mineral which is a complex silicate of primarily aluminum and boron but varying widely in chemical composition.

town fog. An ice fog created by extremely low temperatures (−50° to −65°F), usually noticeable over more or less densely inhabited places, because of the conflict between locally generated warm moist air and the surrounding cold air. At extremely low temperatures, such a fog may appear over a body of troops, herd of cattle, gasoline-powered vehicles, artillery fire, etc. *(Ref. 12)*.

townsend support. A fixed support mounting maximum and minimum thermometers of the liquid-in-glass type. The support holds the thermometers at the correct operating attitude and also permits their rotation for resetting when desired *(Ref. 3)*.

trafficability. Capability of terrain to bear traffic. It refers to the extent to which the terrain will permit continued movement of any and/or all types of traffic.

traffic circulation map; *also* circulation map. A map showing traffic routes and the measures for traffic regulation. It indicates the roads for use of certain classes of traffic, the location of traffic control stations, and the directions in which traffic may move *(Ref. 5)*.

traffic density. The average number of vehicles that occupy 1 mi or 1 km of road space, expressed in vehicles per mile or per kilometer *(Ref. 5)*.

traffic flow. The total number of vehicles passing a given point in a given time. Traffic flow is expressed as vehicles per hour *(Ref. 5)*.

train. 1: A service force or group of service elements that provides logistic support; e.g., an organization of naval auxiliary ships or merchant ships attached to a fleet for this purpose; similarly, the vehicles and

operating personnel that furnish supply, evacuation, and maintenance services to a land unit.

2: Bombs dropped in short intervals or sequence. *(Ref. 5)*

training wall. *See:* jetty.

transducer. A device for converting energy from one form to another. For example, a thermocouple transduces heat energy into electrical energy *(Ref. 3)*.

transfer area. In an amphibious operation, the water area in which the transfer of troops and supplies from landing craft to amphibious vehicles is effected *(Ref. 5)*.

transfer loader. A wheeled or tracked vehicle with a platform capable of vertical and horizontal adjustment used in the loading and unloading of aircraft, ships, or other vehicles *(Ref. 5)*.

transient vibration. *See:* vibration, transient.

transmissibility. The nondimensional ratio of the response amplitude of a system in a steady-state forced vibration to the amplitude of the vibration excitation. The ratio may be one of forces, displacements, velocities, or accelerations *(Ref. 22)*.

transmissibility, absolute. 1: For foundation motion excitation, the ratio of the vibration amplitude of a piece of equipment to the vibration amplitude of the structure to which it is mounted.

2: For force excitation from within a piece of equipment, the ratio of the force amplitude transmitted to the base on which the equipment is mounted to the amplitude of the existing force in the equipment. *(Ref. 22)*

transmissibility, relative. The ratio of the relative deflection amplitude of an isolator to the displacement amplitude imposed at the isolator base *(Ref. 22)*.

transmissometer. *See:* telephotometer.

transmittance *or* **transmissivity.** A measure of the amount of radiation propagated through a given medium; defined as the ratio of transmitted radiation to the total radiation incident upon the medium *(Ref. 3)*.

transonic. Of or pertaining to the speed of a body in a surrounding fluid when the relative speed of the fluid is subsonic in some places and supersonic in others. This is encountered when passing from subsonic to supersonic speeds and vice versa *(Ref. 5)*. *See also:* speed of sound.

transpiration. 1: The process by which water in plants is transferred as water vapor to the atmosphere.

2: The amount of water so transferred, usually as measured by use of a potometer or phytometer. *(Ref. 3)*

transport area. A sea area in the proximity of the landing beaches of an amphibious assault for transport unloading operations *(Ref. 5)*.

transportation. When considered as a component of the logistic cycle, transportation can be considered to be, in general terms, the movement of material from one geographic location to another.

transportation emergency. A situation that has been created by a shortage of normal transportation capability and of a magnitude sufficient to frustrate military movement requirements, and that requires extraordinary action by the President or other designated authority to insure continued movement of essential Department of Defense traffic *(Ref. 5)*.

transportation operating agencies. 1: *Military.* These agencies are the Military Traffic Management and Terminal Service, under the Department of the Army; the Military Sealift Command, under the Department of the Navy; and the Military Airlift Command, under the Department of the Air Force.

2: *Civil.* Those Federal agencies having responsibilities under national emergency conditions for the operational direction of one or more forms of transportation; they are also referred to as Federal Modal Agencies or Federal Transport Agencies. *(Ref. 5)*

transportation priorities. Indicators assigned to eligible traffic that establish its movement precedence. Appropriate priority systems apply to the movement of traffic by sea and air. In times of emergency, priorities may be applicable to continental United States movements by land, water, or air *(Ref. 5)*.

transport capacity. The capacity of a vehicle is defined by the number of persons and the tonnage (or volume) of equipment that can be carried by the vehicle under given conditions *(Ref. 5)*.

transport control center. *Air Transport.* The operations center through which the air transport force commander exercises control over the air transport system *(Ref. 5).*

transport network. The complete system of the routes pertaining to all means of transport available in a particular area. It is made up of the networks particular to each means of transport *(Ref. 5).*

transport stream. Transport vehicles proceeding in trail formation *(Ref. 5).*

transport vehicle. A motor vehicle designed and used without modification to the chassis, to provide general transport service in the movement of personnel and cargo *(Ref. 5).*

transverse dune. A ridge of sand oriented at a right angle to the direction of the prevailing wind. Cross-sectional shape is generally asymmetric and crested, with some areas rolling *(Ref. 1).*

transverse wave. *See:* wave, transverse.

trapping. The process whereby a fixed part of a vehicle, such as the bumper, comes in contact with the ground and prevents motion.

tree line. *See:* timberline.

trellis drainage. The pattern formed when major streams are arranged in relatively straight parallel lines with tributaries joining them at right angles.

triangulation. In popular usage, a trigonometric operation for finding a position or location by means of bearings from two fixed points separated by a known distance.

triaxial test; *also* **confined compression test.** *Soil Mechanics.* A test to determine the maximum shearing strength of a soil *(Ref. 1).*

triple point. The thermodynamic state at which three phases of a substance exist in equilibrium. For water, the triple point is at 273.16 K with a saturation vapor pressure of 6.11 mb.

tropical climate. The climate observed in the hot-wet tropics or torrid zone of the earth. The outstanding characteristics of tropical regions are hot, but not very hot, temperatures, frequent rain, and high humidity.

tropical cyclone. The general term for a cyclone that originates over the tropical oceans. By international agreement, tropical cyclones have been classified according to their intensity, as tropical depressions, tropical storms, and hurricanes or typhoons *(Ref. 1).*

tropical depression. A tropical cyclone in which the surface windspeed is less than 34 kt (39 mph) *(Ref. 1).*

tropical easterlies; *also* **subtropical easterlies.** A term applied to the trade winds when they are shallow and exhibit a strong vertical shear. With this structure, at about 5,000 ft the easterlies give way to the upper westerlies (antitrades) which are sufficiently strong and deep to govern the course of cloudiness and weather. The tropical easterlies occupy the poleward margin of the tropics in summer and can cover most of the tropical belt in winter *(Ref. 3).*

tropicalization. Preparation of materiel to limit infiltration of moisture into critical parts of equipment and to kill and discourage fungous growth, thereby permitting storage and use in tropical regions *(Ref. 12).*

tropicalized equipment. Materiel that has been especially prepared and treated for use in tropical climates.

