Thesis: The energy concept: a spiritual interpretation of reality

Submitted by Lewis Guy Rohrbaugh as partial fulfillment of the requirements for the Ph. D. degree at the State University of Iowa

Part I: DYNAMICS IN SCIENCE AND PHILOSOPHY

Chapter I

ENERGY AS REALITY

Upon all sides to-day we hear emphasis put upon the energy concept in philosophy. Dynamism has superseded materialism. Activism, voluntarism, pragmatism, and philosophies of this active type are coming more and more to take the place of the older systems of mechanism. Students in philosophy are compelled to recognize the significant place which such systems as those of Leibnitz, Bergson, Ostwald, etc., are holding in the field of modern thought. If Leibnitz' philosophy were to be re-stated to-day from the standpoint of modern scientific thought and terminology, it would probably be termed a system of Energism. With Bergson life is one continuous process of Becoming, and fundamental in this process is the guiding agent which he calls the vital impetus. So active and vital is this inner principle that it would seem impossible to think of Bergson's philosophy out of relation to the energy concept. With Ostwald, energy is the primary concept; everything that exists is but a part of a great system of energies. Such energetic conceptions as these sound the keynote to modern philosophi-

cal thought and receive genuine support from recent scientific discoveries.

In physical science we are told that matter, under the scrutiny of experimental physics, has resolved itself into energy. When asked what this ultimate and final energy is, we are sometimes referred to another concept, that of electricity. And inasmuch as we shall endeavor to interpret reality in terms of energy and make a critical inquiry into the energy concept in its qualitative aspects, it becomes imperative therefore at this stage of philosophical inquiry to examine into this concept of energy and determine, if we can, its philosophical import.

Philosophers have been concerned with the problem of reality since the earliest history of thought, and to the question, What is reality? many and varied answers have been given. We find that in the approach to this problem the scientific understanding of the ancients presents an interesting contrast with that of to-day. Instead of the four elements of Empedocles—earth, air, fire, and water—more than ninety elements have been found, entering into the make-up of the earth and all existing objects. "The spectroscope tells us that in the most distant stars the same elements exist as here, and that the periods of vibrations which cause them to emit light are identical with those of their terrestrial representatives." All material things can be analyzed and resolved into these ninety elements.

In the philosophy of the early days we meet two opposing schools of thought—one teaching that everything *is* and nothing *becomes;* the other declaring that nothing *is* and everything is in a process of *becoming.*

Heracleitus, representing the latter school, believed all things to be in a state of flux; there is no such thing as rest. In this he anticipated a fundamental principle in modern science, for science to-day holds that matter is made up of a countless number of moving particles. In the decomposition and changes peculiar to inorganic matter, and in the myriads of living cells composing organic matter we find that there are no two successive moments when any single particle of substance fails to experience some genuine change.

BRIEF STATEMENT CONCERNING THE ATOMIC THEORY

As we proceed with our task it becomes evident that a study of the atomic theory, which has to do with the organization of these little moving particles, is fundamental to any treatment which might be made of matter and any search for facts which have to do with ultimate reality. It is a long road, however, from Democritus, the first real exponent of Atomism, to the present time, and many and varied have been the interpretations made of this system along the way.

With Democritus the atom is simply a hard little body moving mechanically through space. The atoms coming together are responsible for all changes. By this method in his system of materialism he would endeavor to explain all phenomena, from the most simple external occurrences to the deepest experiences of the mental life.

A new light was thrown on the atomic theory when Newton's law of gravitation took its place in the world

of science. Instead of the atoms clashing at random and being held together in a chance way by means of their jagged surfaces, the element of attraction was introduced. "It was natural that, having explained the cosmical, and subsequently many terrestrial phenomena, successfully by the formula of attraction, Newton himself, and still more Laplace and his school, should have attempted the explanation of molecular phenomena by similar methods. The astronomical view spread into molecular physics. Newton himself made use of the notion of molecular attraction—i.e., of attraction existing only at very small distances—to explain the refraction and inflection of light passing from empty space, or from the atmosphere, into or in the neighborhood of solid bodies." [1]

Boscovich was among the first to lose faith in a dependence on the impact of the atoms; nor could he be satisfied with allowing them extension. He felt that the fundamental essence of matter was to be found in atom points, situated in space, from which, as a basis, repulsive forces operated.

Dalton, who gave to each atom a definite weight, was responsible for the establishment of the atomic theory of the modern day. He taught that the small particles in all bodies are held together by an attractive force, and that there is also present and operating in matter a repulsive force. This introducing into the theory the element of forces was carried even further by such men as Fechner, Moigno, and Faraday, who would make the atoms simple centers of force, which

[1] Merz, *History of European Thought in the Nineteenth Century*, Vol. I, pp. 354-356.

closely approaches a system of dynamism and paves the way to the energy concept.

In the analysis of substance according to the atomic theory, the smallest unit we meet is the molecule which can be further divided into atoms. In HNO_3 we have a molecule of nitric acid, containing one atom of hydrogen, one of nitrogen, and three of oxygen. The molecules differ according to the number of atoms constituting them. The atoms of the same element have been considered invariable in size, having a definite and fixed weight. It is believed to-day, however, that the so-called atomic weights are merely averages. Radium, thorium, and uranium have the heaviest atoms and hydrogen the lightest. "We are as certain of the existence of these atoms and of their uniformity and invariability as if we could count and measure them. Indeed they are actually counted in certain cases of radioactivity." [2]

THE ELECTRONIC THEORY

The atomic theory has been a very profitable instrument in the hands of science for a long time, but acquired knowledge now enables us to make an analysis of Nature which transcends the limitations of the atom. Just as the molecule of substance was divided and the atom made the smallest measure of matter, so the atom to-day is analyzed and found to be composed of still smaller particles.

One of the most remarkable pieces of work accomplished by science in recent years has been this success-

[2] Soddy, *Matter and Energy*, p. 55.

ful analysis of the atom. As the smallest unit of matter entering into the make-up of the elements, the atom has lost its prestige, and science to-day is thinking in terms of the electron instead. It is the development of the electronic theory which has not only popularized the energy concept but given it a well established place in modern scientific discovery and thought. It has confirmed the long-held belief in the presence of a dynamic force in Nature, and seems to show that ultimate reality itself is identical with what science has been calling electricity, but *now looks upon as some form of energy.*

According to Rutherford each atom is believed to be like a little solar system, being composed wholly of charges of negative electricity, electrons, revolving "in regular orbits" [3] about a core or nucleus which is a charge of positive electricity. More recent thought, however, is inclined to believe that the electrons are vibrating in certain regions, rather than revolving about a nucleus, within the atom. Motion results as the electrons repel each other and in their activities they are held in balance by the attraction of the positive unit. It is thought that the negative charges are equal to the free positive charge of the nucleus and in this fact the atom realizes a possible equilibrium.

Some writers consider the electron to be a unit of electricity whether negative or positive. For our present purpose we shall call only the unit of negative charge an electron. The electrons of the atom are all the same, no matter from whatever element's atoms they come. They are constituents of every atom, are

[3] Gibson, *Scientific Ideas of To-day,* p. 53.

real electricity, which flowing, constitute electric current.

Concerning the nucleus of the atom, science does not have full knowledge. We are sure, however, that it is electricity and predominantly positive. In this nucleus have been found electrons which under certain conditions are set free. This core or positive charge is less than one ten thousandth the diameter of the atom and numerically equal to one half the atomic weight,[4] while "the whole atom is perhaps one hundred thousand times as large in diameter as the electrons." [5]

The velocity of the electrons in their flight is almost inconceivable; thus they occupy but small space and constitute a solid. The immense possible velocity is suggested in the statement that "the velocity of the electron when impelled by strong electric force may reach sixty thousand miles per second when shot through a vacuum, the better the vacuum the higher the speed." [6]

Under certain conditions atoms gain and lose electrons. Sometimes the negative charges predominate and sometimes the positive, according to whether the atom has taken on or given off electrons. Some elements will give up electrons quicker than others. The stronger a metal, the stronger the tendency to give up electrons when exposed to the impact of light. The latest theory of color is based on the principle of the looseness of the electrons in the atom. The weight itself of an element is determined by the electrons. Thompson says "the atomic weight of an element is

[4] Stewart, *The Homiletic Review*, Oct., 1914.
[5] Mills, *The Realities of Modern Science*, p. 90.
[6] Gibson, *Scientific Ideas of To-day.*

proportionate to the number of electrons contained in the atoms." So in hydrogen, the lightest atom, we find but one electron and in uranium, the heaviest known atom, there are ninety-two. To-day then, science does not have to stop with the atom, but can take that more ultimate particle, the electron, as a working basis.

This brings us safely to the place of assumption that electricity is a common, pervading factor peculiar to the finest particles in all matter, and the electron as a unit of energy presents itself as a general medium of permeation running through all forms of material existence, animate and inanimate. This is given partial confirmation in the fact that electrical excitation can very often get definite responses from animals, plants, and inorganic substances. "The everyday laboratory faith of the physicist is now not in visible material as formerly understood, but in the invisible thing we call electricity. He has repudiated the atom as a unit, observing in it a wonderful and complex system of unending interest and great experimental possibilities, and has accepted the atom of electricity as the basis for his scientific belief. . . . The reality of matter, as formerly conceived, is now abandoned, and the invisible becomes the everyday reality of the scientific laboratory." [7]

As we now come face to face with Nature in its ultimate analysis, reality itself, we come face to face with what, in commercial as well as scientific language, has been called electricity. In this we foresee meanings

[7] Stewart, *The Homiletic Review,* Oct., 1914.

and possibilities more far-reaching than was ever dreamed. And in dealing with this dynamic something, science is not willing any longer to talk in terms of what has been known as the electricity concept but endeavors to broaden and deepen its hold on truth and proceeds in this field of inquiry in the name of the energy concept.

THE ENERGY CONCEPT AND COSMIC EVOLUTION

A study of cosmic evolution confirms the belief that there is and has been an all-prevailing something more fundamental than electricity, which something is energy, and which is manifesting itself to-day as electricity. When we find the dynamic conception of reality prevailing in much of the best philosophy of all ages, in modern psychology, and even in to-day's philosophy of life, it is not strange that in its progress toward ultimate truth modern science should be confirming this interpretation by its strong and positive representation of the concept of energy. It seems necessary then for us to "reverse our thought in the search for causes and take steps toward an energy conception of the origin of life and energy conception of the nature of heredity." [8]

As intimated in the foregoing, the history of the earth's evolution is fundamentally the history of the changes in forms of energy. Four of these have primarily manifested themselves in this process of cosmic development—heat, light, chemical affinity, and electricity. According to MacFarlane,[9] in the very primi-

[8] Osborn, *The Origin and Evolution of Life,* p. 10.
[9] MacFarlane, *The Causes and Course of Organic Evolution.*

tive state of the earth when everything was in a nebulous [10] state, energy manifested itself as heat. The intensity of the heat must have been extreme "in this gaseous state of the earth and according to Arldt a temperature of at least 15000c may have existed." [11] Associated with the intense heat was a corresponding rapidity in the motion of the constituents of this fiery mass; and in the development from this gaseous state the degree of motion of these particles increased, proportionate to the condensation of heat which took place. Here then in the condensation of heat energy we meet with motion and its cause as first experienced in the cosmic order.

In the gradual change from the gaseous to the liquid state, instead of energy primarily manifesting itself as heat, it began to assert itself as light. Then, as the energy continued its condensation, with an increased activity and higher degree of organization of the atoms we find that energy expressed itself as "chemical affinity." Thus as the earth progressed in its cooling process, associated with which was a definite progress in the organization of the centers of energy, bodies began to come into definite forms of existence, reaching the highest and best condition in the solid state when energy expressed itself primarily as electricity. Thus when we study the transformation of energy

[10] In suggesting this program we are fully aware that science in America, especially geology and biology, is giving precedence to the Planetesimal Hypothesis as over against the Nebular Hypothesis. But even so, this does not at all controvert our theory as to the part energy has played in the process of cosmic evolution.

[11] MacFarlane, *The Causes and Course of Organic Evolution*, p. 21, *passim.*

through the gaseous, liquid, and solid states, from original heat and light to electricity, we are not surprised to see electricity quickly and easily taking the forms of heat and light, harmonizing somewhat with Fanvell's view that electricity is a "highly condensed or latent heat." As Osborn would say, it is but the old forms of energy taking new directions.

According to our hypothesis then, in the ultimate analysis of all things we meet energy. In it wonderful possibilities and potentialities are to be found. It is the Alpha and Omega of all forms of existence, the different bodies being but different expressions of the same thing. Haeckel confirms this in saying that "mechanical and chemical energy, sound and heat, light and electricity are mutually convertible; they seem to be but different modes of one and the same fundamental force or energy.[12] That energy is a common principle underlying all existence, organic and inorganic, is also supported by Osborn: "No form of energy has thus far been discovered in living substances which is peculiar to them and not derived from the inorganic world." [13] "Thus the evolution of life may be written in terms of invisible energy as it has long since been written in terms of visible forms." [14]

HE ENERGY CONCEPT AND THE UNITY OF NATURE

In the unity of Nature we have a situation which seemingly is best explained by the presence of some

[12] Haeckel, *Riddle of the Universe,* p. 254. (Translated by McCabe.)
[13] Osborn, *The Origin and Evolution of Life,* p. 12.
[14] *Ibid.,* p. 17.

universal, dynamic essence such as energy; and the more progress we make in our understanding of Nature the more we are impressed with the harmonious interactions and relationships existing between Nature's constituents. Marvin feels that if we could see Nature through perfect eyes all seeming discords would disappear. He says "the doctrine of evolution has made the forms of animal and plant life, the institutions, customs, and languages and arts of different peoples all seem but different chapters in one connected story of earthly life. In short, increased knowledge reveals increased interconnection and complete knowledge would reveal complete interconnection." [15] Since organic and inorganic bodies are composed of the same ingredients, all coming from the same elements, it is very natural to look upon the world as one great unitary whole.

