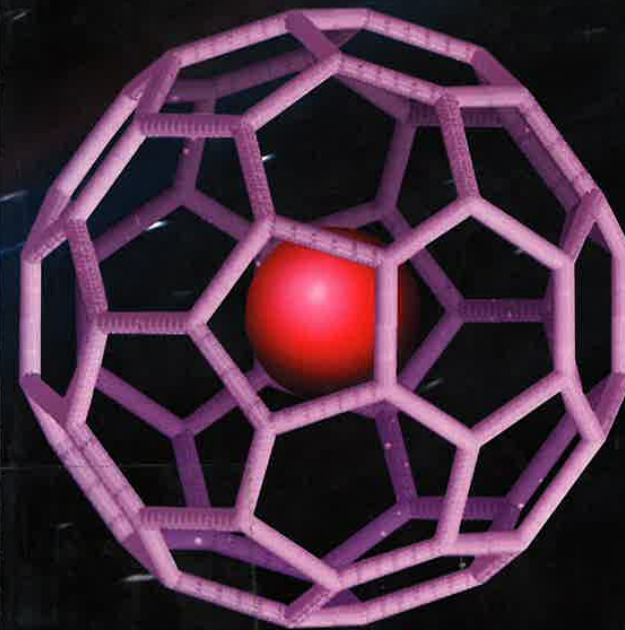


McGraw-Hill
Dictionary of
SCIENTIFIC
and
TECHNICAL
TERMS



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Sixth Edition

On the cover: Representation of a fullerene molecule with a noble gas atom trapped inside. At the Permian-Triassic sedimentary boundary the noble gases helium and argon have been found trapped inside fullerenes. They exhibit isotope ratios quite similar to those found in meteorites, suggesting that a fireball meteorite or asteroid exploded when it hit the Earth, causing major changes in the environment. (Image copyright © Dr. Luann Becker. Reproduced with permission.)

Over the six editions of the Dictionary, material has been drawn from the following references: G. M. Garrity et al., *Taxonomic Outline of the Prokaryotes*, Release 2, Springer-Verlag, January 2002; D. W. Linzey, *Vertebrate Biology*, McGraw-Hill, 2001; J. A. Pechenik, *Biology of the Invertebrates*, 4th ed., McGraw-Hill, 2000; U.S. Air Force Glossary of Standardized Terms, AF Manual 11-1, vol. 1, 1972; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, Department of Defense, 1967; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, National Aeronautics and Space Administration, 1965; *Glossary of Stinfor Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; *ADP Glossary*, Department of the Navy, NAVSO P-3097; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology*, White Sands Missile Range, New Mexico, National Bureau of Standards, AD 467-424; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission.

**McGraw-Hill Dictionary of Scientific and Technical Terms,
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earth or rock to carry water for irrigation or drainage. 2. A long, narrow cut made in the earth to bury pipeline, cable, or similar installations. [PETRO ENG] On a drilling rig, a mudflow trench leading from the conductor-pipe outlet. {dich}

ditch check [CIV ENG] A small dam positioned at intervals in a road ditch to prevent erosion. {dich, chek}

ditcher See trench excavator. {dich-ər}

ditching [AERO ENG] A forced landing on water, or the process of making such a landing. [ENG] The digging of ditches, as around storage tanks or process areas to hold liquids in the event of a spill or along the sides of a roadway for drainage. {dich-ɪŋ}

diterpene [ORG CHEM] $C_{20}H_{32}$ 1. A group of terpenes that have twice as many atoms in the molecule as monoterpenes. 2. Any derivative of diterpene. {di'tər,pən}

dither [COMMUN] A technique for representing the entire gray scale of a picture by picture elements with only one of two levels ("white" and "black"), in which a multilevel input image signal is compared with a position-dependent set of thresholds, and picture elements are set to "white" only where the image input signal exceeds the threshold. [CONT SYS] A force having a controlled amplitude and frequency, applied continuously to a device driven by a servomotor so that the device is constantly in small-amplitude motion and cannot stick at its null position. Also known as buzz. {di'th-ər}

dither matrix [COMMUN] A square matrix of threshold values that is repeated as a regular array to provide a threshold pattern for an entire image in the dither method of image representation. {di'th-ər,mā-triks}

dithiocarbamate [ORG CHEM] 1. A salt of dithiocarbamic acid. 2. Any other derivative of dithiocarbamic acid. {di,thi-ə'kär-bə,mät}

dithiocarbamic acid [ORG CHEM] NH_2CS_2H A colorless, unstable powder; various metal salts are readily obtained, and used as strong accelerators for rubber. Also known as aminodithioformic acid. {di,thi-ə'kär'bäm-ik 'as-əd}

dithioic acid [ORG CHEM] An organic acid in which sulfur atoms have replaced both oxygen atoms of the carboxy group. {di,thi-ə'ik 'as-əd}

dithionate [CHEM] Any salt formed from dithionic acid. {di'thi-ə,nät}

dithionic acid [INORG CHEM] $H_2S_2O_6$ A strong acid formed by the oxidation of sulfurous acid, and known only by its salts and in solution. {di,thi-än-ik 'as-əd}

dithiooxamide [ORG CHEM] $NH_2CSCSNH_2$ Red crystals, soluble in alcohol; used as a reagent for copper, cobalt, and nickel, and for the determination of osmium. {di,thi-ə'ak-sə,mid}

