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COSMOS, THE SOUL AND GOD

A Monistic Interpretation of the Facts and Findings of Science

BY

CHARLES LONDON ARNOLD, M.A.

11

Τὰ γὰρ βλεπόμενα πρόσκαιρα· τὰ δὲ μὴ βλεπόμενα αἰώνια

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PREFACE

PERMISSION having been granted by SIR OLIVER LODGE to embody in the preface of the present book certain passages from his recent important work, "Life and Matter,"[1] the author takes this opportunity to express his profound gratitude to his benefactor for the great privilege accorded him. This eminent scientist, in the book from which the following quotations are made, has rendered a most valuable service to the cause of truth, not only in exposing the speculative fallacies of Professor Ernst Haeckel of Jena, but in suggesting certain fundamental philosophical principles and their application to the solution of many hitherto insoluble problems of the universe and of human experience. It will readily be seen by the reader how fittingly these quotations are made to constitute a preface to this volume.

"Before everything, a philosopher should aim to be all-inclusive; before everything, a man of science should aim at being definite, clear, and accurate. An attempt at combination is an ambitious attempt which may legitimately be made. Positive contributions, either to fact or to system, may be real and should be welcome.

[1] Sir Oliver Lodge, "Life and Matter." G. P. Putnam's Sons.

"The problem to be solved — and an Old World problem indeed it is — is the range, and especially the nature of the connection between mind and matter; or, let us say, between the material universe on the one hand and the vital, the mental, the conscious, and spiritual universe or universes on the other. It would be extremely surprising if any attempt yet made had already been thoroughly successful, though the attack on the idealistic side appears to many of us physicists to be by far the most hopeful line of advance. An excessively wide knowledge of existence would seem to be demanded for the success of any such most ambitious attempt; but, though none of us may hope to achieve it, many may strive to make some contribution towards this great end; *and those who think they have such a contribution to make, or such a revelation entrusted to them*, are bound to express it to the best of their ability, and leave it to their contemporaries and successors to assimilate such portions of it as are true, and to develop it further.

"It may be worth while to explain how it is that, to a physicist unsmitten with any taint of solipsism, a well elaborated scheme which is consistent with already known facts necessarily seems to correspond, or to have close affinity, with the truth. It is the result of experience of a mathematical theorem concerning unique distributions. For instance, it can be shown that in an electric field, however complicated, any distribution of

potential which satisfies boundary conditions and one or two other essential criteria, must be the actual distribution, for it has been rigorously proved that there cannot be two or more distributions which satisfy those conditions; hence if one is arrived at theoretically, or intuitively, or by any means, it must be the correct one; and no further proof is required.

"So, also, in connection with analogies and working models; although they must necessarily be imperfect so long as they are only analogies, yet the making or imagining of models (not necessarily or usually a material model, but a conceptual model) is a recognized way of arriving at an understanding of recondite and ultrasensual processes, occurring, say, in the ether or elsewhere. As an addition to evidence derived from such experiments as have been found possible, and as a supplement to the experience out of which as out of a nucleus every conception must grow, the mind is set to define and invent a self-coherent scheme which shall imitate as far as possible the results exhibited by nature. By then using this as a working hypothesis and pressing it to extremes, it can be gradually amended until it shows no sign of discordance or failure anywhere, and even serves as a guide to new and previously unsuspected phenomena. . . .

"In the transcendental or ultramundane or supersensual region there is the further difficulty to be encountered, that we are not acquainted with

anything like all the 'boundary conditions,' so to speak; we only know our little bit of the boundary, and we may err egregiously in inferring or attempting to infer the remainder. We may even make a mistake as to the form of function adapted to the case. Nevertheless there is no better clew, and the human mind is impelled to do the best it can with the confessedly imperfect data which it finds at its disposal. The result, therefore, in this region is no system of definite and certain truth, as in physics, but is either suspense of judgment altogether, or a tentative scheme or working hypothesis, to be held undogmatically, in an attitude of constant receptiveness for further light and in full readiness for modification in the direction of truth.

"So far concerning the ascertainment of truth alone, in intangible regions of inquiry. The further hypothesis that such truth when found will be most satisfactory or, in other words, higher and better than any alternative plan — the conviction that faith in the exceeding grandeur of reality shall not be confounded — requires further justification, and its grounds are not so easy to formulate. Perhaps the feeling is merely human and instinctive; but it is existent and customary, I believe, among physicists, possibly among men of science in general, though I cannot speak for all; and it must be based upon a mass of experience in which, after long groping and guesswork, the truth has ultimately been discovered and been recognized as 'very good.' . . .

"Life may be something not only ultraterrestrial, but even immaterial, something outside our present categories of matter and energy; as real as they are but different, and utilizing them for its own purpose. What is certain is that life possesses power of vitalizing the complex material aggregates which exist on this planet, and of utilizing their energies for a time to display itself amid material surroundings, and it seems to disappear or evaporate whence it came. It is perpetually arriving and perpetually disappearing. While it is here, if it is at a sufficiently high level, the animated material body moves about and strives after many objects, some worthy, some unworthy; it acquires thereby a certain individuality, a certain character. It may realize *itself*, becoming conscious of its own mental and spiritual existence; and it then begins to explore the Mind which, like its own, must underlie the material fabric — half displayed, half concealed by the environment, and intelligible only to a kindred spirit. Thus the scheme of law and order dimly dawns upon the nascent soul, and it begins to form clear conceptions of truth, goodness, and beauty; it may achieve something of permanent value, as a work of art or of literature; it may enter regions of emotion and may evolve ideas of the loftiest kind; it may degrade itself below the beasts, or it may soar till it is almost divine.

"Is it the material molecular aggregate that has of its own unaided latent power generated this

individuality, acquired this character, felt these emotions, evolved these ideas? There are some who try to think that it is. There are others who recognize in this extraordinary development a contact between the material frame of things and a universe higher and other than anything known to our senses; a universe not dominated by physics and chemistry, but utilizing the interactions of matter for its own purposes; a universe where the human spirit is more at home than among these temporary collocations of atoms; a universe of noble contemplation and of lofty joy, long after this planet — nay, the whole system — shall have fulfilled its sphere of destiny, and retired cold and lifeless upon its endless way."

These eloquent words from the pen of one of the most widely recognized authorities upon the questions of Modern Science may be thought by some to constitute a grand and magnificent vestibule to a rather mean and unattractive temple. It may even be that many who read these words of great worth will proceed no further with me, but seek the instruction rather of that master of science. Should this be so, only good could result.

However, I think I have rightly placed these quotations in the very forefront of my book, for they afford me the strongest evidence I have yet met with in scientific literature that I have not been following an *ignis fatuus* through the past

quarter of a century. I feel confident that the reader will readily perceive that I have pursued the line of thought and investigation indicated in these quotations, and set forth a somewhat comprehensive hypothesis firmly based upon principles therein suggested.

