

THROUGH SCIENCE UP TO GOD, OR COSMOLOGY

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THERE is great need of a new synthesis, a new philosophy, a new orientation toward the cosmos in which we exist, a new statement of why and for what we live. This need is made imperative by the prodigious strides that the sciences have made during the past twenty-five years, which has made untenable the philosophies of the past. Particularly is this true of the science of psychology, which has brought into view an entirely new field that demands an entirely new synthesis. The application of Mendel's law; the flood of light that has been thrown upon the electron and its manifestations; the increased knowledge of the composition and effects of the endocrine glands; the investigations into the nature and operations of the nervous systems of all living things; all call for a new interpretation of the cosmos and of the impulses that control it. It is generally accepted that a revision of old philosophies is needed to bring them into line with the present state of knowledge; the conflicts between science and religious creeds are a proof of this need. Every individual person lives in a world of his own, his interpretations differ from the interpretations of others in all cases that are not subject to identical experiences, moreover, we react differently to stimulations from the same environment. Those who have a wide range of knowledge of the facts of science and a wide acquaintance with the conceptual theories of the past and present, exist in a vastly different atmosphere from that of the uncultivated man; a realization of this comes when we compare the conditions of the savage with those of the most highly cultivated person. Such differences are equally true of individuals in every state of culture. The differences arise from variations in the make-up and operations of the sensory system, through which all ratiocination is possible. This system consists of the nerve stuff that ex-

tends from the organs of the senses to cells in the spinal cord or cortex of the brain that have been organized by training or experience as focussing regions to receive the stimulations that are transmitted through the efferent nerves; thence the activity is transmitted to the efferent nerves which motivate the striped muscles and the energy is transformed into heat and motion. This system is a passive one, it merely transmits stimulations, it originates nothing of itself.

According to the latest discoveries in psychology the sensory operations may be briefly outlined as follows: a stimulation of the end organs of the senses induces an electro-chemical action which decomposes the fibrils that are affected; the energy existing in them is passed on to the synchronizing fibril in the connected neuron where a similar decomposition occurs and so on from neuron to neuron, the energy accumulating, from the series of decompositions and the sucking in of coadunate energies at every connection between neurons (synapses), until the accumulated energy reaches the centralizing cells that training and experience has established to receive them. By induction this energy is passed over from the afferent to the efferent system and passed on to the muscles where the energy is transformed into heat and motion. This transformation causes a feeling, an awareness of the activity and constitutes what we call "consciousness." The genesis of this sensory system is a purely environmental affair; the newly-born babe has no co-ordinated centres, he has no control of any definite movements of his muscles, his movements are uncontrolled, he has no conscious reaction to his surroundings, he knows not his father or his mother. Comprehension comes only through the establishment of focussing cells; these are formed through habitual reactions to stimulations of the sensory nerve cells; this co-ordination of focussing cells with the impulses in the neurons is brought about by customary coadjuvancy that is, as the energy from the fibrils tends to excite certain centres every repetition increases the strength of the association and the power of the fibrils. This increased energy arises from the fact that in sucking from the blood-stream the elements that restore the fibrils to their active condition there is accumulated an extra amount of substance to meet the next stimulation, exactly as the muscles acquire strength from exercise.

Concomitant with the discharge of energy from the sensory system caused by the stimulation of other end organs there is a stimu-

lation of certain of the auditory fibrils that actuate the vocal muscles, these serve to interpret the energy transformation. These interpretations take the form of words which are supposed to denominate sensations. These words are furnished by the language into which each person is born; it is inculcated by training in the home, school, contact with associates, reading, study and experience; it constitutes all of the knowledge we have, all that can be conceived. These auditory reactions are enmeshed with other reactions so that whenever either are stimulated the others are induced, that is, words will cause a reaction of the nerve fibres with which they have been closely associated, while the reactions from even the feeblest stimulation will draw into activity all of the reactions that have habitually been associated with it. This result has been named "memory" which is a misnomer if considered a function that has an enduring place in the brain cells. A clear understanding of the working of the sensory system will drive many words out of the vocabularies of cultured people, or invest them with radically different significations. Such a clarification or interpretation will go far to correct many beliefs that hang over from a more ignorant age. No longer would the word "mind" stand for an entity or objective reality; no longer would "mental characters" have any meaning; the words "will," "attention," and "conscience" would attain new meanings, while convictions would be known as interpretations of neural activities that had been fixed or established by the training and experience of the person who held them.

