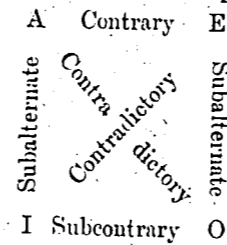


three fundamental classes of phenomena recognized by science (*Les Lois Sociales*, 1898, Eng. trans., 1900; *Opposition Universelle*, 1896).

Cases of opposition are (see these terms) SUGGESTION (contrary), ANTITHESIS, CONTRAST, INHIBITION, CONTRADICTION, INTERFERENCE (in physics), ANTAGONISM (muscular), and, in technical senses, OPPOSITION (in logic), SOCIAL OPPOSITION, and CONSTRAINT (in social science). (J.M.B.)

Opposition (in logic). One of Aristotle's POSTPREDICAMENTS (q. v.). There are said, in the book of *Categories* (cap. x), to be four kinds of opposites. Relative opposites are related and correlate of a disjunctive relation. Contrary opposites are the most unlike species of the same genus, as black and white, sickness and health. The third kind of opposition is between a habit and its privation, as sight and blindness. The fourth kind is between affirmation and negation. This passage has prevented the word opposite from taking any definite meaning in philosophy. (C.S.P.)

The following scheme is currently used to illustrate the forms of opposition as between the assertions of each two of the four propositions A, E, I, O (see those topics).



Optical Axis: Ger. *Augenaxe*; Fr. *axe de l'œil*; Ital. *asse oculare*. A straight line drawn through the centre of curvature of cornea and lens, and prolonged to the posterior wall of the eye. It is the sagittal axis mentioned under CENTRE OF ROTATION (q. v.).

Literature: HELMHOLTZ, *Physiol. Optik* (2nd ed.), 5, 88, 108; WALLER, *Human Physiol.*, 412. (E.B.T.)

Optical Illusions: Ger. *optische Täuschungen*; Fr. *illusions visuelles, illusions d'optique*; Ital. *illusioni visive* (or *ottiche*). (1) Broadly, any visual perception or judgment which cannot be harmonized with the deliverances of the other senses or of vision under ordinary conditions. In this sense the term includes all physical illusions (effects of mirrors, lenses, prisms, &c.), the physiological illusions attending the perception of colour (after-images, contrast, colour-induction, &c.), and the physiological and psychical illusions

attending the perception of space, movement, motion, and the character of objects. (2) In a more restricted and usual sense, it includes only the last group, and of these only those occurring with sound and sane observers.

I. *Assimilative illusions*. Illusions due to the assimilation of the sensory data with an improper group of ideas, i.e. illusions resting on a false interpretation of visual data, as the mistaking of a dimly seen stump for a high-wayman by a timid traveller. Illusions affecting the meaning and character of objects belong to this class.

II. *Equivocal figures*. Mostly figures capable of two or more spatial interpretations. The double interpretation is most easy when the figures are observed monocularly. Fig. 1 (the figures are numbered consecutively on the accompanying Plates I-IV¹) may be seen in the form of a partly open book with the back or the face towards the observer; Fig. 2 as a tetrahedron, erect or leaning backward. The first three of the group of forms marked Fig. 3 show similar possibilities with still simpler lines; all can be seen as right angles in perspective, and with two spatial arrangements of one or both lines. The fourth form is a reduplication of one of the simpler ones, intended to show their relation to Zöllner's Figure (Fig. 26). Two of the equivocal figures are known by special names: Fig. 5 is *Schröder's Stair*, and Fig. 6 *Necker's Cube*. Fig. 4 allows double interpretation of a non-spatial kind; the pattern may be regarded as black on a white ground, or vice versa. Inversions of relief may also be observed in actual objects when the ordinary criteria of relief are weakened or absent. Some investigators have classed these figures with the assimilative group; others have explained their behaviour by eye-movements and other perceptive factors.

III. *Geometrical-optical illusions*. These are false perceptions, or judgments, of the geometrical relations in plane figures, except such as involve irradiation, which are usually classed by themselves. Figures exhibiting the geometrical-optical illusions are numerous, as are also the theories for their explanation. In the absence of agreement among the latter no satisfactory classification is possible. The following may serve roughly, however, for

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P 00847