It may be regarded as bold and presumptuous on my part to seem to claim that I have in a measure realized the attempt to solve the "Old World problem," as to "the range, and especially the nature of the connection between mind and matter; or, let us say, between the material universe on the one hand and the vital, the mental, the conscious, and spiritual universe on the other." The "excessively wide knowledge . . . demanded for the success of any such most ambitious attempt" is certainly at one's command in this marvellous age. The facts established by the great scientific investigators of the past century as set forth in the introductory chapter of the present work constitute a vast store of knowledge provided with which a thinker of to-day may go forth to achievements heretofore altogether impossible.

I think I make it clear that there has been consistent progress in all departments of science toward the discovery of the limitations and boundaries of the physical world, establishing the necessity of postulating the essential psychical or spiritual nature of the universe or cosmos, and distinctly proving that the present physical world or process is finite, transient, and but a phase of cosmic

activities, without manifesting anything of agency originating within itself — hence in no sense self-explanatory or accounting for its own activities.

Had it been permitted to Spinoza to have at his command all the rich treasures of fact which modern science has gathered and given to the world in such comprehensible and usable form, that great philosopher would have formulated a universal philosophy which would still command the assent of all men. His philosophy was founded upon the facts of the universe as they were then certified to him, and his method was that of seeking to interpret these facts rationally and consistently with all human experience.

Before everything, I have sought to develop an all-inclusive philosophy. Starting with the established facts of science, seeking the causes of manifested phenomena, tracing the causal series to the very limits of scientific investigation, inevitably finding at the limits of the physical process an effect for which no physical cause can be discovered, and driven to attribute such effect to some agency outside the world of sense, I reach at length the inevitable conclusion that there is a world or universe out of which this physical process comes, upon which it rests, by which it is energetically sustained; in a word, that the present world is but the phenomenal representation of some of the forms of cosmic energy.

The physical world embraces that region of the universe whose phenomena are apprehensible by

our senses, its boundaries are the limitations of our actual and possible sensible knowledge and experience. It is a process identical with the process of evolution. In the order of development it ever manifests higher and higher forms of cosmic energy.

The process of evolution is, therefore, a physical process only. All progress is manifested in the origin, development, and improvement of material conditions, aggregates, compounds, and physical organisms and organs. The atoms, molecules, mass, and all aggregations large and small are within the physical world. All forms of energy capable of being scientifically investigated, such as gravitation, cohesion, chemical affinity, heat, light, and electricity, constitute the activities of the physical process. The phenomena of life and mind, too, so far as capable of being apprehended by our bodily senses, belong to the material order. In all this region we observe the progress of evolution. Atoms in accordance with definite laws unite into molecules, molecules constitute mass. Mass is divided into innumerable material forms. These forms are aggregates of molecules having many different properties. Out of these the nebulæ, the suns, the planets, all terrestrial bodies, all organisms are formed. The process of evolution is that of the formation and transformation of all these material forms. What is sometimes called mental and spiritual evolution is only the manifestation of higher psychical or cosmic forces as the process of evolution brings forth the more

highly developed physical organisms capable of responding to, and manifesting, these higher forms of spiritual energy.

The cosmic hypothesis which it is the purpose of this book to set forth and establish may be briefly stated as follows: The universe or cosmos is infinite, eternal, infinitely energetic, and essentially psychical or spiritual, and perfect, from everlasting to everlasting the objective to *G*od. It is *G*od's creature in that it exists because *G*od exists. All forms of so-called physical energy are manifestations of cosmic and psychical forces or activities. The theory herein advanced accounts for all the facts of science and all the items of human experience. It offers a coherent scheme of scientific knowledge into which there are no things which cannot be fitted. No possible advance of science can render this hypothesis inapt, invalid, or obsolete. It disproves materialism by offering a more satisfactory explanation of its own fundamental principles. It substitutes for idealism a consistent, comprehensive, and rational theory of the universe as real, eternal, infinite, and psychical.

The doctrine of evolution determines man's place in organic nature. The hypothesis here presented designates the place of organic nature in the course of the development of the earth. The Copernican theory determined the place of the earth in the physical world or process. The theory here offered determines the place of the physical process in the infinite and eternal cosmos.

PREFACE

In the discussion following we recognize the two paths which alone can lead to the solution of the great cosmic problems, experiment and speculation, as of equal value and mutually complementary. It must be admitted that pure speculation cannot bring us to the knowledge of reality. On the other hand, the bare facts of science out of relations with all other facts of the universe and of experience present us with a world composed of a heap of dead atoms. Our endeavor has been and will ever be to make due use of the recognized results attained by the great progress of anatomy, physiology, histology, ontology, and all other branches of science, as the fundamental basis on which to build a permanent and enduring superstructure of legitimate speculation.

Without wasting time in discussing a theory of knowledge or a system of epistemology, as was recommended to me by a critic of my manuscript, I am satisfied to accept as reliable and irrefutable portions of truth the facts which science warrants to us as such. Reasoning from these facts consistently with experience, my method is to construct of them, as imperishable blocks of truth, a theory of the universe into which all cosmic facts and incidents will fit without manipulation. The test of the truth and adequacy of this theory is its power to account for *all* the facts.

C. L. A.

DETROIT, MICH., *January 1, 1907.*

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CHAPTER I

INTRODUCTORY

The Interdependence of Science and Philosophy — Astronomy the Earliest of the Sciences — Results of the Union of Physical Science with Astronomy — Application of Newton's Theory to the Stars — Composition of the Stars demonstrated by Chemistry — The Author's Theory of the Source of the Physical Process — Development of the Science of Geology — The Indestructibility of Matter — Efforts of Chemists to produce Living Protoplasm — Impossibility of explaining Chemical Affinity, Electricity, Matter, and Force — The Cell the Basis of all Organisms — Manifestations of Mind in Micro-organisms — Psychology not a Science.

The great progress in anatomy, physiology, histology, and ontogeny has recently added a wealth of interesting discoveries to our knowledge of the mechanism of the soul. If speculative philosophy assimilated only the most important of these significant results of empirical biology, it would have a very different character from that it now unfortunately presents. — ERNST HAECKEL.

Although Science is essentially engaged in explaining, her work is necessarily confined to the sphere of natural causation; beyond that sphere (i.e., the sensuous) she can explain nothing. In other words, even if she were able to explain the natural causation of everything, she would be still unable to assign the *raison d'être* of anything. — G. J. ROMANES.

If Science could transcend the conditions of space and time, of phenomenal relativity, and of all human limitations, only then could Science be in a position to touch the supernatural theory of religion. But obviously, if Science could do this, she would cease to be Science. In soaring above the region of phenomena, and entering the tenuous ether of noumena, her wings, which we call her methods, would in such an atmosphere be no longer of any service for movement. Out of time, out of space, out of phenomenal relations, Science could no longer exist as such. — G. J. ROMANES.

Such, then, I conceive to be one of the most important consequences of the monistic theory, namely, that, by regarding physical causation as everywhere the objective or phenomenal aspect of an ejective or ontological reality, it furnishes a logical basis for a theory of things which is at the same time natural and spiritual. — G. J. ROMANES.

Cosmos, the Soul, and God

CHAPTER I

INTRODUCTORY

Nothing after all is of such permanent worth as a rational interpretation of the Universe. — PROFESSOR PEABODY.