Tagore, the poet-philosopher of India, protests against the idea that certain parts of Nature are set off from the rest. He advocates a real unity of Nature in saying that "in the west the prevalent feeling is that Nature belongs exclusively to inanimate things and to beasts, that there is a sudden, unaccountable break where human nature begins. According to it, everything that is law in the scale of beings is merely Nature, and whatever has the stamp of perfection on it, intellectual or moral, is human nature. It is like dividing the bud and the blossom into two separate categories and putting their grace to the credit of two different and antithetical principles." [16]

[15] Marvin, *A First Book in Metaphysics*, p. 92.
[16] Tagore, *Sadhana—The Realization of Life*, pp. 6-7.

Not only no man liveth unto himself, but no thing liveth unto itself. There is a common chord running through all life. The interests of all forms of existing life are mutual. The tender, sympathetic strain common to all life is necessarily based upon a reciprocity in relationships.

Even between the lower animals and man a tender understanding is often experienced, and in many cases the responses obtained from them are almost incredible. The pipe organ not only thrills us as human beings but gets a sympathetic response from inanimate objects as well. We love to commune with Nature but the reality of this experience would vanish if we should try to make it a one-sided affair on our part. Being human we best understand man's feelings in relation to other existing things but that does not say that he contributes more than his proportionate share of appreciation to the unity and harmony of Nature. In this fact of mutual relationships there must be some element of reality upon which these interactions can ride back and forth. We find this principle of reality in energy into which man and beast and clod can be resolved.

Behind this attitude modern thought seems to be arraying itself. De Tunzelmann says "the observed correlation of mental and material phenomena definitely demonstrates the power of the human mind and the minds of other living beings, to influence and be influenced by, changes in the distribution of energy in their material environment." [17]

[17] de Tunzelmann, *The Electrical Theory and Problem of the Universe*, p. 471.

Some would go so far as to say "physical and psychical processes depend so on one another that it is possible to find in energy not only a possible unifying of Nature but an occasion for an efficient and moving cause." Energy seems to be established as the fundamental means of interaction and relationship between mind and matter, mind and mind, and matter and matter. Perry would get to the heart of the whole question and says: "Instead of conceiving a matter that manifests itself in forms and motions, why not stop at force and invest it with finality and universality?" [18]

Perhaps de Tunzelmann comes out strongest in championing the cause of energy as the ultimate basic element in all matter. He says we cannot conceive of a substance from which the uniform distribution of energy has been abstracted. Its very life would be taken away if the energy element were eliminated. He seems to sum up his attitude in saying, "All the phenomena of the material universe may therefore be considered as arising solely from changes in energy distribution. That is to say, energy is the sole ultimate phenomenal basis of matter." [19]

It is very evident then that in recent years a great change has taken place in the field of science due to the development of the electronic theory of matter. In fact, we have come to that place where it can be said that "the old concept of stuff has been completely displaced by the new concept of radiant energy." [20] Thus it seems that the old scientist-philosophers, some of

[18] Perry, *Present Philosophical Tendencies,* p. 70.
[19] de Tunzelmann, *The Electrical Theory and Problem of the Universe,* p. 470.
[20] Carr, Preface to Bergson's *Mind-Energy,* p. vi.

whose systems we shall review in the next chapter, in teaching the presence in matter of a dynamic element, were feeling after the real truth in the situation. For modern science not only confirms this attitude but, as has been suggested, goes still further, and by satisfactory experiments has come to the conclusion that "there is no difference between matter and energy" [21] and *that the world in its ultimate essence, reality itself, is energy.*

[21] Wendt, *Lectures.*

Chapter II

THE DYNAMIC TREND IN THE HISTORY OF THOUGHT

As suggested in our first chapter the dynamic conception of the world is not at all new, and the attitude of modern science toward the energy concept has a strong background of support in the energetic conception of reality so evident in the history of thought. We shall now undertake as our immediate task to pass in review those thinkers, ancient and modern, who have dwelt upon the dynamic aspect of reality.

ΦΥΣΙΣ

The men of the early Ionian school were the first to try to get into the heart of Nature and find out what is the abiding element in all changing things—that common substance from which all things come and into which they pass.[1] To understand the teaching of these early Greek thinkers it is necessary to understand the meaning of *φυσις* as used by them, for this seems to constitute the source and backbone of their philosophy.

In the philosophy of these writers we find *φυσις* (Physis) to be a fiery, living, moving, ultimate essence permeating all things. From it, which knows no be-

[1] Bakewell's *Source Book in Philosophy*, p. 1.

ginning or end, through the media of water, air, and fire, by means of its own self-activity, have come all things, souls, gods, the world itself. *Φυσις* then, the substratum and essence of all bodies,[2] is a vitalistic, self-producing element from whose eternal mobility and life all existing forms receive impulses to activity, as it constantly plays the rôle of an urging, guiding, and determining factor. To Anaximander have been ascribed these words: "*ἀθάνατον γὰρ καὶ ἀνώλεθρον περιέχειν ὥπαντα καὶ πάντα κυβερνᾶν.*"[3] This ultimate essence then is not only living and free but also divine.

HYLOZOISM

The first philosophy which will be taken up is that of the hylozoists as represented by Thales, Anaximander, Anaximenes, and Heracleitus, in which is prominent the idea that the whole world is a living being and that all matter is moving; living matter and moving matter being identical. All material elements of Nature are related in a common life. In this system we find evinced the belief that the universe is animated by an inner, fiery, vital principle which operates as a qualitatively psychic factor. This conception of an inner, moving principle of unity appears early among Greek thinkers, and naturally the question arose, what matter is most moving, most alive? What is this ultimate reality which affords a basis for all moving and

[2] Veazie, *Studies in the History of Ideas,* Ch. II, *passim.*

[3] "Immortal and indestructible, surrounds all and directs all." (Fairbanks, *The First Philosophers of Greece,* pp. 8-9.)

changing, and which continues to exist after the changes occur?

In answer to this question Thales replied that it was water, seeing that moisture was very essential in animal and vegetable life; also perceiving it to be very subtle and versatile, appearing in the forms of a solid, liquid, and vapor. He felt that the plasticity of matter furnished the possibility for everything to change, through water as the medium; all things have their origin in water and go back into water again. The active vitality of matter so impressed Thales that he taught the existence of a world soul, and that a divine mind was constantly at work. He would say according to Aristotle: "All things are full of gods. The magnet is alive; for it has the power of moving iron." [4] Thales' water, "the soul substance, possesses a superhuman mana, a dæmonic energy distinct from the natural properties of the water." [5]

Plato quotes Thales as saying: "Is there any one who acknowledges this and yet holds that all things are not full of gods?" "Its motion and its power of generating things other than itself are due to its life (*ψυχή*), an inward, spontaneous principle of activity." [6] Thus in the hylozoism of Thales *we have a dynamic conception of Nature which is inseparable from the modern energy concept.*

Anaximander also was keenly conscious of the presence of an unlimited, active, vital force in matter, but

[4] Quoted from Burnet's *Early Greek Philosophy*, p. 48.
[5] Quoted from Cornford's *From Religion to Philosophy*, p. 135.
[6] *Ibid.*, p. 128.

he did not give it the name of an element such as water. He called his the Unlimited or Infinite which is not only unlimited and infinite but is "without beginning, indestructible and immortal." *This dynamic, inner life surging through matter* is endowed by Anaximander with the possibility of "encompassing and guiding all things." We find Theophrastus saying that "Anaximander . . . said that the material cause and first element of things was the Infinite, he being the first to introduce this name for the material cause. He says it is neither water nor any other of the so-called elements, but a substance different from them which is infinite, from which arise all the heavens and all the worlds within them. . . . He says that this is eternal and ageless and that it encompasses all the worlds . . . and besides this there was an eternal motion, in the course of which was brought about the origin of the worlds." [7]

Anaximenes, *continuing the same dynamic trend of thought,* said that air, with an inner vitality and force peculiar to itself, was the underlying and pervading principle in everything. Air is continually in motion and has the same relation to the world as man's soul has to his body. According to Theophrastus, Anaximenes says: "Just as our soul, being air, holds us together, so do breath and air encompass the whole world."

[7] Quoted from Burnet's *Early Greek Philosophy,* pp. 54-55.

HERACLEITUS

In Heracleitus also *we meet with a remarkable anticipation of the modern energetic attitude toward reality.* In his philosophy he reaches forward to a fundamental principle in modern science, teaching that everything moves; everything is in a state of flux. Nothing abides; all things in Nature are changing into one another—are in a constant process of becoming. He called his primary cosmic substance, fire. It is not what we mean by ordinary fire but a something which changes into all things and into which all things can be transformed. It so permeates the last iota of all substance that in all matter there is the "ever-living fire." These changing processes, which are expressions of a *restless vitality,* are fateful, rational and just. Thus the world is explained in terms of a cosmic substance, a transforming force, fire, which continually burns but never burns out; man himself being a spark of fire struck off from, and at death becomes lost in the great cosmic Fire.

In this whole system there is a marked element of harmony characterizing all Nature, back of which is a Universal Order, Divine Law, whose force is intelligent and efficient, governing all things. Heracleitus calls this all-prevailing principle intelligent Will,[8] Law,[9]

[8] Fragment 19—There is one wisdom, to understand the intelligent will by which all things are governed through all.

[9] Fragment 91—The law of understanding is common to all. Those who speak with intelligence must hold fast to that which is common to all, even more strongly than a city holds fast to its law. For all human laws are dependent upon one divine law, for this rules as far as it wills, and suffices for all, and overbounds.

Justice,[10] Destiny or Fate,[11] Wisdom,[12] God.[13] It is both material and spiritual. In its fiery make-up it is identical with evident, tangible activities; as Law it becomes pure Form which abides amid all changing relationships. Do we not have here an interpretation of the world in its ultimate essence which is charged through and through with an unmistakable vitalism? Confirmation and emphasis are given this belief by the fact that to the original substance there is ascribed a spirit of appetency, which determined by Universal order—a rational Law—supplies the urge necessary to the conflicting activities by which Nature has come from a general substratum to the experience of specific individual identities. *Heracleitus even carries this doctrine of activism over into his ethics and teaches that the "summum bonum" is reached chiefly through the medium of intellectual striving.*[14]

DEMOCRITUS

We introduce at this time the philosophy of Democritus,[15] the first materialistic system. An analysis of this philosophy is made, not because it belongs to the

[10] Fragment 29—The sun will not overstep his bounds, for if he does, the Erinyes, helpers of justice, will find him out.

[11] Fragment 63—For it is wholly destined . . .

[12] Fragment 65—There is only one supreme wisdom. It wills and wills not to be called by the name of Zeus.

[13] Fragment 36—God is day and night, winter and summer, war and peace, plenty and want. But he is changed, just as when incense is mingled with incense, but named according to the pleasure of each.

[14] Patrick's *Heracleitus,* p. 56 ff.

[15] Democritus (460-370 B.C.). A native of Abdera, Thrace. He studied in the famous Atomistic school of Leucippus which was at that place.

history of energy systems but because it is the best example of a purely materialistic system and must be carefully examined to show the limitations of a non-energetic system of thought; and also to show that this elaborate program of materialism, being without a vitalistic principle, offers a substitute for this seeming need.

Here, then, we find no vitalism, no idealism; everything is considered from a mechanistic standpoint. Democritus, taking up the work begun in Atomism by his master Leucippus, was the best representative of the Atomistic school. Naturally with him all phenomena are explained in terms of atoms and the impact of atoms. The atoms to which he reduces all substance are invisible, uncreated, solid, indivisible little bodies moving in empty space. Though alike qualitatively they differ in form and size. The various groupings or constellations of these atoms furnish a basis for all changing relationships. There is no moving force outside of them. Motion is a quality peculiarly their own; and as they move in space they mechanically strike each other. The impact causes the coming together of other atoms, and "thus worlds are formed as well as smaller objects from the original vortex." The fire atoms, characterized by mental activity, are the finest, smoothest, and most active. They are to be found not only in man but in plants and animals as well, constituting the soul life of that body of which they are a part. Man's superior mentality is due to a fuller abundance of these atoms. At death the fire atoms take their flight and the soul life ceases to be.

Democritus does not give to his atoms a kind of

spontaneity as does Lucretius, nor feeling and will as does the materialist Haeckel. *He does not fail, however, to make provision for the energy part of the world. He endows his atoms with original motion which enables them to experience independent self-activity.* Inherent in the nature of the atoms there is a tendency to combine. And also in making the fire atoms to be the principle of activity in all organisms,[16] the real "soul stuff," endowing their motion with a psychical activity which permeates the entire organism, producing the "phenomena of heat and life," he presents *a definite substitute for the dynamic conception of reality.*

ARISTOTLE'S VITAL PRINCIPLE

In Aristotle's philosophy of the organic world we have an interpretation of reality which rises above the materialism of Democritus and is more practical than the idealism of Plato. He forsakes the conceptual bent acquired in his early training and builds a world of perceptual existence. He would say there are no ideas apart from individual things. "True reality is the essense which unfolds in phenomena." Matter and Form are the two facts constituting reality. There is a constant development in progress in the world which represents the endeavor of matter to find expression in Form. By matter he does not mean a hard, dead mass but an undercurrent of Being endowed with potentiality and possibility. By Form he means the ideas or

[16] Windelband, *History of Ancient Philosophy*, p. 165. (Translation by Cushman.)

qualities which constitute the object. We can get Aristotle's conception of reality by using the illustration of a building in process of construction which would be something like this: "Matter is the stone in the quarry and wood in the tree. Here is potential being. Form is the idea of the future building as it is in the mind. Reality then is the building as it will be when finished." So of all reality.