tropical rainforest. A type of forest that exists in tropical regions where precipitation is heavy (generally more than 100 in. per yr). It consists mainly of a wide variety of lofty broadleaf evergreen trees that carry a profusion of parasitic or climbing plants *(Ref. 1).*

tropical storm. A tropical cyclone in which the surface windspeed is at least 34, but not more than 63 kt *(Ref. 5).*

tropopause. The transition zone between the stratosphere and the troposphere. The tropopause normally occurs at an altitude of about 25,000 to 45,000 ft in polar and temperate zones, and at 55,000 ft in the tropics *(Ref. 5). See also:* atmosphere.

troposphere. The lower layer of the atmosphere, extending 7 to 10 mi above the earth. Vital to life on earth, it contains clouds and moisture that reach earth as rain or snow *(Ref. 9).* The change of temperature with height is relatively large. It is the region where clouds form, convection is active, and mixing is

continuous and more or less complete *(Ref. 5). See also:* atmosphere.

tropospheric ducting. The sequential refraction downward by the atmosphere and reflection upward by the surface of the earth of radio frequency energy. It occurs when sharp rises in atmospheric temperature or a drop in water vapor content of the air above the surface produces a change in the refractive index of the atmosphere.

tropospheric scatter. The propagation of radio waves by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere *(Ref. 5).*

troubleshooting. Locating and diagnosing malfunctions or breakdowns in equipment by means of systematic checking or analysis *(Ref. 33).*

trough. *Meteorology.* An elongated area of relatively low atmospheric pressure; the opposite of a ridge *(Ref. 1).*

true convergence. The angle at which one meridian is inclined to another on the surface of the earth *(Ref. 5).*

true horizon. The boundary of a horizontal plane passing through a point of vision, or in photogrammetry, the perspective center of a lens system *(Ref. 5).*

true north. The direction from an observer's position to the geographic North Pole. The north direction of any geographic meridian *(Ref. 5).*

trunk air route. An established air route along which strategic moves of military forces can take place *(Ref. 5).*

tsunami; *also* **seismic sea wave;** *(popularly)* **tidal wave.** An ocean wave produced by a submarine earthquake, landslide, or volcanic eruption. These waves may reach enormous dimensions and have sufficient energy to travel across entire oceans. Tsunamis steepen and increase in height on approaching shallow water, inundating low-lying areas; and where local submarine topography causes extreme steepening, they may break and cause great damage. Tsunamis have no connection with tides; the popular name is entirely misleading *(Ref. 1).*

TTS *Abbr. for* temporary threshold shift.

tuberculation. A corrosion process in which localized, knoblike mounds are formed over a surface.

tundra. 1: A flat or gently rolling area, generally having a black, mucky soil underlain by permafrost, above or north of the timberline.

2: *Botany.* A mixture of several types of vegetation occurring in arctic and alpine districts, beyond and above timberline, where the plant cover includes low shrubs, herbs, sedges, grasses, lichens, and mosses *(Ref. 11).*

tundra soil. *Pedology.* One of a series of a zonal group of soils having a tough fibrous peaty mat underlain by a dark-colored humus-rich stratum, which grades into lighter colored gray or mottled soil beneath *(Ref. 11).*

turbidity. A thick, hazy condition of air due to the presence of particulates or other pollutants, or the similar cloudy condition in water due to the suspension of silt or finely divided organic matter *(Ref. 9).*

turbulence. A state of fluid flow in which the instantaneous velocities exhibit irregular and apparently random fluctuations so that in practice only statistical properties can be recognized and subjected to analysis *(Ref. 1).*

turbulent diffusion. A form of snow transport in which the snow particles are held in suspension by vertical mixing. It is most common during a snow storm when the snow on the ground is picked up in the turbulent air and mixed with falling snow.

turbulent flow. A fluid flow characterized by turbulence *(Ref. 3).*

tussock. A tuft of grasses or grasslike plants *(Ref. 11).*

TV *Abbr. for* television.

twilight. The periods of incomplete darkness following sunset (evening twilight) or preceding sunrise (morning twilight). Twilight is designated as civil, nautical, or astronomical, as the darker limit occurs when the center of the sun is 6, 12, or 18 deg below the celestial horizon, respectively *(Ref. 15).*

two-factor analysis. As used in this handbook, the analysis of the interdependency and effects on materiel of two environmental factors occurring simultaneously or near simultaneously.

typhoon. A severe tropical cyclone in the western Pacific *(Ref. 1). See also:* hurricane.

U

uhf *Abbr. for* ultrahigh frequency.

uhf band. The portion of the electromagnetic spectrum extending from approximately 2×10^8 to 2×10^9 Hz.

ullage. The amount by which a container is not full, resulting, for liquids, in a free liquid surface inside the container.

ultrasonic. Of or pertaining to sound frequencies above those that affect the human ear; i.e., above 20,000 Hz *(Ref. 14)*.

ultrasonic noise. Acoustic noise whose frequency is above the limit of human audibility.

ultraviolet degradation. The deleterious change in properties of various materials, especially plastics, caused by long-term exposure to sunlight or other ultraviolet-containing radiation *(Ref. 4)*.

ultraviolet degradation. The deleterious change in properties of various materials, especially plastics, caused by long-term exposure to sunlight or other ultraviolet-containing radiation *(Ref. 4)*.

umbra. The darkest part of a shadow in which light is completely cut off by an intervening object. A lighter part surrounding the umbra, in which the light is only partly cut off, is called the penumbra *(Ref. 15)*.

unbalance, dynamic. *See:* dynamic unbalance.

unbalance, static. *See:* static unbalance.

uncoupled mode. *See:* mode of vibration, normal.

undercurrent. A water current flowing beneath a surface current at a different speed or in a different direction *(Ref. 18)*.

underfilm corrosion. *See:* corrosion, underfilm.

underflow. 1: The downstream flow of water through the permeable deposits that underlie a stream *(Ref. 6)*.

2: Any movement of water below a structure such as underneath ice or in the soil.

undergrowth. The small trees, shrubby plants, and vines growing underneath a forest canopy *(Ref. 19)*.

understory. *Botany.* The young or stunted trees in a forest that are below the level of the main canopy *(Ref. 11)*.

undertow. 1: A seaward flow near the bottom of a sloping beach.

