

in which the Spirit of Jehovah "came mightily upon" certain divinely appointed individuals (e.g., Samson, Saul, David, etc.), to clothe them with extraordinary physical and mental powers for special divine ends. Nor is there anything incredible about this, for it is a well-known fact that psychic power is capable of greatly intensifying the physical powers of the human organism under certain conditions. This is true even in cases of insanity: the abnormal physical strength of frenzied persons is a well-known fact, and has been known for ages. (*Vide* especially the *Bacchae* of Euripides. Phenomena of this kind have always characterized orgiastic "religions.") Hence we may reasonably conclude that the operation of the Divine Spirit at the very lowest level of being, produces energy (shall we call it "physical"?), which has the inherent power to build itself up into the gross matter, with its manifold representations, of our present physical world. The transmutations of energy into matter and of matter into energy are now known to be ontological facts.

Dr. Harold Paul Sloan seems to have given us the "conclusion of the whole matter" quite forcefully, in these words:

The new science itself is now pointing us to philosophy. It is now affirming that the ultimate ground of objective things is spirit. Matter, these leaders say, is not *stuff*; it is force; it is a complex of interacting forces; and these forces seem to resolve into mental values—into the "mathematical formulae" of Jeans—into ideas of an Infinite Mind.<sup>1</sup>

## 2. The Mystery of Sensation

Some further light is thrown upon the problem of the ultimate constitution of matter by a study of the phenomenon of sensation as experienced by sentient beings.

Alexander Polyhistor, a writer of the first century B.C., has put posterity everlastingly in his debt by his formulation of a brief account of the metaphysical cosmogony of the ancient Pythagoreans, in a treatise no longer extant, entitled *Successions of Philosophers*. Fortunately, however, this account has been preserved by another writer, Diogenes Laertius, in his work written in the early part of the third century of the Christian era, a work entitled *Lives and Opinions of Eminent Philosophers*.<sup>2</sup>

1. *He Is Risen*, 127.

2. This work, in two volumes, may be found in the Loeb Classical Library, Harvard University Press. Translation by R. D. Hicks.

The first paragraph of Alexander's account, as reproduced by Laertius, tells us that the Pythagorean cosmogony went as follows:

The first principle of all things is the One. From the One came an Indefinite Two, as matter for the One, which is cause. From the One and the Indefinite Two came numbers; and from numbers, points; from points, lines; from lines, plane figures; from plane figures, solid figures; from solid figures, sensible bodies. The elements of these are four: fire, water, earth, air; these change and are wholly transformed, and out of them comes to be a cosmos, animate, intelligent, spherical, embracing the central earth, which is itself spherical and inhabited round about.<sup>1</sup>

In this connection, it should be explained, perhaps, that the Pythagoreans appear to have conceived the cosmos as being constructed ultimately of primary entities, a kind of atoms, to which they applied the term "numbers"; the celebrated dictum, "Things are numbers," is quite generally attributed to Pythagoras himself. According to the clear testimony of Aristotle, these "numbers" were conceived as having spatial magnitude, i.e., as extended unit-points—the ultimate stuff of the whole physical universe.<sup>2</sup> The arithmetical or numerical process seems to have been regarded by the Pythagoreans, at least by those of the fourth century B.C., especially Philolaus and his contemporaries, as having been paralleled by the cosmogonical process; they attempted to describe at one and the same time both the formation of the number system (as symbols) and that of the physical universe (as made up of the entities thus symbolized); the construction was a parallel one, in terms of the ideal and the concrete, of symbol and reality. It appears too that they conceived the whole cosmogonical process as partaking of the character of the growth and development of seeds; that is to say, as some sort of an essentially dynamic, generative, or life process.<sup>3</sup> This, of course, was in strict harmony with the Pythagorean conception of the Cosmos as a Living Being. According to other ancient writers, notably Sextus Empiricus and Proclus, they were wont to describe their extended unit-points as "flowing" into lines, the lines as "flowing" into plane figures, the plane figures as "flowing" into solid figures, and the solid figures as

1. Diogenes Laertius, *op. cit.*, VIII, 25. Translation by F. M. Cornford; *vide* Cornford, *Plato and Parmenides*, 3.

2. Aristotle, *Metaphysics*, I, v, 986a ff.; I, viii, 989b 3 ff.; XIII, vi, 1080b 1 ff.; XIII, viii, 1083b 8 ff.; XIV, ii, 1090a 22 ff.; XIV, iii, 1090a 32 ff.; also *Physics*, III, iv, 203a 6.

