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of SCIENCE and
TECHNOLOGY

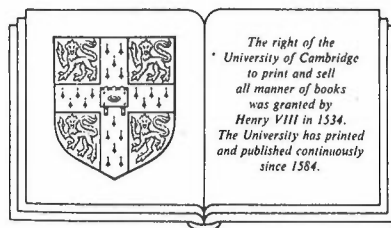


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Cambridge Dictionary of Science and Technology

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baleen

It helps to balance the stick forces. Cf.

concerned with how the instrument gives the same of the instrument.

d to counterbalance the inertia forces of the engine.

the form of a wheel, the spring.

production, control elements to achieve a colour bias, especially grey tones.

using a traverse, i.e. not survey lines and angular error.

ation. Auxiliary reception ring but not to the ls thus picked up are the main antenna, reference.

.). See neutralizing

hine for testing the ut of balance, and to of the masses to be ce.

ilizer ring. ee-running speed. he glans penis. on of the glans penis

l inflammation of the

fection, especially of nus *Balanitidum*.

ibous portion of the

the rose-red variety of

x of the bullet tree of to gutta-percha, but sively in the manufac-

gnating cotton duck

ytic separation of gold it the anode in a bath g discharged at the

uffs at specific sites on chromosomes. Occur ry proteins, is being

attering. al railing to a door or yond the threshold or of architecture.

m projecting from the it, supported by pillars a balustrade or railing.

suspended above altar, position by columns.

ine that opens up the bale, producing a large uent blending, cleaning

s, horny plates arising e palate and acting as a

balk

balk (*Civ.Eng.*). The material between two excavations. Also *baulk*.

Balken frame (*Med.*). A frame, with pulleys attached, for supporting the leg in the treatment of fractures.

balking (*Elec.Eng.*). See *crawling*.

ball-and-socket head (*Image Tech.*). Camera mounting allowing universal movement in rotation and tilt before fixing by clamping; usually fitted to the top of a tripod.

ball-and-socket joint (*Eng.*). A joint between two rods, permitting considerable relative angular movement in any plane. A ball formed on the end of one rod is embraced by a spherical cup on the other. Used in light control systems (e.g. in connecting a pair of bell-cranks which operate in planes at right angles) and in the steering mechanism of motor vehicles, in which both ball and cups are of case-hardened metals.

ball-and-socket joint (*Med.*). *Enarthrosis*. A joint in which the hemispherical end of one bone is received into the socket of another.

ballast (*Civ.Eng.*). (1) A layer of broken stone, gravel, or other material deposited above the formation level of road or railway; it serves as foundation for road-metal or permanent-way respectively. (2) Sandy gravel used as a coarse aggregate in making concrete.

ballast (*Ships*). Gravel, stone, or other material placed in the hold of a ship to increase her stability when floating without cargo or with insufficient cargo.

ballast lamp (*Elec.Eng.*). Normal incandescent lamp used as a ballast resistor, current limiter, alarm, or to stabilize a discharge lamp.

ballast resistance (*Elec.Eng.*). A term used in electric-railway signalling to denote the resistance between the two track rails across the ballast on which the track is laid. If allowed to fall too low, it will have the effect of shunting the signal from a train's wheels.

ballast resistor (*Elec.Eng.*). One inserted into a circuit to swamp or compensate changes, e.g. those arising through temperature fluctuations. One similarly used to swamp the negative resistance of an arc or gas discharge. See also *barretter*.

ballast tube (*Elec.Eng.*). Same as *barretter* or *ballast resistor*.

ball-bearing (*Eng.*). A shaft bearing consisting of a number of hardened steel balls which roll in spherical grooves (ball tracks) formed in an inner race fitted to the shaft and in an outer race carried in a housing. Balls are spaced and held by a light metal or plastic cage. Usually first choice for general engineering application. See also *linear ball bearing*, *recirculating ball thread*.

ball catch (*Build.*). A door-fastening in which a spring-controlled ball, projecting through a smaller hole, engages with a striking plate.

ball clay (*Geol.*). A fine-textured and highly plastic clay — a reworked china clay. So named because it used to be rolled into balls. Also known as *potter's clay*.

ball-cock, ball-valve (*Build.*). A self-regulating cistern-tap which, through a linkage system, is turned off and on by the rise and fall of a floating ball.

