

sense organ affects the sensations, and renders sense knowledge to some extent relative. Man knows objects as they affect him, as they appear to him. To use a Kantian terminology, the senses give a phenomenal, not a noumenal knowledge of reality (*see* NOUMENA; PHENOMENA). It should be remembered, in this connection, that man never experiences pure sense knowledge. Human sensations are always accompanied by concepts and judgments, which assure an objective knowledge of reality.

Organic Bases of Sensation. Sensation is rooted in the animated body. Whereas the body is only a necessary CONDITION of thinking, it is, together with the soul, a cause of sensation. This organic causality is exercised by specialized parts of the body, known as SENSES or sense organs. Traditionally five of these senses are mentioned: sight, hearing, smell, taste, and touch.

Modern psychology calls the fifth sense the somesthetic sense, and distinguishes within it four cutaneous and three intraorganic senses. The cutaneous senses are those of pressure, cold, warmth, and pain. They are considered distinct senses, because they consist of specialized nerve endings that, as a rule, react only to their specific stimuli. The senses of sight, hearing, smell, taste, pressure, cold, warmth, and pain are called exteroceptive senses. They give information about the exterior world.

The intraorganic senses inform man about his own body. These are divided into the proprioceptive and the interoceptive senses. Proprioceptive sensations are known also as kinesthetic sensations. Through them man is aware of the movements of his limbs in relation to each other (e.g., flexing the arm, stretching the leg), and of the resistance met by such movements. The organs of this sense are in the muscles and the tendons. The two interoceptive senses are the static and the visceral sense. The static sense, whose organ is located in the inner ear, tells man about the position of his body as a whole; it is the sense of balance and of equilibrium. Movement of the body as a whole, when nonuniform, may also be perceived by this sense. Visceral or organic sensations provide information about the state of the inner organs. Under this heading come such sensations as hunger, thirst, satiety, fatigue, and nausea. Such sensations gradually fade into feeling and drives. The general bodily feeling constituted by the totality of the visceral sensations is sometimes called coenesthesia. It is important for man's affective life, as an underlying basis of his moods, and seems to function also in his perception of TIME.

See Also: KNOWLEDGE, PROCESS OF; SENSE KNOWLEDGE; SENSIBLES.

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SENSE KNOWLEDGE

The component of KNOWLEDGE that is directly traceable to the operation of the SENSES. Since man's intellectual and verbal abilities add new dimensions to his knowledge even at the level of SENSATION, "pure" sense knowledge is only a hypothetical entity. As commonly understood, sensing is the ability to respond to certain stimuli on an automatic or preconscious level; as such it makes knowledge possible, although in itself it "knows" nothing. Yet, granted the existential unity of man's sensory and intellectual activities, one can still make an epistemological study of the role of the senses in knowledge. This article outlines such a study, explaining the generation of sense knowledge, its validity, its relation to intellectual knowledge as conceived by St. THOMAS AQUINAS, and its evaluation by other philosophers.

Generation. Sensation is proper to the animated organism, i.e., to a psychosomatic unity. Highly specialized cells or receptors receive various kinds of stimuli and transform these into neural impulses. Each receptor is sensitive to a particular form of physical energy. Because of the relational character of sensation, the two facets of this phenomenon cannot be grasped as one—thus the tendency to reduce sensation either to a purely psychic activity or to a purely physical modification.

Thomists regard sensation as the operation of a psychical power or faculty through a corporeal organ (*see* FACULTIES OF THE SOUL). One aspect is the act of the form functioning as a formal cause and specifying the power; the other is the act of the sense that apprehends the sensible and formally constitutes sensation. The formal object of the sense is the aspect of the material object that is capable of becoming the intrinsic form of the power when activated. The sensible causality of the object precedes the intelligible causality in generation, although in the order of finality the intelligible principle is the source of sensory activity.

The extramental reality or object, in this explanation, must have characteristics that enable the particular receptor or sense organ to react toward it. In this very proportionality lies the possibility of some aspect of the object becoming the sense power's intrinsic form. In other words, only beings or objects that can have a causal relation to the cognitive sense powers are sensibly knowable.

When this condition is satisfied, the psychical capabilities of the sense powers can be actuated by material or physical phenomena. The INTELLECT then assimilates the essential nature (form) of its object, changing only the object's mode of existence.

Validity. A psychosomatic unity, man perceives as an epistemological unit; his bodily senses serve this unit as a bridge between his mind and the external world. They must be considered a trustworthy source of knowledge because they testify to the existence of man's own body and of other bodies. The evidence they themselves provide is confirmed by an intellectual analysis of the facts of sense PERCEPTION.

The intellect in judging may be in error in its interpretation of the phenomena that stimulate sensation, but sensation as such cannot be false. To test the validity of a sense reaction, a normal state of organism must be assumed as a standard. When such a standard is established, errors are traceable to defective senses, to improper media, or to some disproportion existing between the sense and the object. The most frequent source of error, however, lies not in the sense but in the intellect's precipitancy in judging.

The actual impinging of the object on the senses is the objective grounding of all human knowledge. Only in experience can intellectual knowledge be resolved, and since the external senses are ultimate among the cognitive powers, either man contacts reality through them or he never contacts it at all. Sensation is the only intuitive knowing accessible to him. Experience everywhere confirms it and abstract knowledge demands it. The intellect would be powerless to infer the existence and attributes of beings without the data of sense.