2: The subsurface return by gravity flow of the water carried up on shore by waves or breakers *(Ref. 18)*.

underway replenishment forces. A task force of fleet auxiliaries (consisting of oilers, ammunition ships, stores issue ships, etc.) adequately protected by escorts furnished by the responsible operational commander. The function of this force is to provide underway logistic support for naval forces *(Ref. 5)*.

undistorted accelerated aging. A short-term exposure of an item that attempts to produce the same aging effects as the related long-term natural exposure *(Ref. 1)*.

undisturbed. 1: *Geology.* Geologic structures in which the strata lie essentially horizontal or, as a coastal plain, with gentle seaward dip. Rocks lie in the attitudes in which they were originally formed.

2: *Soil Mechanics.* Undisturbed samples are samples in which the material has been so little disturbed that it is suitable for laboratory tests and thereby for approximate determination of the physical properties of the material *in situ*. *(Ref. 32)*

unfreezing. The upward movement of stones to the surface as a result of repeated freezing and thawing of the containing soil *(Ref. 11)*.

unit. 1: Any military element whose structure is prescribed by competent

authority such as a table of organization and equipment; specifically, part of an organization.

2: An organizational title of a subdivision of a group in a task force.

3: A standard or basic quantity into which an item of supply is divided, issued, or used. In this meaning, also called unit of issue. *(Ref. 26)*

unit hydrograph. The hydrograph of direct runoff from a storm uniformly distributed over the drainage basin during a specified unit of time; the hydrograph is reduced in vertical scale to correspond to a volume of runoff of 1 in. from the drainage basin *(Ref. 6)*.

unitized load. A single item, or a number of items packaged, packed, or arranged in a specified manner and capable of being handled as a unit. Unitization may be accomplished by placing the item or items in a container, or by banding them securely together. A unitized load, when placed on a pallet and fastened thereto, may further be referred to as a palletized load *(Ref. 26)*.

unit loading. The loading of troop units with their equipment and supplies in the same ships, aircraft, or land vehicles *(Ref. 5)*.

unit of issue. In its special storage meaning, refers to the quantity of an item; as each number, dozen, gallon, pair, pound, ream, set, or yard. Usually termed unit of issue to distinguish from "unit price" *(Ref. 5)*.

unit personnel and tonnage table. A table included in the loading plan of a combat-loaded ship as a recapitulation of totals of personnel and cargo by type, listing cubic measurements and weight *(Ref. 5)*.

unit reserves. Prescribed quantities of supplies carried by a unit as a reserve to cover emergencies *(Ref. 5)*. *See also:* **reserve supplies.**

unstable oscillation. *See:* **oscillation, unstable.**

unstable wave. A wave motion whose amplitude increases with time or whose total energy increases at the expense of its environment *(Ref. 3)*.

upland. A highland; ground elevated above the lowlands along rivers or between hills *(Ref. 10)*.

upper air. In synoptic meteorology and in weather observing, the portion of the atmosphere above the lower troposphere. No distinct lower limit is set but the term is generally applied to the levels above 850 mb *(Ref. 3)*.

upper front. A front that is present in the upper air but does not extend to the ground *(Ref. 3)*.

uprush. The updraft in a thunderstorm. The speed of the ascending current in a thunderstorm may be estimated from the size of hail produced and from study of a sounding representative of the air producing the thunderstorm.

upslope fog. A type of fog formed when air flows upward over rising terrain and is, consequently, adiabatically cooled to or below its dewpoint *(Ref. 3)*.

upward atmospheric radiation. Upward longwave atmospheric radiation.

upward effective radiation. Net radiation on a horizontal, downward-facing black surface at the ambient air temperature.

upward radiation. Upward solar, terrestrial surface and atmospheric radiation.

upward terrestrial radiation. Upward terrestrial surface and longwave atmospheric radiation.

upward terrestrial radiation surface. Terrestrial surface radiation as measured at the surface of emission.

upwelling. The process by which water rises from a lower to a higher depth, usually as a result of divergence and offshore currents. It is most prominent where persistent wind blows parallel to a coastline so that the resultant wind-driven current sets away from the coast *(Ref. 18)*.

urban heat island. A region of the atmosphere associated with an urban area that has a higher temperature than surrounding regions due to the cumulative effects of man's activities.

urban heat island circulation. The atmospheric circulation pattern associated with urban heat islands. It is self-contained, tends to trap atmospheric pollutants in the urban region, and can create a serious health problem.

useful life. *See:* **life, useful.**

U-shaped valley. A valley having a distinctive rounded profile and a gentle gradient bottom resulting from the abrasive and

plucking action of the glacier it once contained *(Ref. 11)*.

USASI *Abbr. for* United States of America Standards Institute (now ANSI).

USATEA *Abbr. for* U S Army Transportation Engineering Agency.

USC *Abbr. for* United States Code.

USCS *Abbr. for* Unified Soil Classification System.

USDA *Abbr. for* U S Department of Agriculture.

U S Standard Atmosphere *or* **standard atmosphere.** A hypothetic vertical distribution of atmospheric temperature, pressure, and density which, by international agreement, is taken to be representative of the atmosphere for purposes of pressure altimeter calibrations, aircraft performance calculations, aircraft and missile design, ballistic tables, etc. The air is assumed to obey the perfect gas law and the hydrostatic equation, which, taken together, relate temperature, pressure, and density variations in the vertical *(Ref. 3)*.

USSR *Abbr. for* Union of Soviet Socialist Republics.

UV *Abbr. for* ultraviolet.

UV band. *See:* **ultraviolet radiation.**

V

V *Abbr. for* volt.

vacuum. 1: An enclosed space from which air is evacuated to reduce the atmospheric pressure inside the enclosure to a very low value.

2: A region of space containing a negligible amount of matter. *(Ref. 1)*

valence. A measure of the capacity of an element or radical to combine with another indicated by the number of atomic weights of an univalent element (as hydrogen) with which the atomic weight of the element or the partial molecular weight of the radical will combine or replace. As an example, oxygen has a valence of two; i.e., one atom of oxygen will combine with two hydrogen atoms.

valley. A depression in the land surface, generally elongated and usually containing a stream; low land bounded by hills or mountains; a sink *(Ref. 10)*.

valley breeze. *See:* **breeze.**

valley glacier. A glacier that flows down a valley *(Ref. 31)*.

valley train. An outwash deposit extending downstream from a glacier terminus or terminal moraine, usually confined by valley sides. The valley train may or may not merge with the outwash plain *(Ref. 11)*.

valley wind. A wind that ascends a mountain valley (up-valley wind) during the day; the daytime component of a mountain and valley wind system *(Ref. 3)*.

Van Allen radiation belt. A belt of intense ionizing radiation that surrounds the earth in the outer atmosphere.

van der Waals' adsorption. A physical adsorption process in which the force of attraction is physical in nature, involving interaction between dipoles or induced dipoles.

vapor. Any substance existing in the gaseous state at a temperature lower than that of its critical point; i.e., a gas cool enough to be liquefied if sufficient pressure were applied to it *(Ref. 1)*.

vapor density. *See:* **absolute humidity.**

vaporization. *See:* **evaporation.**

vapor lock. A condition occurring in the fuel systems of internal combustion engines operating in very hot ambient temperatures. At high temperatures, gasoline vaporizes. When a pocket of vapor occurs in the fuel pump, the pump "loses prime" and does not pump fuel to the engine.

vapor pressure. 1: The pressure exerted by the vapor of liquid in a confined space such that vapor can form above it; the pressure exerted by a vapor in equilibrium with its solid or liquid form.