ball-ended magnet (*Elec.Eng.*). A permanent magnet, consisting of a steel wire with a steel ball attached to each end; this gives a close approximation to a unit pole.

ball flower (*Arch.*). An ornament, like a ball enclosed within three or four petals of a flower, set at regular intervals in a hollow moulding.

balling (*Eng.*). (1) A process that occurs in the cementite constituent of steels on prolonged annealing at 650°–700°C. (2) The operation of forming balls in a puddling furnace.

ballistic circuit-breaker (*Elec.Eng.*). A very high-speed circuit breaker, in which the pressure produced by the fusing of an enclosed wire causes interruption of the circuit.

ballistic method (*Elec.Eng.*). A method of high-grade testing used in electrical engineering, a ballistic galvanometer being used.

ballistic missile (*Aero.Space*). See *missile*.

ballistic pendulum (*Phys.*). A heavy block suspended by strings so that its swings are restricted to one plane. If a

bullet is fired into the block, the velocity of the bullet may be calculated from a measurement of the angle of swing of the pendulum.

ballistics (*Phys.*). The study of the dynamics of the path taken by an object moving under the influence of a gravitational field.

ballistospore (*Bot.*). A spore that is violently projected e.g. the basidiospore of the basidiomycete fungi.

ball joint (*Eng.*). Same as *ball-and-socket joint*.

ball lightning (*Meteor.*). A slowly-moving luminous ball, which is occasionally seen at ground level during a thunderstorm. It appears to measure about 0.5 m in diameter.

ball mill (*Chem.Eng.*). Mill consisting of a horizontal cylindrical vessel in which a given material is ground by rotation with steel or ceramic balls.

ballonnet (*Aero.*). An air compartment in the envelope of an aerostat, used to adjust changes of volume in the filler gas.

balloon (*Aero.*). A general term for aircraft supported by buoyancy and not driven mechanically.

balloon (*Arch.*). A spherical ball or globe crowning a pillar, pier etc.

balloon barrage (*Aero.*). An anti-aircraft device consisting of suitably disposed tethered balloons.

balloon former (*Print.*). On rotary presses, an additional former mounted above the others, from which folded webs are gathered to make up the sections of multi-sectioned newspapers or magazines. See *length fold collection*.

ballooning of yarn (*Textiles*). The shape taken up by yarns on the spinning or doubling machines.

ballotini (*Civ.Eng.*). Small glass beads. Used to increase reflectivity in paints.

ballottement (*Med.*). Method of diagnosing pregnancy by manual displacement of the foetus in the fluid which surrounds it in the uterus.

ball-pane hammer (*Eng.*). A fitter's hammer, the head of which has a flat face at one end, and a smaller hemispherical face or pane at the other; used chiefly in riveting.

ball race (*Eng.*). (1) The inner or outer steel ring forming one of the ball-tracks of a ball-bearing. (2) Commonly, the complete ball bearing.

ball sizing (*Eng.*). Forcing a suitable ball through a hole to finish size it, usually part of a *broach* with a series of spherical lands of increasing size arranged along it.

ballstone (*Geol.*). The name applied to masses of fine unstratified limestone, occurring chiefly in the Wenlock Limestone of Shropshire, and representing colonies of corals in position of growth.

ball-track (*Eng.*). See *ball-bearing*.

ball valve (*Eng.*). A single nonreturn valve consisting of a ball resting on a cylindrical seating; used in small water and air pumps.

Balmer series (*Phys.*). A group of lines in the hydrogen spectrum named after the discoverer and given by the formula:

$$v = R_H \left(\frac{1}{2^2} - \frac{1}{n^2} \right),$$

where n has various integral values, v is the wave number and R_H is the hydrogen Rydberg number ($= 1.096\,775\,8 \times 10^7 \text{ m}^{-1}$).

balneology (*Med.*). The scientific study of baths and bathing, and of their application to disease.

BALPA (*Aero.*). Abbrev. for *British Airline Pilots Association*.

balsam of fir (*Chem.*). See *Canada balsam*.

balsam of Peru (*Chem.*). An oleoresin containing esters of benzoic and cinnamic acids, obtained from a South American papilionaceous tree. Used in perfumery and chocolate manufacture.

balsam of Tolu (*Chem.*). An oleoresin containing esters of benzoic and cinnamic acids, obtained from a South American evergreen tree (*Myroxylon toluiferum*). Used in perfumery, chocolate manufacture, and medically as a mild expectorant.

