

states are considered under WILL (defects of). (J.J.)

**Involution** [Lat. *in + volvere*, to roll]; Ger. *Involution*; Fr. *involution*; Ital. *involuzione*. A term of SYMBOLIC LOGIC (q.v.) borrowed from algebra, where it means the raising of a base to a power. In logic it has two different senses. (1) Relative involution: let *lwm* denote any lover of a well-wisher of a man. That is, any individual *A* is denoted by *lwm*, provided there are in existence individuals *B* and *C* (who may be identical with each other or with *A*), such that *A* loves *B*, while *B* wishes well to *C*, and *C* is a man. Further, let *l'm* denote any individual *A*, if, and only if, there is in existence an individual *C*, who is a man, and who is such that taking any individual *B* whatever, if *B* is a well-wisher of *C*, then *A* is a lover of *B*. The operation of combining *l* and *w* in this statement is termed 'progressive involution.' Again, let *l'm* denote any individual *A*, if, and only if, there is in existence an individual *B*, who is loved by *A*, and who is such that taking any individual *C* whatever, if *C* is wished well by *B*, then *C* is a man. The operation of combining *w* and *m* in this statement is termed 'regressive involution.' These designations were adopted because of the analogy of the general formulæ to those of involution in the algebra of quantity.

These kinds of involution are not, at present, in use in symbolical logic; but they are, nevertheless, useful, especially in developing the conception of continuity. These two kinds of involution together constitute relative involution.

(2) Non-relative involution: consisting in the repeated introduction of the same premise into a reasoning: as, for example, the half-dozen simple premises upon which the Theory of Numbers is based are introduced over and over again in the reasoning by which its myriad theorems are deduced. In exact logic the regular process of deduction begins by non-relatively multiplying together all the premises to make one conjunctive premise, from which whatever can be deduced by using those premises as often as they are introduced as factors, can be deduced by processes of 'immediate inference' from that single conjunctive premise. But the general character of the conclusion is found to depend greatly upon the number of times the same factor is multiplied in. From this circumstance the importance and the name of non-relative involution arise. (C.S.P.)

**Ionics**: see PRE-SOCRATIC PHILOSOPHY (Ionics).

**Ire**: see WRATH.

**Irenaeus**. Born probably in the first quarter of the 2nd century A. D. One of the most important of the early church fathers. Educated under Polycarp among others, he became a presbyter at Lyons. In 177, upon the martyrdom of Photinus, he became bishop of Lyons. He championed orthodoxy against Gnosticism. The place and manner of his death are uncertain; possibly he suffered martyrdom in 202 or 203 A. D.

**Iron Age**: see SOCIALIZATION.

**Irony** [Gr. *εἰρων*, a dissembler]; Ger. *Ironie*; Fr. *ironie*; Ital. *ironia*. Assumed ignorance with an implied conscious superiority. (1) Socratic irony: see SOCRATIC METHOD.

(2) Romantic irony: used by a set of writers (Schlegel, Tieck, Solger) to characterize an aesthetic standpoint which emphasizes the artist's or critic's self-consciousness as the only reality and standard, and from this position of superiority regards the world of so-called reality, with its laws, morality, &c., as futile, unreal, and illusory. This conception grew out of Fichte's emphasis upon the ego as the central principle of philosophy. The 'genius' as critic showed this irony by his exposition of the futility of the works criticized; as artist he should set forth characters or situations which bring out the futility of life and its supposed principles.

**Literature**: LOTZE, *Gesch. d. Aesthetik in Deutschland* (1868), 370 ff.; SCHASLER, *Gesch. d. Aesthetik* (1872), 779 ff.; HEGEL, *Philos. of Fine Art* (trans. by Bosanquet), 121 ff.; J. H. SCHLEGEL, *Die neuere Romantik* (1863). (J.H.T.)

**Irradiation** [Lat. *irradiare*, to radiate]; Ger. *Irradiation*, *Ausstrahlung*; Fr. *irradiation*; Ital. *irradiazione*. The lateral diffusion of nervous stimuli out of the path of normal discharge, as a result of which the excitation of one peripheral end-organ may excite other central organs than those directly correlated with it or anatomically related to it by direct nervous connection.

Where it takes place is not certainly known. Dogiel shows that in skin areas subject to great irradiation (genital organs) the end-organs of one order are connected by communicating rami, suggesting peripheral irradiation. There are also indications of irradiation of excessive stimuli in the spinal cord. The stimulus may not be excessive, but in

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