PHILOSOPHY is an attempt as far as possible to know the universe as a whole. In modern times the so-called natural sciences occupy a vast portion of the ancient domain of philosophy. These special sciences deal with facts from their several special points of view. They severally investigate separate fields of phenomena. Physics, in its narrower significance, treats of matter — its properties; of mass — molecule and atom; of the forms of energy — heat, light, electricity, sound; and of the laws of motion. The student of physics invades the domain of other sciences. He studies the nature of solutions in physical chemistry; he trespasses within the boundaries of astronomy in his researches in astrophysics; he investigates earthquakes, volcanoes, etc., in geological physics.

All the sciences are attempts to know certain portions or phases of nature or the physical world. They seek to investigate the facts and phenomena of the material process as these are discovered through the senses, and to classify and unify the discovered facts. The physical sciences claim the right to carry their investigations throughout time and space so far as their methods of observation and experiment will enable them to search. Gross matter, the subtile ether, the heavenly bodies near and remote, all forces and forms of motion, the chemical elements and activities, life in all its manifold manifestations, biology and physiology, are all within the domain of the natural sciences. It would be wearisome to enumerate the ever increasing branches of science in our day. Philosophy attempts to unify all these several classifications of phenomena and to fashion them into one comprehensive and consistent system of things. Philosophy seeks fundamental principles and to interpret the facts gleaned in all the diverse fields of science, consistently. Philosophy may not disregard the findings of science and build castles in the air. The facts discovered by patient investigation, and the theories verified and established by science, must be accepted as the sure foundation

for any enduring system of philosophy. Speculative philosophy must assimilate the most important of the significant results of empirical science in all its departments, if it would offer any comprehensive or intelligible view of the universe.

The oldest of the physical sciences is astronomy, and its early history is more important than that of any other; indeed, it may be said that the state of scientific culture among the early peoples was little more than the practical observations of astronomy. This science had its beginning among the Chaldeans and the Chinese. These ancient observers of the heavens were able to predict eclipses with considerable accuracy, were acquainted with certain forms of the calendar. Among the Chinese are extant authentic observations of eclipses, comets, etc., extending back for a thousand years before our era. In Egypt, among the Greeks, and among the most ancient races, the observations of the heavens and the study of the stars constituted the scientific culture of the most conspicuous intellects.

In the second century before our era, Ptolemy, from superficial observation of the apparent movements of heavenly bodies, invented the Epicyclic System of the Universe, making the sun and

planets revolve in circles whose centres are themselves in motion upon other circles, the earth being the centre of the system. All the observations and speculations under this hypothesis contributed nothing to the development of a science of astronomy, hardly increasing the material out of which such a science could be constructed.

It is with Copernicus that astronomy is born into the family of sciences as the eldest child. For centuries the general notion of the system, which probably originated with Pythagoras, was altogether overlooked, owing to the general acceptance of the Ptolemaic astronomy. The claim of Copernicus to the glory of being the father of the science rests upon the fact that, after centuries had passed, he brought to light this ancient conception, and greatly increased the probability of its truth by his calculations and arguments. Here we meet the fresh beginning of another branch of science, and one that was indispensable to the further development of astronomy. Physical philosophy had its origin, too, in a distant past, and many illustrious names of thoughtful Greeks are associated with its early attempts to solve the riddle of the universe. Pythagoras is placed at the origin of the Italic school, but history records no

systematic development of his teachings. The Ionic school, however, which is referred back to Thales, one of the ancient wise men of *G*reece, had a progressive development culminating in the physical treatises of Aristotle. But with this culmination its progress closed and "left the human mind to remain stationary on all such subjects for nearly two thousand years. The physical philosophy of these two schools is especially deserving of our study as exhibiting the character and fortunes of the most memorable attempt at universal knowledge that has ever been made. It is highly instructive to trace the principles of this undertaking, for the course pursued was certainly one of the most natural and tempting that could be imagined; the essay was made by a nation unequalled in fine mental endowments, at a period of its greatest activity and vigor; and yet it must be allowed . . . to have been unsuccessful."[1] So physical science rested until the times of Copernicus and *G*alileo and Kepler and Newton, when, joining hands with astronomy, an advance was made which has ever since been going on with increasing velocity to the present day. The whole conception of the physical world has been revolutionized in these

[1] Whewell, "History of the Inductive Sciences," Vol. I, page 56.

modern times. A heliocentric solar system has taken the place of the geocentric. The stars have been resolved into suns like our own, and all the heavenly bodies are seen to be moving in their majestic orbits around remote centres. The laws of motion as discovered by *G*alileo and Kepler, and the law of gravitation, rule throughout the visible universe, and all the motions of the heavenly bodies are capable of being set forth in mathematical formulæ.

After the long period of inactivity in physics and astronomy had come to an end, the human mind was again thoroughly aroused, and discoveries crowded rapidly upon one another. On every side tempting fields of investigation and speculation opened, offering richer promises to laborers. The invention of the telescope made possible new views of the heavens. The moon's surface was scrutinized, the phases of the planet Venus were seen, the discovery was made of the rings of Saturn and the satellites of Jupiter and spots on the sun. Then Napier gave to mathematicians an incalculable aid to their efforts by the invention of logarithms. A twofold progress resulted from these inventions, — a rapid ingathering of a vast harvest of facts, and a widespread and most

fruitful mathematical treatment of these facts of observation.

The science of Mechanics became an attractive field of inquiry and investigation, resulting in the discovery and formulation of the laws of motion. Applying these mechanical principles to the motions of the planets, Galileo and Kepler determined their elliptical orbits, their periods of revolution, etc. Then came Newton's great work, the "Principia," which may be primarily considered a work on Mechanics. Until a science of Dynamics was discovered and formulated, until the laws of earthly motion were divulged, the most profound and keenest intellects groped aimlessly in their pursuit of the laws of heavenly movements. Bacon and Kepler failed because there was wanting in their day a true theory of motion; because there was not a science of Mechanics.

Bacon himself bears witness to the futility of the efforts of the great minds of his time in constructing a true science of Astronomy. This great father of the inductive method declares that while Astronomy, up to that time, had had for her business to inquire into the principles or rules of the heavenly motions, and Philosophy into their causes, they had both so far worked without due

appreciation of their respective tasks. Philosophy ignored facts, while Astronomy claimed assent to her mathematical hypotheses, which ought to be considered as mere steps and symbols of calculation. He goes on to say: "Since, therefore, each science has hitherto been a slight and ill-constructed thing, we must assuredly take a firmer stand; our ground being that these two subjects, which, on account of the narrowness of men's views and the traditions of professors, have been so long dissevered, are, in fact, one and the same thing, and compose one body of science."

The guesses and speculations of that very great and illustrious mathematician, Kepler, to whom we are indeed more greatly indebted than to Copernicus himself for the establishment of the so-called Copernican Theory, are stated in formulæ and phrases that to-day seem puerile and amusing. Thus he introduces a chapter of his work on the planet Mars: "A physical speculation, in which it is demonstrated that the vehicle of that Virtue which urges the planets, circulates through the spaces of the universe after the manner of a river or whirlpool moving quicker than the planets." He speaks of the "*moving force, the magnetic nature*, the *immaterial virtue*"

of the sun, which cannot be said to convey any distinct conception. Kepler's physical theory, as applied to astronomy, was, in fact, the doctrine of vortices around the central bodies, and these vortices constantly whirling around these central bodies carry the moon and planets as the whirlpool carries straws. He further asserts that these vortices are "an immaterial species." All these are mere conjectures, not founded upon ascertained facts, nor attempted to be verified by observation of terrestrial movements.