Aristotle, however, was not so much interested in reality itself as he was in its causes. Thus we find him teaching that beneath the struggle of everything toward a higher and better realization of itself there is a *dynamic quality* which initiates and lends impetus to the movement, whether we call it idea, Form, or energy. Aristotle emphasizes the fact that there is no particle of substance from which this quality is absent. As matter strives to become Form—the potentiality to develop into actuality—it is moving toward its highest end in time, man; reaching out for the highest realization possible, perfection, which is God. This inner principle, the very soul of all things, is constantly moving every part of Nature toward a definite end, revealing a principle of purpose, which indicates a knowing quality. *This force then inherent in all Nature is a rational principle of activity and has a real relationship to the energy theory of the present time.*

EPICURUS AND LUCRETIUS

In Epicurus' conception of reality there is a program patterned after that of Democritus. There is nothing in the universe except innumerable, indestructible little

atoms and empty space. In the beginning all atoms were falling in a straight line. Falling in empty space, they fell with the same velocity. Each atom has in itself a characteristic freedom, a psychical quality which was responsible for their swerving from their original path. Striking one another a nucleus was formed, finally objects, and the earth itself. Thus ultimate reality is found in this little body, ruling out an outside force, final causes, God. There is no system, no law, no purposive organization.

Lucretius, who belonged to this same school, in his didactic poem, *De Rerum Natura,* reëmphasizes the philosophy of Epicurus, further saying that only atoms and void exist. All things are the combinations of these two or an "event of these." [17] But he gives his atoms a certain spontaneity and free will, saying that the world, the same as everything else, is the spontaneous result of the combination of these little atoms which are the constituents of life. *In this idea of spontaneity* Lucretius makes a marked addition to the psychical activity suggested by Democritus and Epicurus, *and hence gives to his atoms a genuine dynamic quality.*

THE STOICS

In a study of the Stoics we find a system of materialism which says everything is matter, from God to the most insignificant thing. Matter is the mover as well as the thing moved. The whole universe is matter in

[17] Lange, *History of Materialism,* Vol. I, p. 135.

constant motion. Nature not only operates according to law but is a supreme law in itself. It, however, is permeated by a force, a fire, a reason, which is a formative, governing, and vital principle. This principle with a power inherent in itself operates constantly in the process of development, guiding things to a perfect end. This force is the very central fact in the universe's existence. It is to the universe what the soul of man is to man, man's soul being but a part of the great Soul, the great pervading force. Consequently having here a vital force which is also rational, we have a *qualitatively psychic and dynamic interpretation of reality.*

Augustine, representing the church fathers, and one of the first subjectivists, in trying to locate certainty and reality said truth and reason are within one's self. These inner principles constitute the real life. "These are really God, for He is truth and reason." The more we learn the meaning of these inner experiences the closer we get to reality. With him then ultimate reality is *God operating in one's self and life.*

LEIBNITZ

We now come to that place in the history of the search for reality where the dynamic and vitalistic conceptions of reality which are found in Heracleitus, Aristotle, the Stoics, and even in Lucretius, come to an end for the time in the mathematico-mechanical conception of the seventeenth century. Scientific interest centers primarily in matter, space, extension and mo-

tion. There is one outstanding exception, however, to the suggestion that in this period all energetic theories are banished, and this exception is Leibnitz. His interpretation of reality will now be treated, remembering that he wrote later than Descartes or Spinoza, the chief exponents of the mechanical conception prevailing in this period.

Leibnitz attempted to do away with the old idea of the atom as a divisible little body, also to eliminate the single substance theory of Spinoza, and in this endeavor he built up in his monadology a theory which is fired through and through with a *dynamic conception of reality*. In his system the universe is made up of innumerable, indivisible little units called monads which are bits of force constituting the ultimate essence of all things, reality itself. "These primal essences or forces, which he calls monads, constitute the whole of reality; they are the fundamental elements of the entire material and spiritual world . . . they are contrasted with mere atoms in that they are not dead, inert particles, but instinct with vitality and movement." [18]

In the world there are degrees of consciousness, ranging from low to complete states, corresponding to the make-up of the monads constituting the object. This fact of degree roots itself in the two kinds of quality which enter into matter so-called—passive and active. Passive matter obstructs clear perception while active matter represents pure perception.

In minerals the monads have a large measure of passive matter; consequently there is confused perception,

[18] Alexander, *A Short History of Philosophy*, p. 320.

not fully conscious. In organic life a large number of the monads possess a greater proportion of active matter constituting a nucleus or governing center around which the other monads cluster. Naturally then in organic life there is a higher degree of perception, man standing at the head of the group. It is only in God that we find monads representing absolutely clear perception. Thus individually and in groups, in all the activities of the universe, we find these little centers of force, with their own peculiar spirit of appetency, climbing toward higher realizations of being. The cause of the natural changes of the monads Leibnitz would ascribe to an internal principle, "since an external cause can have no influence upon their inner being." [19] Thus his philosophy becomes a fertile oasis of *dynamism* having its setting in a desert of dead mechanism.

As we have already suggested, in this period the current of philosophical thought runs from vitalism to mechanism. Descartes' philosophy well represents the change of attitude toward reality. In his system a distinction is drawn between conscious and spatial reality. Matter is diametrically opposed to spirit. There are really three realities, "self, God, and matter." God is the Absolute Reality and thus is the moving cause. The two secondary substances are dependent on the Absolute Reality, God. The chief qualities of matter are extension and motion, but matter is essentially extension, i. e., space. There is no place in this system for indivisible facts like atoms. The attributes or

[19] Latta, *Leibnitz—The Monadology,* p. 223.

qualities of objects do not rest in objects themselves but are traceable to the creations of our mental activities.

He applies a mechanical conception to everything outside of God and self, denying mental states even to animals. Huxley was pleased because Descartes had been able to see that "the remotest parts of the universe are governed by mechanical laws including our own bodily frame, and attempted for the first time to account for all natural phenomena as only a simple development of the laws of mechanics with the effect of arriving . . . at that purely mechanical view of vital phenomena toward which modern physiology is striving." [20]

Spinoza, continuing the mechanical conception of reality characteristic of this period, makes no great, fundamental change in the philosophy of Descartes. Known as the God-intoxicated man, he taught the existence of but one substance, God. God and the world are identical. This infinite Substance has two attributes—mind and matter. There are things other than God which exist and yet they exist in Him; they are a part of God. God is everything; everything is God, might be considered a summary of his philosophy.

MECHANISM VERSUS DYNAMISM

The mechanism prevailing in this period to which we have referred would say "the substance itself does not change. All that changes is the relation between

[20] Cooley, *The Principles of Science,* p. 135.

the substances. These changes in relation give rise in us, as onlookers, to the illusion that the substance itself is changing its qualities," [21] thus making the world of mechanics tell the complete story of reality. This as over against the dynamic conception which would say "it is of the very nature of the substance spontaneously to produce new qualities and states." Thus according to mechanism the idea of an inner force directing to an end, or even present at all, is supplanted by the belief that all harmony, all changes are due to the mechanical interactions of parts and their relation to outside influences. As the principles of "adjustment, interaction, continuity, uniformity, and causation" play their part we have the secret of all activities. And as a result of the work of Descartes, Newton, Spinoza, etc., the dynamic theory of reality had to wait for expression until the nineteenth and twentieth centuries, at which time we are ushered into the biological, psychological, and dynamic era in which energy becomes the more basal concept.

In connection with the mechanical theories it is in order here to reach forward and mention the philosophy of Herbert Spencer, although his writings do not appear until after the middle of the nineteenth century. Spencer endeavored to show that all activities of the universe have as a basis of operation a fundamental principle, a persistent force.[22] Then in at-

[21] Marvin, *A First Book in Metaphysics,* pp. 184-185.

[22] "As shown before, we cannot go on merging derivative truths in those under-truths from which they are derived, without reaching at least a widest truth which can be merged in no other, or derived from no other. And the relation in which it stands to the truths of science in general shows that this transcending demonstration is the Persistence of Force. . . . But

tempting to account for the way in which this principle reveals itself, he gives an interpretation of reality which is mechanical and unsatisfactory. He would say "the law of the continuous redistribution of matter and energy" *is* fundamental in all changes and relationships. As constant activity characterizes everything, in this constant movement there is an upward and downward process going on continually. The end of the upward movement is reached when like units are brought together in such way as to obtain a balance of stability. It is then when this point is reached that the downward movement begins in the process of disintegration. Thus the universe is one big piece of machinery whose parts are moving one way for a time and then another. All activities are thus reduced to a system of mechanism.

That such a dead mechanical view, which had been dominating in this field of thought for years and held by Spencer in the latter part of the nineteenth century, was unable to satisfy the mind (pragmatically insufficient) is shown by the new dynamic currents of thought entering from many quarters, all suggestive of the energy concept, several of which we shall take up at this time.

when we ask what the energy is, there is no answer save that it is the noumenal cause, implied by the phenomenal effect. Hence the force of which we assert persistence is that Absolute Force we are obliged to postulate as the necessary correlate of the force we are conscious of. By the Persistence of Force we really mean the persistence of some cause which transcends our knowledge and conception. In asserting it we assert an Unconditional Reality without beginning or end." (Spencer, *First Principles,* Sixth Edition. 175-176.)

KANT'S THEORY OF THE WILL

"There were those who said everything could be explained by natural science as a great world machine," but this attitude seemed cold and harsh to Kant, he feeling keenly conscious that there was something lacking in the philosophy prevailing at that time. It seemed to him to be out of touch with real facts, with real life. He aimed at supplying this seeming need.

In seeking the real facts of life Kant goes past the secondary world of phenomena and discovers a primary world of absolute values. Here we meet with human nature in which there is a marvel of beauty and dignity. In this realm of higher values we come in touch with real life, the innermost essence of man, the will. This ultimate fact, will, is untrammeled, free, supreme.

All law proceeds from the will for we can do just what we *will* to do. There is only one good thing in the world, a good will, and this striving will, acting as a unifying power, a synthetic activity, is the Alpha and Omega of all things. Thus Kant's system, the central, vital principle of which is a *striving, energetic will, must be given a place in the list of dynamic philosophies, and a definite relationship to the energy concept.*

SCHOPENHAUER'S PHILOSOPHY OF THE WILL

Schopenhauer makes will to be the moving principle, the vitalizing force, not only in man but in all Nature as well. This striving principle is common to all Na-

ture, nothing being too small or remote to escape its influence. It is the eternal and indestructible ultimate essence, the final reality in all things. Will not only reveals itself in external things but is matter itself. Our bodily movements, and the organs which enter into our experiences are but manifestations of a surging, striving will. "The brain is the will to know, the foot the will to go, the stomach the will to digest." [23]

Will is the force urging the grass to grow, the flowers to bloom, the tree to bear fruit, in short, all Nature to observe its uniform methods of behavior. It is the primary characteristic of all life, the lowest type being the *willing* to preserve life, the simple *willing* to live. From this lowest type there is a gradual rise in the series until the highest type is reached which is conscious, and is represented by man. The beauty and harmony of all Nature is due to the fact that there is but one will and this same will operates in all phenomena including man, its great objective always being the highest and best possible.

Striving for the best does not mean any particular end, for Schopenhauer rules out purposes. Thus all activities of the universe constitute a mass of constant, endless, irrational striving, the great driving motor being the will.

In this connection Wundt's philosophy of will units and Hegel's philosophy of spirit could be offered as dynamic theories as over against the mechanical theories advocated by Descartes and Spinoza. We

[23] Quoted from *A Short History of Philosophy,* Alexander, p. 501.

simply mention them here and later, under another heading, we shall offer a brief analysis of each.

HAECKEL

In each of the immediately foregoing systems of thought, indicative of modern belief, we find an active, striving, vitalizing force at work. So, continuing our line of thought which is characteristic of modern scientific presentation, we shall now turn aside for the time being and consider the philosophy of the materialist Haeckel, the monism-intoxicated scientist. It may seem out of order to introduce his system in connection with a study of the energy concept, but we shall give a summary of his philosophy and add quotations from his work, *The Riddle of the Universe,* with the purpose of showing that he actually gives to his atoms a quality of energetic striving.

He purports to represent a system of monism which rises above spiritualism and sheer materialism, as they ignore matter and teach the doctrine of dead atoms, respectively.[24] He would merge both into one and call it monism. There is but one substance into which everything roots itself. In this substance its two attributes, matter and mind, are linked together as one.

Very often Haeckel's representations are not altogether clear. In his explanation of some activities he points to the soul principle, and at other times pictures the psychical activities as representing the ordinary

[24] Haeckel, *Riddle of the Universe,* p. 20. (Translation by McCabe.)

functions of the brain, as rooting themselves in the central nervous system. Psychology is but a sub-head under physiology in his general presentation.

Though a heralded materialist he definitely gives to his atoms a quality of feeling, of will, of striving, which challenges the correctness of the classification which some are inclined to give his philosophy. His atoms seem to have an affinity for each other, a satisfaction in harmonious relationships and resent an interruption of these experiences. This unconscious, pleasurable affinity noticed in the lower strata of life is what we meet in the sexes of organic life, simply more highly developed in the latter, for this fundamental unity of affinity is found in all Nature.[25]

This program which places all vital phenomena under mechanical processes of life, even making psychic activities dependent on a definite material substratum, like all other phenomena, later adds that "covering the whole field of organic and inorganic nature the two fundamental forms of substance, ponderable matter and ether, are not dead and only moved by extrinsic force, but they are endowed with *sensation* and *will;* they experience an *inclination* for condensation, a *dislike* for strain; they *strive* after the one and struggle against the other." [26]

In speaking of the atom Haeckel says it "is not without a rudimentary form of sensation and will, or as it is better expressed, of feeling and inclination—that is a universal 'soul' of the simplest character." [27] He

[25] *Ibid.*, p. 224.
[26] *Ibid.*, p. 220. (Italics are mine.)
[27] *Ibid.*, p. 225.

would carry this same principle of activity into the molecule.