The interrelationships among all parts of the sensory system and their resulting effects upon the body is stated by Watson in the following:

"The brain and spinal cord with their various peripheral connections may be looked upon as a unitary aggregation of simple and complex reflex conduction systems such as we have just considered. The brain and cord connected on the one hand with the sense organs and on the other hand with the muscles and glands afford a multiple connection system between the various receptors and the various effectors. No matter how minute the sense organ structure is which is stimulated, the impulse arising there can travel to the central system and produce a response of the whole organism which is entirely out of proportion to the actual energy applied at the sense organ. In other words, a stimulus applied anywhere on the body produces not only a local segmental reflex action,

but it changes the system of tensions and secretions probably in every part of the body. (Footnote *Psychology*, By John B. Watson; p. 122.)

The reactions of the sensory system to stimulations and the inductions accompanying them may well be termed "patterns," but we know nothing as to what these patterns are, all that we know of them is the words by which they are interpreted, however the conception may differ from the real pattern itself. Every pattern carries energies that do not rise into the consciousness as we are aware of only the dominant energies, there is a fringe about these dominant energies of which in some cases we have an inkling and which color our conceptions.

To communicate ideas a person has to use words that are current among those to whom they are addressed. But language was coined in long past ages when all kinds of superstitions and fallacies were in vogue, and these, embedded in words of common use, persist and color the conclusions of today. Such language has no terms suitable to express the finer shades that persons are conscious of in the fringe about their dominant reactions; to use terms that are generally understandable distorts, covers-up, and misrepresents the actual patterns; acceptance of new ideas is prevented by the rigid definitions and general connotations of words. For every one will apply that connotation which their training and experience have imposed upon them. Those who are foreign to the language or to the culture of the utterer can have no conception of what he is saying because the words arouse no activity in the sensory system due to lack of previous associations; this also applies in all cases where the stimulation arouses different responses than the ones desired by the writer or speaker. We all live in different worlds of ideas and comprehensions as determined by our state of culture.

If the sensory system is clogged up with old beliefs so that it is made immune to new stimuli; if it is starved by lack of erudition; if debarred from scientific knowledge; if robbed of leisure to listen for the impulses that arise from within, it will fail to develop its real function and degenerate into a mere medium for support of superstitions, imposed beliefs and conventions. Technique is also a matter wholly confined to the sensory system, it is there that the aptitudes are acquired, it is only through the sensory that we know and believe. Aside from patterns that have been formed and es-

tablished by accurate investigations and actual experiences, our language misrepresents the true content of our patterns.

Back of these sensory patterns and their interpretations there is an unconscious, hereditary sympathetic system, with its separate nerves and tissues, which is the real self, the actual being. No definite patterns are formed in the sensory system in default of impulses from the elements that make up the temperament of the personality; curiosity, wonder, fear or self-interest of some sort is necessary before establishment of definite and enduring patterns; without impulses from this fundamental self, all stimulations are merely fleeting impressions, all interpretations that do not arouse an interest "go in one ear and out the other" leaving no trace behind. The fundamental character of a person determines his line of interests, and these must be satisfied if a wholesome life is to be had. Manifestation of the inner nature is the universal law of the universe and, in man, any violation of this law brings punishment in way of discomfort, disease, distortion, unhappiness, even to the extent of insanity and suicide.

This sympathetic system is the real self in each one of us, it is the "soul," the "spirit," the "heart," the "God within us;" it is the source of what is variously termed our "instincts," "feelings," "interests," "impulses," that govern our acts, our loves, and our passions; it is the foundation for all of our aptitudes.

