

'In experiments carried on at the Woods Holl Biological Laboratory, Loeb finally succeeded in rearing large numbers of perfect larvae from eggs which, without fertilization, are first treated with a weak solution of magnesium chloride and then transferred to normal sea-water. Carried out under rigidly controlled conditions, these decisive experiments show that the egg is capable of complete development, without union with a spermatozoon, as a result of chemical stimulus; and they indicate that even in normal fertilization we must regard the stimulus to development as being given by a specific substance or substances carried by the spermatozoon. Loeb's highly interesting further experiments, together with the slightly earlier ones of Herbst, indicate that the normal equilibrium of the egg depends upon an equilibrium of chemical conditions in the protoplasm which is maintained by the conditions of the environment. The experiments give ground for the remarkable conclusion that the substances dissolved in the sea-water are individually poisonous to the egg, but are normally so balanced as to neutralize one another's injurious effects and maintain the equilibrium of the egg. If this armed neutrality be disturbed the egg responds, undergoing degenerative changes, and dying if the change be too violent, passing through an abnormal development and giving rise to monstrous embryos if the new conditions be less unfavourable, but under appropriate stimulus being, as it were, released from bondage, and rendered free to run its normal course of development.

'It is certain that new results of the highest interest, relating to the chemical conditions in living matter, may be looked for along the lines of research thus opened. One of the most interesting specific problems in this direction is the long-standing one of sex-determination. Experiments on insects, frogs, and rotifers have already given good ground for the conclusion that sex is in these cases determined by conditions of nutrition, which again in the long run are reducible to chemical conditions. The possibility is thus opened that we may yet succeed not only in fertilizing the egg by chemical means, but also in rendering the organism male or female by analogous methods. A highly interesting question, still undetermined, is whether organisms produced by artificial parthenogenesis, as above, are capable of reaching the adult condition and of further reproduction. Individuals thus produced lack the paternal nuclear material,

and must possess but half the normal number of chromosomes. What the ultimate result of this deficiency may be is still a matter of conjecture.'

The statement ventured just above that 'individuals thus produced must possess but half the normal number of chromosomes,' has since been experimentally demonstrated by Wilson (*Proc. N. Y. Acad. Sci.*, 1901). (J.M.B.)

Literature: R. OWEN, Parthenogenesis (1849); A. BRAUER, Zur Kenntniss der Reifung des parthenogenetisch sich entwickelnden Eies von *Artemia Salina*, Arch. f. mikr. Anat., xiii (1893); VON SIEBOLD, Wahre Parthenogenesis (1856); T. H. HUXLEY, On the Agamic Reproduction of Aphis, Trans. Linn. Soc., xxii (1858); Y. DELAGE, Structure du Protoplasma, Biol. Gén. (1895). (C.L.L.M.)

Partial [OF. *parcial*, borrowed from the L. Lat. *partialis*]: Ger. *partiell*; Fr. *partiel*; Ital. *parziale*. Incomplete, or affecting a part.

Partial abstraction: the abstraction of one integrant part from others.

Partial cause: a cause which is joined with others of its own species in causing that which is caused.

Partial conversion: Aristotle's ἀντιστρέφειν ἐν μέρει is the conversion of a proposition, whether universal or particular, into a particular proposition.

Partial method: a method applying to a part of a science.

Partial term: a term of a proposition, such that not every object it denotes need be examined to verify the proposition (De Morgan, *Syllabus*, § 17). The *Century Dictionary* defines it as an undistributed term, which seems to come to the same thing. (C.S.P.)

Partial Tones: Ger. *Partiälöne*; Fr. *tons partiels*; Ital. *suoni parziali*. The simple constituents of a COMPOUND TONE (q.v.), inclusive of the fundamental. Cf. OVERTONE, and TIMBRE. (E.B.T.)

Particular [Lat. *particularis*, singular]. In untechnical language, applied to single cases coming under general heads and occurring, or supposed to occur, in experience; in this sense it is also a substantive. The particulars are the experientially known circumstances of general nature, but as they appear in the individual case.