2: The pressure of water vapor in the air; the part of the total atmospheric pressure that is due to water vapor. *(Ref. 15)*

vapor trail. *See:* condensation trail.

varve. A pair of sediment layers ideally representing an annual record of melt water deposition in a glacier-fed lake or bay. The laminated soil structure of varves is similar in appearance to annual growth rings in trees. The sediments are known as varved clays or varved sediments *(Ref. 11)*.

vasoconstriction. The reduction in diameter (cross-sectional area) of blood vessels.

vascular. Pertaining to or associated with vessels, specifically blood vessels.

VCI *Abbr. for* vehicle cone index.

vector. Any quantity, such as force, velocity, or acceleration, that has both magnitude and direction at each point in space, as opposed to a scalar, which has magnitude only. Such a quantity may be represented geometrically by an arrow of length proportional to its magnitude, pointing in the assigned direction *(Ref. 3)*.

vehicle cargo. Wheeled or tracked equipment, including weapons, that requires certain deck space, head room, and other definite clearance *(Ref. 5)*.

vehicle cone index (*Abbr.* VCI). The index assigned to a given vehicle that indicates the minimum soil strength required for 40 to 50 passes of the vehicle *(Ref. 1)*.

vehicle ground mobility. The measure of the ability of an automotive vehicle to traverse the variety of terrain conditions, including inland waterways, found on the surface of the earth, in a minimum time with minimum support, and still to remain capable of performing its design function *(Ref. 1)*.

velocity. Rate of motion in a given direction *(Ref. 15)*.

velocity damping. *See:* viscous damping.

velocity pickup. A small, electromagnetic generator employed to measure the instantaneous velocity of a vibrating object. The coil or magnet of the generator is mounted on a soft suspension so that it remains stationary when the generator is mounted on a vibrating surface. It is of limited value because of its bulk and weight.

velocity pressure. *See:* pressure, velocity.

velocity shock. *See:* shock, velocity.

velocity, terminal. *See:* terminal velocity.

ventifact. A stone fashioned or modified by wind-driven debris *(Ref. 11)*.

venturi tube. A tube designed to measure the rate of flow of fluids. It consists of a tube having a constriction or throat at its midsection. The difference between the pressure measured at the inlet and at the throat is a function of the fluid velocity *(Ref. 1)*.

vertical component of direct solar radiation. Solar radiation coming from the solid angle of the solar disk, as received on a horizontal surface.

vertical obstacle. An obstacle that forces a vehicle to move in the vertical plane while surmounting it *(Ref. 35)*.

vertical totals index. The 500-mb dry-bulb temperature subtracted from the 850-mb dry-bulb temperature.

vertical velocity. *Meteorology.* The component of the velocity vector along the local vertical *(Ref. 3)*.

VFR *Abbr. for* visual flight rules.

vhf *Abbr. for* very high frequency.

vhf band. The portion of the electromagnetic spectrum extending from approximately 2×10^7 to 2×10^8 Hz.

vibrating string accelerometer. An accelerometer employing two vibrating strings. It is sensitive to accelerations along the string axis. Application of such accelerations produces tension differences in the two strings causing the natural frequencies of the strings to vary accordingly.

vibration. 1: A periodic or random motion of the particles in an elastic body in alternately opposite directions *(Ref. 14)*.
2: The variation with time of the magnitude of a quantity, which is descriptive of the motion or position of a mechanical system, when the magnitude is alternately greater and smaller than some average value *(Ref. 8)*.

vibration absorber. A device that dissipates energy to modify the response of the mass that houses a vibration source, and thus to reduce or prevent vibration transmission to other structures to which the vibration source is attached.

vibration annoyance level. The exposure

level at which the severity of vibration on man elicits an annoyance reaction. The annoyance level varies with frequency; maximum human sensitivity occurs in the range of 6 to 15 Hz.

vibration, complex wave. Vibration consisting of sinusoidal components that are not harmonically related to one another *(Ref. 1).*

vibration control. Any of various methods employed to reduce vibration levels applied to man and materiel.

vibration, forced *or* forced oscillation. The vibration of a system imposed by an excitation. If the excitation is periodic and continuing, the oscillation is steady-state *(Ref. 38).*

vibration isolator. A resilient support that absorbs the energy of impressed steady-state excitation and tends to isolate a system from its effects *(Ref. 22).*

vibration machine. An apparatus designed to impress controlled and reproducible mechanical vibrations on a mechanical system *(Ref. 22).*

vibration response. The motion or other type output resulting from dynamic excitation *(Ref. 37).*

vibration, self-induced *or* self-excited. The vibration resulting from conversion, within the system or apparatus, of nonoscillatory excitation to oscillatory excitation *(Ref. 38).*

vibration spectra. An analysis of a vibration in which frequency is plotted versus amplitude.

vibration, steady-state. *See:* **vibration, forced.**

vibration, swept random. A type of random vibration test in which the test specimen is subjected to a narrowband or random excitation, swept across the total frequency spectrum. The bandwidth of the filter may be constant or a constant percentage of the center frequency *(Ref. 1).*

vibration, transient. A vibration of short duration occurring in a mechanical system. It may consist of forced or free vibration, or both *(Ref. 22).*

vibratory reed meter. A device to measure the frequency of an excitation by detecting the resonance of one or more vibratory reeds *(Ref. 1).*

vibrograph. A recording unit employing a mass-spring pickup that provides an output proportional to displacement. The output is usually recorded on a moving chart.

virga. Wisps or streaks of water or ice particles falling out of a cloud but evaporating before reaching the surface of the earth as precipitation *(Ref. 1).*

virtual pressure. The pressure of a parcel of moist air when it has the same density as a parcel of dry air at the same temperature *(Ref. 3).*

virtual temperature. The fictitious temperature that dry air must have at a given pressure in order to have the same density as moist air at the same pressure *(Ref. 1).*

viscometer. An instrument for measuring flow properties. The term viscometer is preferred to viscosimeter *(Ref. 1).*

viscosity. 1: The molecular property of a fluid that enables it to support tangential stresses for a finite time and thus to resist deformation *(Ref. 3).*