1,4-dithiothreitol [ORG CHEM] $C_4H_{10}O_2S_2$ Needlelike crystals soluble in water, ethanol, acetone, ethylacetate; used as a protective agent for thiol (SH) groups. {wän 'fər di,thi-ə'thür-ə,tol}

ditokous [VERT ZOO] Producing two eggs or giving birth to two young at one time. {di'd-ə-kas}

Dittus-Boelter equation [FL MECH] An equation used to calculate the surface coefficient of heat transfer for fluids in turbulent flow inside clean, round pipes. {di'd-əs 'bel-tər i,kwə-zhən}

ditty box [NAV ARCH] A small box with a hinged lid and lock used by a crew member for personal belongings. {di'd-ē,bäks}

ditungsten carbide [INORG CHEM] W_2C A gray powder having hardness approaching that of diamond; forms hexagonal crystals with specific gravity 17.2; melting point 2850°C. {di,təŋ-stən 'kär,bid}

diuresis [MED] Increased excretion of urine. {di-yü're-sas}

diuretic [PHARM] Any agent that increases the volume and flow of urine. {di-yü'red-ik}

diuretic hormone [BIOCHEM] A neurohormone that promotes water loss in insects by increasing the volume of fluid secreted into the Malpighian tubules. {di-yü'red-ik 'hör,mōn}

diurnal [BIOL] Active during daylight hours. [SCI TECH] Occurring during the daytime. {di'är-nəl}

diurnal aberration [ASTRON] Aberration caused by the rotation of the earth; its value varies with the latitude of the observer

and ranges from zero at the poles to 0.31 second of arc. Also known as daily aberration. {di'är-nəl,äb-ə'rä-shən}

diurnal age See age of diurnal inequality. {di'är-nəl 'äj}

diurnal arc [ASTRON] That part of a celestial body's diurnal circle which lies above the horizon of the observer. {di'är-nəl 'ärk}

diurnal circle [ASTRON] The apparent daily path of a celestial body, approximating a parallel of declination. {di'är-nəl 'sär-kəl}

diurnal inequality [OCEANOGR] The difference between the heights of the two high waters or the two low waters of a lunar day. {di'är-nəl,ün-ə'kwäl-əd-ē}

diurnal migration [BIOL] The daily rhythmic movements of organisms in the sea from deeper water to the surface at the approach of darkness and their return to deeper water before dawn. {di'är-nəl mī'grä-shən}

diurnal motion [ASTRON] The apparent daily motion of a celestial body as observed from a rotating body. {di'är-nəl 'mō-shən}

diurnal parallax See geocentric parallax. {di'är-nəl 'par-ə,laks}

diurnal range See great diurnal range. {di'är-nəl 'räng}

diurnal tide [OCEANOGR] A tide in which there is only one high water and one low water each lunar day. {di'är-nəl 'tid}

diurnal variation [GEOPHYS] Daily variations of the earth's magnetic field at a given point on the surface, with both solar and lunar periods having their source in the horizontal movements of air in the ionosphere. {di'är-nəl,ver-ē'ä-shən}

divagation [HYD] Lateral shifting of the course of a stream caused by extensive deposition of alluvium in its bed and frequently accompanied by the development of meanders. {di-və'gä-shən}

divalent carbon [ORG CHEM] A charged or uncharged carbon atom that has formed only two covalent bonds. Also known as divalent carbon. {di'vä-lənt 'kär-bən}

divalent metal [CHEM] A metal whose atoms are each capable of chemically combining with two atoms of hydrogen. {di'vä-lənt 'med-əl}

divariant system [THERMO] A system composed of only one phase, so that two variables, such as pressure and temperature, are sufficient to define its thermodynamic state. {di-ver-ē-ənt 'sis-təm}

divaricate [BIOL] Broadly divergent and spread apart. {di'var-ə,kät}

divaricator [ZOO] A muscle that causes separation of parts, as of brachiopod shells. {di'var-ə,käd-ər}

dive [AERO ENG] A rapid descent by an aircraft or missile, nose downward, with or without power or thrust. [ENG] To submerge into an underwater environment so that it may be studied or utilized; includes the use of specialized equipment such as scuba, diving helmets, diving suits, diving bells, and underwater research vessels. [NAV] To submerge a submarine under power. {div}