Some score of years later, Descartes, the father of modern philosophy, himself a master in mathematics, set forth a similar "Theory of Vortices," incorporated in his "Principia Philosophiæ." He imagines three kinds of matter, the properties of which are equally imaginary. "The first kind of matter makes luminous bodies; the second, the transparent substance of the skies; the third is the material of the opaque bodies, the earth, planets, and comets." Then he supposes that the motions of these parts take the form of vortices. By this means, the first kind of matter, which produces the luminous bodies like the sun, is collected to the centre of each vortex, while the second and subtile matter surrounds it, and by its centrifugal

effort constitutes light, and the planets, composed of the third kind of matter, are carried round the sun by the motion of his vortex.

For a considerable period this was the accepted theory of matter and of celestial mechanics. Many eminent philosophers and mathematicians readily adopted it, doubtless upon the reputation of its illustrious author, who was a man of high claims in every department of speculation and "as a mathematician a genuine inventor of great eminence." Of course this theory did not long survive in the rapid progress of discovery that had already begun. It had no value whatever in the advancement of science, and is here alluded to only as an instance of theorizing without regard to discovered and verified facts, and without following the inductive method of observation and experiment. Leibnitz, though not a follower of Descartes, had said that the Cartesian philosophy was the antechamber of Truth — a compliment scarcely deserved; for, as Whewell pleasantly remarked, "Those who first came into the presence of the Truth herself were those who had never entered this imagined antechamber, and those who were first in the antechamber were the last in penetrating farther." Playfair extends to Descartes,

as a natural scientist, the doubtful credit of having rendered Newton a service "by having exhausted one of the most tempting forms of error."

In England, before the days of Newton, there were many men of preëminent ability in mathematics who discerned the true character of the problem of curvilinear motion. Conspicuous among these was Hooke, of Christ Church, Oxford, "who distinctly stated that the planets would move in straight lines if they were not deflected by central forces; and that the central attractive power increases in approaching the centre in certain degrees dependent on the distance." Here we have an attempt at a solution, of far greater value than all the speculations of all the former philosophers, who disregarded the careful observation of the laws of terrestrial mechanics.

Reaching the work of Sir Isaac Newton, we are in the presence of the greatest scientific discovery ever made. The order and movements of the heavenly bodies stand forth in all their perfection and beauty. The guesses of the past were verified or refuted, the observations were mathematically expressed and justified, and the unity and harmonious order of the universe were made clear as the day. The ancient speculations of astronomers, by

the effectual aid of physics and mathematics, were reduced to one all-embracing cosmic generalization, the science of Astronomy was created, and the whole physical universe was presented in a new and comprehensive aspect.

The known solar system at that time consisted of sun, moon, earth, and five planets visible to the naked eye. Through all the centuries of the past, since the days when the Chaldean shepherds studied the starry heavens, no discoverer had observed another member of the solar system. It was not until a century had passed after the publication of Newton's "Principia" that Herschel's telescope won the first great triumph in the discovery of Uranus. After the general acceptance of the Newtonian theory, the glorious labors of Lagrange, Laplace, and other mathematicians were necessary to remove many remaining difficulties connected with planetary perturbations and the inequalities in the moon's motion. Their illustrious labors bore their full fruitage a half-century later, when the discovery of Neptune by pure mathematical reasoning from the perturbations of Uranus furnished for this theory the most triumphant confirmation and demonstration known in the whole history of science. The sidereal heavens were not studied,

at this time, beyond the cataloguing of such stars and nebulæ as could be seen with the telescopes then at command. A century and a half had passed after Newton's great generalization before it was sought to bring the stars within it. Until less than one hundred years ago the ascertaining of the distance of a star had not been successfully attempted. So late as 1836 Auguste Comte declared such a feat to be impossible, and that the Newtonian theory could never be proved to extend throughout the stellar regions of the universe. Three years later Bessel measured the distance of 61 Cygni, and the subsequent study of the movements of double and multiple stars soon established the fact that the law of gravitation embraces the whole sidereal heavens.

The development of another science, that of Chemistry, opened the way for marvellous advance in Astronomy. In 1774 Dr. Priestley found that by heating red precipitate an incombustible gas was obtained. This gas, the commonest element in nature, constituting "one-fifth of the atmosphere in volume, eight-ninths of the ocean by weight, and one-half the earth's solid crust," was oxygen. This was the period of the emergence of Chemistry from the unfruitful alchemy of a distant past. As

the science of Chemistry advanced, and the seventy odd chemical elements were discovered, and all the constituent elements of earth and the atmospheric ingredients were ascertained, the mind of man sought to know whether or not all the shining orbs of heaven were alike composed. And here opens before us a chapter in the science of Astronomy which even the boldest speculation of half a century ago would have dismissed as a baseless dream. The invention of the spectroscope and the discovery of spectrum analysis have supplied the data for a celestial chemistry.

"Hydrogen is detected in the far-off Dog Star and the nebula of Orion; sodium, potassium, calcium, and iron in the sun; demonstrating the gaseous character of the nebulæ, and revealing chemical elements hitherto unknown, such as helium, a mineral first detected in the sun and afterward found in Norway."[1]

More wonderful still is the fact that spectrum analysis enables us, through a slight shifting in the wave-lengths of the light it emits, to measure the motion of a star. We can by this means detect the approach or recession of a distant heavenly body. The spectrum of the star Algol tells a most

[1] John Fiske, "A Century of Science," p. 7.

interesting story. Algol, a sun of the magnitude of our sun, has a dark body revolving about it nearly its own size; and itself is in revolution round another dark body. The spectrum reveals the presence and gravitative effects of the two invisible stars, and also explains, as due to irregular eclipses, its long observed variations in brilliancy. Thus again is witness borne to the uniformity and unity of the physical world. Not only are the laws of motion on earth identical with those of the whole material universe, but the same chemistry applies to celestial as to terrestrial phenomena.

The questions ever present in the human mind, "Whence came this wonderful world? was it created by divine act? was it always as now? has it come to its present state and condition by gradual development and evolution?" have led to many attempts to construct a cosmogony. Some of these guesses of the ancients we shall hereafter consider. In modern times the Nebular Hypothesis of Laplace was the first fruitful effort to apply scientific facts and methods to the solution of these cosmic problems. The author of this theory, one of the very first mathematicians of all time, did not claim for it the authority of a demonstration, but the most advanced physicists and

astronomers of to-day assume its general correctness and accept the same as a valid working hypothesis. By this hypothesis we have the physical world originating in an infinitely diffused nebula possessing a rotary motion. Intense heat is generated by physical or mechanical forces. Portions, cooling, give off their heat and contract, leaving rings behind, which themselves break up into globes rotating on axes and revolving round centres of gravitation. So the innumerable stars that fleck the immensities of space came into their present state, and their several systems were thus developed. *G*azing at the heavens through the telescope, and studying the composition and states of development of the celestial bodies by means of the spectroscope, and the sensitive photograph plate applied to the telescope, we see suns and solar systems in every stage of evolution, from the nebula entering upon its cosmic being, to bodies like the moon, passing down to darkness, decay, and death. Though it may be that this hypothesis has not yet obtained the formal credentials of science entitling it to a place among its verities, it seems to withstand successfully all criticism, and to maintain an honorable position among the most probable theories of the evolution of the physical

process. It has been stated by its great author in correct mathematical formulæ, and observation affords us more and more satisfactory evidence of its truth.