2: The property of a fluid that resists internal flow by releasing counteracting forces *(Ref. 1).*

viscosity, absolute. For a given liquid, the force that will move 1 cm^2 of plane surface with a speed of 1 cm s^{-1} relative to another parallel plane surface from which it is separated by a layer of the liquid 1 cm thick. This viscosity is expressed in dynes per square centimeter, the unit being the poise, which is equal to 1 g cm^{-1} s^{-1} *(Ref. 1).*

viscosity, dynamic. The ratio of the shearing stress to the shear of the motion in a fluid. It is independent of the velocity distribution, the dimensions of the system, and the pressure of a gas, except at very low pressures. Its numerical value is the coefficient of (molecular) viscosity. For dry air at 0°C, the dynamic viscosity is about 1.7×10^{-4} g cm^{-1} s^{-1} *(Ref. 3).*

viscosity, kinematic. A coefficient defined as the ratio of the dynamic viscosity of a fluid to its density. The kinematic viscosity of most gases increases with increasing temperature and decreasing pressure. For dry air at 0°C, the kinematic viscosity is about 0.13 cm^2 s^{-1} *(Ref. 1).*

viscous damping. Damping occurring where

there is relative motion between two well-lubricated surfaces and where a viscous fluid is forced through a relatively long passage of small cross-sectional area. The damping force is a linear function of velocity.

visibility. In United States weather observing practice, the greatest distance in a given direction at which it is just possible to see and identify with the unaided eye *(Ref. 1)*: (a) In the daytime, a prominent dark object against the sky at the horizon, and (b) At night, a known, preferably unfocused, moderately intense light source.

visibility chart. Map or photograph showing areas that can be seen, and that cannot be seen, from a given observation point *(Ref. 12)*.

visible radiation. Electromagnetic radiation lying within the wavelength interval to which the human eye is sensitive, the interval from approximately 380 to 760 nm (4,000 to 8,000 Å) *(Ref. 1)*.

visible spectrum. The portion of the electromagnetic spectrum occupied by the wavelengths of visible radiation, i.e., from 400 to 700 nm.

visual range *or* daytime visual range. The distance, under daylight conditions, at which the apparent contrast between a specified type of target and its background becomes just equal to the threshold contrast of an observer; to be distinguished from the night visual range. The visual range is a function of the atmospheric extinction coefficient, the albedo and visual angle of the target, and the observer's threshold contrast at the moment of observation *(Ref. 3)*.

vlf *Abbr. for* very low frequency.

vlf band. The portion of the electromagnetic spectrum extending from 0 to 10^4 Hz.

void ratio. The ratio of the volume of voids in a body to the volume of solid material in the body. A body without voids has a void ratio of zero *(Ref. 32)*.

volatilization. The evaporation or changing of a substance from liquid to vapor *(Ref. 16)*.

volcanic ash. Fine particles of lava that have been ejected from a volcano in eruption. The particles are coarser than those of volcanic dust and consist of minute fragments of glass and other rock material *(Ref. 1)*.

volcanic breccia. More or less indurated volcanic rocks consisting chiefly of angular ejecta 32 mm or more in diameter *(Ref. 1)*.

volcanic cinders. Uncemented glassy or bubble-filled volcanic fragments ranging from 4 to 32 mm in diameter *(Ref. 32)*.

volcanic cone. A cone-shaped eminence formed by volcanic discharges *(Ref. 10)*.

volcanic eruption. The sudden, violent ejection of lava, ash, vapor, steam, and other materials from a volcano *(Ref. 32)*.

volcanic neck. The solidified material filling a vent or pipe of a dead volcano. If or when a volcanic neck has resisted degradation better than the mass of the mountain, it will stand alone as a column, tower, or crag of igneous rock *(Ref. 10)*.

volcanic rocks. *See:* igneous rocks.

volcanic rubble. An unconsolidated accumulation of volcanic fragments larger than volcanic cinders *(Ref. 1)*.

volcanism. The transfer of igneous or molten matter that is frequently accompanied, preceded, or followed by earth movement.

volcano. A mountain that has been built up by the materials ejected from the interior of the earth through a vent *(Ref. 10)*.

vortex. In its most general use, any flow that possesses vorticity; i.e., local rotation in a fluid flow. Usually, the term refers to a flow with closed streamlines, or to the idealized case in which all vorticity is concentrated in a vortex filament *(Ref. 3)*.

W

W *Abbr. for* watt.

w *Abbr. for* warm (air).

wadi. *See:* dry wash.

wallow course; *also* **mud lime slurry course.** Wide trench filled with a decontaminating chemical, usually chlorinated lime mixed with mud. Vehicles that have come in contact with chemical agents are driven or wallowed through this trench so that they can be freed from the agents *(Ref. 12).*

wannigan. A shelter used in arctic regions. It is often mounted on wheels or tracks and towed by tractor.

warm fog. Water droplets suspended in the atmosphere at temperatures above 0°C (32°F).

warm rain. Rain formed in clouds whose temperature at the top is > 0°C (32°F).

wash. 1: A dry wash.
2: Detritus (alluvium) collected, carried, and deposited by the action of water *(Ref. 10).*

washboard road. A test road consisting of 6-in. waves spaced 72 in. apart. The vibration frequency imparted to a vehicle can be varied by altering the speed of traverse of the vehicle.

washout by rain or precipitation. The processes by which sea-salt droplets in the atmosphere are removed by precipitation. This loss of particles in the atmosphere is accomplished by (a) particles acting as condensation nuclei, (b) by agglomeration of cloud droplets, and (c) loss by collection during fall of raindrops.

wastage. 1: The process or processes by which glaciers lose substance. Wastage is usually considered as including wind erosion, corrosion, and calving as well as evaporation and melting, but is sometimes used as a synonym for ablation.
2: The amount of material lost by this process. *(Ref. 11)*

wasteland. Land not suitable for, or capable of, producing materials or services of value *(Ref. 1).*

water absorption test. A method to determine the water penetration through an insulating material after a given water immersion period *(Ref. 4).*

water content. *See:* moisture content.

watercourse. 1: A stream of water.
2: A natural channel through which water may or does run. *(Ref. 15)*

water equivalent of snow. Amount of water that would be obtained if the snow should be completely melted *(Ref. 6). See also:* snow density.

waterfall. Perpendicular or very steep descent of water as from a stream.

water gap. A pass in a mountain ridge through which a stream flows *(Ref. 10).*

water line. *See:* shore line.

water loss. The difference between the average precipitation over a drainage basin and the water yield from the basin for a given period *(Ref. 6).*

water sky. Dark patches or streaks on the clouds due to the reflection of leads and polynyas, or a uniform black due to an open sea in the vicinity of large areas of ice- or snow-covered land. Details of the arrangement of the ice can be seen clearly when low stratus clouds are present *(Ref. 12).*

waterspout. A tornado over water *(Ref. 13). See also:* spout.

water table. The surface of the ground water or the surface below which the pores of a rock are saturated with water. This surface is uneven and variable *(Ref. 20).*

water vapor. Water in vapor form; one of the most important of all constituents of the

atmosphere. Its amount varies widely in space and time due to the great variety of both "sources" of evaporation and "sinks" of condensation that provide active motivation to the hydrologic cycle *(Ref. 1)*.

water year. In referring to surface-water supply, the 12-mo period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 mo *(Ref. 6)*.

water yield. The runoff from the drainage basin, including ground-water outflow that appears in the stream plus ground-water outflow that bypasses the gaging station and leaves the basin underground. Water yield is the precipitation minus the evapotranspiration *(Ref. 6)*.

wave. 1: An undulation or ridge on the surface of a fluid. A wind wave is generated by friction between wind and the fluid surface. Ocean waves are produced principally in this way.