dive bomber [AERO ENG] An aircraft designed to release bombs during a steep dive. {di'v,bäm-ər}

dive brake [AERO ENG] An air brake designed for operation in a dive; flaps at the following edge of one wing that can be extended into the airstream to increase drag and hold the aircraft to its "never exceed" dive speed in a vertical dive; used on dive bombers and sailplanes. {di'v,bräk}

divergence [ELECTR] The spreading of a cathode-ray stream due to repulsion of like charges (electrons). [FL MECH] The ratio of the area of any section of fluid emerging from a nozzle to the area of the throat of the nozzle. [MATH] For a vector-valued function, the sum of the diagonal entries of the Jacobian matrix; it is the scalar product of the del operator and the vector. [METEOROL] The two-dimensional horizontal divergence of the velocity field. [NUCLEO] In a nuclear reactor, the condition wherein the number of neutrons produced increases in each succeeding generation. [OCEANOGR] A horizontal flow of water, in different directions, from a common center or zone. [PHYS] The spreading apart of a beam of particles of light. {də'vər-jəns}

divergence loss [GEOPHYS] During geophysical prospecting, the portion of the power lost in transmitting signals that is caused by the spreading of seismic or sound rays by the geometry of the geologic features. {də'vər-jəns,lös}

divergence speed [AERO ENG] The speed of an aircraft above which no statically stable equilibrium condition exists

and the deformation will increase to a point of structural failure. { dā'vār-jōns ,spēd }

divergence theorem See Gauss' theorem. { dā'vār-jōns ,thir-əm }

divergent adaptation [EVL] Adaptation to different kinds of environment that results in divergence from a common ancestral form. Also known as branching adaptation; cladogenic adaptation. { dā'vār-jōnt ,ad,ap'tā-shān }

divergent l-beam technique [PHYS] A method of x-ray diffraction analysis in which a divergent beam of x-rays is used to produce Kossel lines. { dā'vār-jēnt 'l,bēm 'tek'nēk }

divergent die [ENG] A die with the internal channels that lead to the orifice diverging, such as the dies used for manufacture of hollow-body plastic items. { dā'vār-jōnt 'dī }

divergent integral [MATH] An improper integral which does not have a finite value. { dā'vār-jōnt 'in-tā-grəl }

divergent nozzle [DES ENG] A nozzle whose cross section becomes larger in the direction of flow. { dā'vār-jōnt 'nāz-əl }

divergent sequence [MATH] A sequence which does not converge. { dā'vār-jōnt 'sē-kwāns }

divergent series [MATH] An infinite series whose sequence of partial sums does not converge. { dā'vār-jōnt 'sir-ēz }

divergent transcription [MOL BIO] The initiation of genetic transcription at two promoters that are facing in opposite directions. { dā'vār-jōnt ,tran'skrip-shān }

diverging duct [DES ENG] Fluid-flow conduit whose internal cross-sectional area increases in the direction of flow. { dā'vār-jīng ,dakt }

diverging lens [OPTICS] A lens whose focal length is negative, so that light incident parallel to its axis diverges after passing through it. Also known as negative lens. { dā'vār-jīng ,lens }

diverging meniscus lens See negative meniscus lens. { dā'vār-jīng mō'nis-kas ,lens }

diverging mirror [OPTICS] A convex mirror that causes rays of light parallel to its axis to diverge. Also known as negative mirror. { dā'vār-jīng ,mir-ər }

diverging yaw [AERO ENG] In the flight of a projectile, an angle of yaw increasing from the initial yaw, so that the projectile is unstable. { dā'vār-jīng 'yō }

diver method [PHYS CHEM] Measure of the size of suspended solid particles; small glass divers of known density sink to the level where the liquid-suspension density is equal to that of the diver, allowing calculation of particle size. Also known as Berg's diver method. { 'dī-vər ,meth-əd }

diverse vector [NAV] In air operations, an instruction issued by a radar controller to fly a specific course which is not a part of the predetermined radar pattern. Also known as random vector. { dā'vārs 'vek-tər }

diversionary missile See missile decoy. { dā'vār-zhə ,ner-ē 'mis-əl }

diversion canal [CIV ENG] An artificial channel for diverting water from one place to another. { dā'vār-zhən kə,nəl }

diversion chamber [ENG] A chamber designed to direct a stream into a channel or channels. { dā'vār-zhən ,chām-bər }

diversion dam [CIV ENG] A fixed dam for diverting stream water away from its course. { dā'vār-zhən ,dam }

diversion gate [CIV ENG] A gate which may be closed to divert water from the main conduit or canal to a lateral or some other channel. { dā'vār-zhən ,gāt }

diversion tunnel [CIV ENG] An underground passageway used to divert flowing water around a construction site. { dā'vār-zhən ,tən-əl }

