

Indeed, it is seldom that reflective emotion such as this is not complicated with special feelings and attitudes toward the object.

Literature: see SHYNESS. (J.M.B., G.F.S.)

Modification (in biology) [Lat. *modificatio*]: Ger. (*individuell erworbene*) *Abänderung* (Wundt); Fr. *modification*; Ital. *modificazione*. A structural change wrought during the individual's lifetime (or acquired), in contradistinction from variation, which is of germinal origin (or congenital).

The term was used sometimes, but not consistently, in this sense by Darwin. In the Darwinian phrase 'descent with modifications' the ambiguity is evident as between what is congenital and what acquired.

The distinction indicated in the definition has been rendered necessary by the discussion as to the inheritance of acquired characters. Modifications are acquired by the individual; whether they can be transferred to the germinal substance and thus become hereditary as variations is the problem under discussion. See ACQUIRED CHARACTERS, and HEREDITY. Organisms capable of extensive modification are termed plastic; and this PLASTICITY (q.v.) may be subject to selection. The term ACCOMMODATION (q.v.) is reserved by some writers for the moulding of behaviour to enviroing circumstances on the part of organisms, referring to function rather than to structure. On the hypothesis of ORGANIC SELECTION (q.v.) modifications of structure may serve to foster COINCIDENT VARIATIONS (q.v.) of like nature, and accommodations of behaviour may thus set the direction of congenital variation, and so of evolution under the action of natural selection.

Literature: LLOYD MORGAN, *Habit and Instinct*; J. MARK BALDWIN, *A New Factor in Evolution*, Amer. Natural., June-July, 1896; HEADLEY, *The Problems of Evolution* (1901). (O.L.L.M.—J.M.B.)

Modification and Variation (mental). The same distinction between these terms is recommended as that given under MODIFICATION (in biology). Cf. VARIATION. (J.M.B.)

Modulus [Lat. *modus*, a mode]. (1) Proposed by Schröder (Ger. *Modul*; Fr. not in use; Ital. *modulo*, suggested—E.M.) for the four relative terms upon which the logic of dual RELATIVES (q.v.) hinges; namely, 'Not,' 'Same as,' 'Excluded from a universe containing,' and 'With, or within a universe containing.'

These terms were first called by Peirce the 'definite dual relatives of second intention';

he now thinks it might be well to term these the four 'cardinals,' or four cardinal dual relatives.

Literature: PEIRCE, in *Studies in Logic by Members of the Johns Hopkins University*, 191, and Amer. J. Math., iii. 47; SCHRÖDER, *Algebra d. Logik*, iii. 117.

(2) See ERRORS OF OBSERVATION. (C.S.P.)

Modus ponens and Modus tollens [Lat.]

Two ways of reasoning from a conditional proposition or consequence. The *modus ponens* from the consequence and the antecedent infers the consequent; the *modus tollens* from the consequence and the falsity of the consequent infers the falsity of the antecedent, thus:

Modus Ponens. *Modus Tollens.*
If *A* is true, *C* is true; If *A* is true, *C* is true;
A is true; *C* is false;
∴ *C* is true. ∴ *A* is false.

A third way of reasoning, namely, from the truth of the antecedent and falsity of the consequent, to the falsity of the consequence, is generally overlooked. See HYPOTHETICAL (syllogism). (C.S.P.)

Mohammed, or Mahomet, or Mahoméd, or Muhammed. (cir. 570–632 A.D.) An Arabian prophet, born at Mecca. His father died about the time of Mohammed's birth, and his mother in his sixth year. He was raised by a grandfather and an uncle. The latter, Abu Talib, was his faithful friend and protector all through life. Accounts of Mohammed's youth are legendary: he probably tended flocks until his twenty-fifth year, when he entered the service of a rich widow named Chadidja, whom he married. In his fortieth year Mohammed saw his first 'vision' and received his 'message.' In four years he made forty proselytes, and it was revealed to him that he must preach openly. As his followers increased in numbers, he was forced to the most careful watchfulness to save his life. About 622 he moved to the friendly city of Medina, and the Mohammedan era dates from the first month of the following Arabic year. Mohammed now became the law-giver, judge, and ruler of Medina and of two powerful Arabian tribes. In the first year of the new era, he assumed hostilities against his enemies. War followed, and in the sixth year of the new era the first pilgrimage to Mecca was announced, but not carried out until the following year. The Meccans concluded peace with him, however, and he had become an equal power. His missionaries passed throughout Arabia, and even beyond its borders. Mohammed's forces being de-

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