2: A disturbance propagated in such a manner that it may progress from point to point. An electromagnetic wave is produced by oscillation of an electric charge.

3: A marked variation from normal weather, as a heat wave or a cold wave. *(Ref. 15)*

wave analyzer. *See:* spectrum analyzer.

wave-built terrace. The coarser upper portion of a beach where the waves have thrown the pebbles up in low ridges parallel to the shore line and a few feet above mean high water level *(Ref. 1)*.

wave celerity. *See:* wave velocity.

wave-cut terrace. A flat or gently sloping surface that waves have cut by removal of bedrock or unconsolidated material usually covered by shallow water.

wave cyclone; *also* wave depression. A cyclone that forms and moves along a front. The circulation about the cyclone center tends to produce a wavelike deformation of the front. The wave cyclone is the most frequent form of extratropical cyclone (or low) *(Ref. 3)*.

wave, diffracted. A wave whose direction of propagation has been changed by an obstacle or other nonhomogeneity in a medium *(Ref. 38)*.

wave guide. A hollow rectangular or cylindrical tubing used as a special form of very high frequency transmission line, the dimensions of the tubing determining the wave length to be transmitted *(Ref. 14)*.

wave-induced motion. The motion of a ship resulting from wave action.

wave interference. The interaction between two waves near in frequency to each other that results in a change in the distribution of amplitude with distance or time different from the amplitude distribution of the individual waves *(Ref. 38)*.

wavelength. For a periodic disturbance or waveform, the distance, measured in the direction of propagation, between two successive points that are characterized by the same phase of vibration *(Ref. 4)*.

wave, longitudinal. A wave with the direction of propagation parallel to the displacements of the medium.

wave, shear. A wave that produces a change in shape of a volume element in an elastic medium.

wave, transverse; *also* distortional wave. A wave in which the direction of propagation is normal to the displacements of the medium; e.g., a vibrating string.

wave velocity; *also* phase speed. The speed of propagation of a point of constant phase (or phase angle) of a simple harmonic wave component. With reference to ocean waves, the terms wave velocity or wave celerity are used more commonly than phase speed *(Ref. 1)*.

WBGT Index (*Abbr. for* **wet-bulb, globe temperature index**). A measure of the severity of a hot climate by taking into account relative humidity and radiant heat load as well as the dry-bulb temperature. The WBGT Index is made up by weighting the wet-bulb temperature by 0.7 (for relative humidity), the black globe temperature by 0.2 (for radiant temperature), and the dry-bulb temperature by 0.1 (shade temperature) *(Ref. 1)*.

weapon operations. Operations involving the use of combat weapons, including aircraft, armored, small arms, heavy weapons, amphibious, etc.

weapon system. A general term used to describe a weapon and the components

required for its operation. The term is not precise unless specific parameters are established *(Ref. 26)*.

wear out. The point at which further operation of materiel is uneconomical *(Ref. 33)*.

weather. 1: The state of the atmosphere, mainly with respect to its effects upon life and human activities.

2: As used in the making of surface weather observations, a category of individual and combined atmospheric phenomena that must be drawn upon to describe the local atmospheric activity at the time of observation *(Ref. 1)*.

3: To expose to the atmosphere *(Ref. 3)*.

weather central. An organization that collects, collates, evaluates, and disseminates meteorological information in such manner that it becomes a principal source of such information for a given area *(Ref. 5)*.

weather code. Pro forma code used for describing weather conditions *(Ref. 12)*.

weather forecast. A prediction of weather conditions at a point, along a route, or within an area for a specified period of time *(Ref. 5)*.

weathering. The mechanical, chemical, or biological action of the atmosphere, hydrometeors, and suspended impurities on the form, color, or constitution of exposed material; to be distinguished from erosion *(Ref. 1)*.

weathering, accelerated. An artificial means used to accelerate and duplicate the effects of climatic factors on materiel.

weather intelligence. Weather information interpreted in relation to its effects upon personnel, materiel, and the area of operations *(Ref. 12)*.

weather map. A map showing weather conditions prevailing or predicted over a considerable area. Usually, the map is based upon weather observations taken at the same time at a number of stations *(Ref. 5)*.

weather minimum. The worst weather conditions under which aviation operations may be conducted under either visual or instrument flight rules. Usually prescribed by directives and standing operating procedures in terms of minimum ceiling, visibility, or specific hazards to flight *(Ref. 5)*.

weather station. An installation or facility that provides meteorological observations and may also provide medium range weather forecasts for limited geographical areas on a full- or part-time schedule *(Ref. 12)*.

weather (vat B). Short form weather report, giving:

(a) V. Visibility in miles

(b) A. Amount of clouds, in eighths

(c) T. Height of cloud top, in thousands of feet

(d) B. Height of cloud base, in thousands of feet.

Note: The reply is a series of four numbers preceded by the word "weather". An unknown item is reported as "unknown" *(Ref. 5)*.

weight barograph. A recording weight barometer *(Ref. 3)*.

wet-bulb depression. The difference in degrees between the dry-bulb temperature and the wet-bulb temperature *(Ref. 3)*.

wet-bulb temperature. The lowest temperature to which air can be cooled at any given time by evaporating water into it at constant pressure, when the heat required for evaporation is supplied by the cooling of the air. This temperature is indicated by a well-ventilated wet-bulb thermometer *(Ref. 15)*.

No distinction is made between the wet-bulb temperature, which is the lowest temperature to which a sample of air may be cooled by isobaric evaporation of water into it, and the pseudo-wet-bulb temperature, which is the temperature of a parcel raised dry adiabatically to saturation, then returned pseudoadiabatically to its original pressure. The wet-bulb temperature curve, actually the pseudo-wet-bulb temperature curve, is used to a great extent in severe-weather forecasting *(Ref. 13)*.

wet-bulb thermometer. A thermometer having the bulb covered with a cloth, usually muslin or cambric, saturated with water *(Ref. 15)*.

wet-bulb-zero. The height in the environment sounding of the wet-bulb at the intersection of the 0°C (32°F) isotherm

on the adiabatic chart. It is assumed that this is an indication of the height of the freezing level, in a storm column, that might develop in the airmass.

wet snow. In the International Snow Classification, snow that is saturated or almost saturated with water. If free water entirely fills the air spaces in the snow, it is classified as "very wet snow" *(Ref. 11)*.

whaleback. A very large sand ridge built by movement of dunes over the same path for long periods of time. Ridges are elongated in plan and exhibit gentle, rounded crests, although one or more longitudinal dunes may be superimposed *(Ref. 1)*.

white body. A hypothetical "body" whose surface absorbs no electromagnetic radiation of any wavelength; i.e., one that exhibits zero absorptivity for all wavelengths; an idealization exactly opposite to that of the blackbody *(Ref. 1)*.

whitecap. *See:* breaker.

white dew. *See:* dew.

white noise. *See:* noise, white.

whiteout; *also* milky weather. A weather condition in the polar regions in which no object casts a shadow, the horizon becomes indistinguishable, and light-colored objects are very difficult to see. A whiteout occurs when there is complete snow cover, and the clouds are so thick and uniform that light reflected by the snow is about the same intensity as that from the sky *(Ref. 11)*.

williwaw. 1: A sudden violent gust of cold land air, common along mountainous coasts of high latitudes *(Ref. 12)*.

