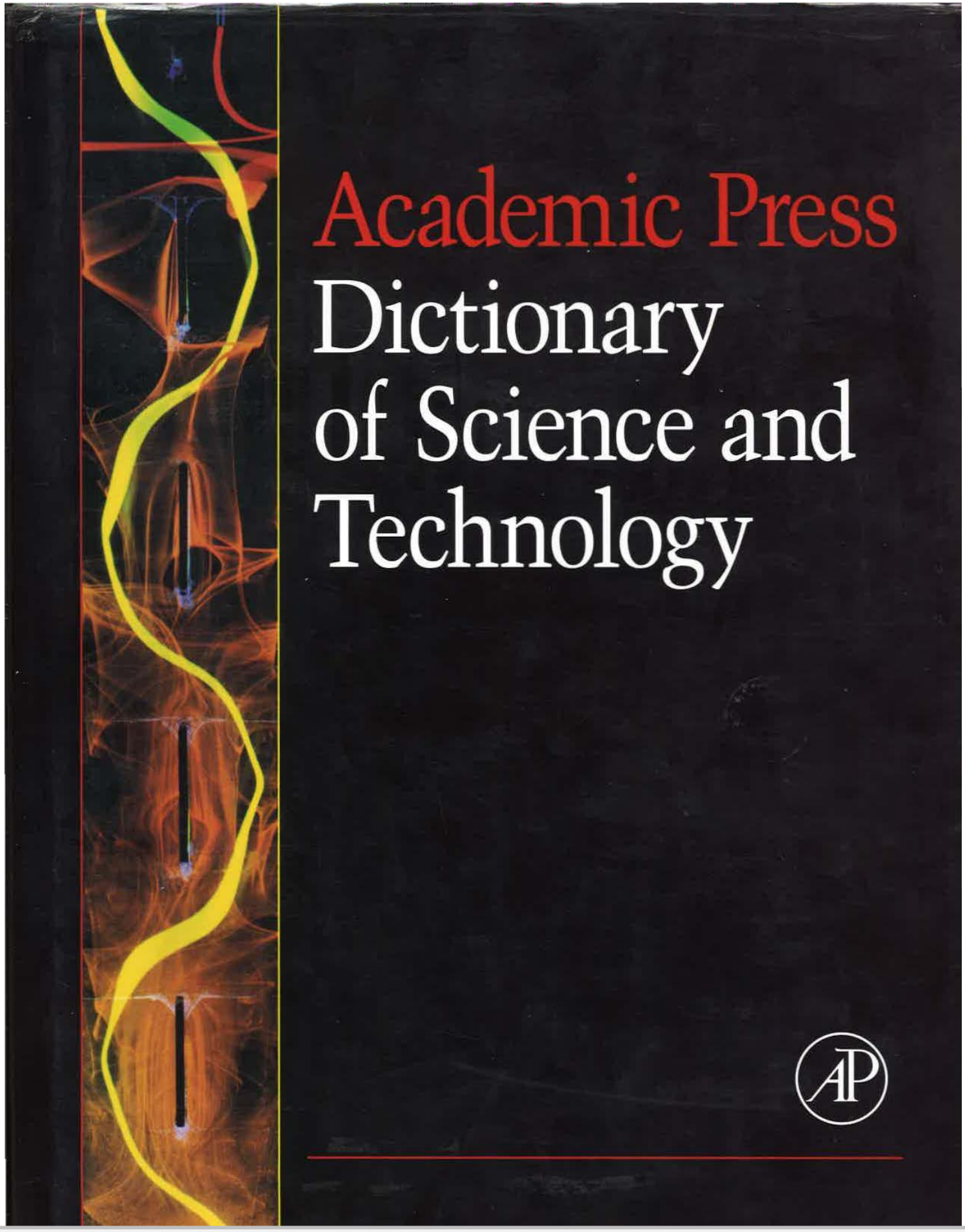

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Solenichthyes *Vertebrate Zoology*. an alternate name for the suborder Syngnathoidei, which contains the pipefishes, sea horses, snipefishes, shrimpfishes, trumpetfishes, and flutemouths.

