

stood, that what was meant was that the hypothesis should contain no facts of a kind not open to direct observation. That position would leave the memory of the past as something not so much as to be entertained as plausible.

**Vertebrate** [Lat. *vertebra*, a joint]: Ger. *Wirbeltier*; Fr. *vertébré*; Ital. *vertebrato*. Strictly, an animal having vertebrae, but used to designate all members of the sub-kingdom to which animals with vertebrae belong. Cf. INVERTEBRATE.

The lowest fishes (myxinoidea and amphioxus, a fish-like animal) present no trace of vertebrae, the axial skeleton comprising only the notochord.

The Vertebrata, sometimes called Chordata, all possess a dorsal skeletal notochord at some time in their development.

**Literature**: GEGENBAUR, *Compar. Anat.*; WIEDERSHEIM, *Vergleichende Anat.*; PARKER and HASWELL, *Zoology*; C. CLAU, *Textbook of Zoology* (Eng. trans., 1890). (C.S.M.—E.S.G.)

**Vertex** [Lat., from *vertere*, to turn]: Ger. *Scheitel*; Fr. *sommet*, *vertex*; Ital. *vertice*, *bregma*. The top or crowning point of the head; the highest point of the human skull when the body is in a perfectly erect position.

It is usually just behind the bregma (*Bg*, in figure given under CRANIOLOGY, q.v.). (J.J.)

**Vertigo** [Lat. *vertigo*, a turning]: Ger. *Schwindel*; Fr. *vertige*; Ital. *vertigine*. Dizziness, with fear of falling, a confused sensation as of swimming of the head, and apparent motion of outward objects.

Vertigo as a sensation may vary in degree from a slight sense of confusion or instability up to violent reeling and actual falling in an attempt to correct the subjective sensations of apparent motion of surrounding objects. The mechanism, the disturbance of which produces vertigo, is a very complicated one. The special organs of EQUILIBRIUM (q.v.) are concerned, probably, the semicircular canals, and the brain centre for such co-ordinations of equilibrium, situated in the cerebellum. The sensations obtained from this source are co-ordinated with visual inferences of position and movement. Vertigo may be produced in most persons by unusual or violent locomotion, as oscillation in a swing, turning rapidly around on one's heels, ascent or descent in an elevator, the irregular movements of a ship, balloon, or train. Vertigo as the result of drug action is marked in the case of alcohol.

As a symptom of disease, vertigo is of

various significance. It has been associated with pressure upon the brain, concussion or injury of the brain (as by tumours, disturbances of circulation, blows, &c.), particularly in diseases of the cerebellum; with anaemia of the brain from general anaemia or arteriosclerosis; its frequency in multiple sclerosis has been noted; it is often a characteristic factor in the epileptic seizure, and in some cases takes the place of such a seizure; it is particularly significant in aural, especially labyrinthine, difficulties, in one form of which (Ménière's disease) the vertigo forms the chief symptom; it is frequent in neurasthenia and related conditions; and it is connected with ocular as well as visceral disturbances.

Ocular vertigo is an unusual disorder, due generally to weakness or paralysis of an ocular muscle, and a consequent false orientation of the body with reference to seen objects. The ocular sensation (as of moving objects) is an important one in all forms of vertigo. Aural vertigo arises from disease in the internal ear, and includes Ménière's disease as one of its severer forms. This disorder, which is often preceded by earache, slight deafness, ringing in the ears, is of a paroxysmal nature. The patient is more or less suddenly seized with intense vertigo, may reel about or fall to the ground; objects seem to move about, and even slight loss of consciousness may occur. Some patients feel impelled to go through circular or backward movements, others are hurled to the ground as by an unseen force. In repeated attacks the same forms of movement are experienced, indicating in some cases a local affection of one canal or group of canals. In most cases there is a succeeding dazed period, often accompanied by pallor, vomiting, and severe physical depression.

The vertigo that is characteristic of neurasthenia is largely of a subjective character, a feeling of swimming and confusion, rarely amounting to reeling or the apparent moving of outward objects. It is generally relieved by assuming a horizontal position, and is associated with states of fatigue. Vertigo of gastric origin is probably not a frequent disorder, although an attack of indigestion, seasickness, and the like, is the occasion or predisposition to vertigo in those liable to these disorders.

**Literature**: GOWER, *Diseases of the Nerv. Syst.*; HIRTIG, *Der Schwindel*, in *Notting's Spez. Ther.*, xvii. 2 (2nd ed., 1898). (J.J.)

**Vested Rights**: see RIGHTS.

**Vestige** [Lat. *vestigium*, a footprint]: Ger. *Spur*; Fr. *vestige*; Ital. *vestigio*. See VESTIGIAL ORGANS AND CHARACTERS.