In speaking of ether, which is boundless and immeasurable, he says: "It is in eternal motion, and this specific movement of ether in reciprocal action with mass movement is the ultimate cause of all phenomena." [28] The question naturally arises as to what causes the ether to move or the mass to reciprocate. He would say "the conversion of one form of energy into another, as indicated in the law of the persistence of force, illustrates the constant reciprocity of the two chief types of substance, ether and mass." [29] But this does not answer the question as to the fundamental cause of change.

Haeckel would make the law of reciprocity dominate the elaborate performances of the nervous system itself. But even when saying that "movement is as innate and original a property of substance as is sensation," he is not fully clear as to cause. It is when speaking of the evolutionary division of mass and ether that he ascribes the real cause of change and which cause embodies a vitalistic conception—"this division so effected by a progressive condensation of matter as the formation of countless infinitesimal centers of condensation in which the inherent primitive properties of substance—*feeling and inclination*—are the active causes." [30] Thus there is a "unity of all natural forces" which is the *"monism of energy."* [31]

[28] Haeckel, *Riddle of the Universe,* p. 228.
[29] *Ibid.,* p. 230.
[30] *Ibid.,* p. 243. (Italics are mine.)
[31] *Ibid.,* p. 254. (Italics are mine.)

OSTWALD

Among those scientists of modern times who have presented definite energy theories, a prominent place must be given the philosophy of Ostwald.[32] Here we meet a system in which force or energy is established as the primary concept; the concept matter being classified as a secondary phenomena, having its origin in the association and mingling of certain energies. According to Siebert,[33] Ostwald means by energy everything that grows out of work and everything that can be transformed into work. The explanation of all occurrences in the whole of Nature rests in an understanding of the activities and shiftings of energies in space and time.

There is a continual process going on in Nature of distributing and gathering energy. If a living being is to continue life it must, by an initiative and energy all its own, gather unto itself quantities of energy sufficient not only for preserving life but in addition thereto, for it is thus that it makes possible its continuance in the preservation of the species. When the barriers of resistance against which the organism has to fight, as it gathers energy, become stronger than the latter, then the living form dies. As the body takes in energy the nervous apparatuses constitute the medium for the transmutation of the energy into activities.

[32] Wm. Ostwald (1853–), Professor of Physical Chemistry at Leipsic.

[33] *Geschichte der neuren deutschen Philosophie seit Hegel,* Siebert, pp. 302-305.

It is thus seen in the history of thought that it would be impossible successfully to relegate to the background the strong tendency to dynamism. It has been in this type of philosophy that the scientific as well as the everyday type of mind has found most genuine satisfaction. Confirmation of this attitude is seen in the seeming fact that those systems have been lasting as well as satisfying which have been built around an energetic conception. It is not strange then that modern thought is speaking out definitely in support of an *energetic interpretation of reality.*

Chapter III

THE DYNAMIC TREND IN MODERN PSYCHOLOGY

There is so much in modern psychology which has a strong bearing on the energy concept that no one writing in this field would fail to mention the definite current of thought in contemporary psychology, setting in the direction of an emphasis upon the will and conative element in our mental life. These together with the voluntaristic tendency of thought, the Freudian wish, the emphasis placed upon feeling, self-regard, and fear, all indicate a relationship to an energetic conception of reality which cannot be overlooked.

In the search for the cause responsible for the "pull" or "urge" which is so evident in human nature, the psychologist naturally goes into the realm of the mental life, for it is here that the fundamental element in all activity is to be found. Modern thought, however, is not stopping with the intellect; this seems to have had its day. This fact is very clear in Bergson who in trying to organize the delicate machinery of the inner life definitely relegates intellect to a subordinate place. With him intellect seems to be in a foreign field when trying to deal with the life of the body and mind. Intellect is unable to get hold of life. It seems to be at home in dealing with the inert; always mechanically applying the forms of unorganized matter. Here only

does it seem to find complete satisfaction. Intellect simply takes things as they are given to it and tries to organize them. When we come to those things which flow from the heart of the living we begin to talk in terms of behavior and give a primary place to instinct, impulse, will.

We are not dealing simply with that which enables us to know things but with that something which is continually drawing to the yes-side and no-side of life, as situations demand decisions. Is this something due to a mechanical organization of our dispositions predetermined at our very inception in life? Or is it due to organized persistent energy or endeavor characteristic of all life? Modern psychology believes the latter to be the case.

The school of voluntarism, wielding an important influence in psychology to-day, will have but little to do with intellect, putting emphasis on the will instead, saying that in this we meet finality. As individual purposiveness characterizes all our actions, the factor guiding to this end is the will, playing continually the volitional rôle peculiar to itself. Our inward experiences then, controlled by the will and of which we are immediately conscious, reveal ultimate reality and constitute a willing dynamism.[1]

Wundt is an able representative of this school of thought which gives such a large place to the will. With him voluntary action is feeling in which the will asserts itself. "The feelings of each moment unite in a single total feeling; this total feeling is the resultant

[1] Perry, *The Present Conflict of Ideas,* pp. 205-210; 454-459.

volitional tendency." [2] Volition finds its causes in motives, but for a motive to be effective it must be associated with a willing self. And since volition has its origin in internal processes "it is at once clear that motives must be internal psychical causes."

According to Wundt the connate impulse roots itself in an interplay of psychical processes, as seen in the actions of a hungry infant. This impulse is "physiological in its ultimate basis but springs directly from psychological conditions which may at any time interfere to modify its original character." [3] Thus we have in this psychology an interpretation of reality in which there is an *underlying, energetic principle dominating the whole category of life's activities.*

In James' psychology we also find much stress put upon the will as an ultimate factor in the execution of purpose. He would say that the triumph of a motive or the realization of a desire is due to their being held fast before the mind at the focus of consciousness and that this is accomplished by inhibiting all other ideas competing for domination. Thus there is much in real will power.

Bergson finds no satisfaction in a mechanistic interpretation of reality nor in a theory of finalism.[4] *At every turn in his system we meet activity, back of which is an energetic impulse.* With him mind is "a force working, seeking to free itself from trammels and also to surpass itself, to give first all it has and

[2] Wundt, *Human and Animal Psychology,* p. 234.
[3] *Ibid.,* p. 401.
[4] Bergson, *Creative Evolution,* p. 87. (Translation by Mitchell.)

then something more than it has." [5] When speaking of mind he means, above everything else, consciousness; and to this he ascribes heavy responsibilities, all of an active nature. The most obvious feature of consciousness is memory. Consciousness, however, not only retains the past but anticipates the future as well. In the performance of these two primary functions, its chief rôle is to decide, to choose. Bergson feels that "whether we consider the act which consciousness decrees or the perception which prepares the act, in either case consciousness appears as a force seeking to assert itself in matter in order to get possession of it and turn it to its profit." [6] "The evolution of life, from its earliest origins up to man, presents to us the image of a current of consciousness flowing against matter determined to force for itself a subterranean passage." [7]

With Bergson consciousness cannot be explained apart from matter, and *vice versa;* and even matter itself he makes to be of an active type. In his *Creative Evolution* he says that matter is the inverse of consciousness. While "consciousness is action unceasingly creating and enriching itself . . . matter is action continually unmaking itself or using itself up." [8] A creative consciousness is continually striving against matter. "Things have happened just as though an immense current of consciousness, interpenetrated with potentialities of every kind, had traversed matter to draw it towards organization and make it, notwith-

[5] Bergson, *Mind-Energy,* p. 27. (Translation by Carr.)
[6] *Ibid.,* p. 22.
[7] *Ibid.,* p. 27.
[8] *Ibid.,* p. 23.

standing that it is necessity itself, an instrument of freedom." [9] In seeking to account for the origin of consciousness and matter he suggests that they both have a common source.

As we go deeper into Bergson's philosophy the question naturally arises, What is the secret of this ceaseless struggle? And then we learn that there must be an "impulse driving it (life) to take ever greater and greater risks toward its goal of an ever higher and higher efficiency." [10] He explains this ultimate guiding and developing element in Nature by what he calls the vital or original impetus. This vital principle continually operates in a way very suggestive of the energy concept. As generations of germs come and go, this impulse, in the processes of evolution, continues to abide. Thus it is fundamental to the formation of variations and especially those new species which are permanent. As variations begin to appear they may become further and further from the original and yet may in particular ways show not only similarity, but identity as well, the original impetus being responsible for the situation. Thus Bergson's *whole system is seen to be distinctively dynamic.*

McDougall, like James, would emphasize the will, saying that when two motives are competing for supremacy the will is thrown on the side of one of them which leads to a volitional decision; we thus "in some way add to the energy with which the idea of the one desired end maintains itself in opposition to its rival." [11]

[9] *Ibid.*, p. 25.
[10] *Ibid.*, p. 24.
[11] McDougall, *Social Psychology*, p. 246.

But McDougall feels that there is something back of all this and suggests that "human activities, both mental and bodily are only to be explained or understood by tracing them back to a number of innate dispositions, tendencies to feel and act in certain more or less specific ways, in certain situations . . . like the similar innate tendencies of the animals." [12]

Thorndike in his "Educational Psychology" says "these innate tendencies too bear the impetus and means to their own improvement." This makes them somewhat independent, self-directing and supporting. Thus we find many psychologists are pointing to the field of instincts as having a vital connection with all experiences, maintaining that "each instinct is a great source or spring of the psycho-physical energy that supports our bodily and mental activities."

In modern Psychology we also find *self* being stressed as the abiding entity. Naturally then much is made of the *self-regarding* sentiment. According to Freud and his school, in the heart of this self is an unburied wish, which is persistent, imperishable and unfulfilled. This wish as a vitalistic element is so persistent that it is continually appealing for a chance for expression, and if thwarted once, will appear elsewhere, again and again, perhaps in a new form.

Fundamental to all thought and activity is this ever striving wish, which is inherited from one generation to another. "Inherited wishes . . . are pulses of energy and not organic structure. Can the wish of

[12] McDougall, *Social Psychology*, p. 385.

the parent arouse the same wish in the offspring? Yes, if the wish is a pulse energy and not a structural product. The pulse which is a wish in consciousness passes through the whole organism affecting every part to some degree. The child in the womb or undischarged sex cell would be somewhat altered by the pulse. . . . The child thus receives the wish pulses aroused by the parent." [13] This wish then is an *undying energetic principle* running in the middle of the stream of human nature. As an active principle inherited from one generation to another, it reminds us somewhat of Bergson's original impetus which passes from one generation of germs to another, and which we have suggested as being very similar to the *activities of a restless energy.*

Not only the Freudian school but others as well would root all these processes in the sex impulse. In the last few years there has been much of sex in psychological literature, as seen in the works of Freud, Hall, Ellis, and others. Barton, recognizing the relationship between religion and adolescence, says sex is the predominant source in religion. As a background of proof for this attitude reference is made to the genetic account of relationship of sex to religion in which it is shown that the curve of conversion which is the religious awakening, harmonizes with the frequency of accession to puberty, the peak for boys coming at the age of sixteen and seventeen and for girls thirteen and fourteen.

But the fact as to whether or not this innate ten-

[13] Patten, *The Monist*—Article on the Divided Self.

dency, this inner striving, this vitalistic principle with its processes roots down into the sex instinct does not interest us so much here as the fact that much in modern psychology in teaching the presence of an innate tendency, is leaning toward a dynamic interpretation of life, and thus makes its *definite contribution to the establishment of a relationship between this field of thought and the energy concept.*

Even in the philosophy of life itself, as it is being lived by the multitudes to-day, *we meet a strain of the energy concept.* Such terms as "up and doing," "wide awake," "full of life," "on the go," "full of pep," all bespeak life with a large expenditure of energy. *And this is present day life.* The passive life is altogether out of harmony with the spirit of the times. The gospel of to-day is that of action.

Rudolph Eucken in his philosophy of activism is the apostle of this type of thought. His works beam with a dynamic interpretation of life. Passivity is diametrically opposed to his idea of real life. The individual who plays only a passive part in life's work not only fails to make his expected contribution but fails in the development of his own self. We find ourselves only as we fight to work out our own salvation. We cannot expect to

> "Be carried to the skies
> On flowery beds of ease,"

but must

> "Fight to win the prize,
> And sail through bloody seas."

We come to the full realization of the beauty and worth of life only as the spiritual self triumphs over the resistance which it meets in the world. Activity is the only avenue through which one can take his place in the world of real values. Thus a life full of energy and organized toward right ends is reality itself.

So we see that in the philosophy of the past, in contemporary psychology, and even in the philosophy of life there is strong support for the attitude of modern science which is definitely declaring its belief in a *dynamic conception of reality.*

Part II: ENERGY AS A SPIRITUAL FORCE

Chapter I

THE SPIRITUAL INTERPRETATION OF ENERGY

In the first part we set out to learn, if possible, the identity of that something which in the midst of unceasing change, continues to abide; that something which constitutes the ultimate essence of the world. It was seen that the search for ultimate reality was not anything new but that the inquiry concerning final reality constitutes a strong current in the general stream of philosophical endeavor. Finally, we came to the conclusion that that abiding something is energy and endeavored to show that from the standpoint of science and philosophy *the whole universe is to be conceived in terms of energy.*

Also it was seen that many of the profound thinkers recognized a mysterious, dynamic principle in Nature and ascribed to it wonderful possibilities. This energetic conception seemed to prevail until the seventeenth century when a mechanistic interpretation began to predominate. But science and philosophy seemingly failed to find satisfaction in a cold, dead, mechanical system, with the result that the dynamic conception of reality began to reappear, receiving a new emphasis, until to-day science is speaking out boldly, saying that *not only does dynamism justifiably take precedence*

over mechanical materialism but that reality itself is energy.