HIMAT (*Aero.*). Abbrev. for *Highly Manoeuvrable Aircraft Technology*.

hind-brain (*Zool.*). In Vertebrates, that part of the brain which is derived from the third or posterior brain-vesicle of the embryo, comprising the cerebellum and the medulla oblongata: the posterior brain-vesicle itself.

hindered settling (*Min.Ext.*). Hydraulic classification of sand-sized particles in accordance with their ability to gravitate through a column of similar material expanded by a rising current of water.

hindered settling (*Powder Tech.*). Settling of solids in a suspension of a concentration greater than 15% by volume, in which the predominant physical process is the draining of the fluid out of a thick slurry. No particle segregation by size occurs, a clear boundary being formed between the supernatant fluid and the settling suspension.

hind-gut (*Zool.*). That part of the alimentary canal of an animal which is derived from the posterior ectodermal invagination or proctodaeum of the embryo.

hindrance (*Phys.*). Impedances (0 for zero, and 1 for infinite) used in theoretical manipulation of switching.

hinge (*Zool.*). The flexible joint between the 2 valves of the shell in a bivalve Invertebrate, such as a pelecypod Mollusc or a Brachiopod: a similar structure: a joint permitting of movement in one plane only.

hinge-bound door (*Build.*). A door which will not close easily or fully owing to the hinges being too deeply sunk.

hinge fault (*Geol.*). A fault along which the displacement increases from zero at one end to a maximum at the other end.

hingeing post (*Build.*). The post from which a gate is hung. Also called *swinging post*.

hinge ligament (*Zool.*). The tough uncalcified elastic membrane which connects the 2 valves of a bivalve shell.

hinge moment (*Aero.*). The moment of the aerodynamic forces about the hinge axis of a control surface, which increases with speed, necessitating aerodynamic balance.

hinge region (*Immun.*). A flexible region of immunoglobulin heavy chains near the junction of the Fab and Fc portions. This flexibility allows the angle between the arms bearing the antigen combining sites to vary widely and so accommodate different dispositions of the antigen.

hip (*Arch.*). The salient angle formed by the intersection of a gable or a hipped roof slopes.

hip hook (*Build.*). A strap of wrought-iron fixed at the foot of a hip rafter and bent into the form of a scroll, as a support for the hip tiles.

hip iron (*Build.*). See **hip hook**.

hip knob (*Build.*). A final surmounting the peak of a gable or a hipped roof.

hipped end (*Build.*). The triangular portion of roof covering the sloping end of a hipped roof.

hipped roof (*Build.*). A pitched roof having sloping ends at the gable ends.

hippocampus (*Zool.*). In the Vertebrate brain, a tract of nervous matter running back from the olfactory lobe to the posterior end of the cerebrum. adj. *hippocampal*.

hippuric acid (*Chem.*). *Benzoyl-aminoethanoic acid*, $C_6H_5CO.NH.CH_2.COOH$, rhombic crystals, mp $187^\circ C$, occurring in the urine of many animals, particularly herbivores.

hippus (*Med.*). Rhythmical alternate contraction and dilatation of the pupil of the eye.

hip rafter (*Build.*). The rafter at the hip of roof where the two slopes meet. It supports the top ends of the jack rafters.

hip replacement (*Med.*). Operative replacement of hip joint particularly for severe osteo-arthritis.

hip roll (*Build.*). A timber of circular section with a vee cut out along its length, so as to adapt it for sitting astride the hip of a roof.

hip tile (*Build.*). A form of arris-tile laid across the hip of a roof.

Hirschsprung's disease (*Med.*). A condition occurring in children in which there is great hypertrophy and dilatation of the colon. Also *megacolon*.

hirsute (*Bot., Zool.*). Hairy; having a covering of stiffish hair or hairlike feathers.

hirsuties (*Med.*). Excessive hairiness.

hirudin (*Zool.*). An anticoagulin, present in the salivary secretion of the leech, which prevents blood clotting by inhibiting the action of thrombin on fibrinogen.

Hirudinea (*Zool.*). A class of Annelida the members of which are ectoparasitic on a great variety of aquatic and terrestrial animals; they possess anterior and posterior suckers, and most of them lack setae; hermaphrodite animals with median genital openings; the development is direct. Leeches.