Sir Norman Lockyer has given to the world a cosmogonic theory quite different from the Nebular Hypothesis of Kant and Laplace, which he calls the Meteoritic Hypothesis. It assumes that the stars have been made up by the combining together of masses of meteors, space being supposed to contain numberless swarms of these little bodies. It is altogether probable that these theories taken together give the full account of the development of the sidereal and planetary systems. The meteoritic upbuilding may have been preliminary to the nebulous state. The forcible gathering together of the meteorites may have caused the intense heat by which the mass was vaporized and transformed into the nebulous state. Then begins the wondrous tale of contraction, the throwing off of rings and cooling and contracting into solid spheres supplied with air and water, fitted for the abode of life.

These theories carry us back to a beginning of the physical process. I use the words "a beginning" with intent, for there is now arising a school

of scientific philosophers who insist that the whole process is made up of series of evolutions and devolutions *ad infinitum*. It is inconceivable, however, that there should be no actual beginning of the entire process, unless we shall accept some such hypothesis as that which this treatise is intended to propose and support, — that THE PHENOMENA OF THE PHYSICAL PROCESS ARE ALL THE PRODUCTS OF THE ENERGY OF AN INFINITE, ETERNAL, INFINITELY ENERGETIC PSYCHICAL UNIVERSE, upon which the material world depends for its being and innumerable activities. An evolving world, passing from a universal homogeneity to an infinite heterogeneity, must increasingly manifest the presence of manifold forms of energy, and demands a source of its ever increasing supply of active or kinetic power. If the physical process be only a phase of universal, infinite, and eternal activity; if this material world rests upon, and is interpenetrated by, the immaterial, infinite, and infinitely energetic universe, — then we need not inquire as to its beginnings, for every activity is but an expression of an ever and everywhere present energy. This hypothesis sets aside at least one of those "transcendental and insoluble world-enigmas," which, according to

Ernst Haeckel, Emil du Bois Reymond stated some years since before the Berlin Academy of Sciences, namely, "the origin of motion."

Thus briefly have we traced the history of the development of the science of Astronomy, which is no less than the history of the physical process, until the organic world is reached. From our long flight out into the immensities of space, from our journey amid the wonderful revelations of Astronomy, we descend to earth, and resume the study of the record of man's pursuit of truth. The development of the science of Astronomy has resulted in a vast enlargement of the mental horizon with reference to space; but the nineteenth century has witnessed also a notable enlargement with reference to time.

The eighteenth century closed before any fruitful endeavor was made to study inductively the earth's history as written through the centuries in the stony volume of the earth's crust. Indeed, during the early years of the nineteenth century, men of intelligence and education could be found, who with unshaken confidence maintained that fossils had been created dead and petrified and placed by the hands of Omnipotence beneath the rock-ribbed surface of the earth. It was not until

1830 that the science of *G*eology won its first and memorable triumph with Sir Charles Lyell. "*G*eologists before his time had been led to conclude that the general aspect of the earth's surface with which we are familiar is not its primitive and permanent aspect, but there has been a succession of ages in which the relations of land and water, of mountains and plains, have varied to a very considerable extent." In order to account for such changes, geologists were disposed to imagine violent catastrophes brought about by strange agencies, in some vague and unaccountable way, utterly unlike those forces now at work in the visible and familiar order of nature. But Lyell proved that the very same processes now going on all about us are altogether sufficient to account for the changes in the inorganic world which distinguish one period of the earth's development from another. It was then that attention was first drawn to the important element of time. These changes were slowly effected. Through long periods, unobtrusive and apparently inefficient agencies were at work, at length bringing forth by cumulative action marvellous results. Astronomy, as we have seen, steadily advanced toward the proof that in the abysses of space the physical forces are

identical with those operating on earth. So *G*eology, carrying us back through long periods of time, shows us that the forces now at work are the same as those which have brought forth all the geologic changes since the remotest past. The philosophic significance and purport of all this in *G*eology are the same as proclaimed by the progress of Astronomy. Of course, in the very earliest stages of the development of the earth's crust, the temperature was excessively high, and so phenomena were manifested no longer to be witnessed on the earth's surface; but in other parts of the solar system, as, for instance, on the great planet Jupiter, the same forces are at work producing the same results as in those far-off ages in the history of the earth.

"Ever since our earth cooled to a point at which its solid crust acquired stability, since the earliest mollusks and vertebrates began to swim in the seas, and worms to crawl in the damp ground, if at almost any time we could have come here on a visit, we should doubtless have found things going on at measured pace very much as at present, — here and there earthquake and avalanche, fire and flood, but generally rain falling, sunshine quickening, . . . all as quiet and peaceful as a daisied field in June, without the slightest visible presage of the continuous series of minute secular changes that were gradually to transform a carboniferous world into what was by and by to be a Jurassic world, and that

again into what was after a while to be an Eocene world, — and so on, until the aspect of the world that we know to-day should noiselessly steal upon us."[1]

These conclusions of Sir Charles Lyell exerted an enormous influence upon men's habits of thought. The orderly ongoing of nature, the quiet working out of an advancing progress by the familiar forces ever operative, led naturally to a dynamical rather than a statical conception of the physical world.

In the course of our brief review of the history of astronomy allusion has been made to celestial chemistry and the marvellous results attained by spectrum analysis. These achievements would have been impossible without the previous development of the science of Chemistry. This science may be said to have been born and reared in the nineteenth century. It may be positively asserted that the ancients — the Egyptians, the Greeks, and the Romans — never made the smallest contribution to the science of Chemistry. Indeed, what could be expected of an age when its greatest thinker and scientist, Aristotle, did not hesitate to say that a vessel filled with ashes will hold as much water as if empty? When Priestley

[1] John Fiske, "A Century of Science," p. 12.

discovered oxygen, in 1774, there was no science of Chemistry, and men of that day did not know what took place when a log of wood was burned on the hearth. Stahl, a contemporary of Newton, invented, or rather imagined, the doctrine of phlogiston to account for combustion. This doctrine supposed that all combustible substances contained a common element — a preprinciple — called phlogiston, which escapes in burning. This fire principle was regarded as having no weight, so as to avoid the conclusion following upon the discovery of the fact that there was no loss of weight in the process of combustion. The discovery of oxygen, and the further study of its properties, revealed the fact that whatever may escape during combustion, oxygen is always combined with the burning substance. Then Lavoisier came with his balance and proved that when a thing burns, it unites with oxygen, and that the resulting product is equal in weight to the substance burned plus the oxygen drawn from the atmosphere. It did not take long for the awakened mind of man to step from this discovery to the verification of the truth that in all chemical changes nothing is lost, nothing is gained, and to formulate the fundamental law of the material world, the *indestructibility of matter.*

Not only has the science of Chemistry discovered the seventy or more elemental substances, invented methods of innumerable transformations and combinations, and formulated a system for the investigation of substances of inorganic nature, but it has entered the organic world and investigated the chemical processes in the living organism. Chemists have actually succeeded in building up from their elements several thousand compounds found ready-made only in the organisms of plants and animals, doing away with the idea that life-force is indispensable to the formation of these compounds. As yet, the most advanced chemists have been unable to produce protoplasm, — the physical basis of life, — but there are many daring investigators who are confident not only of producing this ultimate compound, but of bringing forth a conscious, thinking, willing, and loving being artificially in their laboratories.