Relation to Intellect. Phenomena act upon the human senses and alter them during the process. A formal, sensible likeness is produced; in the Aristotelian-Thomistic tradition this is termed the impressed species (*see* SPECIES, INTENTIONAL). The sense power becomes its object intentionally on the level of sensation. The act of external sensation in turn initiates the act of internal sensation or perception, which integrates, synthesizes, stores, and evaluates external sense impressions. Perception itself terminates in a highly refined sensorial image called the PHANTASM.

St. Thomas recognized in human intelligence a dual power, the ability to abstract, which characterizes the agent intellect, and the ability to understand, which characterizes the possible intellect. The datum of sense is presented to the agent intellect by way of the phantasm. The agent intellect illuminates the phantasm, abstracts from its individuating characteristics, and discerns the

nature underlying these. This product of the agent intellect is termed the impressed intelligible species. By virtue of its immaterial action upon the possible intellect the latter is enabled to generate the CONCEPT or IDEA.

The intelligible species or disengaged form is the vehicle whereby the intellect is actualized to know the object or phenomenon, "becoming" that object in an intentional way. The species is the prolongation of the phenomenon's action upon the knowing power. It bears within itself a relation to the phenomenon as existing and at the same time represents the formal nature of the object that acts. When impressed with the species, the intellect is informed by a formal and existential prolongation of the objective phenomenon. Since the intelligible species lacks individuated matter, the intellect grasps the existence of the thing whose species activates it only by reflecting back upon the phantasm that represents the object concretely. The intellect knows the form, but in order to know that it has existence in an object, it must restore the form to the thing, must recapture its individuality, and in and through this, its existence. The phenomenon itself causes this reflexive process. In producing the species and thus causing its "re-presence" within the intellect, its being-before-a-knower, it moves the intellect to operate. The act in which the intellect knows the phenomenon is the act of JUDGMENT, which is the culmination of human knowledge.

Various Theories. J. LOCKE considered secondary qualities (color, sound, taste, smell, and tactile qualities) as occurring only in the experience of the sentient organism and as having no objective reality in the sensible object. He derived all simple ideas from external experience and held that ideas are transfigured sensations. In making ideas the immediate object of human knowledge, Locke, followed by G. BERKELEY and D. HUME, rendered it logically impossible to know whether or not these conform to reality. Hume, an empiricist, held that the mind knows only its own subjective sense impressions and that beyond these nothing is knowable. All perceptions, for him, fall into the two categories of impressions and ideas, which are distinguishable only by their force or vivacity.

The sensists, in the tradition of DEMOCRITUS and LUCRETIUS, explained all cognitional states in terms of a mechanical, passive transformation of external sensations. Thought they reduced to the level of sense perception and regarded quantified matter as adequately explaining the phenomenon of knowing. This theory recurred in the thought of T. Hobbes, E. B. de CONDILLAC, Hume, Alexander Bain, James MILL, T. REID, and H. SPENCER.

The rebirth of empirical philosophy in the 20th century was due mainly to the work of G. E. Moore and B.

RUSSELL. The new realism of Moore and Russell views human ideas, both of common sense and of the sciences, as logical or linguistic constructions of sense data. In the early stages of LOGICAL POSITIVISM it was assumed that the data of the senses were the only possible objects of direct observation; a proposition must either be given a meaning in terms of sense data or be discarded as meaningless. From a Cartesian starting point, Moore found himself in the dilemma of attempting to resolve how a self aware only of sense data could transcend these data. By holding that the objects of self are simply the specific sense qualities, Moore denied himself the material to work out a conclusive theory of perception. His appeal to sense phenomena inevitably led him back to the position of Hume.

Critique. The limitation of experience to singular sense experiences, however, results in the inability to provide an adequate foundation for universal ideas or for scientific knowledge. Mere phenomenal similarity or the imaginative association of ideas is not adequate to uphold necessity or universality. On the other hand, to limit human experience to sensibly verifiable phenomena is to fail to be sufficiently empirical, for a thoroughgoing empiricism demands that all factors of human experience be acknowledged and explained.

Although there is intimate involvement between intellectual acts and sense representations, moderate or critical realists recognize a real distinction between sense images and intellectual concepts. The latter represent natures or essences of things abstracted from sensible qualities, e.g., “life,” “truth,” “humanity,” and “existence.” Even the concepts of sensible qualities are abstract and universal, e.g., “color” and “redness.” This abstract and universal character of concepts is never experienced in any sensation or image, for these always represent existing and concrete phenomena.

See Also: CERTITUDE; EPISTEMOLOGY; KNOWLEDGE, PROCESS OF; KNOWLEDGE, THEORIES OF; PHENOMENALISM; SENSIBLES; SENSISM.

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Humorous illustration of “The Five Senses.” (©Historical Picture Archive/CORBIS)

SENSES

The senses are the immediate principles of sensation. They have an organic structure that is scientifically observable and are energized by an operative power or faculty of the soul, a fundamental source of vital energy. Organic structure and vital energy or power are intrinsically linked to make a unique reality, namely, sense.

The existence of the external senses is obvious; ordinary experience recognizes most of them, and scientific observation confirms and completes its findings. As will be seen, the existence and nature of the internal senses is problematic. The organic structure of the external senses must be sought in the peripheral and central nervous systems. Sensory receptors that are anatomically and functionally discernible and are specifically affected by different typical stimuli are generally distinguished. The peripheral organ’s stimulation unleashes in the connector nerve fibers afferent influxes that rise to the brain along complex routes, intersected by synaptic relays. In the brain these influxes terminate in different zones. It is in these zones that attempts are made to pinpoint specific centers for each sensation. The internal senses, without peripheral organs, are all found in the brain or at its base.