consanguinity, by prohibiting, successively, incest, polyandry, polygamy, and bigamy. The marriage laws of Europe and America still bear the impress of the deliberations of the Council of Trent. (F.H.G.)

Literature: McLennan and Westermarck, as cited (the latter having an extensive bibliography); Starcke, The Primitive Family. See also under Family. (J.M.B.)

Marsilius Ficinus: see Ficino, Marsiglio.

Martineau, James. (1805–1900.) An English writer in moral and religious philosophy. Of Huguenot ancestry, he was born in Norwich. He attended successively the Norwich Grammar School, Lant Carpenter's private school at Bristol, and a school for engineers at Derby. Changing his plans, he studied theology for five years at Manchester College, situated at that time at York. Admitted to preach, 1827; ordained in Dublin, 1828, he moved to Liverpool. In 1839 he took a prominent part in the Liverpool Controversy, and in 1840 he was appointed professor of mental and moral philosophy in Manchester New College, a position which he held until 1885.

Martyr, Justin: see Justin Martyr.

Mass [Lat. *missa*, dismissal]: Ger. *Messe*; Fr. *messe*; Ital. *messa*. The Sacrament of the Eucharist as administered in the Roman and Greek Churches, in which, through the separate consecration of the bread and wine, the sacrifice of Christ is exhibited and the real body and blood of Christ are received in the communion.

There are several species of Masses, as High Mass, which is accompanied with chant, incense, and the assistance of deacon and subdeacon; Low Mass, which lacks these accompaniments; Requiem Mass, celebrated for the dead; and Pontifical Mass, celebrated by the bishop.

Literature: see Sacrament, and Transubstantiation. (A.T.O.)

Mass (in physics) [Lat. *massa*, a lump]: Ger. *Masse*; Fr. *masse*; Ital. *massa*. The quantity of matter in a body, as measured by the amount of its inertia or the amount of force necessary to produce in it a given motion in a given time, it being entirely free to move in the direction of the force.

The weight of the body at a given place is equally a measure of its mass, and the only measure that can be readily applied in practice. Experiment shows the results of the two measures to be identical, since weight, or gravity, and inertia have the same ratio for all substances. All bodies retain their mass unchanged, whatever transmutations they may undergo. (S.N.)

Material. Matter (q.v.), or, as adjective, belonging to or composed of matter. See also Matter and Form, and cf. topics in Form and Formal. (J.M.B.)

Material Fallacy. This term originated with Whately (*Encyc. Metropolitana*, i. 218 *b*). Whately's material fallacies are those in which the conclusion does follow from the premises. Therefore, excluding the multiple interrogation, which is no syllogism, of the rest of Aristotle's thirteen, only the *ignoratio elenchi* and the *petitio principii* are material. Cf. Fallacy (also for foreign equivalents).

Aldrich had modified Aristotle's division into fallacies *in dictione* and fallacies *extra dictionem*; making a division into *Sophismata in forma argumenti* (*sicubi conclusio non legitime consequatur ex praemissis*), and *Sophismata in materia argumenti* (*sicubi legitime non tamen vere concludere videatur syllogismus*). Under the latter head he placed the *ignoratio elenchi*, the *non causa pro causa*, the *non sequitur*, and the *petitio principii*. Whately's distinction is—whether from a theoretical or a practical point of view—by far the most important that can be drawn among fallacies; so that besides the reason of priority, which ought itself to be final, the needs of the logician forbid us to depart from Whately's definition. Some logicians do not admit material fallacies among the number of fallacies, but consider them to be faults of method (Hamilton, *Lects. on Logic*, xxvi; Ueberweg, *Syst. d. Logik*, §§ 126, 137). E. E. Constance Jones (*Elements of Logic as a Science of Propositions*, § xxvi) reduces them to formal fallacies. Hyslop (*Elements of Logic*, chap. xvii) uses the term material fallacy, quite unjustifiably, to include all fallacies due to something in the matter of reasoning. (C.S.P.)

Material Logic: Ger. *materielle Logik*; Fr. *logique matérielle*; Ital. *logica materiale*. Formal logic classifies arguments by producing forms in which, the letters of the alphabet being replaced by any terms whatever, the result will be a valid, probable, or sophistic argument, as the case may be; material logic is a logic which does not produce such perfectly general forms, but considers a logical universe having peculiar properties.