**Vestigial Organs and Characters**. Reduced and often useless organs or characters which, on the theory of evolution, represent the fully functional and useful organs or characters of ancestral animals: a single such organ or character is called a vestige.

(C.L.M.—J.M.B.)

This phrase has largely replaced the earlier phrases—rudimentary organs and rudiments. It thus distinguishes organs in process of DEGENERATION (q.v., in biology) from organs in process of evolution (cf. RUDIMENT). Darwin discussed the value of such organs as evidence of the transmutation of species. Cf. also ATROPHY.

Since the theory of evolution has become widely accepted, the method of suppression has been discussed. On the Lamarckian hypothesis disuse is itself sufficient to effect reduction of size and complexity, since the effects of disuse are on this hypothesis inherited. Those who reject this hypothesis account for the facts by reversed selection, assuming that the possession of the organ constitutes a disadvantage, by cessation of selection with PANMIXIA (q.v.), and by the principle of economy of growth with INTRASELECTION (q.v.). Weismann has added the hypothesis of GERMINAL SELECTION (q.v.) or a competition for nutriment in the waxing and waning determinants or structural units in the germinal substance, by which the stronger increase while the weaker diminish.

**Literature**: C. DARWIN, *Origin of Species*; J. G. ROMANES, *Darwin and after Darwin*, ii; WEISMANN, *The Germ-Plasm*; and *Germinal Selection*. (C.L.M.)

**Veto**: see FIAT, and NOLITION.

**Vibration** [Lat. *vibrare*, to shake]: Ger. *Vibration*; Fr. *vibration*; Ital. *vibrazione*.

The rapid rhythmical movement of a body or parts of a body back and forth in a linear path or closed curve. In the latter case the vibration is called circular, elliptic, &c., according to the form of the path.

Movement in one direction is sometimes called a single, and that in both directions a complete vibration. Such a vibratory movement when propagated through a homogeneous medium is called an undulation or wave. Cf. ETHER. (S.N.)

**Vicarious Atonement** [Lat. *vicarius*, taking another's place]: Ger. *stellvertretendes Sühnopfer*; Fr. *expiation vicariale*; Ital.

*espiatione vicaria*. That theory of the Atonement which represents it as a substitutionary sacrifice for sin on the part of the Redeemer, by virtue of which the sinner's debt to the divine law is satisfied and the merit of Christ's obedience is imputed to him as the ground of his justification.

The vicarious theory is opposed to the moral theory and presupposes the necessity of expiation. It rests on the notion of substitution, and is the work which was accomplished by Christ in the stead of the sinner.

**Literature**: see ATONEMENT. (A.T.O.)

**Vice** [Lat. *vitium*]: Ger. *Laster*; Fr. *vice*; Ital. *visio*. Gross, and more or less habitual, departure from VIRTUE (q.v.).

Like virtue, vice extends to character, disposition, and habit of life. It is contrasted in degree with moral defect and FAULT (q.v.). See also SIN. (J.M.B.)

**Vico, Giovanni Battista**. (1668–1744.) Born at Naples, and educated by the Jesuits. Private tutor for several years in the house of the bishop of Ischia; professor of rhetoric in Naples, 1697; royal historiographer, 1735. 'The bold and profound creator of the philosophy of history' (Falkenberg). See CANTONI, *G. B. Vico*.

**Victorinus, Marius**: see SCHOLASTICISM, I.

**Virtual** [Lat. *virtus*, strength, from *vir*, a man]: Ger. *virtuell*; Fr. (1) *virtuel*; Ital. (1) *virtuale*. (1) A virtual *X* (where *X* is a common noun) is something, not an *X*, which has the efficiency (*virtus*) of an *X*.

This is the proper meaning of the word: but (2) it has been seriously confounded with 'potential,' which is almost its contrary. For the potential *X* is of the nature of *X*, but is without actual efficiency. A virtual velocity is something *not* a velocity, but a displacement; but equivalent to a velocity in the formula, 'what is gained in velocity is lost in power.'

So *virtual representation* was the non-representation of the American colonies in the British Parliament, which was supposed to be replaced by something. So Milton asks whether the angels have *virtual* or immediate touch. So, too, the sun was said to be *virtualiter* on earth, that is, in its efficiency.

(3) *Virtual* is sometimes used to mean pertaining to virtue in the sense of an ethical habit.