A particular PROPOSITION (q.v.) is one which gives a general description of an object and asserts that an object to which that description applies occurs in the universe of discourse, without asserting that it applies to the whole universe or to everything in

the universe of a specified general description; as 'Some dragons breathe fire.' If we hold that the particular proposition asserts the existence of something, then the precise denial of it does not assert the existence of anything; as 'No dragon breathing fire exists.' It is, therefore, not true that from such precise denial any particular proposition follows, such as 'Some dragon does not breathe fire.' For if there is no dragon that does not breathe fire, this is false, although it may be true that there is no dragon that breathes fire. (C.S.P., C.L.F.)

This rule is not, of course, intended to apply to relative logic, in which there is frequently occasion to make a change from one copula to another—a change which is not contemplated in the ordinary logic. For instance, of the two propositions, 'Some woman is adored by every Catholic,' 'Every Catholic adores some woman,' the second follows from the first; to decide whether the first follows from the second or not, some further explicit convention as to the existence of terms which enter the proposition not as simple subject or predicate is necessary. (C.L.F.)

For instance, from the particular proposition, 'Some woman is adored by all Catholics,' it follows that 'Any Catholic that may exist adores a woman,' i.e. 'There is no Catholic that does not adore a woman,' which is the precise denial of 'Some Catholic non-adores all women,' which is a particular proposition. From this, in turn, it follows that a woman adored by all Catholics does not exist, which is the precise denial of the first proposition, 'Some woman is adored by all Catholics.' Of every particular proposition the same thing is true. Thus, if 'Some crow is white,' it follows that 'No inevitable consequence of whiteness is wanting to all crows,' which is the precise denial of the particular proposition, 'Some inevitable consequence of whiteness is wanting to all crows.' Thus, from every particular proposition follows the precise denial of a particular proposition, but from no precise denial of a particular proposition can any particular proposition follow. But this does not extend to a *simple* particular proposition, such as 'Something is white,' since to say 'Something is non-existent' (which the analogous treatment would yield) is an absurdity, and ought not to be considered as a proposition at all. (C.S.P., C.L.F.)

Particulate [Lat. *particulatim*, bit by bit. *Particularis* appears in Apuleius. *Particulatio* is used by Martianus Capella to

mean breaking up into bits. *Particulare* and *particulate* are met with, not very often, in Albertus Magnus and others, to mean to *particularize*, *particularized*, whether in words or metaphysically of an essence]: (not in use in other languages). Particulate is used by recent writers chiefly in the sense of consisting of, or concerned with, particles. They appear to know nothing of the traditions of the word, but to have formed this adjective from *particle*, since *particular* bears a different meaning. (C.S.P.)

Party (in law) [Lat. *pars*, a part]: Ger. *Partei*; Fr. *partie*; Ital. *partito*. (1) A person directly concerned in a lawsuit, either as a plaintiff or a defendant.

(2) A person concerned in any legal transaction, e.g. a *party to a contract*, a party to a question in dispute. *Act of party*, a voluntary act, as distinguished from 'act of law.' Land is conveyed by act of party, inherited by act of law. *Party to the record*, a party to a lawsuit named as such in the written process or pleadings; *party in interest*, one not so named, but who has a beneficial interest in the subject-matter of the litigation. (S.E.B.)

Parva Logicalia [Lat.]. In scholastic logic the departments of that science go by the names of books. Thus, the *logica vetus* embraces what is treated in the 'predicables,' or introduction, of Porphyry, in Aristotle's *Categories*, and in the *Peri hermeneias*; the *logica nova* treats of the remaining subjects of the *Organon*; and finally the *parva logicalia* is the name at once of certain tractates and of the subjects treated in them—to wit, suppositio, relativa, ampliatio, restrictio, appellatio, distributio, exceptivae, reduplicativae, incipit et desinit, alienatio, exponibilia, consequentiae, syncategoremata, insolubilia, copulata, positio propositionum in esse, status, decensus et ascensus, obligationes, &c. (C.S.P.)

Pascal, Blaise. (1623-62.) Born at Clermont in Auvergne, and carefully educated in Paris, he very early developed remarkable abilities as a mathematician. About 1644, he came under the influence of the Jansenists of Port Royal. His attention was fixed chiefly on religion, morals, and philosophy for the remainder of his life.

Passion and Passive [Lat. *passio*, the trans. of Gr. πάθος, from πάσχειν, to suffer]: Ger. *Passivität* (*leidend*, *passiv*); Fr. *passion* (*passif*); Ital. *passività* (*passivo*). Generally passion is the condition of being acted upon, of being affected, receptive; opposed to action. Passive is the corresponding adject-