2: A very violent squall in the Straits of Magellan. They may occur in any month but are most frequent in winter *(Ref. 3)*.

Wilson cloud chamber *or* cloud chamber. A device that makes the paths of high energy subatomic particles visible. A supersaturated vapor condition is created in a chamber filled with dust-free air by a sudden adiabatic expansion and cooling. In this environment, the small molecular ions formed along the path of a high energy particle act as effective condensation nuclei. The line of droplets so formed can be used to mark the path *(Ref. 3)*.

wind. Air motion relative to the surface of the earth. Since vertical components of atmospheric motion are relatively small, especially near the surface of the earth, the term is used almost exclusively to denote the horizontal component of atmospheric motion *(Ref. 3)*.

windbreak. A planting of trees, shrubs, or other vegetation to protect soil, crops, buildings, roads, etc., against the effects of winds. Such plantings are usually perpendicular to the prevalent direction the wind blows during the season protection is desired.

windchill. The combined cooling effect of wind and air temperature on heated bodies. Windchill is expressed in kilogram calories per square meter per hour *(Ref. 12)*.

wind component indicator. A device that mechanically determines the range and deflection components of the computed wind that are equivalent to all true winds encountered by a projectile in flight *(Ref. 12)*.

wind correction. Any adjustment that must be made to allow for the effect of the wind; especially the adjustments to correct for the effect on a projectile in flight, on sound received by sound-ranging instruments, and on aircraft flown by dead reckoning navigation *(Ref. 12)*.

wind corrector. A mechanical device that computes the correction necessary for the effect of wind, used in sound ranging and artillery fire control *(Ref. 12)*.

wind direction. The direction from which the wind is blowing *(Ref. 3)*.

wind drift. Shift in the apparent position of a sound source or target observed by sound apparatus. Wind drift is caused by the effect of wind on sound waves which changes their direction and increases or decreases sound lag *(Ref. 12)*.

wind erosion. The process of wearing away a surface by wind action and the abrasion of windborne materials *(Ref. 11)*.

windfall. 1: A tree that has been uprooted or broken off by the wind.

2: An area in which large numbers of trees have been uprooted or broken off by the wind *(Ref. 19)*.

wind gap. A pass or gap not occupied by a stream; an air gap *(Ref. 10)*.

wind pressure. The total force exerted upon a structure by wind. For a flat surface it consists of two factors, the first being the

dynamic pressure exerted on the windward side of the surface, the second being the pressure decrease, or suction, produced on the leeward side of the surface *(Ref. 1)*.

wind resolving mechanism. A device similar to a wind component indicator, which is mounted on a deflection board or is part of a computer. It mechanically determines the range and deflection components of the ballistic wind *(Ref. 12)*.

wind rose. Any one of a class of diagrams designed to show the distribution of wind direction experienced at a given location over a considerable period; it thus shows the prevailing wind direction *(Ref. 1)*.

wind shear. A change in space of wind direction and magnitude *(Ref. 5)*.

wind tee. A large weather vane located on or near a landing field to show the direction of the wind or direction of the traffic pattern around the field *(Ref. 12)*.

wind tunnel. A tunnel through which a stream of air is drawn at controlled speeds for aerodynamic tests and experimentation *(Ref. 40)*.

wind vane. An instrument used to indicate wind direction. It consists basically of an asymmetrically shaped object mounted at its center of gravity about a vertical axis. The end that offers the greater resistance to the motion of air moves to the downwind position. The direction of the wind is determined by reference to an attached oriented compass rose *(Ref. 3)*.

winterization. Any of a variety of procedures used to insure continued materiel operation during cold weather. The most common example is the use of antifreeze in internal combustion engine liquid cooling systems. For very cold climates, much more extensive procedures are required.

wipe sample. A sample made for the purpose of determining the presence of removable radioactive contamination on a surface. It is done by wiping, with slight pressure, a piece of soft filter paper over a representative area of surface *(Ref. 1)*.

WMO *Abbr. for* World Meteorological Organization.

X

xerophytes. Plants capable of thriving in hot and extremely dry climates.

X-radiation or X rays. Electromagnetic radiation in the wavelength region from about 10 to 0.01 nm, which overlaps the ultraviolet region at long X-ray wavelengths and the gamma ray region at short X-ray wavelengths. The distinction is that X rays and ultraviolet radiation are produced by different processes *(Ref. 1)*. *See also:* gamma ray.

xylophagous. Eating, boring in, or destroying wood, said especially of certain insect larvae, crustaceans, and mollusks *(Ref. 1)*.

Y

yardangs. Irregular ridges or mounds, commonly alternating with round-bottomed troughs, formed by wind erosion of silt and clay, often of ancient playa surfaces *(Ref. 1)*.

yeast. A mass of Saccharomycetaceae fungi that germinate and multiply in the presence of starch or sugar. Used especially in the making of alcoholic liquors and as a leaven in baking.

yellow podzolic soils. *Pedology.* Formerly used for a zonal group of soils having thin organic and organic-mineral layers over grayish-yellow leached horizons that rest on yellow B horizons, developed under coniferous or mixed coniferous and deciduous forests in a warm-temperate to warm-moist climate. These soils are now combined into the red-yellow podzolic group *(Ref. 16)*.

yield. *See:* nuclear yields.

yield strength. The minimum stress at which a material will start to deform physically without further increase in load *(Ref. 4)*.

young ice. Ice that has formed so recently that it is not strong enough for a man to walk on. Frequently referred to in connection with leads *(Ref. 12)*.

Z

zenith. The point on the celestial sphere directly above the observer's position *(Ref. 40)*.

zephyr. A warm, gentle breeze, especially one from the west *(Ref. 15)*.

zero curtain. The layer of ground between the active layer and the permafrost where the temperature 0°C (32°F) lasts for a considerable time during the freezing and thawing of overlying ground *(Ref. 11)*.

zero-g environment. An environment in which gravitational forces are the same in all directions so that there is no net gravitational force on objects in the environment.

zero gravity. The complete absence of gravitational effects, existing when the gravitation attraction of a primary is exactly nullified or counterbalanced by inertial force *(Ref. 1)*.

zonal. *Meteorology.* Latitudinal; easterly or westerly; opposed to meridional *(Ref. 3)*.

zonal soil. *Pedology.* 1: A soil characteristic of a large area (zone).
2: One of the three primary subdivisions in soil classification as used in the United States. *(Ref. 2)*

zone of aeration. The region of soil or rock above a water table where the pore spaces contain air as well as water *(Ref. 3)*.

zone of maximum precipitation. In a mountain region, the belt of elevation at which the annual precipitation is greatest *(Ref. 1)*.

zone of saturation. The soil or rock beneath the water table. Pore spaces in the zone of saturation are filled with water, in contrast with the pore spaces above the water table which may contain considerable air *(Ref. 3)*.

zulu time. An expression indicating Greenwich mean time *(Ref. 5)*.