**Virtual knowledge**: a term of Scotus defined by him (*Opus Oxon.*, Pt. I. iii. 3) as follows: 'Quantum ad notitiam habitualement sive virtu-

# VIRTUE

alem, primo expono quid intelligo per terminos. *Habitualement* notitiam voco, quando obiectum sic est praesens intellectui [i.e. to the thought] in ratione intelligibilis actu ut intellectus statim possit habere actum elicatum circa illud obiectum. Voco *virtualement*, quando aliquid intelligitur in aliquo, ut pars intellecti primi, non autem ut primum intellectum sive ut totale terminans intellectionem; sicut cum intelligitur homo intelligitur animal in nomine, ut pars intellecti, non ut intellectum primum, sive totale terminans intellectionem. Hoc satis proprie vocatur intellectum *virtualiter*, quia est satis proximum intellectui in actu. Non enim posset esse actualius intellectum, nisi esset propria intellectione intellectum, quae esse ipsius primi, ut termini totalis.

*Virtual difference*: a term of the doctrine of *formalitates* set forth by Scotus, *Opus Oxon.*, Pt. I. ii. 7. (C.S.P.)

**Virtue** [Lat. *virtus*, manliness, equivalent to Gr. *ἀρετή*, excellence]: Ger. *Tugend*; Fr. *vertu*; Ital. *virtù*. Excellence of character, disposition, and habit of life, with reference to generally accepted moral standards. (J.S.-J.M.B.)

The nature of virtue and the classification of the virtues engaged the attention of both the ancient and the mediaeval moralists. Socrates made the moving spring of virtue adequate knowledge of the good, that of vice ignorance of it; and from this view of the nature of virtue he deduced the unity of the virtues, which were simply the different applications of the knowledge of the good. Plato distinguished four cardinal virtues, wisdom (*σοφία*), courage (*ἀνδρεία*), temperance (*σωφροσύνη*), and righteousness (*δικαιοσύνη*). Aristotle, investigating more carefully the psychological nature of virtue, defined it as a habit (*ἔξῃς*), as distinguished from a mere activity (*ἐνέργεια*). This habit implies deliberate choice or preference, and is in accordance with right reason. Its object or content is the mean (*μεσότης*) between the two extremes of excess and defect. The application of this doctrine to the details of the moral life gives Aristotle his list of virtues, which includes, besides courage and temperance, liberality, munificence, high-mindedness, gentleness, agreeableness, truthfulness, wittiness, and modesty. In addition to these virtues of the individual life, Aristotle recognizes justice and friendship, as the virtues called for by the social relations in which the individual stands to the state and to other individuals. So far, however, account has been taken only of moral or practical virtue, which consists in an established or

habitual control of irrational impulse by reason. Intellectual virtue is the excellent or rational exercise of the rational soul itself. The chief intellectual virtues are speculative wisdom (*σοφία*), which deals with the absolute nature of things, and prudence or practical wisdom (*φρόνησις*), which deals with the relative and changing conditions of human conduct. Aristotle insists upon the intellectual nature of moral virtue, since the latter, in all its forms, presupposes rational insight (*φρόνησις*).

The mediaeval moralists followed Aristotle in his division of virtues into intellectual and moral. To the cardinal virtues of Plato they added the 'theological' virtues. The former they regarded as 'natural,' or 'acquired by human acts'; the latter as 'supernatural,' or 'infused by God.' The cardinal virtues lead only to natural or human happiness; the theological lead to supernatural or divine happiness. 'Habituation,' says Thomas Aquinas, 'contributes to both, but in different ways. It causes acquired virtue; it disposes to infused virtue; and where infused virtue exists, it preserves it and advances it' (*Summa Theol.*, i-ii. q. 92, art. 1, § 1; cf. i-ii. q. 65, art. 2; i-ii. q. 62). The theological virtues are faith, hope, and charity. Faith has special reference to the intellect, hope and charity to the will. The Christian Church further added to the classical list of virtues such additional phases of character as patience and humility.

The question of the fundamental nature and value of virtue was investigated by the Stoics and Epicureans, the former regarding it as an end-in-itself, the latter as the most important means to happiness. The early British moralists were also more concerned with this problem than with that of the good, raising the further questions of the 'sanctions' of virtue, and of its egoistic or altruistic content. Butler's contribution to this discussion is most important. In his view virtue is a following of human nature as a systematic whole, or acting in accordance with the guidance of the higher (rational or reflective) principles—conscience, self-love, and benevolence. Its obligation is intrinsic: man, as a rational being, is a law unto himself.

*Literature*: that of *ETHICS*; see also *BIBLIOG.* I, 2, c. (J.S.)

**Virtue** (in theology): Ger. *Kräfte* (plural), *Tugend*; Fr. *vertu*; Ital. *virtù*. Those elements of character are virtues which are distinctive of the Christian ideal, as faith, hope, love, submission to the divine will, &c., and which

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