These two systems, the sensory and the sympathetic, are distinct and separate systems which mutually influence each other. The sensory is ancillary to the sympathetic and more or less under its control, it is the means, the instrument through which the inner nature manifests itself. The sensory is a purely environmental creation, it is mainly self determined, while the sympathetic is wholly a hereditary creation. The question as to the effects of heredity and environment have been confused by failing to separate these two distinct departments in the human constitution.

As the physical development is covered by the conclusions of the various physical sciences we need not retrace that development, but may start with the origin and development of present day man. His origin is in the germplasm from which all creatures come and which carries the factors that have been incorporated in all forms that have existed in the past. The cell, from which each individual person develops, is a combination of the elements existing in both the ovum and the sperm, both of which carry minute particles

called chromosomes; these chromosomes join and split lengthwise before the cell grows into two daughter cells by being pinched in two. The resulting embryo is thus inoculated with equal quantities of the elements coming from the maternal and paternal lines of ancestry. Like elements in both lines serve to increase their power in the offspring, while unlike elements combine and produce new and different characteristics than those of the parents. These combinations produce the temperament of the child, the real nature of which is unknown except so far as it is revealed through manifestations. The working of the sympathetic system is, as yet, a mystery; it is wholly unconscious, that is, it has no sensory nerves to affect the consciousness. The heart may be cut without arousing any sensation, yet any interference with its regular operation will cause a feeling of discomfort. The same condition exists with respect to all other members of the viscera, particularly the ductless glands.

This hereditary sympathetic system is developed by the conflicts in adjustments to the environment or the social complex as induced by the impulses from the highest attributes. The progenitors, having existed and adjusted themselves to the ever-changing environment, carry forward from age to age the elements that have survived in these conflicts, therefore the inheritances of present day human beings reflect the results; only in abnormal cases will the surviving elements be lacking, although they may be inherited in different degrees, and the combination of chromosomes may produce a new character. Unless one inherits a dominant element pertaining to the acquirement of the fundamentals of any art, it is useless to try to cultivate it; if one has not the combination of chromosomes that enable one to respond to the essence of music one cannot become a musician, no matter how much energy is put into the acquirement of a technique; if a child is not born with the germs that develop a mathematical sense he will not make a mathematician, if the elements of courage be lacking nothing but a coward will result. Genius results when a child is endowed with a dominant passion; his whole interest, his absorbing love will be concentrated upon the acquirement of a technique to manifest that passion in his sympathetic system. No one can know what important impulses are buried up in the self of an individual when through ignorance, lack of opportunity, or defects in the sensory system prevent the manifestation of the inborn impulses. Such

development may be hindered or stopped by the environment in which the individual exists, for only in the free atmosphere of opportunity can persons develop the best that is within them. Erroneous interpretations, fostered and perpetuated by training of children into the social beliefs of the preceding generation, are fruitful hindrances to the attainment of unprejudiced and efficient working of the sensory system. A clear comprehension of the make up of human beings as it has evolved from simple elements through the stresses and conflict of existence, gives a clear understanding of the tortuous course humanity has pursued in "coming out of darkness into light;" all history is illuminated; and it is clearly seen that what has been was inevitable; that what is is the resultant of all past forces; it furnishes a basis upon which to postulate what ought to be; and shows what can be, nay; what must be in the future.

The synthetic philosopher, summing up all the evidences, can watch the electron developing the gasses, fluids and solids that constitute the physical universe; he can trace the sublimation of material forms until they become refined in slime and algae to the degree of acquiring the capacity of sensibility, introducing life upon this planet; he can trace the growth of this sensibility through the various forms of the lower animal world, until he reaches the human form with its ever growing capacity for the apprehension and manifestation of the highest qualities. In the electron he finds a manifestation of energy; he sees in the universality of the urge to manifest the inner nature another imperfectly recognized quality; he sees in beauty that "symmetry of wholeness" that satisfies the feelings; he sees the manifestations of order which governs all relations; he sees the universal aspiration for truth, for justice, harmony, and love; he sees in the evidences of self-preservation, reproduction, persistence, conservation of energy that quality that is known as immortality, which is further supported by "that pleasing hope, that fond desire," which has ever resided in the sympathetic system of mankind. He will conclude that the only real objects in the cosmos are the unknown, imponderable qualities, and that all material forms are but temporary, transcient instruments through which to secure a manifestation of those immortal qualities. He will realize that the development was not planned, that it was attended with many misfits, many forms that were not useful in manifesting the supreme qualities and hence discarded, that it was