solenium *Invertebrate Zoology*. **1.** see STOLON, def. 2. **2.** a tube connecting adjacent polyps in some colonial anthozoans.

solenocyte *Invertebrate Zoology*. a type of elongated flame bulb having a single long flagellum.

solenodon *Vertebrate Zoology*. any member of the family Solenodontidae, primitive ratlike insectivorous mammals that are found in Cuba and Hispaniola.

Solenodontidae *Vertebrate Zoology*. a family of very rare, large ratlike insectivores of the mammalian group Lipotyphia having a long snout, short ears, a long scaly tail, hard fur, and forty teeth.

Solenogastres see APLACOPHORA.

solenoid [sō'li noid; sal'i noid] *Electromagnetism*. an electromagnetic coil wound in the shape of a hollow cylinder or spool, often containing a movable iron core that is pulled into the coil when current flows through the wire turns, thus allowing it to move other devices such as relays and circuit breakers. *Mechanical Engineering*. a switch or other device that is activated by such a coil, as in an automobile starting system. *Meteorology*. a tube formed in space by the intersection of surfaces of equal pressure and density.

solenoidal *Electromagnetism*. relating to or powered by a solenoid. *Mathematics*. a vector field F defined in a simply connected domain is said to be solenoidal if its divergence vanishes at every point of the domain. Also, SOURCE-FREE.

solenoidal index *Meteorology*. a mathematical expression of the difference between the mean virtual temperature from the ground to a known altitude aloft at 55° latitude and the mean virtual temperature for the corresponding layer averaged at 35° latitude.

solenoid brake *Mechanical Engineering*. an electromechanical braking device in which the brake toggle is operated by the plunger of a solenoid.

solenoid model *Genetics*. a model proposed to explain the supercoiled nature of chromatin, postulating that DNA is compacted and coiled around histone molecules to form nucleosomes of 30-nm diameter; common to most chromosomes.

solenoid valve *Mechanical Engineering*. a valve actuated by the magnetic field produced in a solenoid to control the flow of gas or fluid in a pipe.

Solenopora *Paleontology*. a genus of calcite-secreting algae in the extinct family Solenoporaceae; extant from the Cambrian to Cretaceous.

Solenoporaceae *Paleontology*. a family of calcareous red algae classified in the phylum or division Rhodophyta; they formed nodular masses of calcite consisting of tightly packed vertical tubes; extant in the Cambrian to Miocene.

solepiece *Civil Engineering*. **1.** any horizontal member used to distribute the loads from one or more uprights. **2.** a member that supports the foot of a raking shore. *Naval Architecture*. an attachment to the foot of a rudder that aligns with a false keel.

sole plate or **soleplate** *Building Engineering*. the lower surface of the body of a plane or plate upon which studding is erected. Also, SHOE, SOLE. *Mechanical Engineering*. **1.** a flat piece of material that serves as a foundation for a machine. **2.** a flat, thin piece of material upon which a bearing may be attached and sometimes adjusted. *Neurology*. an obsolete term for subneural apparatus of the neuromuscular junction.

soleus *Anatomy*. a muscle on the posterior surface of the tibia that plantar flexes the foot.

solfatara *Volcanology*. a volcanic vent from which only gases are emitted. (Named for the volcano *Solfatara*, near Naples, Italy; from the Italian word for "sulfur.")

solfataric stage *Volcanology*. the final stage of a volcanic eruption, during which only gases are emitted from the vent.

sol-gel coating *Materials Science*. a coating produced by the sol-gel process of glassmaking, in which glass is formed at low temperatures from suitable compounds by chemical polymerization in a liquid phase; a gel is formed from which glass may be derived by the successive elimination of interstitial liquid and the collapse of the resulting solid residue by sintering.