His (*Chem.*). Symbol for **histidine**.

hispid (*Bot., Zool.*). Coarsely and stiffly hairy as in many Boraginaceae; having a covering of stiffish hair or hairlike feathers.

hiss (*Telecomm.*). See **noise**.

His's bundle (*Med.*). See **bundle of His**.

histamine (*Med.*). A base $C_5H_9N_3$, 2-imidazolyl-4 (or 5) ethylamine. Formed *in vivo* by the decarboxylation of **histidine**. Released during allergic reactions, e.g. hay fever; large releases cause the contraction of nearly all smooth muscle and dilatation of capillaries, which cause a fall of arterial blood pressure and shock.

histidine (*Chem.*). 2-Amino-3-imidazolepropanoic acid. The L- or S-isomer is a constituent of proteins and a precursor of **histamine**. Symbol His, short form H. ⇌

histiocyte (*Immun.*). A macrophage found within the tissues in contrast to those found in the blood (monocytes).

histioma, histoma (*Med.*). Any tumour derived from fully developed tissue, such as fibrous tissue, cartilage, muscle, blood vessels.

histochemistry (*Zool.*). The chemistry of living tissues.

histocompatibility antigen (*Immun.*). Genetically determined antigens present on the surface of nucleated cells, including blood leucocytes. Coded for by *MHC genes*. They are responsible for the differences between genetically non-identical individuals which cause rejection of homografts. See **major histocompatibility complex**.

histocompatibility testing (*Immun.*). Tests whereby donor and recipient are matched as closely as possible prior to tissue grafting in humans.

histogen (*Bot.*). One of three meristems (**dermatogen**, **periblem**, **plerome**) at the shoot or root tip that give rise exclusively to particular tissues in that organ (epidermis, cortex, stele + pith, respectively). (The concept of discrete histogens has been replaced more recently by the **tunica-cortex concept**).

histogenesis (*Zool.*). Formation of new tissues.

histogram (*Stats.*). A graphical representation of class frequencies as rectangles against class interval, the value of frequency being proportional to the area of the corresponding rectangle.

histology (*Zool.*). The study of the minute structure of tissues and organs.

histolysis (*Bot.*). The breakdown, and sometimes liquefaction, of a cell or tissue.

histolysis (*Zool.*). Dissolution and destruction of tissues.

histoma (*Med.*). See **histioma**.

histones (*Biol.*). Basic proteins involved in the packaging of DNA in the eukaryotic nucleus to form **chromatin**, which is packed into **nucleosomes**, the first level of chromosome organization above the DNA helix. There are five types of histone molecule, four of which have been highly conserved in sequence throughout eukaryotic evolution.

histoplasmosis (*Med., Vet.*). A disease of animals and man due to infection by the fungal organism *Histoplasma capsulatum*. Affects the lungs in man, being relatively common in the US.

Historical Geology (*Geol.*). That major branch of geology that is concerned with the evolution of the Earth and its environment from its origins to the present day.

history of geology (*Geol.*). The study of the history or development of geological knowledge.

histozoic (*Zool.*). Living in the tissues of the body, amongst the cells.

hit (*Comp.*). Occurrence searched for a particular found these are called

hit-and-miss ventilation consisting of a slot another slotted plate air may be restricted

hitch (*Min.Ext.*). (1) not exceeding the rock face to hold

Hittorf dark space (*HIV* (*Immun.*). Ab

Virus.

HLA-A, HLA-B, HLA-C antigens, each coded and for which there are structures, consisting to which is attached Class I antigens are Cytotoxic T-cells. Class I molecules.

HLA-D (*Immun.*). by separate loci three distinct loci has several alleles are dimers composed of polypeptide chains from most nucleolar dendritic (interdigitated by interferon association with

HLB (*Chem.*). Ter

HMI (*Image Tech.*)

H-network (*Telecom.*)

Hn RNA, heterogeneous

of RNA molecules of mature messenger

the cytoplasm.