a trial and error, a hit and miss process, the guide to the "survival of the fittest" was capacity to manifest even the least of the imponderable qualities. Would he not come to the conclusion that all evils, all violation of the supreme good, are the results from imperfect instruments which distort, unbalance or mistakenly apply the pure impulses that arise in the inner nature; for it is plainly evident that the unconscious urges of mankind have always been upon the side of the best good, however absurdly they have been expressed; expression is dependant upon language and language can rise no higher than the state of knowledge at the time it is coined and used by an imperfectly organized sensory system.

Would not such a philosopher, realizing the orderly progression from the manifestations of energy to the responses of the most sensitive human being, be justified in concluding that there was a Supreme Essence, above and through all forms, that is constituted of the imponderable qualities that are suggested in the manifestations of the highest attributes. The universal impulse is to assume the existence of a higher power, however heterogeneous the patterns that an uncultivated sensory system has formed and however language has misinterpreted those patterns. That the sympathetic system is saturated with this feeling is shown by the universal impulse to form theories of the nature of God, the basis upon which all religions have been founded, the main tenet of which is a belief in the existence of a supreme power as the creator and cause of all objects in the cosmos. Every one feels that beyond the limits of knowledge there is a cause for the phenomena that occur. The most pronounced atheist is obsessed with the feeling that this unknown power resides in energy, the conservation of which proves that it has always existed; he believes that all effects are but the natural results of impacts of energy upon environment; what he wars against are the various interpretations that have been advanced to describe or define that power, he is apt to ignore the fact that qualities exist that cannot be ascribed to the quality of energy. The agnostic, banishing from his sensory system all speculations, is content to rest upon scientific knowledge, he is satisfied in holding to the dictum that it is futile to speculate beyond the facts that science has discovered; he refuses to contemplate that which he says is unknowable, regardless of the manifestations of impulses from the inner nature which science has not yet touched. Both of these attitudes are contrary to all scientific formulas through which all of

the present scientific facts were obtained. The suppositions of astronomers led to the location and naming of planets before they had been discovered through their telescopes; they postulated dark stars which are not yet apparent to the senses. Chemists have discovered new elements by reason of suppositions that were entertained because of abnormal results from their experiments. The suppositions of Einstein are now being subjected to extensive scrutiny, out of which new facts will be established. In short, progress in all the sciences has been attained through speculations that had no tangible proof behind them; they were stimulations from the fringe surrounding the dominant impulses that affected the brain patterns.

The consistent Christian formulates a God to whom he ascribes all that his sensory patterns seem to tell him are the highest and best, finding an ecstasy in contemplating those qualities, which are in truth but the impulses which well up from his sympathetic system. So with all other religions which may be accounted for by a "feeling after God if haply we may find him."

Is not the Supreme Essence, as exemplified in the imponderable attributes, the God that humanity has always been seeking? Do we not find in all religions, in all writings that have gripped the feelings of many people, however much distorted and misinterpreted in language, befogged by ignorance and weaknesses of a poorly organized sensory system, as re-interpreted in accordance with the latest science, give proof of this indwelling Essence? Does not poetry, music and other fine arts, which appeal to and are supported by the inner feelings and impulses of man, proclaim that all embracing influence of the imponderable qualities? This is a God, divested of all anthropomorphic features, that can be revered, worshipped, loved and followed by the scientist, by the idealists, by the atheists and agnostics, by the ignorant and the learned, without violence to their acquirements and which will accord with their inner recognition of the "Beautiful, the Good, and the True?"