diversity [COMMUN] Method of signal extraction by which an optimum resultant signal is derived from a combination of, or selection from, a plurality of transmission paths, channels, techniques, or physical arrangements; the system may employ space diversity, polarization diversity, frequency diversity, or any other arrangement by which a choice can be made between signals. { dā'vār-sād-ē }

diversity factor [ELEC] Ratio of the sum of the individual maximum demands to total maximum demand, as applied to an electrical distribution system. { dā'vār-sād-ē ,fak-tər }

diversity gain [COMMUN] Gain in reception as a result of the use of two or more receiving antennas. { dā'vār-sād-ē ,gān }

diversity radar [ENG] A radar that uses two or more transmitters and receivers, each pair operating at a slightly different frequency but sharing a common antenna and video display,

to obtain greater effective range and reduce susceptibility to jamming. { dā'vār-sād-ē 'rā,dār }

diversity receiver [ELECTR] A radio receiver designed for space or frequency diversity reception. { dā'vār-sād-ē rī'se ,vər }

diversity reception [COMMUN] Radio reception in which the effects of fading are minimized by combining two or more sources of signal energy carrying the same modulation. { dā'vār-sād-ē rī'sep-shān }

diverter [ELEC] A low resistance which is connected in parallel with the series or commutating pole winding of a direct-current machine and diverts current from it, causing the magnetomotive force produced by the winding to vary. [PETRO ENG] 1. Equipment installed in a well for controlling a well blowout occurring at a relatively shallow depth. 2. A system designed to protect a floating rig during a blowout by conducting the flow away from the rig. { dā'vārd-ər }

diverter-pole generator [ELEC] Compound wound direct-current generator with the series winding of the diverter pole opposing the flux generated by the shunt wound main pole; provides a close voltage regulation. { dā'vārd-ər ,pōl 'jen-ə ,rād-ər }

diverter valve See air bypass valve. { dā'vārd-ər ,valv }

diverticulitis [MED] Inflammation of a diverticulum. { dī-vər,tik-yə 'līd-əs }

diverticulosis [MED] Presence of many diverticula in the intestine. { dī-vər,tik-yə 'lō-səs }

diverticulum [MED] An abnormal outpocketing or sac on the wall of a hollow organ. { dī-vər'tik-yə-ləm }

diverting agent [PETRO ENG] A viscous gel or suspension of graded solids used during acidizing of an oil reservoir to temporarily block off the most permeable sections of the pay zone to force the acid into less permeable sections. { dā'vārd-īng ,ā-jōnt }

Divesian See Oxfordian. { dā'vēzh-ən }

divide [GEOGR] A ridge or section of high ground between drainage systems. [MATH] One object (integer, polynomial) divides another if their quotient is an object of the same type. [SCI TECH] A point or line of division. { dā'vid }

divide-and-conquer relation [MATH] A recurrence relation which expresses the value of a number-theoretic function for an argument *n* in terms of its value for an argument *n/b*, where *b* is an integer greater than 1. { dī'vid ən 'käg-kər n ,jā-shān }

divide check [COMPUT SCI] An error signal indicating that an illegal division (such as dividing by zero) was attempted. { dā'vid ,chek }

divided differences [MATH] Quantities which are used in the interpolation or numerical calculation or integration of a function when the function is known at a series of points which are not equally spaced, and which are formed by various operations on the difference between the values of the function at successive points. { dā'vid-əd 'dīf-rən-sās }

divided lane [CIV ENG] A highway divided into lanes by a median strip. { dā'vid-əd 'lān }

divided pitch [DES ENG] In a screw with multiple threads, the distance between corresponding points on two adjacent threads measured parallel to the axis. { dā'vid-əd 'pich }

divided slit scan [COMPUT SCI] In optical character recognition, a device consisting of a narrow column of photoelectric cells which scans an input character at given intervals for the purpose of obtaining its horizontal and vertical components. { dā'vid-əd 'slit ,skan }

dividend [MATH] A quantity which is divided by another quantity in the operation of division. { 'dīv-ə ,dend }

divider [DES ENG] A tool like a compass, used in metalworking to lay out circles or arcs and to space holes or other dimensions. { dā'vid-ər }

dividing network See crossover network. { dā'vīd-īng ,net ,wər }

divine proportion See golden section. { dī ,vīn prə'pōr-shān }

diving bell [ENG] An early diving apparatus constructed in the shape of a box or cylinder without a bottom and connected to a compressed-air hose. { 'dīv-īng ,bel }

diving bird [VERT ZOO] Any bird adapted for diving and swimming, including loons, grebes, and divers. { 'dīv-īng ,bārd }

diving plane See diving rudder. { 'dīv-īng ,plān }

diving rudder [NAV ARCH] One of the movable plane surfaces attached to the hull of a submarine that control the vertical

DIVING BIRD



The common loon (*Gavia immer*).