sol-gel process *Materials Science*. a processing technique in which a fibrous gel is drawn from a solution at near room temperature and converted into glass or ceramic fibers at several hundred degrees Celsius.

soliciting or **solicitation** *Zoology*. the movements and postures of a female animal that attract a male to her for copulation. Also, PROCEPTIVE BEHAVIOR.

solid *Physics*. one of the three fundamental states of matter, along with liquids and gases. Of these three forms, a solid has the greatest tendency to resist forces that would alter its shape; thus its shape and volume are fixed and are not affected by the space available to it. In comparison with liquids and gases, solids have closely packed molecules; their normal condition is a crystalline structure. *Mathematics*. a closed and bounded subset of three-dimensional space having positive volume.

solid angle *Mathematics*. a measure on the space of rays emanating from a point in Euclidean 3-space; equal to the area of the intersection of the set of rays with the surface of the unit sphere centered at the point. The set of all rays emanating from a point has solid angle equal to 4π steradians.

solid coupling *Mechanical Engineering*. a nonflexible connection between two shafts that forms a permanent joint designed to bear a full load of rotation or transmission.

solid cutter *Mechanical Devices*. the cutting part of a machine tool, made from a single piece of material.

solid die *Mechanical Devices*. an internally threaded, screw-cutting tool, constructed of a single piece of material.

solid drilling *Engineering*. a process used in diamond drilling, in which the entire face of an area is ground, and no core is extracted for sampling.

solid electrolytes *Materials Science*. materials that conduct electricity by ionic diffusion, including crystalline, vitreous, polymeric, or electrolyte-colloidal-particle composites; used as thin-membrane separators of two reactants, as in batteries.

solid electrolytic capacitor *Electricity*. a capacitor that uses a solid electrolyte for one plate.

solid explosive *Materials*. an explosive in the form of a powder, a granulated mass, or solid sticks.

solid geometry *Mathematics*. the geometric study of space figures such as polyhedra, cylinders, cones, and spheres, including the notions of similarity, congruence, and computation of area and volume.

solid helium *Physics*. a solid phase of helium that is only obtained with the application of about 25 atmospheres of external pressure while at a temperature near absolute zero.

solidification *Physics*. the transition of a liquid or a gas to the solid phase; the process of becoming solid.

solidification inclusion *Materials Science*. a defect in a metal casting resulting from the inclusions of generally nonmetallic materials, such as slag, that can affect the mechanical properites by acting as stress raisers.

solidification shrinkage *Metallurgy*. in casting, the shrinkage occurring during solidification.

solidify *Physics*. to undergo or cause to undergo solidification.

solid injection system *Mechanical Engineering*. a diesel-engine injection system in which a pump forces the fuel through a line and an atomizing nozzle into the combustion chamber.

solid insulator *Electricity*. any dielectric material with high mechanical strength that is used to separate conductors without allowing electric current to flow.

solid laser *Optics*. see SOLID-STATE LASER.

solid-liquid equilibrium *Physical Chemistry*. **1.** the thermodynamic relationship between a solid and its melt when vapor pressure remains constant. **2.** the thermodynamic relationship between the concentration of a solid and a solvent, other than the melt of that solid. Also, LIQUID-SOLID EQUILIBRIUM.

solid logic technology *Electronics*. a computer design technology that incorporates miniaturized modules, resulting in faster circuitry due to the reduced distances that electric current must travel.

solid lubricant *Materials*. a thin film of solid material interposed between two surfaces to reduce friction and wear under severe operating or environmental conditions; includes solid inorganic compounds such as graphite, solid organic compounds such as soaps and waxes, and metal surface coatings such as chemically deposited oxide films, soft metal films, and bonded coatings.

solid moment of inertia *Physics*. a quantity applicable to a solid having a definite volume; used to describe the rotational inertia of the solid about some specified axis.