HNW (*Build.*). A

Ho (*Chem.*). The

hoarding (*Behav.*)

items in the animals

hoarding, hoar

temporary character

hoar frost (*Meteo.*)

objects, especially

point is below the

formation produce dew.

hob (*Eng.*). (1)

sinking, which by

the die. It make

the die resembling a

is interrupted

hobbing cutter

hobbing machine

gear blanks, worm

gears **hobbles** (*Vet.*)

horse for casting

Höchststärker cable

in which insulation of

tion of electrical

purely radial **hock** (*Zool.*)

hock (*Zool.*)

hoctonsphere

boiling-point

atures at which

The vessels

before weld

spherical. D

transmission primaries

t of solutes about the plant, ent of inorganic salts in the ylem, and the movement of ss flow hypothesis.

l which is capable of trans- ich no object can be seen. means by which power is of an automobile to the live ar, propeller shaft, clutch, automatic transmission. nsmittance.

l The process of transferring or data, still or moving etc.) from one location to rs (as in broadcasting) by (2) The actual information munication or broadcasting

n.). Section of a frequency um attenuation is desired, speed of transmission of

m.). Device for separating a d outgoing sections for the e same time permitting the e frequencies. oller or inverted tooth chain wer.

ss.). Probability of penetra- le striking it.

Eng.). A device for measur- ft, and hence the power ference from the measured shaft, obtained by a torsion riment of the torque acting planetary pinions of an

ys.). One in which radiation measured, to investigate the e. Such experiments are used cross-sections for neutrons. n.). The increase of power n a transmission from one

nm.). Electric power in a as the decibels or nepers by el. Also called *power level*. .). General name for any electric or electromagnetic hone line, coaxial feeder, G- for the acoustic equivalent. (Telecomm.). A wideband fying devices are distributed nmission line. Also *distrib-*

Ten times the logarithm to scribing the transmission of ws etc. The nominator is the ind and the denominator the ind. Abbrev. *TL* or *R* in

m.). Difference between the e input power level of the ission system in decibels or

st (Telecomm.). Apparatus sending circuit and a level ng circuit has a specified and its output power is

im.). Field configurations by oustic energy may be propa- , especially waveguides. See

ge Tech.). In colour TV, the sen so that each one corre- ndent signals which comprise

transmission ratio

transmission ratio (*Image Tech., Phys.*). The ratio of the transmitted luminous flux to that incident upon a transparent medium. Reciprocal of *opacity*.

transmission reference system (*Telecomm.*). See *master telephone transmission reference system*.

transmission speed (*Comp.*). The number of bits or elements of information transmitted in unit time. See *baud*.

transmission tower (*Elec. Eng.*). The steel structure that carries a high-voltage transmission line.

transmission voltage (*Elec. Eng.*). The nominal voltage at which electric power is transmitted from one place to another.

transmissivity (*Phys.*). See *transmission coefficient*.

transmit-receive tube (*Electronics, Radar*). Switch which does or does not (*anti-transmit-receive tube*) permit flow of high-energy radar pulses. It is a vacuum tube containing argon for low striking, and water vapour to assist recovery after the passage of a pulse. Used to protect a radar receiver from direct connection to the output of the transmitter when both are used with the same scanning aerial through a common waveguide system. Abbrev. *TR tube*.

transmittance (*Phys.*). Ratio of energy transmitted by a body to that incident on it. If scattered emergent energy is included in the ratio, it is termed *diffuse transmittance*, otherwise *specular transmittance*. Also called *transmis-*

transmitted carrier system (*Telecomm.*). An *amplitude modulated system* in which the carrier wave is radiated. Cf. *suppressed carrier system*.

transmitter (*Telecomm.*). Strictly, complete assemblage of apparatus necessary for production and modulation of radiofrequency current, together with associated antenna system; but frequently restricted to that part concerned with the conversion of d.c. or mains a.c. into modulated RF current.

transmitter frequency tolerance (*Telecomm.*). Maximum permitted frequency departure.

transmitting valve (*Telecomm.*). One which handles output power of a radio transmitter; may be in parallel or push-pull with others.

transmittivity (*Phys.*). Transmittance of unit thickness of nonscattering medium.

transmutation (*Phys.*). See *atomic transmutation*.

transom, transome (*Build.*). An intermediate horizontal member of a window frame, separating adjacent panes.

transonic range (*Aero.*). The range of air speed in which both *subsonic* and *supersonic* airflow conditions exist round a body. Largely dependent upon body shape, curvature and **thickness-chord ratio**, it can be broadly taken as Mach 0.8 to Mach 1.4.

transparency (*Image Tech.*). (1) The measure of light transmitted by a transparent medium, see **transmission ratio**. (2) A picture on a clear support in which the tones and colours of the image are transparent, intended to be viewed by transmitted light or by projection on a screen.