Such, for example, would be a logic in which every class was assumed to consist of a finite number of individuals; so that the

syllogism of transposed quantity would hold good. In most cases material logic is practically a synonym of applied logic. But a system like Hegel's may also properly be termed material logic. The term originated among the English Occamists of the 14th century, who declared Aristotle's logic to be material, in that it did not hold good of the doctrine of the Trinity. (C.S.P.)

Materialism [Lat. *materialis*, material]: Ger. *Materialismus*; Fr. *matérialisme*; Ital. *materialismo*. That metaphysical theory which regards all the facts of the universe as sufficiently explained by the assumption of body or matter, conceived as extended, impenetrable, eternally existent, and susceptible of movement or change of relative position.

Matter in motion is held to be the fundamental constituent or ultimate fact of the universe; and all phenomena, including the phenomena of consciousness, are reduced by the theory to transformations of material molecules. As Paulsen points out, the reduction of psychical processes to physical is the special thesis of materialism.

The atomism of Leucippus and Democritus is the first formulation of a definitely materialistic system. It is true that in all the theories of the Pre-Socratics (q.v.) the principle of explanation is materialistically conceived, but this is due to the fact that the contrast between matter and spirit had not yet been fully realized. Hence it is customary to apply the term Hylozoism (q.v.) to the earliest Greek speculations. But even where the principle of explanation appears most abstract and idealistic, as in the Being of Parmenides, it is found on closer scrutiny that the definition of Being as 'a finite, spherical, motionless plenum' implies the unchallenged identification of being with sensible reality. Hence it has been argued by Burnet (cf. *Early Greek Philos.*, 192–5) that 'Parmenides is not, as some have said, the father of idealism; on the contrary, all materialism depends on his view of reality.' As a matter of fact, the atoms of Leucippus and Democritus correspond exactly to the Eleatic definition of Being. But Parmenides had brought philosophy to an *impasse* through the impossibility of deducing from his immovable one the phenomena of actual experience. The atomists solve this difficulty by placing Non-being or the void alongside of the Eleatic plenum, the latter conceived, however, not monistically, but pluralistically. 'Leucippus,' according to Aristotle's account (*Gen. Corr.*, A. 8. 324 B, 35 ff.), 'thought he had a theory which was in harmony with sense-perception, and did not do away with coming into being and passing away, nor motion, nor the multiplicity of things. . . . For, said he, that which is, strictly speaking, real is an absolute plenum, but the plenum is not one. On the contrary, there are an infinite number of them, and they are invisible owing to the smallness of their bulk. They move in the void (for there is a void), and by their coming together they effect coming-into-being; by their separation, passing-away.' The atomists, as Lange says, were the first to fix the definition of matter and consciously to derive the totality of phenomena solely from matter so conceived. In the form given to it by Democritus, adopted (with a slight modification) by Epicurus and clothed in poetry by Lucretius, the materialistic theory undergoes little change in ancient times. Its characteristic features are (1) the reduction of all qualitative differences to quantitative, namely, to differences in the size, form, arrangement, and situation of the individual atoms, and (2) the denial of intelligent purpose or final cause. The origin of the world-structure from the clash of moving atoms is held to be fully explained by mechanical necessity (*ἀνάγκη*). Of the origin of motion no account is given: it is apparently considered as equally primordial with the existence of the atoms themselves. But the velocity of the atoms is made to depend on the size or mass of the atoms, whence arise those clashings and interferences which sift out the atoms of different kinds, and, by the separations and combinations produced, give rise in process of time to the existing cosmic system. Epicurus adopted the materialism and atomism of Democritus, but modified the principle of natural necessity by ascribing to the atoms (which he conceived as falling through infinite space) a power of voluntary deviation from the direct line of descent, explaining thereby the origin of the clashings and whirling movements from which the ordered system of things took its rise. The Stoics, as the great teleologists of the ancient world, with their pantheistic doctrine of the world-reason, stand at the opposite extreme from the pure atomism of the Epicureans; yet both schools are completely materialistic in their theoretical conceptions. The Stoics go so far as to declare that even the qualities, forces, and relations of things are 'bodies,' and the creative reason is con-