solid-phase sequenter *Biotechnology*. a device used to determine the amino acid sequence in a protein; the sample is covalently attached to a solid-phase glass or styrene bead and packed in a micro-column prior to degradation.

solid-phase welding *Metallurgy*. any of several welding processes in which joining occurs by solid-state diffusion and a filler metal is not used. Also, SOLID-STATE WELDING.

permanent fault *Computer Programming.* a computer error that consistently occurs when certain conditions exist.
permanent gas *Chemistry.* a gas that cannot be condensed or liquefied by pressure alone. *Thermodynamics.* a gas that is at a temperature far above its critical temperature.
permanent hardness *Chemistry.* water hardness that cannot be removed by boiling; a property of water that contains sulfates or chlorides, as distinguished from the temporary hardness of water that contains bicarbonates.
permanent ice foot *Hydrology.* a narrow strip of ice attached to a polar coast that does not melt completely in summer.
permanent magnet *Electromagnetism.* a ferromagnetic substance that has been subjected to a magnetic field strong enough to cause the material to retain its own magnetization indefinitely.
permanent-magnet focusing *Electronics.* an adjusting of the electron beam in a television picture tube by the magnetic field produced by permanent magnets mounted around the neck of the tube.
permanent-magnet generator *Electricity.* a generator in which the magnetic field is created by permanent magnets.
permanent-magnet loudspeaker *Acoustical Engineering.* an inductive loudspeaker in which a steady-state magnetic field is produced by permanent magnets.
permanent mold *Metallurgy.* in casting, a term for a mold that is used more than once.
permanent press *Textiles.* **1.** the process of applying a synthetic finish to fabrics and garments in order to make them retain desired creases and to impart shape retention and crease resistance. **2.** a fabric produced by such a process. **3. permanent-press.** of or relating to this process. Also, DURABLE PRESS.
permanent-press resin *Organic Chemistry.* a thermosetting resin used to impart crease resistance to textiles and fibers.
permanent set *Mechanics.* the plastic deformation of a body that remains after the applied load is removed. Also, PLASTIC DEFORMATION.
permanent-split capacitor motor *Electricity.* a capacitor motor that operates with the starting capacitor and auxilliary winding closed or operative in the circuit. Also, CAPACITOR START-RUN MOTOR.
permanent spring see PERENNIAL SPRING.
permanent storage *Computer Technology.* **1.** storage that cannot be modified. Also, FIXED STORAGE, READ-ONLY STORAGE. **2.** storage, such as magnetic tapes and diskettes, that does not lose its contents in the event of a loss of power.
permanent stream see PERENNIAL STREAM.
permanent tooth *Anatomy.* any of the thirty-two adult teeth, including replacements for the deciduous teeth.
permanent water *Hydrology.* a water source that stays constant throughout the year.
permanent wave *Fluid Mechanics.* a wave in a fluid whose streamline pattern remains constant in time in a coordinate system that moves with the wave.
permanganic acid *Chemistry.* $HMnO_4$, an acid known only in solution.
Permasyn motor *Electricity.* a synchronous motor that provides an equivalent DC field as a result of permanent magnets embedded in its squirrel-cage motor.
permatron *Electronics.* a thermionic gas tube in which conduction is controlled by an external magnetic field.
permeability [per´mē ə bil´ə tē] *Fluid Mechanics.* the capability of a porous substance or membrane to allow a fluid to filter through it. *Agronomy.* the ease with which water, air, or plant roots penetrate or pass through a soil horizon. *Engineering.* the relative ability of a rock or soil to conduct magnetic lines of force. *Electromagnetism.* a factor that is characteristic of the magnetic properties of a substance; given by the ratio of the magnetic flux induction B to the magnetizing force H, and symbolized by m; in most cases, B is parallel to H and m is a scalar quantity, otherwise m is a tensor.
permeability alloy see PERMALLOY.
permeability coefficient *Fluid Mechanics.* a quantity associated with a porous substance indicating its ability to allow fluid to pass through it; given by the rate of fluid flow through a unit cross section of the substance, subject to a unit pressure gradient while maintained at a specified temperature.