THEORIES OF ENERGY

There are several theories of energy as outlined by Cooley in his book, *The Principles of Science:*

(1) Energy is given a place as substance beside matter; it is made to be a universal, formative agency. Matter is the means through and by which energy accomplishes its purposes, the something which it shapes. This, then, is a dualistic attitude, there being two substances—energy and matter.

(2) The second view makes matter the only substance, and energy is simply the name representing its activities. Energetic phenomena are simply matter in action. So we call heat, chemical affinity, electricity, etc., different forms of matter's activities.

(3) "We may think of energy as the true fundamental substance of the world, and matter as one of its modes, its more highly organized form. This is the conception embodied in the electronic theory of matter, or at least in one form of it. According to that conception fundamental existence is essentially active—a heaving ocean of being—but it is *not* active *matter;* it is that more subtle, weightless agency which we call *electricity.* This, which is the real agent in all that goes on in the physical world, the root of all natural forces, exists in the form of more or less discrete and extremely active units (electrons).[1] . . . Thus we may think of it as itself the one fundamental

[1] Cooley, *The Principles of Science,* pp. 126-127.

(physical) existence, manifold in all forms, ceaselessly active in its nature." [2]

It is the third view which modern thought is coming more and more to accept. And the more we study the present scientific attitude the more are we amazed at the large field of facts which the term energy is selected to represent. Thus it seems that at this time, by way of explanation, it should be said that the word energy with its established meaning in our vocabulary is really not big enough to represent all that science means when using the term. Since we are making energy stand for so much, it would be more satisfactory if a new word had been introduced into the list of scientific terms. With these facts in mind regarding the use of the term energy we now approach the immediate task of endeavoring to interpret what seems to be the facts of its inner content.

THE SPIRITUAL HYPOTHESIS

Having reached the conclusion that reality is energy, we now want to know what this energy is. Ours is an ontological problem and naturally leads us in our inquiries into an attempt to obtain a critical understanding of what "being" really is. Apparently the old philosophers were satisfied to say that reality was earth, air, fire, water, etc., and being just pioneers in the field of scientific investigation could not with positive assurance get close to the heart of their problems. Science to-day is past the place where it is willing to take very much for granted and is dissatisfied unless it

[2] *Ibid.*, p. 128.

can get on the inside of its investigated subjects. With the models of the centuries at hand and with accumulated insight and improved scientific methods, we have a right to expect a scientific progress commensurate with the advantages which the present enjoys, in relation to the past. So we must not stop with the general concept of energy but inquire concerning its qualitative aspects.

Since science to-day is operating on the assumption that energy is that element fundamental to all forms of existence and which represents the final analysis of all things, it is logical for us to adopt the short-cut method and simply knock at the door of chemistry and physics and ask, What is energy?

We go to the physicist and ask him for a definition of matter and he tells us it is "an aggregation of electric charges." If we ask for a definition of energy he says it is the "capacity for doing work"; and if urged to be more concrete he may say it is "force times the distance." Then if we ask for a definition of reality we are told that that does not belong to physics but to another field of thought, philosophy.

Thus we make the discovery that the scientist concerns himself very little with our side of the problem. He deals with energy chiefly in its quantative aspects and is not as persistent in his endeavor to make a qualitative analysis. It seems that the interest of science in this latter phase is measured and determined by the amount of philosophy which happens to be therein.

"Who or what moves bodies, in the sense of agency or potency, is for scientific purposes a negligible ques-

tion." [3] In dealing with energy the end of the physicist and chemist are met primarily in the mathematico relationships.

In our study of the energy concept, we are interested in this problem from a qualitative standpoint. The "number, length, breadth, volume, interval," etc., will not suffice for our purpose; nor is it satisfactory to stop with saying that things behave thus and so as they are influenced by certain causes. We want to go deeper than this and know "why" and "how" these causes operate. And since our immediate objective is to analyze reality qualitatively, we have a goal, therefore, which is very different from that which could be reached by means of mathematical science.

In probing into the question concerning the attributes of energy we read with great interest, in de Tunzelmann's *Problem of the Universe,* the statement that "the concept of the ether has led us to the conclusion that energy is a more fundamental concept than either ether or matter. It is therefore more fundamental than the concept of mass, so that the indicated path of progress is not the remodeling of our representation in order to make it capable of simpler expression in terms of a system of dynamics in which mass was regarded as fundamental. What we have to contemplate is, in my opinion, the remodeling of our system of dynamics on the basis of energy in the place of mass. We *may then begin to contemplate the ultimate possibility of a future remodeling in which mind*

[3] Perry, *Present Philosophical Tendencies,* p. 53.

will replace energy as the fundamental basis of the physical scheme." [4]

Chamberlain lends emphasis to this attitude in saying that "an immeasurably higher evolution than that now reached, with attainments beyond present comprehension, is a reasonable hope. The forecast of an eon of intellectual and spiritual development comparable in magnitude to the prolonged physical and biotic evolutions lends to the total view of earth-history great moral satisfaction." [5]

Also, Perry says, "If it is impossible to construe the world in terms of thought or in terms of moral life, there yet remains a further conception, complete enough to embrace these and every other possible value—the conception of a universal spiritual life that shall be infinitely various and infinitely rich." [6] *These attitudes point to the same possible conception of reality; they stress the spirit concept.*

Since, as we have suggested before, physical science offers no answer to our legitimate demands for a qualitative interpretation of energy, we are therefore forced to make our own hypothesis respecting its inner nature; and are encouraged by the tendency of modern thought, as mentioned above, to champion a belief in the hypothesis which says that *energy is of a spiritual psychical nature.*

This hypothesis is what in philosophy is called spiritualism, and gains for its support whatever

[4] de Tunzelmann, Preface to *The Electrical Theory and the Problem of the Universe,* pp. 15-16. (Italics are mine.)
[5] Chamberlain and Salisbury, *Introductory Geology,* p. 684.
[6] Perry, *Present Philosophical Tendencies,* p. 153.

trength there is in this system of belief. There are nany important facts in philosophy with which spirit-alism is in harmony and whose problems this theory ıelps to solve. While on the other hand, any theory vhich opposes these outstanding facts or leaves them vithout explanation, must in its very nature be looked ıpon as incomplete. In the approach to this part of ›ur task, ours is a virgin field. We repeat, while cience is looking upon reality as energy it offers no ualitative interpretation of energy. This being true, he spiritualistic hypothesis, as such, is legitimate, and ince it will be verified as far as it explains things vhich need explanation, can demand a respectful hear-ng.

'HE SPIRITUAL HYPOTHESIS AND THE CREATIVE IDEA

In the first place, a spiritual interpretation of reality ıelps to solve the problem of creation. There is a ›revailing notion in modern thought that creation is ıot a finished fact, a thing of the past, but as a prin-iple inheres in the life of the present. "Traces of evi-lence are lately beginning to come into view, which ıre highly suggestive of continuous present day crea-ion of matter at the inorganic level, and of creation ›f life from inorganic materials at the organic level." [7] A creative workmanship seems to be characteristic of ıll Nature, underlying which is a dynamic, energetic ›rinciple. This vital, creative impulse is continually 'eaching its objective. It is not strange, then, that in he recent movements of thought we should meet repre-

[7] Moore, *The Origin and Nature of Life*, p. 31.

sentatives of creative evolution, creative synthesis, creative intelligence. It seems there is no fact in modern philosophy which looms up quite so large as the creative idea. But in this incessant life of continuous creation there must be more than an interplay of mechanical agencies. *A creative activity is difficult to conceive apart from spirit.*

THE SPIRITUAL HYPOTHESIS AND VITALISM

Again, we have seen how general is the stream of vitalism which runs through philosophical and scientific thought. It holds a prominent place in the history of thought because there are strong evidences of it in Nature. If there are remarkable evidences of a vitalistic principle in Nature we are justified in believing it to be there. Even the "naked eye" reveals to us Nature throbbing with a fervent life. In fact we have concluded that reality is energy. Can we think of a vitalistic principle rooting itself in mechanism? Hardly so. Nor can we conceive of vitalism out of relation to spirit. History and personal experience have clearly shown that a mechanical "letter of the law" program kills, while it is the spirit which gives life. *Interpreting energy spiritually seems to furnish the only explanation for the presence of the vitalistic element inherent in Nature.*

The mechanistic interpretation may satisfy in a limited way but unless spirit is posited back of all this, it is impossible to beat down the troublesome question, Whence came this great piece of smoothly working machinery—the universe? Here the me-

chanical materialist, although applying his interest intensively to other tasks, takes things as he finds them and asks no questions. It is genuinely inconsistent and unsatisfactory to pass up the problem of origin in this way; it smacks too much of incompleteness.

THE SPIRITUAL HYPOTHESIS AND TELEOLOGY

In observing the harmonious relationships characterizing the activities of the universe, most thinkers are inclined to say with Tennyson,

> "Yet, I doubt not through the ages, one increasing purpose runs."

And Henderson, speaking as a bio-chemist in the *Order of Nature,* stresses the impossibility of ignoring the fact that there is a purposive tendency in things. The evident expression of intelligence which is met everywhere has been explained by many as a teleological provision on the part of a great Designer. There is evidence of teleology in Nature, but the old system of teleology is not satisfactory, because it makes God too much of a transcendent Being. Realizing that the kingdom of heaven is within us, modern thought is making him less of a sky God and is giving him his rightful place in the very heart of life. He is not only transcendent but is immanent as well. It is inconceivable that a ruling King should be living outside his kingdom.

Many teleologists are thus modifying their attitude somewhat and are advocating what might be called an

immanent teleology. The problem of an intelligent principle guiding all existing forms to the highest ends possible, easily finds its solution in a spiritual system of reality.

THE SPIRITUAL HYPOTHESIS AND EVOLUTION

Then, too, a spiritualistic program helps with the problem of evolution. It is a well-known fact that the discovery of this theory has revolutionized science. Modern thought is strongly inclined to a belief in creative evolution, and this principle being true, its cause can hardly be found in a cold system of materialism. Generally speaking, there seems to be a missing link in evolution. If one is willing to stay on the outside and simply take facts as they come, then probably a general mechanical theory of evolution will suffice.

There are those who would follow in the footsteps of Hobbes and apply a mechanical interpretation even to the facts of the mind, thus reducing all mental phenomena to a system of physics. But this method would force us to live in a lifeless age, similar, for instance, to that outlined in Pearson's *Grammar of Science*. And also, a system such as this fails to account for the richness and reality of human experiences. No human being would be satisfied to live in a world which could offer only hypotheses. Thus we cannot afford unreservedly to adopt a system which can only say "it happens so every time," mere chance, and then stop with that.

The evolution of progress can find no justification in the realm of chance; nor can it be explained by a

system of mechanism. *It is when we place spirit at the bottom of the whole evolutionary process that evolution becomes more reasonable and complete; and a satisfactory explanation of its inner working is given, for we have thus introduced the possibility of a vitalistic, knowing quality.*

Chapter II

HISTORICAL SUPPORT FOR THE SPIRITUAL THEORY

Early in our work a study was made of the philos ophy of those men in whose systems could be found strong dynamic element, the purpose being to shov that from the beginning of philosophical inquiry a energetic interpretation of reality has characterize many of the strongest systems. Now we shall pass i review some of those writers whose conceptions ar distinctively spiritual, confirming our attitude tha many of the best students working with the problen of reality interpret it spiritually, thus helping to estab lish the hypothesis that energy operates as a spiritua force.

LEIBNITZ

In Leibnitz' philosophy we have what is perhaps th most elaborate spiritual system ever formulated. Hi interpretation of reality has already been presented because of its dynamic, energetic qualities, suggestin a close relationship to the energy concept. As ou immediate interest now has to do with the qualitativ aspects of this concept, his theory is re-stated some what in detail, from the angle of its spiritual impor

Leibnitz resolves everything into centers of psychi spiritual force which are without parts, extension c

form and are indivisible and immaterial. In the Atomism of that day these little units were material *but with Leibnitz they were distinctively spiritual.* These "simple substances" constitute ultimate reality; they differ from each other in quality but not in quantity,[1] each being self-sufficient and a little world unto itself. This is somewhat similar to the modern idea of the atom which elsewhere we have likened to an independent little solar system.

Not only are the highest types of being concerned, but the very substance of all reality is found in these psychical, spiritual units. The lowest classification is to be found in minerals, plants, etc., and here the centers of force are called monads. Here we meet perception just the same, but it is not clear or conscious, the grade of thought being something like a stupor. Also here as in all forms of being each monad has in itself a principle of striving to a higher condition of activity or perception. The clearness of perception is not only proportionate to the activity of the monads but conditions their grade or classification. The confused perception of the lowest state is illustrated by the wave sounds of the sea; we know that each wave makes its individual contribution to the general sound, yet it is impossible to perceive them separately, the attempt resulting in confused perception. This is the characteristic thought life of minerals and plants.

The psychical, "simple substances," fundamental in all Nature, whose perception is more distinct and associated with feeling and memory are called souls. Memory which is the sign of consciousness is the dif-

[1] Latta, *Leibnitz: the Monadology,* p. 221 ff.

ferentiating factor between the lowest types of being and animal life.

Human beings have a clear perception and thus live in a higher scale of being. Having reason and knowledge, they can come to a knowledge of themselves and even of God. This quality in man is called rational soul or mind. There is just one Being who experiences the full power of perception, God, who is infinite and absolutely perfect. Thus we see the whole universe to be alive with thought, the principle of perception prevailing from the most insignificant thing up to God.

