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essentially involves, belief and imagination are mutually exclusive. What is called aesthetic illusion or *SEMBLANCE* (q. v.) partly excludes the belief-attitude, and even 'reality-feeling.' The spectators at a theatrical performance do not act as they would if the same scenes occurred in real life. But it should be noted that the freedom from objective control which characterizes imagination is only comparative, not absolute, and that it admits of very varying degrees. Combinations which involve explicit contradictions are always excluded, even in the most unrestricted play of fancy. There are also almost always other objective limitations. So far as objective control exists at all, the attitude of belief (or reality-feeling) is present. A man may mentally frame a narrative concerning normal men and women which has no reference to any actual man or woman. 'The flow of his ideas will be relatively free; it will not be bound down by conditions of date, place, &c.; none the less it will be tied, inasmuch as he is not at liberty to introduce into his mental construction features at variance with the normal constitution of human beings. . . . There is no belief in the narrative as historical fact; but belief about human nature is involved in it through and through' (Stout, *Manual of Psychol.*, 545 f.).

*Literature*: the treatises on psychology and BIBLIOG. G, 2, j; AMBROSO, L'Immaginazione (1898); RIBOT, L'Imagination créatrice (1900). (G.F.S.-J.M.B.)

**Imaging** (in logic): Ger. *Abbildung*; Fr. (in mathematics) *représentation*; Ital. *rappresentazione*. A term proposed to translate *Abbildung* in its logical use. In order to apprehend this meaning, it is indispensable to be acquainted with the history of the meanings of *Abbildung*. This word was used in 1845 by Gauss for what is called in English a map-projection, which is an incorrect term, since many such modes of representation are not geometrical rectilinear projections at all; and of those which Gauss had in view, but a single one is so. In mathematics *Abbildung* is translated *representation*; but this word is preempted in logic. Since *Bild* is always translated *image*, *imaging* will answer very well for *Abbildung*. If a map of the entire globe were made on a sufficiently large scale, and out of doors, the map itself would be shown upon the map; and upon that image would be seen the map of the map; and so on, indefinitely. If the map were to cover the entire globe, it would be an image of nothing

but itself, where each point would be imaged by some other point, itself imaged by a third, &c. But a map of the heavens does not show the map itself at all. A Mercator's projection shows the entire globe (except the poles) over and over again in endlessly recurring strips. Many maps, if they were completed, would show two or more different places on the earth at each point of the map (or at any rate on a part of it), like one map drawn upon another. Such is obviously the case with any rectilinear projection of the entire sphere, excepting only the stereographic. These two peculiarities may coexist in the same map.

Any mathematical function of one variable may be regarded as an image of its variable according to some mode of imaging. For the real and imaginary quantities correspond, one to one and continuously, to the assignable points on a sphere. Although mathematics is by far the swiftest of the sciences in its generalizations, it was not until 1879 that Dedekind (in the 3rd edition of his recension of Lejeune-Dirichlet's *Zahlentheorie*, § 163, p. 470; but the writer has not examined the second edition) extended the conception to discrete systems in these words: 'It very often happens in other sciences, as well as in mathematics, that there is a replacement of every element  $\omega$  of a system  $\Omega$  of elements or things by a corresponding element  $\omega'$  [of a system  $\Omega'$ ]. Such an act should be called a substitution. . . . But a still more convenient expression is found by regarding  $\omega'$  as the image of  $\omega$ , and  $\omega'$  of  $\omega$ , according to a certain mode of imaging.' And he adds, in a footnote: 'This power of the mind of comparing a thing  $\omega$  with a thing  $\omega'$ , or of relating  $\omega$  to  $\omega'$ , or of considering  $\omega$  to correspond to  $\omega'$ , is one without which no thought would be possible.' [We do not translate the main clause.] This is an early and significant acknowledgment that the so-called 'logic of relatives'—then deemed beneath the notice of logicians—is an integral part of logic. This remark remained unnoticed until, in 1895, Schröder devoted the crowning chapter of his great work (*Exakte Logik*, iii. 553-649) to its development. Schröder says that, in the broadest sense, any relative whatever may be considered as an imaging—'nämlich als eine eventuell bald "undeutige," bald "eindeutige," bald "mehrdeutige" Zuordnung.' He presumably means that the logical universe is thus imaged in itself. However, in a narrower sense, he says, a mode of imaging is restricted to a relative which