Here we step over the border line of another and still newer branch of science, Biology. To many who are not too conservative this science, as set forth by its more radical students, seems to venture beyond reason in its claims as to the possible limits of its discoveries. The writer of the article on Biology in "The International

Encyclopædia" sets forth the mechanical interpretation of biological facts in the following words: "Future discovery may prove that all the facts of biology, including those of consciousness, reason, volition, and moral obligation, are, in ultimate analysis, movements of matter in accordance with the mechanical principles which hold good throughout the inorganic universe." Although this young science has made remarkable progress in discovery and has already reaped a large harvest of facts, these claims sound like the groundless vauntings of youth or the baseless expectations of young manhood.

It seems as if the actual discovery of spontaneous generation were now imminent. From various laboratories has come the declaration of reputable chemists and men of science that the discovery has indeed been made. It is now reported that Professor Burke, who for the past six years has been conducting experiments in the Cavendish laboratory at Cambridge University, has, by putting together in a test tube radium and sterilized bouillon, produced cultures presenting many appearances of vitality, such as growth and subdivision. This discovery has caused much alarm and concern on the part of the believers in special

creations, who also believe that every new life is fresh from the hands of *G*od. Those, too, who have felt themselves compelled to give a general assent to the doctrine of evolution, have thought to find place for divine interposition, if nowhere else, at least at the impassable chasm between the organic and the inorganic. This being successfully bridged, *G*od is excluded from the whole process of physical development, which seems, therefore, to go on its way automatically, and to be self-explanatory. If the physical world be the eternal and infinite universe, then is there no place for God. On the generally accepted hypothesis of a *deus ex machina*, or even that of an immanent Deity, there can be no ground for a theist to stand upon if life can be chemically or mechanically produced. We cannot admit the unbroken continuity of the physical process and still allow place for the divine agency. If the entire process is accounted for in terms of physical energy, then is there no need of a Creator or Sustainer of the world. Nevertheless, if all this and more were scientifically established, — if the rational and willing being should come to be manufactured to order without waiting for the slow and painful processes of nature, — the hypothesis set forth

in the following pages would not be unfavorably affected.

Suppose the chemist shall succeed in producing protoplasm, and further suppose, upon being chemically produced, it should immediately spring into life, that would not prove life to be the product of the chemical process. In order to establish such a conclusion, it would be necessary to find the equivalence of the life force in mechanical terms. When, a generation ago, leading men of science were endeavoring to establish the spontaneous generation of life, the most careful observations and experiments were made. The liquid in which these new germs were expected to manifest themselves was boiled, so as to destroy all existing life, and the same was hermetically sealed, so as to prevent any other germs from the atmosphere coming into it. Under these conditions life did not appear. It was thereupon concluded that life can come only from life. So if, as we have supposed above, the physical basis of life should be artificially produced with all the essential chemical properties, and life should be manifested therein, then it would be required of our biologist to show that there is no force in the universe, other than that he is able to investigate, which

always manifests itself under such conditions. Living protoplasm and dead protoplasm, if not essentially different, differ wholly in function and properties. The one has powers of natural growth and development; the other is in a state of disintegration.

All the processes of the living organism, so far as they can be investigated by scientific methods and appliances, are physical or chemical. But the ultimate forces and essential conditions are beyond the sphere of scientific investigation. Science can discover the law and develop the mathematical formulæ of the force of gravitation, but what gravitation is, and how one body attracts another body at a distance, science has no well grounded hope of ever finding out. With all the wonderful discoveries of Chemistry peering into the most mysterious secrets of nature's penetralia, that science now confesses utter ignorance concerning affinity, the force that holds in combination the constituent elements of chemical compounds and causes the reactions taking place between material substances. The imagination has had its part in offering explanations, if not solutions, of this problem. Borelli and Lemery, followed by thousands less distinguished, imagined that the

atoms or ultimate particles of matter were supplied with minute hooks, the shape of which determined the capacity of a particle for combining with other particles. Bergman, Bertollet, and others thought chemical affinity might be identical with the energy of gravitation. Berzelius, who played so large a part in the early development of the science of Chemistry, than whose name there is none more distinguished on the roll of honor of that science, sought to explain all chemical phenomena on the hypothesis that chemical combination was caused by the mutual attraction of electrically different substances. All these hypotheses, however, do not go any further toward an explanation of the transformations and combinations of substances than did the ancient idea that different atoms combined, or substances were transformed, because of the love or hate they felt for each other. This long ago rejected product of man's youthful imagination seems to be adopted and employed by Haeckel in his last successful appeal for popular favor, "The Riddle of the Universe."

So stand all the subordinate branches of Biology — zoölogy, embryology, and physiology — toward the question of what life is; and the ineffectual efforts to show vitality to be a form of physical

energy by its transformation into some mechanical equivalent capable of being expressed in foot-pounds, ought to warn such scientists against the waste of most valuable time and effort in seeking that which by their methods must ever remain undiscoverable. Other biologists ignore or deny the existence of any such agency or energy. More reason, certainly, would the chemist have to deny chemical affinity, or the physicist to deny the force of gravitation. Treat it as we may, there is a vast and inexplicable difference between the organic world and the inorganic, between that which is living and that which is not alive.

The physicist, too, in his present diligent search into the structure of matter, going down into the deepest region of speculation, expresses no hope of discovering the ultimate explanation. Professor Lodge, in "Modern Views on Matter,"[1] which may be regarded as the latest authoritative declaration of the most recent findings of science in this field, says:

"This, when established, will be a unification of matter such as has throughout the ages been sought; it goes further than had been hoped, for the substratum

[1] Sir Oliver Lodge, "Modern Views," p. 13.

is not an unknown and hypothetical protyle, but the familiar electrical charge. Nevertheless, of course, this is no ultimate explanation. The questions remain, What, then, is an electric charge? What is the internal structure and constitution of an electron? Wherein lies the difference between positive and negative electricity? and What is their relation to the ether of space?"

These are all legitimate questions, the answer to which may be discovered in the future, but beyond is the impenetrable mystery, What is electricity?

One marked and suggestive characteristic of all the most recent and most promising investigations into the nature of the ultimate atom is the tendeney toward reducing all material existence to a dynamic origin. From the vortex ring of Helmholz and Thomson to the hypothesis stated in Sir Oliver Lodge's lecture from which we have just quoted, a *material* basis of the atom is more and more discredited. The time seems not far distant when Haeckel's hope of reducing his double law of substance to a unity will be realized, but not in accordance with his expectation. He would unify the law by making a compound statement of it as the "Law of the persistence of matter and force"; but the empirical results now point to reducing matter to an expression of force.