3. Aristotle, *Metaphysics*, XIV, iii, 1091a 15 ff.; also *De Anima*, 409a 4.

"flowing" into sensible bodies.<sup>1</sup> All this suggests the concept of an essentially dynamic or generative process.

Now the one aspect of this cosmogonical theory which provoked the criticism of Aristotle more than any other,<sup>2</sup> and the one which has been a subject of great difficulty to all subsequent thinkers, was that which had to do with "sensible objects" and the phenomenon of sensation. The problem may be stated thus: *How did the Pythagoreans effect—theoretically, that is—the transition from geometrical solid to sensible body? Or, to put it in another form: How did these geometrical magnitudes ontologically transform themselves ("flow") into the objects of sense-perception?*

Obviously, any attempt to answer this question necessarily plunges us into one of the profound mysteries of being—the mystery of sensation or sense-perception—which, up to the present time, has refused to yield up its secrets either to the physicist or to the psychologist. We know but little more today about the process of sensation in a sentient being than did the Pythagoreans of twenty-six centuries ago. Again I shall quote at some length from Barnett, who states the problem so clearly that it would be impossible to improve upon his presentation. He writes as follows:

In accepting a mathematical description of nature, physicists have been forced to abandon the ordinary world of our experience, the world of sense-perception. To understand the significance of this retreat it is necessary to step across the thin line that divides physics from metaphysics. Questions involving the relationship between observer and reality, subject and object, have haunted philosophical thinkers since the dawn of reason. Twenty-three centuries ago the Greek philosopher Democritus wrote: "Sweet and bitter, cold and warm as well as all the colors, all these things exist but in opinion and not in reality; what really exists are unchangeable particles, atoms, and their motions in empty space." Galileo also was aware of the purely subjective character of sense qualities like color, taste, smell, and sound, and pointed out that "they can no more be ascribed to the external objects than can the tickling or the pain caused sometimes by touching such objects."

The English philosopher, John Locke, tried to penetrate to the "real essence of substances" by drawing a distinction between what he termed the primary and secondary qualities of matter. Thus he considered that shape, motion, solidity and all geometrical properties were real or primary qualities, inherent in the object itself; while secondary qualities, like colors, sounds, tastes, were simply projections upon the organs of sense. The artificiality of this distinction was obvious to later thinkers.

"I am able to prove," wrote the great German mathematician, Leibnitz, "that not only light, color, heat, and the like, but motion,

1. *Vide* F. M. Cornford, *Plato and Parmenides*, 10-20.

2. *Vide* Aristotle, *Metaphysics*, XIII, vi, 1080b 18 ff., also XIV, iii, 1091a 12 ff.

## MATTER AND SPIRIT

shape, and extension too are mere apparent qualities." Just as our visual sense, for example, tells us that a golf ball is white, so vision abetted by our sense of touch tells us that it is also round, smooth, and small—qualities that have no more reality, independent of our senses, than the quality which we define by convention as white.

Thus gradually philosophers and scientists arrived at the startling conclusion that since every object is simply the sum of its qualities, and since qualities exist only in the mind, the whole objective universe of matter and energy, atoms and stars, does not exist except as a construction of the consciousness, an edifice of conventional symbols shaped by the senses of man. As Berkeley, the archenemy of materialism, phrased it: "All the choir of heaven and furniture of earth, in a word, all those bodies which compose the mighty frame of the world, have not any substance without the mind. . . . So long as they are not actually perceived by me, or do not exist in my mind, or that of any other created spirit, they must either have no existence at all, or else subsist in the mind of some Eternal Spirit." Einstein carried this train of logic to its ultimate limits by showing that even space and time are forms of intuition, which can no more be divorced from consciousness than can our concepts of color, shape, and size. Space has no objective reality except as an order or arrangement of the objects we perceive in it, and time has no independent existence apart from the order of events by which we measure it.<sup>1</sup>