fulfils one or other of the two conditions of being never *undeutig*, or being never *mehrdeutig*. That is, the relation must belong to one or other of two classes, the one embracing such that every object has an image, and the other such that no object has more than one image. Schröder's definitions (however interesting his developments) break all analogy with the important property of the imaging of continua noticed above. If this is to be regarded as essential, an imaging must be defined as a generic relation between an object-class and an image-class, which generic relation consists of specific relations, in each of which one individual, and no more, of the image-class stands to each individual of the object-class, and in each of which every individual of the image-class stands to one individual, and to no more, of the object-class. This is substantially a return to Dedekind's definition, which makes an *imaging* a synonym for a substitution. (C.S.P., H.B.F.)

**Imago** [Lat.]: (the same in the other languages). The perfect or winged stage of those insects which pass through a complete METAMORPHOSIS (q. v.); it is in this stage only that the sexual organs are mature.

*Literature*: COMSTOCK, *Introd. to the Study of Insects*; PACKARD, *Entomology*; KORSCHULT and HEIDER, *Entwicklungsgesch. d. Wirbellosen*. (C.S.M.)

**Imbecility** [Lat. *imbecillitas*, weakness, feebleness]: Ger. *Imbecillität*, *Schwachsinn*; Fr. *imbécillité*; Ital. *imbecillità*. Generally, a weakness of mind; specifically, a degree of this defect inferior to idiocy.

It is applied more often to states of congenital mental enfeeblement. Imbecility may be said roughly to imply a sufficient defect of memory, reasoning, and mental initiation to incapacitate the subject for the ordinary duties of life and to make necessary a special form of education. Cf. IDIOCY. (J.J.)

**Imitation** [Lat. *imitatio*]: Ger. *Nachahmung*; Fr. *imitation*; Ital. *imitazione*. (1) The performance in movement, thought, or both movement and thought, of what comes through the senses, or by suggestion, as belonging to another individual.

This is the traditional and customary usage. It makes essential the fact that another person serves to set the copy imitated. This usage is that of Preyer and Lloyd Morgan. To distinguish imitation in this limited sense from the wider meanings designated below, it has been suggested that this be called 'conscious imitation' (when the repetition as such

is conscious to the thought of the imitator), 'imitative suggestion' (when imitative to the onlooker only), and 'plastic imitation' (the subconscious conformity to types of thought and action, as in crowds).

(2) Any repetition in thought, action, or both, which reinstates a copy. This definition of imitation is wider than the foregoing. It includes what is called 'self-imitation,' or repetition of what is in one's own mind. This usage requires a certain identity as between the copy and the result made, but the conscious relating of copy to result, as in (1), is not essential. This usage is that of Tarde, James, Royce, Baldwin. As signifying simply 'mental reproduction' of nature, especially in art, it goes back to Plato and Aristotle. This usage is of value in discussions in social psychology, sociology, and the theory of art, as in the 'inner imitation' of K. Lange and Groos (for which see *SEMBLANCE*).

(3) An organic reaction of the stimulus-repeating or self-sustaining type. Organic imitation was used with this meaning as synonymous with CIRCULAR REACTION (q. v.) by the present writer. As this is a purely neurological and physiological conception, the use of the term imitation no doubt leads to confusion, and circular reaction expresses the meaning better. The question may then be discussed as to whether imitation always requires circular reaction.

As to the two first usages, it would seem to be wise to keep the broader meaning (2). Where ambiguity is likely to arise, it is well to use 'conscious imitation,' 'imitative suggestion,' 'self-imitation,' 'plastic imitation,' 'instinctive imitation,' all considered forms of the wider notion MIMETISM (q. v.), which covers also the pathological use of the term imitation. The wider meaning would seem necessary also as covering the imitative impulse before its character, as repeating a copy, becomes clearly conscious.

Distinctions have been made between 'spontaneous' and 'deliberate' imitation (Preyer), both being at first voluntary, but the former having become secondary—automatic; and between 'simple' and 'persistent' imitation (Baldwin), the former being involuntary repetition by imitative impulse and suggestion, and the latter being voluntary 'try-try-again' to reproduce a copy. The need of recognizing a class of relatively simple reproductions of the imitative type is seen in the growing belief that there is a native impulse to perform acts of the imitative sort.