In his "Monadology" then Leibnitz has built up a vast, closely woven system of spiritualism. All reality roots itself in psychical centers of force. These, while individually self-sufficient, together constitute all Nature. In the smallest portion of matter there is a large group of these active, living monads. "Each portion of matter may be conceived as like a garden full of plants and like a pond full of fishes. But each branch of every plant, each member of every animal, each drop of its liquid parts is also some such garden or pond."[2] Each living body has its central or ruling monad. Then each member of this living body is full of living creatures clustering about a central monad or soul. These little particles surrounding the ruling soul continually but slowly change, thus never giving the soul an entirely new body, while the soul itself does not change. The central monad is always associated with some such body of changing creatures, God being the

[2] Latta, *Leibnitz: the Monadology*, p. 256 ff.

only Spirit free from a body. No matter then to what forms of being we might appeal, *spiritual centers of force are found to be fundamental to all reality.*

HEGEL

In Hegel's philosophy "everything is spirit; spirit is everything." *The ultimate essence of the universe, its true reality is found in this self-operating, inner spiritual principle which is fundamental to all Nature.* Spirit finds expression in three forms, subjective, objective, and absolute, covering the entire field of activities.

The subjective spirit strives through the power of the will to bring the spiritual life of the individual to that place of experience where it is free and independent of its environment, and is not satisfied until it reaches the goal of its ambition. The objective spirit is identical with the spiritual life finding expression in the everyday phases and functions of life. Here the will asserts itself in the forms and customs common to human relationships. In a particular institution, for instance, we have a single manifestation of the all-pervading spirit. The absolute spirit is the blending of the subjective and objective spirit. Here we have an active, unifying consciousness, absolute reality itself. All differences between subjective and objective experiences fade away. This self-assertive, absolute spirit moves up into satisfied realization chiefly through the forms afforded by the fields of art, religion, and philosophy.

WUNDT

Wundt has built up a system of idealism, which reminds us somewhat of Leibnitz' theory of monads. Leibnitz made his monads centers of perception while Wundt makes his units of will. Here we do not hear so much about matter, substance, mind, and soul, but speak in terms of ideas, psychical processes, will units. *His whole system is built around the activities of the will, for it is the only thing of which we are definitely sure.* "There is absolutely nothing outside of man, nor in him, which he can call fully and wholly his own, except his will."

All experiences cluster about the will, not because there is an external initiating force, but because in the will and only in the will itself there is a spontaneity of activity which is responsible for all relationships. The organization of activities toward ends originates and is sustained by the psychical processes representing the will.

God is the universal Will and its objectivation is the realization of itself in the will units of the world, in which there is an opposition of activity and passivity, constituting ultimate reality. It is only as every will is related to wills that this reciprocal relationship is obtained and it is only in these reciprocal experiences, which offer an explanation for the passive state, that we have reality.

SCHOPENHAUER

To get Schopenhauer's idea of the qualitative aspects of reality we must understand what an important

place he gives to will. He would say *the very essence of life is the will.* This principle will is inherent and dominant not only in man but in all things. It is the guiding, driving force in the general process of evolution. In the principle of selection which seems to be operating all the time, it is the will which causes certain parts of the organisms to grow and adjust themselves for particular duties while at the same time allowing others to die. For instance, some animals are equipped with instruments for fighting and killing, because that is what they *will* to do. The will not only aids in the organization of the organisms but enjoys a preexistence in relation to them. Amid all those things which come and go, it is the abiding fact. All things are the product of the will. The world is but this principle realizing its great ends. The will is much greater than the phenomenal world which is just the object of thought; it is greater than thought which is simply its by-product. *This striving principle then, which is reality for Schopenhauer, must be given a setting in spiritualism far above everything that partakes of the material.*

PLATO'S IDEALISM

The philosophy of Plato is presented at this time in our study of energy, not because it is energetic but because his elaborate system of idealism makes a large contribution toward the unfolding of our immediate problem—showing that reality is to be interpreted spiritually.

In Plato, the first and greatest idealist, we meet an

exalted and beautiful system which believes there are higher realities than matter and motion and the world of sense perception. "Plato points up, Aristotle down." Most fundamental in his philosophy is the search for ultimate and absolute values, the abiding and unchanging elements in the flux of phenomena. Plato believed with Browning that there is a right ever right and a wrong ever wrong.

True knowledge does not come to us by way of the senses. Such knowledge, often being deceiving, is simply opinion. The highest type, the scientific, comes from the mind through thought and reason. Matter is not the reality of the world. Plato would say with James that the world of wind and weather is not the real world. *Outside the scope of the senses is another realm, a spiritual world, the realm of ideals, of values.* It is possible for us to rise above the world of shadows into this realm of being, into the real world of ideas.

With Plato, ideas only are real; all else is simply appearance. These ideas are incorporeal, immaterial, but are hardly psychical or spiritual according to the modern interpretation of these terms, ideas belonging to even a higher state of being than the psychical or spiritual. He would place the psychical functions in the world of Becoming and would place ideas in the realm of Being. Ideas are not necessarily in the mind but are essences, ideals, the highest and best being those of the Good. In this program εἶδος is that something which science has been eagerly striving to know, reality itself. "The world of true reality *is* but never *becomes;* the world of relative reality *becomes* but never *is.*"

"The unfathomable depth of human personality is essentially Plato's doctrine." Reality is divine and the soul is akin to it. The Soul is a simple, incorporeal being belonging both to the world of ideas and the world of sensuous material change, but belongs primarily to the higher world. It is the principle of life and motion.

Hence Plato is considered the father of idealism, and as over against mechanical force, he makes intelligence to be the real moving power in the world. This places him in the forefront of those who have taught the presence of the invisible soul operating in Nature, and who have given an interpretation of reality diametrically opposed to materialism.

SYSTEMS PARTIALLY SPIRITUALISTIC

There are four important systems of thought which probably have no definite place in a program whose chief immediate interest is in trying to show that all things are of a spiritual nature, even the very world of "material phenomena"—Aristotle, the Stoics, Descartes, and Kant. Especially is this true of the Stoics who were really materialists and of Descartes with whom mind and matter are equally real. And while these systems, by no means make spirit all of reality and cannot even approach being classified as spiritualistic, we mention them here, parenthetically, to show how unable were the leaders in these schools of thought to complete their systems without giving a "real" place to spirit. This is particularly true of Kant's philosophy, but let us first examine Aristotle.

ARISTOTLE

To understand Aristotle's philosophy of reality it is necessary to know his meaning of ψυχή because it is to this that he gives supreme place in all life and activity. With him ψυχή (breath) is more than we mean by soul; it really represents what is wrapped up in the terms Life and Mind, and we have no English word which can represent the combined thought. Sometimes it is called Vital Principle, sometimes Soul. This Vital Principle, though there is just one, has its representation in every part of the body. It and the body are not one, but they so relate themselves to each other as to constitute a unity. As Life finds its highest expression in Mind, so the chief characteristic of the Soul or Vital Principle is thought.

This Vital Principle is the essence of Life. It is "the original reality of a natural body endowed with potential life. . . . If then there be any general formula for every kind of Vital Principle it is—the primary reality of an organism." [3] It is a vitalizing influence, not only holding the body together but constituting the energy of the body. This is true not only of man but also of all animals and plants as well. In plants and all such simple organisms the Vital Principle is of a lower degree of vitality. Aristotle was not sure whether this Soul experiences self-activity or is moved by some outside force, but if the latter be true the operation of the outside influence is possible only through the sensations as a medium. *So we find his*

[3] *Aristotle,* Lewes, p. 231.

ψυχή, "the breath of life," as a "primary reality," to be not only dynamic but also spiritual.

STOICS

Even in the Stoics a spiritual strain is seen running through their idea of the real. In matter we find Spirit; in the world, God. In fact the world and God seem to constitute something of an identity, God being a vital element pervading all things, the very Soul of the world. God, however, is not made to be so general as to rule out his individual consciousness. Between all things enjoying a conscious soul life there is a definite relationship, closer than that which they experience with lower types of creation. The Stoics would not only say that everything outside of God is his body but that all these things came from his own self and thither will return again. God being a soul, then everything can be traced in its origin to a soul life, *and must partake somewhat of the qualities of the great Spirit.*

DESCARTES

With Descartes the fundamental principle is conscious thought. He seems to have brushed all else aside as uncertain and gave to philosophy a new starting point. He would say we cannot build our system of philosophy on things external which we do not know. Only those things "which are clearly and dis-

tinctly perceived are true." Cogito, ergo sum—I think, therefore I am. The fact that I think establishes the thinker as a certainty. Even in doubting we have evidence of a thinking doubter. We can doubt everything else but not the doubter, of which we are certainly conscious. Thus consciousness becomes the criterion of knowledge, *and the thinking, psychical being is the only certain, and the most real, thing in all the world.* Thus according to Descartes the successful search for real values, ultimate reality, leads into the field of psychical interpretation.

KANT

At first, Kant's philosophy seems to be a system of mere phenomena. We begin with the presupposition that the real things of the world are those which are objects of sense. We find then that these are phenomena only. It is soon seen, however, that Kant is not willing to stop here. Since the mind is not satisfied with less than a complete whole and since knowledge does not give this to us, we are compelled to base our hopes on an investigation of moral consciousness. In this search Kant is led to feel sure that back of phenomena there is a world of ultimate reality and his investigation into the nature and limits of knowledge shows to him the possibility of a noumenal self which is free and untrammeled. He calls this the "thing in itself" (Ding an sich), that something which is left after everything with which the senses and knowledge have to do is brushed aside. Although it can be interpreted only by a divine intelligence we know there

is a "thing in itself" because there must be an objective something which causes our sensations. The fact that we may not understand noumenal things does not at all exclude the possibility of their existence.

What is this noumenal something, this "thing in itself" which lies beyond the world of sense and knowledge? Is it the "I think" which as "an act of spontaneity, cannot possibly be due to sense," [4] and "which because of its spontaneous activity, is the only thing to which we may possibly attribute noumenal reality"? [4] Is it the will which with Kant is the only absolutely good thing in the world and which is good because it *wills* to be good? These two, the "I think" and the will are identical, for to both he attributes the qualities of complete noumena. "This spontaneous activity, the 'I think' of the Critique of Pure Reason is nothing else than the autonomous will (final reality) of the Metaphysic of Morality and the later Critiques." [5] And it is in the doctrine of the primacy of the will we meet the real Kant; with him the will stands for absolute values. *Thus with Kant the realm of real things reaches beyond the world of material phenomena, into the richer world of psychical relationships.*

BERGSON

We now come to Bergson and find him teaching a system of philosophy which offers genuine support to a spiritualistic program. In the first Part it was found

[4] Watson's *Selections from Kant*, p. 65.
[5] Schreiber, *Kant's Theory of the Primacy of the Will*, p. 28.

that Bergson introduced into his conception of reality a dynamic element which he called the *vital impetus.* At that time we were satisfied with the discovery of this single fact, but now we want to get his idea of this vitalistic quality which is so fundamental to life. So from a qualitative standpoint we shall probe deeper into his philosophy of reality to see if it is not of a psychical order.

In his *Creative Evolution* is met the belief that every moment brings something new into existence. "Reality appears as a ceaseless up-springing of something new, which has no sooner arisen to make the present than it has already fallen back into the past." [6] Life is one continuous process of Becoming; it "is a tendency, and the essence of a tendency is to develop in the form of a sheaf, creating by its very growth, divergent directions among which its impetus is divided." [7]

Fundamental in this process of development is the original impetus of life which passes from one generation of germs to another. This is the inner directing principle, the ultimately real factor that drives all things to an activity and not only carries life but is the essence of all life. This vital principle takes matter and shapes it. "Life had to enter thus into the habits of inert matter in order to draw it little by little, magnetized, as it were, to another track. The animate forms that first appeared were therefore of extreme simplicity. They were probably tiny masses of scarcely differentiated protoplasm, outwardly resembling the

[6] *Creative Evolution,* p. 47.
[7] *Ibid.,* p. 99.

amœba observable to-day, but possessed of the tremendous internal push that was to raise them even to the highest forms of life. That in virtue of this push the first organisms sought to grow as much as possible, seems likely." [8] But the matter with which the original impetus has to work is not a hard, cold substance. Characterized by a "tendency," an ascending movement, matter finds itself susceptible to the guiding, shaping influence of the vital impetus.

In trying to find an image that will give us an idea of this impetus Bergson has to leave the physical world and go to the psychical. Consciousness becomes for him the motive principle in all development. He says that "if our analysis is correct, it is consciousness, or rather supra-consciousness, that is at the origin of life." [9] Consciousness then, which is real life, is the representation of that vital principle which pervades all things. We are told that there is a consciousness slumbering in instinct, which if finding expression through knowledge instead of action would reveal to us the deepest secrets of life. In his *Creative Evolution* we hear him say that "real duration is to be found in the realm of life and consciousness" and in his *Introduction to Metaphysics* he says that "real duration is of a psychical nature." Thus we are not surprised to hear him say that "in reality, life is of the psychological order, and it is of the essence of the psychical to enfold a confused plurality of interpenetrating forms." In summing up it can be said that "he sees as the mystic sees, that the Élan Vital is the energy of one Being which makes matter its means of

[8] *Ibid.*, p. 99.

[9] *Ibid.*, p. 257.

manifestation, its vehicle, its tool. He sees that *the process of Becoming is a spiritual process of ascension.*" [10]

Corroboration of this interpretation of Bergson is found in the Preface to Carr's translation of *Mind-Energy.* After saying that Bergson went over the material very carefully with him in order to give the translation the same authority as the original French, Carr then says that "the separate articles here collected and selected . . . *are chosen by M. Bergson with the view of illustrating his concept that reality is fundamentally a spiritual activity.*" [11]

EUCKEN AND ROYCE

In Eucken and Royce we have two men who have strongly represented a philosophy of spiritualism, both of whose systems have a distinctly religious bent. Royce is convinced that true reality is spiritual in its nature and that the ultimate ground of things is an eternal, divine world-order. "From the constant interaction of minds he infers the existence of an eternal, divine being which is spiritual and eternal." [12] Royce thinks "we have no right whatever to speak of really unconscious Nature, but only of uncommunicative Nature," and when we deal with Nature we "deal with a vast realm of finite consciousness of which our own is at once a part and an example." [13]

[10] Sinclair, *Defense of Idealism,* p. 288. (Italics are mine.)
[11] Carr, Preface to Bergson's *Mind-Energy,* p. v. (Italics are mine.)
[12] Jerusalem, *Introduction to Philosophy,* pp. 150-151.
[13] Royce, *The World and the Individual,* pp. 225-226.