Certainly it cannot be doubted that sensation, of whatever kind it may be, is physiologically subjective. On the other hand, common sense tells us that our sensations must have their causes; that if there were not something in the world around us or within our own bodies—forces of some kind impinging upon our neural system—we simply would not experience sensations at all. It was this reasoning, no doubt, or to be more exact, this fact of experience, which led John Locke to define matter as "permanent possibility of sensation" and as "something-I-know-not-what." This is, of course, no definition at all. However, it is about as near as anyone has ever come to a "definition" of matter *per se*; for the simple fact is that we do not "know" objects in themselves, we "know" only our sensations of those objects. And even if matter be defined as energy, we still have the problem, *What is energy?* The undeniable truth is that we cannot apprehend or know matter *per se* through the avenue of the physical senses; we know, I repeat, only our sensations of material objects. This is the reason why the physicists of the present day resort to mathematical symbols and formulae in order to apprehend and to describe the ultimate stuff of the Cosmos, and in most cases the intuition of the formula has preceded by several years the empirical verification. It must not be supposed, of course, that these formulas are mere abstractions; they are not; they have been experimentally demonstrated to

1. *Op. cit.*, 10-12.

be accurate interpretations of natural processes; they bespeak the mathematical orthodoxy of the Cosmos itself. As Barnett puts it: "In physics and equation is never a pure abstraction; it is simply a kind of shorthand expression which the scientist finds convenient to describe the phenomena of nature." The fact must not be overlooked that these "shorthand expressions" do actually describe natural (*i.e.*, physical) phenomena. And in virtue of the very fact that they lead us at last to "a final featureless unity of space-time, mass-energy, matter-field—an ultimate, undiversified, and eternal ground beyond which there appears to be no progress," they simply serve to prove that the world of the physical senses is a prison-house—to use Plato's own term—in which man finds himself incarcerated for the tenure of his existence in this present state of being. This is designated "the egocentric predicament."

Now, as previously stated, sensations in living beings certainly must have their causes. What, then, are the physical forces or forms of physical energy which, by impinging upon the neural system, give rise to sensations in human beings and in the lower animals as well? Suppose we take, for example, sensations of the configurations of objects, of the relations of such configurations in space, and the sensations of color. All such sensations depend upon the human sense—and sense-organs—of vision. The sense organ for vision is, of course, the eye with its various parts plus the optic nerve; and the stimulus for vision is radiant energy, which is in turn one of the forms of electromagnetic energy. The electromagnetic spectrum, we are told, includes cosmic rays, radio waves, infra-red rays, visible light, ultra-violet rays, x-rays, and gamma rays. All of these are differentiated one from another by respective *wave lengths*. The human organism has no sense organs, however, which are sensitive to any except those radiant vibrations within the range of sensual vision; that is, between the wave lengths that produce the sensation *red* at one end of the visible spectrum and those which produce the sensation *violet* at the other end. Radiation of various wave lengths between these two extremes produce our sensations of all other colors. And just above this range are the wave lengths which produce the ultra-violet, and just below it are the infra-red wave lengths. As Barnett puts it, "From the standpoint of physics, the only difference between radio waves, visible light, and such high-frequency forms of radiation as x-rays

1. *Op. cit.*, 49, 111

and gamma rays lies in their wave length." (Again): "It is evident . . . that the human eye suppresses most of the 'lights' in the world, and that what man can perceive of the reality around him is distorted and enfeebled by the limitations of his organs of vision. The world would appear far different to him if his eye were sensitive, for example, to x-rays." All of which goes to show that man's "physical" senses are specifically adapted to his needs in this present world only. As the Apostle puts it: "The things which are seen are temporal, but the things which are not seen are eternal" (2 Cor. 4:18). Moreover, the physical senses, in thus adapting man to his present environment, actually shut off from his perception the vaster area which extends il-limitably throughout the vast reaches of this phenomenal world.