REFERENCES

1. MIL-STD 1165, *Glossary of Environmental Terms (Terrestrial)*, Second Printing, 1968.
2. Soil Science Society of America, Committee on Terminology, "Glossary of Soil Science Terms", in *Proceedings of the Soil Science Society of America*, 29 (May-June 1965), pp. 330-51.
3. R. F. Huschke, Ed., *Glossary of Meteorology*, American Meteorological Society, Boston, 1959.
4. AMCP 706-125, Engineering Design Handbook, *Electrical Wire and Cable*.
5. Department of Defense, *Dictionary of Military and Associated Terms*, Joint Chiefs of Staff, JCS Pub. 1, Washington, D C , 3 January 1972.
6. Geological Survey, U S Department of the Interior, "General Introduction and Hydrologic Definitions", by W. B. Langbein and Kathleen T. Iseri, in *Manual of Hydrology*, Part 1, *General Surface-Water Techniques*, Geological Survey Water-Supply Paper 1541-A, Washington, D C , 1960.
7. F. D. Adams, *Aeronautical Dictionary*, National Aeronautical and Space Agency, Washington, D C , 1959.
8. International Standards Organization, Technical Committee 108, *Vibration and Shock Terminology* (Draft 2), Geneva, Switzerland, 1965.
9. G. J. Studdard, *Common Environmental Terms*, Environmental Protection Agency, Washington, D C , 1973.
10. Geological Survey, U S Department of the Interior, "Glossary of Names for Topographic Forms", in *Topographic Instructions*, Book 6, Part 6A, Washington, D C , August 1954.
11. Arctic, Desert, Tropic Information Center, Research Studies Institute, Air University, *Glossary of Arctic and Subarctic Terms*, ADTIC Pub. A-105, Maxwell Air Force Base, Ala., September 1955.
12. Department of the Army, *Dictionary of United States Army Terms*, AR 310-25, Washington, DC, June 1972.
13. R. C. Miller, *Notes on Analysis and Severe Storm Forecasting Procedures of the Air Force Global Weather Control*, Tech. Report 200, Air Weather Service (MAC), United States Air Force, Scott Air Force Base, Ill., May 1972.
14. W. A. Heflin, Ed., *The U.S. Air Force Dictionary*, Air University, Research Studies Institute, Air University Press, 1956.
15. Department of the Navy, *Navigation Dictionary*, H.O. Pub. 220, Washington, D C , 1956.
16. U S Department of Agriculture, *Soil, the 1957 Yearbook of Agriculture*, Washington, D C , 1957.
17. AMCP 706-130, Engineering Design Handbook, *Design for Air Transport and Airdrop of Materiel*.
18. Department of the Navy, *Glossary of Oceanographic Terms*, Naval Oceanographic Office, SP-35, Second Edition, Washington, D C , 1966.
19. Society of American Foresters, *Forestry Terminology: A Glossary of Technical Terms Used in Forestry*, Third Edition, Washington, D C , 1958.
20. American Geological Institute, Glossary Review Committee, *Glossary of Geology and Related Sciences*, Washington, D C.
21. National Academy of Sciences, National Research Council, *Glossary of Pedologic (Soils) and Landform Terminology for Soil Engineers*, Highway Research Board Special Report 25, Washington, D C , 1957.

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22. C. M. Harris and C. E. Crede, Eds., *Shock and Vibration Handbook*, McGraw-Hill Book Co., Inc., N.Y., 1961.
23. G. H. Howe et al., *Classification of World Desert Areas*, TR 65-38-ES, U S Army Natick Laboratories, Natick, Mass., December 1968.
24. Institute of Electrical and Electronics Engineers, *IEEE Standard Dictionary of Electrical and Electronics Terms*, Wiley Interscience, N.Y., 1972.
25. Bureau of Reclamation, U S Department of the Interior, *Earth Manual*, Denver, Colo., July 1960.
26. R. A. Hafner and B. R. Baldwin, *Supply Categories under a Functionalized Supply System*, Research Analysis Corp., McLean, Va., November 1966.
27. H. G. Jerrard and D. B. McNeill, *A Dictionary of Scientific Units*, Third Edition, Chapman and Hall, Ltd., London, 1972.
28. *Van Nostrand's Scientific Encyclopedia*, D. Van Nostrand, Co., Inc., Princeton, N.J., 1958.
29. AR 70-38, *Research, Development, Test, and Evaluation of Materiel for Extreme Climatic Conditions.*
30. AMCP 706-115, Engineering Design Handbook, Environmental Series, Part One, *Basic Environmental Concepts.*
31. U S Navy Electronics Laboratory, *Ice Glossary*, Compiled by R. J. Boyle, San Diego, Calif., June 1965.
32. W. L. Stokes and D. J. Varnes, *Glossary of Selected Geologic Terms with Special Reference to Their Use in Engineering*, Colorado Scientific Society, Denver, Colo., 1955.
33. AMCP 706-134, Engineering Design Handbook, *Maintainability Guide for Design*, October 1972.
34. H. H. Uhlig, Ed., "Glossary of Terms Used in Corrosion", in *The Corrosion Handbook*, Electro Chemical Society, Inc., John Wiley and Sons, Inc., N.Y., 1948.
35. U S Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., Unpublished comments, January 1968.
36. World Meteorological Organization, *International Cloud Atlas*, Vol. 1, Geneva, Switzerland, 1956.
37. J. E. Ruzicka, "Mechanical Vibration and Shock Terminology", *Sound and Vibration*, 1, No. 5 (May 1967), p. 20.
38. American Standards Association, Acoustical Society of America, Standard S1.1-1960, *Acoustical Terminology (Including Shock and Vibration)*, N.Y., 25 May 1960.
39. AR 705-15, *Research and Development of Materiel, Operation of Materiel Under Extreme Conditions of Environment.* (superseded by Ref. 29).
40. Department of the Air Force, *Air Force Glossary of Standardized Terms and Definitions*, Air Force Manual No. 11-1, Washington, D C , 1 May 1965.
41. TM 3-240, *Meteorology.*
42. Department of the Army, *Terrain Intelligence*, FM 30-10, Washington, D C , October 1959.
43. MIL-STD 210A, *Climatic Extremes for Military Equipment*, 2 August 1957 with Change Notice 1, 30 November 1958.

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