Eucken looks within the thinking creature for the source of reality. "It is impossible to hide from ourselves that Nature, as we see it, does not come to us from the outside as a ready-made fact, but that it starts from our own thinking, and under the influence of our intellectual organization, takes on the shape in which it lies before us." [14] He teaches a monism which is really an important process, deeper than and fundamental to both materialism and spiritualism. Eucken lifts his philosophy into the realm of life itself and life becomes "a transformation of reality into a whole endowed with soul." This resultant, vital process becomes the goal and reality of life, because in itself complete satisfaction and fullness are realized. In this real activity the revivifying, guiding, controlling element is the spiritual which enjoys perfection and completeness only as it masters matter.

So in all the systems which we have reviewed, *the search for truth about reality takes us past things material and points with strong emphasis to the realm of the spiritual.* And that something which Plato calls ideas, Leibnitz monads, Schopenhauer will, Bergson the vital impetus, and which we are calling energy is to be interpreted as a spiritual force.

[14] Eucken, *The Life of the Spirit,* p. 188. (Translation by Pogson.)

Chapter III

THE SPIRITUAL INTERPRETATION—CONCLUDED

Since we have found that all physical reality is energy, and then further set forth the hypothesis that the ultimate quality of energy is psychical, we would seem to be in position to interpret the well-known facts regarding the influence of the mind upon the body in a new and seemingly satisfactory way—*making the mind and body to be parts of one vast system of psychical energy.* Hitherto this whole problem has perplexed thinkers from Descartes to the present, and as yet the effect of the mind upon the body has not been consistently explained. A thorough-going dualism, even though it has been resuscitated by McDougall,[1] is repugnant to the law of continuity, which evolution has so greatly strengthened.

After finding spiritualism able to make a definite contribution toward a better understanding of such significant problems as creation, vitalism, teleology, and evolution; and finding in the history of thought such strong support for the spiritualistic interpretation, it probably would be in order at this place in our program of showing that energy is spiritual, to introduce as a genuine presupposition a psychic element active in all Nature. It may be, however, that the materialist would still challenge our right to this assump-

[1] McDougall, *Body and Mind.*

tion, saying that our source of explanation is not sufficiently criticized. Then we might reply by placing the burden of proof with the individual of this attitude and assign to him the more difficult task of showing why, if all Nature is not endowed with a psychic quality, it acts so much like it; why it seems that

> "Every clod feels a stir of might,
> An instinct within that reaches and towers;
> And groping blindly above it for light,
> Climbs to a soul in grass and flowers."

But this method of procedure would get us no place in particular. So before drawing conclusions we shall need to look at our problem a little further.

Our work here in dealing with the qualitative aspects of energy, which we are calling reality, cannot be taken into the laboratory and handled as an ordinary scientific problem. We must search for facts in systems of thought and test these beliefs by their practical consequences, judging not by laws, customs, or principles but by fruits. We have already done this in a general way in the case of such facts as creation, vitalism, teleology, and evolution.

In this chapter it will be our plan first to examine the relationship between mind and body. From this investigation it will seem probably true that the mind is the ultimately guiding, determining, and original factor figuring in these relationships. While there may be evidence denying the priority of mind this excursus will at least make it impossible, seemingly, to doubt the existence of a psychical element. Then later we shall apply the attitude of representative modern

thought to our hypothesis, trying further to show that psychical energy is a fact, that it is universal and the only reality, and finally suggest a theory of reality on the basis of organized units of psychical energy. If ancient and modern thought, consciously or unconsciously, declares itself in favor of our hypothesis it is because the belief in psychical reality has stood the test; and if the converging lines of testimony in its favor are sufficient, then it should be regarded as true.

THE MIND-BODY PROBLEM

It is very clear that science is not willing to stop with the well-established hypothesis which says, no psychosis without a neurosis. Thus we want to go beneath this, if possible, and get a clew concerning this relationship between the mind and body. In the first place we shall introduce the part which *will* plays in determining the issues of the bodily functions. As we proceed it is seen that in a large measure Kant was right in believing we can do what we *will* to do.

The field is large from which could be culled facts having to do with the power of the *will* over the body, but from a multiplicity of experiences we mention simply the case of an individual who is severely ill, life being in the very balance. By sheer determination to live, sufficient vitality is thrown on the side of life, and *will* becomes the determining factor, cheating death of its victim. A leading physician at one of the large camps during the influenza epidemic declared that the large number of deaths was due to the fact that the

men being away from home, many for the first time, and being afraid, "gave up" instead of exercising a *will* power to live.

It is remarkable what influence the attention has been found to have on sensations. When setting ourselves to the task it is possible to think into being a large variety of sensation experiences. For instance, when the attention is concentrated on the hand we can feel sensations glide from warm to cold, numbness, pins and needles, etc., just as the mind dictates. In remembering the sensation associated with eating an unpeeled peach, the teeth are set on edge just the same as in the actual experience. Some would dismiss all this by saying that it is subjective, just imagination, but facts encourage us to believe with Tuke that "there is a real effect produced upon the finger if thought is sufficiently long directed to it, and that these vascular changes are felt in the form of throbbing, weight, etc." [2]

Science sees also a direct relationship between the emotions and the secretive processes. It has been found that glands will often secrete freely when there is no immediate cause other than some irregular mental activity, like imagination. It has been noticed that the mammary glands of a nursing mother will often secrete milk when she thinks of feeding the child. Also it is a well-known fact that mental strain will cause the hair to turn gray in a very short time.

It naturally follows that the emotions are being closely associated with the work of the digestive ap-

[2] Tuke, *Influence of the Mind upon the Body*, p. 57.

paratus, as they assist or retard the necessary secretions. The emotions cannot only paralyze the activities of the stomach but have a direct influence on the entire Alimentary Canal. This is the reason why children should not be fed after being punished or experiencing excitement of any kind. Perhaps the secretions of the salivary glands are most noticeably affected by the emotions. And just as the mouth becomes dry or saliva flows freely according to the emotion experienced, we get a good idea of how the other secretions, such as gastric and pancreatic juices and bile, are influenced by these psychic states. It is not strange then that indigestion in many cases has been traced in its origin to psychic irregularities.

Cannon tells about some very interesting experiments performed on dogs by Pawlow, showing the direct and immediate influence of psychic states on the secretions.[3] In the dog's stomach a side pouch was made, wholly apart from the main cavity where the food entered the stomach. This part which was under observation was representative of the entire stomach. In some cases during this experiment an opening was made in the esophagus so that the food being chewed and swallowed would pass out through the opening and not reach the stomach at all. This was called "sham feeding." In this way all the pleasure of eating was experienced without the food getting any further than the esophagus. It was found that about five minutes after the dogs enjoyed the food and went through the process of swallowing, the gastric juice began to flow

[3] Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage*, p. 4 ff.

from the pouch in the stomach. This continued as long as the dogs ate food and for a short time after the meal was eaten. One very interesting thing observed was that while pleasure encouraged the flow of gastric juice, anger or fright had the opposite effect, which confirms our statement made above, that certain emotions can check secretions and thus interfere with the digestion of food. Cannon says that "since the flow occurred only when the dogs had an appetite, and the material presented to them was agreeable, the conclusion was justified that this was a true psychic secretion." [4]

The emotions have been found to affect the heart also. It will beat faster as it contracts irregularly, if the individual is frightened. Dying of a "broken heart" as the result of worry and sadness is no mere figure of speech. On the other hand the heart often has been too severely strained by the sudden announcement of good news, resulting in death in many cases.

Mental strain has its definite effects on the liver and kidneys. One scientist says that a depressed mind, if of a sufficient duration of time, will actually change the structure of the liver. In the *Medical Times* and *Gazette* is published the findings of Dr. Byasson in a test made of the renal secretion passed under conditions of normal quiet and cerebral activity. The summary is as follows: [5]

(1) "The exercise of thought was followed by an increase in the amount of urine."

[4] *Ibid.*, pp. 5-6.
[5] Quoted from Tuke, p. 135.

(2) "The amount of urea was augmented in a marked manner, there being about a drachm more on the day of cerebral work than on that of repose."

(3) "A slight but uniform increase in the amount of phosphates and sulphates during mental activity."

(4) "The density, acidity, the uric acid, lime, magnesia and potash were scarcely affected. Chlorine was less in amount."

Dr. Byasson states that by a single analysis of the urine he is able to tell whether the individual has spent the day in repose or mental activity, the diet and environment being the same for the three days of test.[6]

In the category of facts which show the controlling influence of the psychic states over the body there is none more significant than the way emotional experiences affect the activities of the blood. "Hemorrhage is often increased by attention, but whether by excitement to the heart's action or by direct influence on the vessels of the part cannot easily be decided." The fact, however concerns us here more than the method. It seems that concentration of thought can send blood to the place supposed to be affected. The stigmata of St. Francis of Assisi has a place in this discussion. Some may want to rule out this experience because it seems to be so irregular and mysterious. But until history can deny the fact it will stand as a remarkable illustration of the influence of the mind upon the body.

Another case of stigmata mentioned by Tuke is that of Louise Lateau. When M. Charbonnier presented an article to the Royal Academy of Medicine of Belgium, reviewing the case of Louise, this organization

[6] Quoted from Tuke, p. 135.

appointed a Commission to examine her before they would accept the article for publication. This Commission was to see if blood really did ooze from her side, feet, hands, and forehead. The examination was made while she was going through the experience and the blood was flowing from her body. We cannot review the case in detail here but simply state that the conclusion reached by the Commission was that "the stigmata and ecstasies are real. They can be explained physiologically." [7] In the light of such facts as these it is not hard to believe that in the agony of Gethsemane Jesus sweat drops of blood.

One of the most specific effects of emotional experience on the blood is to be observed in the adrenal glands pouring their secretions into the blood circulation as the result of psychic excitation. Cannon and D. de la Paz have performed experiments in their laboratories clearly demonstrating this fact. The animal used was a cat. The method used for frightening the cat was a barking dog which was allowed to enjoy himself at a safe distance while the cat was securely fastened in a holder. By a very careful operation blood was secured from near the adrenal glands before and after the fright of the cat and labeled "quiet blood" and "excited blood." In the "excited blood" was found a much larger amount of adrenalin. It was also observed that the secretion of the adrenal glands increased with emotions. Then the glands were removed with the result that the blood was not then affected with adrenalin.

The fact that during these psychic experiences the

[7] *Ibid.*, p. 119.

adrenal glands shoot adrenalin into the blood is not the whole lesson to be learned by any means. Cannon would not feel that this is the "end" attained but simply the "means." We learn from him that injecting adrenalin into the blood causes the liver to liberate sugar into the blood; helps in a faster coagulation; drives blood from abdominal viscera into heart, lungs, central nervous system, and limbs; acts as an antidote for muscular fatigue. So it seems from this and other facts which have been set forth that psychic activities touch in a concrete way the very last iota of being in the body. In other words, *psychical energy seems to be a genuine fact, constituting the ultimately guiding and determining factor in all human experiences.*

PSYCHICAL ENERGY AND MODERN THOUGHT

Perhaps from the foregoing it would seem reasonable to believe that the ultimate quality of reality is psychical or spiritual. But let us look at this problem a little further, and, studying it in the light of recent movements of thought, see if corroboration of our hypothesis can be obtained.

DE TUNZELMANN

According to de Tunzelmann this hypothesis is the only alternative. "Schemes have been propounded with a view of accounting for the established order of Nature without the assumption of a primal intelligence . . . no scheme of the kind has ever been presented

which would appear even superficially plausible to any but untrained minds. . . . In the present state of scientific knowledge we are justified in maintaining that the possibility of such a scheme is unthinkable. . . . I propose to introduce the concept of an all-pervading universal mind or omnipresent intelligence forming an entity even more fundamental than the all-pervading ether." [8]

BERGSON

In Bergson's philosophy there is a graded intelligence which reaches below the animal kingdom. This reminds us somewhat of Leibnitz' "confused perception" which is met in the lowest type of being. Bergson says: "The more the nervous system develops . . . the clearer is the consciousness . . . the lower we descend in the animal series the more the nervous centers are simplified, till finally the nervous elements disappear, merged in the mass of a less differentiated organism. But it is the same with all the other apparatus, with all the other anatomical elements; and it would be as absurd to refuse consciousness to an animal because it has no brain as to declare it incapable of nourishing itself because it has no stomach. . . . This amounts to saying that the humblest organism is conscious in proportion to its power to move freely. We should define the animal by sensibility and awakened consciousness, the vegetable by consciousness asleep and insensibility." [9] This together with the more elaborate

[8] de Tunzelmann, *The Electrical Theory and Problem of the Universe*, p. 454.
[9] *Creative Evolution*, pp. 110-112.

treatment of Bergson's philosophy in the chapter on the history of thought leaves no uncertainty as to his belief in psychical being.