Thus it becomes obvious, in the light of modern physics, that man's visions of all "objects" in space, of their shapes, relations as to distance, colors, etc., are produced by these "wave lengths" of energy as they impinge upon his organs of vision. But what this process of sensation is *in itself* remains inscrutable. Space is "simply a possible order of material objects," and time is "simply a possible order of events." "What we call an hour is actually a measurement in space—an arc of fifteen degrees in the apparent daily rotation of the celestial sphere. And what we call a year is simply a measure of the earth's progress in its orbit around the sun."<sup>1</sup> Light waves, we are told, have maximum velocity of 186,000 miles *plus*, per second; nothing in the universe moves faster. Radio waves travel at the same speed as light waves. These and all other phenomena of electromagnetic radiation are measured by the modern physicist in terms of *wave lengths* and *frequencies*. Wave lengths of *what?* Of *something?* Or of *nothing?* The physicist answers: Wave lengths of quanta ("corpuscles," like bullets from a machine gun), that is, *quanta of energy*. Yet this energy in its ultimate form can hardly be said to have spatial magnitude, in the strict sense of that phrase. As one author puts it: "Electromagnetic energy is radiated or absorbed in discrete quanta . . . and the size of one quantum is directly proportional to the frequency with which it is associated."<sup>2</sup> Thus the "quantum" takes the place of "spatial magnitude," "extension," and "divisibility," in modern physics.

"Radiant energy," writes Barnett, "is emitted not in an unbroken stream but in discontinuous bits or portions" called

1. *Op. cit.*, 13.

2. Barnett, *op. cit.*, 40, 41.

3. William H. Michener, *Physics for Science and Engineering*, 532.

(first by Planck) quanta. Again: "Einstein postulated that all forms of radiant energy—light, heat, x-rays—actually travel through space in separate and discontinuous quanta." Incidentally, the sensation of sound is the effect of the same wavelike kind of movement, with the difference of course that sound waves are transmitted by the air or some other medium, whereas electromagnetic waves are conceived as traveling through empty space. The sensation of sound is produced by the impact of these wavelike movements upon man's organs of hearing. And finally, in this connection, sensations of touch, taste, and smell—indeed all other kinds of sensations—are produced by the impact upon various parts of our neuro-sensory system of those basic atomic and molecular movements by which matter is described as differentiated into its three fundamental forms, namely, gases, liquids, and solids, all of which now pictured as forms of more or less "congealed" energy.

Thus, according to the picture which is given us by the most up-to-date physics, the ultimate dynamic "building stones" of the Cosmos are these "particles" of energy which go to make up the structure of the atom, and the quanta or "corpuscles" of wavelike energy which, similarly, go to make up all the forms of electromagnetic radiation. The effort has been made by Dr. Einstein, we are told, to bring all these ultimate "bits" or "portions" of energy into a unity, that is, to interpret them as being ultimately of the same essential stuff, as "parts" or "aspects" or manifestations of a Primal Dynamic Unity.

The thing that is of special significance to us here, however, is the fact that it is by the co-operation, that is to say, by the action and reaction of these particles or corpuscles of primal energy on the one hand, and the human sense organs on the other hand, themselves apparently corporeal and hence no doubt the products of the same primal forces, that *sensible objects are thus brought into phenomenal existence, or at least into the range of human experience; or, to put the same fact in ancient Pythagorean terminology, that geometrical magnitudes—mere configurations—"flow" into the objects of sense-perception.* This does not mean, of course, that the quantum of the present-day physicist is to be conceived as a geometrical magnitude; on the contrary, it seems to be something essentially qualitative, an entity characterized by the property of *inexhaustibleness* rather than by that of extension; it is the entity which, in modern

1. *Op. cit.*, 16, 17.

physics, replaces the geometrical magnitudes of ancient and medieval philosophers, as the ultimate of "material" stuff. Nor does this mean that the ancient Pythagoreans attained to any of these concepts of modern physics. It means simply that the Pythagoreans, by a sort of intuition, hit upon one of the secrets of the Cosmos, a secret which is made just a little less mysterious by the light shed upon it by the discoveries of our modern physicists. We are justified, I should say, at least in pointing out the correspondences between those "flowing" unit-points postulated by the Pythagoreans, and the "particles" or "corpuscles" of primal energy known to us today as *sensa*, which by impressing themselves upon our sense organs *actualize for us all sensible objects*.