"It becomes a reasonable hypothesis to surmise that the whole of the atom may be built up of positive and negative electrons interleaved together, and *of nothing else*. . . . It is possible, but to me very unlikely, that the electron, as we know it, contains a material nucleus in addition to its charge, so in that case it need not be so concentrated because a portion of its mass would be otherwise accounted for. I say 'accounted for,' but it would be rather true to say unaccounted for; for the mass which is explicable electrically is to a considerable extent understood, but the mass which is merely material (whatever that may mean) is not understood at all. We know more about electricity than about matter; and the way in which electrical inertia is accounted for electromagnetically and localized in the ether immediately surrounding the nucleus of charge, is comparatively clear and distinct. There may possibly be two different kinds of inertia which exactly simulate each other, the one material and the other electrical; and those who hold this as a reasonable possibility are careful to speak of electrons as 'corpuscles,' meaning charged particles of matter of extremely small size, much smaller than an atom, consisting of a definite electric charge and an unknown material nucleus, which nucleus, as they recognize, but have not yet finally proved, may quite possibly be zero." [1]

Further unification of the origin or source of the energy, as well as the material of the physical process, is promised us by the researches of Larmour, Rutherford, and others. It is becoming more and

[1] Lodge, "Modern Views," p. 13.

more probable that there is no other source of light or any other form of radiation possible, except the change in the motion of electrons. "It is known," says Lodge, "that the violent acceleration or retardation of electrons when they encounter an obstacle is responsible for the excitation of Röntgen rays. All light and all the Hertz waves or pulses employed in wireless telegraphy are due to electric acceleration; and the greater the rate of change of velocity, the more violent is the radiation emitted." We seem thus to be getting back to the beginning of things.

Another wonder meets us as we follow the guidance of certain of these most successful investigators. The quest of the alchemists of the Middle Ages was the process by which one form of matter could be changed into another. In the laboratories of Professor Rutherford and of Mr. Soddy these transmutations have been observed by these careful experimenters. In radioactivity the radioactive substance throws off atoms of matter, leaving behind in its pores another substance, which has been examined even more completely than the projected portion. This remaining substance is volatile, it slowly diffuses away and behaves like a gas. Many other qualities have

been discovered. It is also radioactive, throwing away part of itself and leaving yet another residuum, itself radioactive. One of these residues thus left seems to cast off electrons simply instead of atoms of matter. All radioactive substances are not to be supposed to act precisely alike. The emanation from one may lose its activity rapidly and give rise to another substance retaining its power for some time. That thrown off by another element may last some time and generate a substance whose activity rapidly decays.

"The transmutation of elements vaguely deducible by skilful observers from spectroscopic details of solar and stellar appearances, the evolution of matter likewise caught sight of by chemists of genius, these were speculations but yesterday; now, in radioactive matter the process is seen to be going on before our very eyes." Through these daring, yet warranted, investigations into the ultimate structure of matter, we are brought to an atom which exists without a material basis, showing us matter as ultimately a manifestation of energy. When we shall have reached this discovery, we shall have arrived at the outermost boundaries of the physical process and the limits of possible physical investigation.

Another branch of the science of Biology — Histology, or the science of cells — has opened to us a most interesting and fruitful field of research. In 1802, Bichat, a French physician, attempted to determine, with the aid of the microscope, the ultimate constituents of the tissues and organs of the body, but without any valuable results. It remained for Matthias Schleiden to discover that the common element in all the tissues of vegetable organisms is the cell; and very soon thereafter Theodor Schwann proved the same to be true of all animal tissues, thus establishing the ultimate basis of all living organisms. "Kölliker and Virchow," to adopt the language of Haeckel, "proved that, in man and in all other animals, every tissue is made up of the same microscopic particles, the cells; and these elementary organisms are the real self-active citizens which, in combinations of millions, constitute the cellular state, our body." Then we come upon another unifying principle, as follows: all these cells spring, by a process of subdivision, from one simple cell, the impregnated ovum. Not only when we trace the course of the life-history of an individual organism back to its beginning in the impregnated ovum do we come finally to a

primitive cell, but when we follow the process of development of the human organism from the primordial germ, the moneron, we start with the ultimate organism from which all forms of life on earth may be said to spring. This simple cytod, the whole body of which consists of soft, structureless plasson, is more elemental than any cell in any higher organism, for it does not so much as possess even a nucleus, which belongs to every true cell, and is therefore absolutely without organs. Yet this primitive globule of protoplasm is, in a sense, an organized intelligence. Dr. *G*ates, a recognized authority in histology, says: "Unicellular organisms possess all the different forms of activity to be found in the higher animals." Binet, an eminent biologist, who has made a most exhaustive study of the psychic life of micro-organisms, remarks that the complexity of the psychic life of these ultimate living units is shown by the power of selection exercised either in the search for food, or in the manœuvres attending conjugation. "The act of selection," he further says, "is a capital phenomenon." As Romanes has, indeed, observed, "the power of choice may be regarded as the criterion of psychical faculties." These primitive forms of life

manifest in the simplest way the phenomena of the psychic life of higher organisms — even of man.

Romanes, in his great work, "Mental Evolution in Animals," distinguishes clearly between reflex action and instinctive action. The former, he explains, is non-mental, neuro-muscular adaptation to appropriate stimuli; but instinctive action is something more than this, there is in it the element of mind. Curious evidences of mental operation are observed in the conduct of *Difflugia Ampulla*, which inhabits a shell formed of particles of sand. This little rhizopod emits long pseudopodia, which search at the bottom of the water for the materials necessary to construct a new case for the filial organism to which it gives birth by division. The pseudo-pod, having touched a grain of sand, is seen to draw the particle into the body of the tiny animal. Verworn, whose recent investigations have greatly illuminated this most interesting subject, in making certain experiments, placed about the animal small fragments of colored glass instead of sand, and soon noticed a heap of these fragments on the bottom of the shell. He then observed a globule of protoplasm issue from the shell. This was the offspring. Thereupon

the bits of glass were ejected from the shell and enveloped the body of the new individual in a sheath similar to that encasing the mother. These bits of glass, held loosely together at first, are soon firmly cemented by a substance secreted by the body of the parent.

Binet, commenting upon this experiment, makes certain very important observations. He says:

"Two facts are to be remarked in this experiment; first the act whereby the difflugia collects the materials for providing the young individual with a case is an act of preadaptation to an end not present, but remote. This act, therefore, has all the marks of an instinct. Further, the instinct of these little beings exhibits exact precision; for they not only know how to distinguish, at the bottom of the water, the materials available for their purpose, but they in every instance take only the quantity of material necessary to enable the young individuals to acquire each a well-built case; there is never an excess. It is interesting to note that this elemental primitive creature does not act differently from animals possessing more highly complicated organizations, and endowed with differentiated nervous systems, as for instance, the larvæ of Phryganids, which form their sheath from shells, grains of sand, or minute slivers."