PRAGMATISM

A similar attitude is met in modern pragmatism. In this philosophical system "creative intelligence" is championed—a pragmatic theory of intelligence. It is an intelligence that "frees action from an instrumental character," that "frees experience from routine and caprice"; an intelligence that liberates and liberalizes action; an intelligence that is "inherently forward looking," which can forecast future possibilities and can help toward the good. "A pragmatic intelligence is a creative intelligence, not a routine mechanic." [10] In this system the problem of reality is not important and hence there is no attempted explanation of this creative, evolutionary power. But since it has the faculty of discerning the future and distinguishing between the desirable and undesirable it must be interpreted as having a psychical, spiritual nature.[11]

PERRY

In Perry, an able member of the new realistic group, there is evidence of a belief in the presence of psychical reality. He says that "as a potentiality without assignable limits it (matter) may be reasonably endowed

[10] Dewey, *Creative Intelligence,* pp. 63-66.
[11] Compare Lovejoy's Article, *Journal of Philosophy,* Vol. 17 (1920), pp. 622-632.

with intellectual force as with physical force." [12] Then again, he says, "If it is impossible to construe the world in terms of thought or in terms of moral life, there yet remains a further conception, complete enough to embrace these and every other possible value—the conception of a universal spiritual life (geistiges Leben) that shall be infinitely various and infinitely rich." [13] It is not our purpose here to attempt any interpretation. These statements are simply taken at their face value.

THE IDEALISTS

What need be said concerning the presence of a spiritual reality in the recent systems of philosophy represented by Bowne, Royce, Ward, Richardson, Aliotta, Howison, etc.? To take away belief in a spiritual agency would be taking the heart out of these philosophies. And would it not be difficult to find a modern system of thought in which psychical reality does not loom up, consciously or unconsciously, as a significant fact?

Here we have proposed to us all kinds of panpsychisms, pantheisms, pancalisms, etc., and hence all the phenomenalistic theories of matter. A psychic quality in all Nature, however, can hardly be said to be complete panpsychism. These theories simply represent a psychical principle running through all things. Ever and anon we meet such beliefs which are looked upon

[12] Perry, *Present Philosophical Tendencies,* p. 69.
[13] *Ibid.,* p. 153.

as panpsychic. In them there is usually the tendency to interpret body as phenomenal, thus involving us in a epistemological discussion which need not becloud the issue. Etymologically speaking, panpsychism is that theory which ascribes a psychical nature to the whole of being, and should be equivalent to spiritualistic monism. And in our endeavor to show, from the standpoint of scientific attitude, that there is a psychical energy in all Nature, it is imperative that we keep in mind that this is not our ultimate objective; although dealt with in detail it is but a sub-station along the way. As we proceed it will be seen that we are advocating that genuine panpsychism which says that all reality is psychical or spiritual.

THE UNIVERSALITY OF PSYCHICAL REALITY

The criticism may possibly be made here that the converging lines of testimony which have been offered in this chapter and elsewhere to show the presence of a psychical, spiritual reality, have to do primarily with the higher forms of being in the organic world. But it is the belief of many students that the law of analogy can be brought into play in this case, and what is true of life in the organic world will hold good for all forms of being; and as the so-called physical has been found to be, seemingly, a medium through which the psychical finds expression, it is reasonable to believe that this principle prevails in all Nature, holding good even throughout the inorganic world.

The attitude represented in the preceding paragraph has the strong backing of science. The law of con-

tinuity pertains not only to certain types but reaches from the lowest to the highest forms of being, *and no one can safely attempt to annul this law by postulating a line of demarcation between the inorganic and the organic worlds.*

Clifford is very definite in his support of this attitude. He says that "as we go back along the line, the complexity of the organism and its nerve-action insensibly diminishes; and for the first part of our course we see reason to think that the complexity of consciousness insensibly diminishes also. But if we make a jump, say to the tunicate molluscs, we see no reason there to infer the existence of consciousness at all. Yet not only is it impossible to point out a place where any sudden break takes place, but it is contrary to all the natural training of our minds to suppose a breach of continuity so great. . . . But as the line of ascent is unbroken, and must end at last in inorganic matter, we have no choice but to admit that every motion of matter is simultaneous with some ejective fact or event which might be part of a consciousness." [14]

De Tunzelmann also would give a place to the psychical element not only in animal life but in all Nature as well. He says "there is no way of evading the conclusion that a determining cause must be sought for beyond the molecular scheme. There is one and only one such course known to us—our own will or mind; and the fundamental principles of scientific investigation lead us therefore to seek in the extension of mind for the determination of the molecular scheme, and further, of the whole order of Nature. We find

[14] Clifford, *Lectures and Essays,* pp. 283-284.

that the mental scheme, introduced simply as a working hypothesis, proves satisfactory at every point where the molecular scheme is found to be insufficient, and the attempt to ignore it in the development of any scheme attempting to account for the order of Nature, will invariably be found to necessitate its introduction in some disguised and unscientific manner, which very commonly takes the form of personifying natural law, one of the worst of pseudo-scientific absurdities." [15]

Royce very earnestly argues against setting the lower types of being off to themselves and denying to them psychical activities. He says the doctrine of evolution helps to bridge the gulf between the two extremes in Nature—mind and matter. "Between what seems to us, from our ordinary social point of view the highest of accessible mental life, and what we take to be the manifestations of lifeless matter, there is, in the process of mental evolution apparently no breach of continuity anywhere. . . . It is precisely this apparent continuity which is the most impressive of all the inductions that the study of evolution has lately forced upon the attention of all who have taken Nature at all seriously." [16] "When we see inorganic Nature seemingly dead, there is, in fact, conscious life just as surely as there is any Being present in Nature at all." [17]

The same elements are represented in minerals, plants, and animals; they are simply organized differently. Minerals get their subsistence by feeding on materials about them in just as real a sense as the

[15] de Tunzelmann, p. 461.
[16] Royce, *The World and the Individual,* Vol. I, p. 210.
[17] *Ibid.,* p. 240.

highest developed forms of life, only the method is more crude. There is a general process of feeding going all the time. It is a very fundamental fact in agriculture that the soil gets its nourishment from plants, animals, etc. Plants depend for nourishment on the air, moisture, and soil. Animals in turn feed on plants and other animals. Most plants, however, "feed at a lower chemical level than do animals." "It has been recognized that the beech-tree feeds and grows, digests and breathes, as really as does the squirrel on its branches: that in regard to none of the main-functions (except excretion, which plants have little of) is there any essential difference." [18]

In science illustrations of analogy are not wanting which show that the same deep principles which prevail in the organic world are found in the inorganic as well. We see this analogy in the fact that if a block of any one of the thousand minerals known to science, quartz for instance, were broken into myriads of pieces, every particle would be found to be a perfect crystal, just the same as the original, which suggests a similarity to the fact that if a starfish were torn into shreds, every piece would regenerate itself and form a starfish again. If we were to take this same piece of quartz and put it into running water it would become sand-grains. If then these sand-grains were put in the proper environment where they would have access to food, they would regenerate themselves and go back to crystal forms.

Science discusses this whole question as the tendency of all things, inorganic as well as organic, to adjust

[18] Thomson and Geddes, *Evolution*, p. 78.

themselves to their environment, the only difference between the two being that the inorganic is slower than the organic in this respect. In concluding a lecture on evolution in general and life in particular Kay says "there is then a continuity in the development of the earth, and the inorganic world is just as wonderful as the organic." If scientific thinkers of this attitude are correct, and we have no reasons to disbelieve their findings, then even in the inorganic world there is met teleology, and immanent teleology is difficult to conceive apart from a psychical activity.

So it is evident that in science and philosophy there is strong opposition to the idea of separating the inorganic from the organic world; it is just like trying to divide the bud from the blossom. If evolution is right in teaching that higher forms come from the lower, that the organic has evolved from the inorganic level, then the inorganic world has always held wrapped up within itself the potentialities of higher developed life, and even to-day must have in itself possibilities yet to be unfolded. The only difference between the two is that in the organic we have a higher development or organization of energy units. Thus it seems reasonable to believe that what holds good for the organic world holds good for every form of being; *if psychical energy is dominant in one type, it is dominant in all.*

PSYCHICAL ENERGY AS THE ONLY REALITY

The dualist, however, might suggest the possibility of spirit being the directing element and matter the

thing directed, without making spirit the only reality. But the materialist and dualist, in clinging to matter as a final reality will have a difficult task in endeavoring to harmonize their philosophy with the modern belief in the energy concept, for the conception of matter as a static, fixed substance will not stand in the face of progress made by science in recent times. Modern thought points the other way. "It is the discovery of living processes of incessant adjustment and adaptation, rather than of sequences purely mathematical and mechanical, which has in recent years been the source of philosophical reaction." [19] This attitude is endorsed by Woodbridge, who says "this is the one valuable and significant thing in modern philosophy." [20]

So the question arises at this time as to what that something is, which has been designated as physical or material and which seems to be the means by which the psychical achieves its ends. As the psychical is understood to unfold itself in every part of the organism, it makes us wonder whether the old hypothesis of mind and matter is not wrong after all. The relationship between mind and body seems too smooth, too perfect for two different entities to be rubbing up against each other. Facts point to the existence of a single substance.

In Part I we showed the strong monistic tendency of scientific thought, culminating in the belief that reality is energy. Science to-day is inclined toward a monism, a monism of energy. It has been found that

[19] Adams, *Idealism and the Modern Age*, p. 98.
[20] Woodbridge, *Journal of Philosophy, Psychology and Scientific Methods*, Vol. XIV, p. 378.

in the last analysis of things we come face to face with the electrons which are but charges of electricity, a form of energy. No such distinction is made as psychical and physical energy. All the electrons are the same, no matter where found. The atoms differ only in the groupings of electrons constituting them.

If monism is correct, then, it would hardly be possible for everything to be material because modern thought, as has been shown in detail, believes in the presence and priority of psychical activities, of spirit. On the basis of a monism of energy it is perhaps reasonable to doubt whether there is such a thing as physical energy. In other words, we come to that place where it is fair to question the existence of genuine matter. But on the other hand it would seem inconsistent to question the reality of psychical energy; we have found facts pointing to a psychical energy at work and should feel kindly disposed toward a belief in its reality. We are therefore inclined to believe with Huxley that "Matter and Force are, as far as we know, mere names for certain forms of consciousness." "We find ourselves forced to interpret Nature . . . as an orderly realm of genuine conscious life, one of whose products, expressions and examples we find in the mind of man." [21] This is equivalent to saying that the same thing which has been called body or matter and through which mind seems to find expression is also of a psychical nature. These things being true, it is in a *spiritualistic monism then that Nature seemingly finds its correct classification.*

[21] Royce, *World and Individual*, p. 242.

ORGANIZED PSYCHICAL ENERGY AS A THEORY OF REALITY

Facts indicate that Leibnitz was working on the right principle. He resolves everything into monads, centers of psychical, spiritual force. In the very lowest types of being we find a group of monads clustering about a governing or central monad. This group with other groups gather about a still more important central soul; and so on until we come to the highest type of being as found in mind and represented by consciousness. The monads surrounding the central monads or souls are continually changing but the governing souls never change. Here we have a world alive with thought, ranging from the lowest, confused perception, up to mind as consciousness.

The further we go into the study of reality the more it seems that it is a program something like that of Leibnitz which will stand the test of time. Science finds that there are central cells something like those to which Leibnitz refers. "There is a popular fallacy in lay minds that the whole human body is replaced by fresh material in a period which by some whimsical fancy has been fixed at seven years. As a matter of fact some cells are formed, pass to maturity, and perish almost daily, while others last as long as the animal itself. . . . These master cells are to be found in the brain and other parts of the central nervous system, in arterial walls, and in mechanisms which control the heart." [22] Starbuck says "the parts in the finer anatomy which are especially essen-

[22] Moore, *The Origin and Nature of Life,* p. 45.

tial to mental activity are the cells for generating and storing nervous energy, and a rich network of nerve fibers with fatty wrappings for conducting the energy from one part of the brain to another." [23]

Hence we are led to a new conception of the human body, *seeing it as an intricate organization of psychical energy,* in which can be found many minor groupings or systems of more or less importance. Probably in the lower organisms of the body we could find energy units of the simplest organization gathering about the most inferior cells, and in coming up through the more complex systems connected with the more important cells, finally find the whole system culminating in the cells having to do with the brain.

This is not unlike Hughlings Jackson's theory of "levels" or Flechsig's "associated centers." With Jackson the lowest level heads up in the spinal cord, medulla and pons and has to do with the simplest activities of the body. The second level represents a higher organization of relationships; and the third, the highest, is supreme in heading up the entire nervous system and represents mind.

We have shown that science believes that the same principle of psychical activity is fundamental to all being, animate and inanimate; to all bodies, organic and inorganic. It seems reasonable then to accept that system which sees in all Nature a vast organization of psychical units of energy, which amounts to saying that energy operates as a spiritual force. According to this conception we meet in the lowest types of being the most inferior organizations of energy units, the units of every single body clustering about a governing

[23] Starbuck, *The Psychology of Religion,* pp. 149-150.

nucleus or cell. And as we come up through the series we meet the more complex groupings of energy units until finally in the consciousness of mind is met the highest degree of organization in all Nature.

Having come thus far, it would seem consistent in this hypothesis to take another step and suggest a great Mind or Spirit, in which is realized absolute consciousness, dominating the world of spiritual energy. This being accepted, we should have a common meeting ground for scientific thought and those religious beliefs which represent the deeper intimations of humanity, even though science should see it as an over-belief and theology should interpret it as a fact of experience. Here then the religious devotee would be led to speak in terms of energetic Spirit instead of an absentee God, and the scientist in terms of spiritual energy rather than materialism and mechanism.

It is further possible in this program of evolving spiritual energy for the adherent of the Christian faith to believe it was at that place where in the process of development from the "dust of the earth" man came into consciousness, that the great Spirit began to deal with man as a person and that Biblical literature begins its history of the human race; that it was when man stepped forth a conscious being he became a living soul, made in the image of God. In this vast system then the mind of man stands above all organizations of spiritual forces, crowning the network of Nature's activities. This most highly organized system of spiritual energy as represented in human consciousness is probably the only organization of spirit which knows no dissolution, making possible for man the experience of immortality.