permeability number *Engineering.* a number used to indicate the relative ability of a substance to allow a fluid to permeate its surface.
permeability trap *Geology.* an oil trap formed by lateral variation of permeability within a reservoir bed.
permeability tuning *Electricity.* the process of tuning a resonant circuit by moving a ferrite core in or out of a coil, thus changing the effective permeability of the core and the inductance of the circuit.
permeable [per´mē ə bəl] *Science.* capable of being permeated. *Chemistry.* specifically, capable of being passed through by very small particles, such as ions.
permeable bed *Geology.* a porous reservoir formation through which oil, natural gas, or water can flow.
permeable membrane *Physical Chemistry.* a thin layer of natural or synthetic material that allows some substances, but not others, to pass through it; used in reverse osmosis.
permeameter *Engineering.* a device for measuring the permeability of soils or other materials, usually consisting of two reservoirs connected by a conduit containing the material being measured, as water is passed from one reservoir under varying conditions through the connecting conduit.
permeametry *Analytical Chemistry.* a method of measuring the average size of small particles in a gas or liquid by passing the mixture through a powder bed of known dimensions and recording the pressure drop and flow rate.
permeance *Electromagnetism.* the reciprocal of the reluctance of a magnetic circuit, symbolized by P and determined by the magnetic flux divided by the magnetomotive force.
permeant *Ecology.* an organism that habitually moves from community to community.
permeaplast *Cell Biology.* a cyanobacterial cell that has been exposed to agents causing spheroplast formation, usually to facilitate genetic transformation.
permease *Biochemistry.* a membrane protein that controls the passage of a substance through the membrane.
permeate *Science.* to pass, penetrate, or diffuse through.
permeation *Chemistry.* the diffusion or penetration of ions, atoms, or molecules through a permeable substance.
permeation gneiss *Petrology.* gneiss formed or altered by geochemically mobile materials passing through or into solid rock.
permeator *Chemical Engineering.* a membrane device used for separation that allows species to pass from one phase to another.
Permendur *Metallurgy.* an iron-cobalt alloy, at times with vanadium, that is suitable for soft magnets when high permeability at high field strength is required.
permenorm alloy *Metallurgy.* an iron-nickel alloy used in magnetic amplifiers and as a magnet core material.
Permian *Geology.* **1.** a geologic period of the Upper Paleozoic era, extending from the end of the Carboniferous period to the beginning of the Mesozoic era (from about 280 to 225 million years ago). **2.** the rocks formed during that time.
Permian extinction *Paleontology.* a period about 245 million years ago during which large numbers of marine invertebrate families and other species became extinct.
per mil or **per mill** *Science.* per thousand.
permineralization *Geology.* a process of fossilization by which additional mineral material is deposited in the pore spaces of original hard animal parts.
permissible dose *Radiology.* the suggested maximum amount of exposure to radiation over a specified time interval that an individual may safely endure and that is, therefore, allowable by current radiation protection guides.
permissible length *Naval Architecture.* a vessel's floodable length multiplied by its factor of subdivision.
permissible velocity *Civil Engineering.* the maximum safe speed at which water may flow through a channel, pipe, or other facility.
permissive action link *Ordnance.* a safety device that prohibits arming or launching a nuclear weapon system until a specified code or combination has been inserted.
permissive cell *Virology.* any cell in which a given virus can replicate, or in which a conditional mutation has no deleterious effects.
permissive host *Virology.* any organism or cell culture that permits the replication of a given virus, resulting in a productive infection.
permissive stop *Transportation Engineering.* a railroad signal at which trains are permitted to pause and then proceed at a slow speed through a "stop" indication, rather than waiting for the indication to change.
permissive temperature *Genetics.* the temperature range within which a given conditional lethal mutant can survive.
permittivity see PERMITTANCE.