To summarize: *What is sensation?* In modern terms, it is the effect of an impingement upon the neuro-sensory system of a percipient, a *living* creature, of forces external to that system, forces operating both outside and inside the particular organism. How can these various forms of energy which undoubtedly provoke the phenomena commonly designated "sensations," be reduced to quantities of any kind? *Obviously, we ourselves, the percipients, know only the sensations.* We can "know" the causes of these sensations only in terms of atomic changes, molecular movements, chemical affinities, vibrations, intensities, frequencies, etc., most of which are reducible, apparently, to mathematical formulae, just as Pythagoras himself discovered with reference to the perfect consonances in music. Hence, it seems to be in these mathematical terms alone that we can ever know what "things-in-themselves" are. Yet these very forces, interpretable only mathematically, just as the atom is interpretable only in mathematical terms, "fill in" the geometrical configurations, so to speak, and by their impingement upon the sense organs of the living organism, actualize sensible objects. Indeed all the sensations known to psychology—visual, auditory, gustatory, cutaneous, olfactory, organic, visceral, kinesthetic, static, or what not—may properly be said to be the effect of the impact of such primal forms of energy—emanating from outside or from within the organism—upon the neuro-sensory system of the living recipient.

All this emphasizes one fact, however, namely, that even though we do have a partial understanding at least of the *how* of sensation, certainly we are as much in the dark as ever regarding the *what* of the phenomenon. What sensation is *in itself*, no one knows. For sensation involves, in some inscrutable man-



ner, the additional and accompanying phenomena of *perception*, of *consciousness* of the sensation and of the sense-perceived object, and of the *meaning* which thought, by the aid of memory, may attach to the sensation, and even the utilization of the word or *symbol* which linguistic convention has associated with that particular meaning. Not one of these attendant phenomena can be identified strictly with the sensation itself, yet all of them are, in some unexplainable manner, bound up with it. This is especially true in the experience of a *person* or *spirit*. We shall therefore look into these accompanying phenomena further, in a subsequent examination of the processes of thought. For sensation undoubtedly provides the raw material for thought.

### 3. The Mystery of Consciousness

The phenomenon of sensation is inextricably interwoven with those of *perception* and *consciousness*, and all three are related to the greater and over-all phenomenon of *meaning*.

A sensation is an event in the neurosensory system. It is a *physiological* event. Undoubtedly the raw material of knowledge is provided by *sense-perception*. Faith itself, we are told by the Apostle, "cometh of hearing, and hearing by the word of Christ" (Rom. 10:17). "It was God's good pleasure through the foolishness of the preaching to save them that believe" (1 Cor. 1:21). The psychological sequence is clearly stated in Scripture in different places, first in Isa. 6:9-10, as seeing with the eyes, hearing with the ears, understanding with the heart, and turning again: that is, seeing and/or hearing the Gospel message leads to understanding, understanding leads to believing, and believing in turn leads to turning again (repentance), and the entire process culminates in remission, justification, forgiveness, etc., ("turn again, and be healed"). Scripturally speaking, conversion is not mystical—it is definitely psychological. (Cf. Matt. 13:14-15, John 12:40, Acts 28:25-27, Rom. 11:8, etc.). Direct contact with the Word of the testimony, by seeing, hearing, etc., is the first step in conversion. The Gospel is not *a* power, nor *one* of the powers, but it is "*the power* of God unto salvation to every one that believeth" (Rom. 1:16). Hence it follows that "whosoever shall call upon the name of the Lord shall be saved." "How then shall they call on him in whom they have not believed? and how shall they believe in him whom they have not heard? and how shall they hear without a preacher? and how shall they preach,