transparency (*Phys.*). Proportion of energy or number of incident photons or particles which pass through window of ionization chamber or Geiger counter.

transpiration (*Aero.*). The flow of gas along relatively long passages, the flow being determined by the pressure difference and the viscosity of the gas, surface friction being negligible.

transpiration (*Bot.*). The loss of water by evaporation, mainly through the stomata in vascular plants.

transpiration stream (*Bot.*). The flow of water from the soil through the tissues of the plant to the evaporating surfaces, all driven by transpiration. Cf. **cohesion theory**.

transplant (*Med.*). (1) The process of transferring a part or organ from its normal position to another position in the same individual (*autologous*) or to a position in another individual (*heterologous*). Also *transplantation*. (2) The part or organ transferred in this way.

transplant (*Med., Zool.*). (1) In surgery and experimental zoology, the process of transferring a part or organ from its normal position to another position in the same individual or to a position in another individual. Also

transverse-beam travelling-wave tube

transplantation. (2) The part or organ transferred in this way.

transpolarizer (*Elec. Eng.*). Ferroelectric dielectric impedance, controlled electrostatically.

transponder (*Radar*). A form of transmitter-receiver which transmits signals automatically when the correct interrogation is received. An example is a radar beacon mounted on a flight vehicle (or missile), which comprises a receiver tuned to the radar frequency and a transmitter which radiates the received signal at an intensity appreciably higher than that of the reflected signal. The radiated signal may be coded for identification.

transport (*Comp.*). See *tape drive*.

transport (*Phys.*). Rate at which desired material is carried through any section of processing plant, e.g., isotopes in isotope separation.

transport cross-section (*Nuc. Eng.*). Reciprocal of **transport mean free path**.

transporter bridge (*Civ. Eng.*). A bridge consisting of two tall towers, one on each side of the river, connected at the top by a supporting girder along which a carriage runs. A small platform at the ordinary road-level is suspended from the carriage, and this system can be made to travel along the girder across the river. Such bridges, inadequate for modern traffic, are obsolescent.

transport mean free path (*Nuc. Eng.*). If Fick's Law of diffusion is applicable to the conditions in a nuclear reactor then the mean free path is three times the diffusion coefficient of neutron flux. In practice the theory usually has to be modified to take account of anisotropy of scattering and persistence of velocities.

transport number (*Chem.*). The fraction of the total current flowing in an electrolyte which is carried by a particular ion.

transport theory (*Nuc. Eng.*). Rigorous theoretical treatment of neutron migration which must be used under conditions where Fick's Law does not apply. See *diffusion theory*.

transposable element (*Biol.*). See *transposon*.

transpose of a matrix (*Maths.*). The matrix whose rows are the columns of the given matrix. Formerly, *conjugate matrix*.

transposition (*Elec. Eng.*). Ordered interchange of position of the lines on a pole route, and also of phases in an open power line, so that effects of mutual capacitance and inductance, with consequent interference, are minimized or balanced. See *barrel*.

transposition (*Telecomm.*). See *co-ordinated transposition*.

transposition insulator (*Elec. Eng.*). A special type of insulator used at transposition points on a transmission line.

transposition tower (*Elec. Eng.*). A transmission tower specially designed to allow of the transposing of the conductors.

transposon (*Biol.*). A sequence of DNA which is capable of inserting itself into many different sites in the host's chromosome. syn. *transposable element*.

transreceiver (*Telecomm.*). See *transceiver*.

transrectification factor (*Elec. Eng.*). Ratio of change in average output current to change in alternating voltage applied to a rectifier.

trans-sexualism (*Behav.*). Gender identification with the opposite sex.

transudate (*Med.*). A passive effusion of fluid from blood-vessels, the fluid containing little protein, few cells, and not clotting outside the body.

transuranic elements (*Chem.*). The artificial elements 93 and upwards, which possess heavier and more complex nuclei than uranium, and which can be produced by the neutron bombardment of uranium. More than twelve of these have been produced, including neptunium, plutonium, curium, lawrencium etc.

Transvaal jade (*Min.*). Massive light green hydrogrossular garnet, used as a simulant for jade.

transverse (*Bot.*). Perpendicular to the long axis.

transverse architrave (*Build.*). The moulding across the top of a door or window opening.

transverse-beam travelling-wave tube (*Electronics*).