Mind is manifest, as we see, from the very dawn of animal life, and everywhere exhibits the very same marks and characteristics. Life and

intelligence in some degree are invariable concomitants in this material world, just as every beam of sunlight, when analyzed by the spectroscope, is seen to be composed of the actinic, as well as of the light and heat rays. The ever-increasing manifestation of intelligence through instinct to reason, self-consciousness, and sporadic instances of genius, has always been concomitant with the evolution of the organism, the more complex and highly developed mental organism exhibiting the higher powers of intellect. So Romanes, and after him countless investigators of less distinction and genius, have held that "if the doctrine of organic evolution is accepted, it carries with it, as a necessary corollary, the doctrine of mental evolution, at all events as far as the brute creation is concerned."

There seems to be some confusion of thought in this statement, and an unwarranted extension of inference from the verified facts of science. All that can be said in the name and under the warrant of science is that there has been an evolution of the material organ of mind, and that through this more and more complex and developed organ there have been manifested higher and higher forms of mental activity. There is no evidence whatever of an evolution of *mind*. We have no

scientific method by which we can determine more or less of mentality in a scientific sense. The fact of evidence of higher manifestations of mind does not prove that these higher manifestations are not altogether accounted for by the complexity in structure and constitution of the physical organ of mind — the brain.

We have seen that that which distinguishes instinct from mere reflex action is mentality. This mentality is not physically accounted for. It cannot be investigated by scientific appliances and methods. It is not transformable into any form of physical energy. It eludes all attempts to discover its modes of activity. We know experimentally nothing at all about it. This being true, how can we say there has been an evolution of mind concomitant with that of the physical organism? *G*iven an intelligent or psychical universe, the forms of whose energy are crowding to manifest themselves in what we call the material world, then, whenever and wherever the organic evolution brings forth the sufficiently complex organism, the higher and higher forms of mind activity are observed.

We are informed — and the statement is based upon the authority of Darwin and Romanes — that

both primary and secondary instincts are hereditable. But even supported by such authority and that of almost every great biologist, we humbly, but most positively, decline to accept it as true. There is not the slightest evidence, of a scientific character, of any inheritance transmitted from parent to offspring, except that which is physical. The fact that the instinctive intelligence of the *moneron* is identical in nature with that of man does not so much as raise a presumption that the mind of man is an evolution from the rudimentary intelligence of the primordial germ. All that can be proved is the development of the higher organism from the primal and unorganized globule of protoplasm. There are but two possible interpretations of the facts of evolution as science warrants them to us. First: The increasing intelligence, being concurrent and coincident with the growth and development of the organ of mind, is the essential product of the organism. This theory has been accepted by materialists; but it is, at least, unscientific, for it asserts that a material organ, whose processes can all be experimentally accounted for, can bring forth an immaterial product altogether inscrutable and beyond the reach of our methods of investigation. The second

supposition is, that cosmic forces of a higher order than those of the physical process manifest their activities whenever the degree of development of the organism is reached at which these activities can utter themselves. These forces of the unseen universe, ever pressing forward to manifest their activities in the material world, can find expression only under certain appropriate and adequate physical conditions. The sunbeam, as we have seen, is composed of the heat, light, and actinic rays. The heat wave, striking the body, produces the sensation of heat; the light wave, beating upon the sensitive organ of sight, produces vision; but we possess no organ of sense capable of responding to the subtle touch of the chemical wave. In the green leaf of the tree this imperceptible ray decomposes the carbonic acid of the atmosphere and supplies nourishment to the vegetable world.

Further to illustrate from the familiar phenomena of the material world. The dynamo in rapid motion in the power-house, as we say, generates electricity. This electricity is conducted along wires until at length a part of the current, being arrested in its course, is transformed into light. Or, again, traversing the wire, the current passes into a motor and is transformed into motion and

motive power. This current would forever exist unknown and unobserved, unless conditions favorable to its manifestation were created. Nature, indeed, is but the manifestation under favorable conditions of the invisible forces of the universe. The germination of the seed furnishes another apt illustration of the theory we are supporting. The life principle, if such exists, cannot be supposed to be imprisoned in the undeveloped seed, and, under certain favoring conditions of moisture and temperature, to liberate itself and pass through innumerable metamorphoses of being. If the seed by any means has lost its vitality, then moisture and heat will but hasten its decay and disintegration. That which, as we say, has destroyed the life of the grain of wheat has, in truth, only unfavorably affected the organism, so that the unseen energy we call life cannot manifest itself therein. This is a more reasonable hypothesis. All the phenomena are accounted for within the physical process, so far as science enables us to study them.

In recent years attempts, not encouragingly successful, have been made to reduce psychology to a science, and to study the phenomena of the soul in accordance with scientific methods. Professor James introduces his treatise on psychology

with the statement that the subject is to be treated as a natural science. After traversing the whole range of experimental psychology, he concludes with these significant words:

"When, then, we talk of psychology as a natural science, we must not assume that that means a kind of psychology that stands at last on solid ground. It means just the reverse; it means a psychology particularly fragile, and into which the waters of metaphysics leak at every joint, a psychology all of whose elementary assumptions and data must be considered in wider connections and translated into other terms. It is, in short, a phrase of diffidence and not of arrogance; and it is indeed strange to hear people talk triumphantly of the 'New Psychology,' and write histories of psychology, when into the real elements and forces which the word covers not the first glimpse of clear insight exists. . . . This is no science, it is only the hope of a science. The matter of a science is with us." [1]

This confession of failure to construct a science of psychology, as embracing and accounting for all the facts of psychological experience, ought to satisfy us that, in striving to make psychology a branch of natural science, we are attempting to employ methods of observation wholly inapt and inadequate to the matter to be investigated. It is like striving to see with the ears, or to hear with

[1] Professor James, "Psychology," pp. 467 and 468.

the sense of touch. Of course, that which the so-called science of psychology does find itself competent to treat of is already covered by the pure sciences of Physiology, Chemistry, and Physics. When the psychologist comes to talk about *states of consciousness*, "*me*" and "*I*" or *thoughts* without a *thinker*, or the *knower* to whom the knowledge belongs, scientifically considered, he merely talks in a jargon without any meaning.

Professor James further asserts: "Whenever I try to become sensible of my thinking activity as such, what I catch is some bodily fact, an impression coming from my brow or head or throat or nose." In spite of the common-sense of mankind, every careful observer must reach this same conclusion, and thus admit that all we know of such phenomena as objects of sense perception (which phenomena, as such, are alone capable of scientific investigation) are the bodily facts, the physical, chemical, and neurological activities. The diagrams which are produced by the experimental apparatus in psychological laboratories, reveal three lines, we are informed. One is set down as due to respiration; the second as due to blood circulation; the third remains uninterpreted, but is certainly due to nerve activities, about which, as yet,

we have gained very little positive information. There is in these diagrams no suggestion of any other than physical activities, and we are driven to accept one of two conclusions: Either there is in psychological phenomena, nothing beyond or besides the physical element or activity, or the real facts of psychology are postulates beyond the limits of scientific investigation.

To conclude this chapter with the words of Professor James:

"It seems as if consciousness, as an inner activity, were rather a postulate than a sensibly given fact, the postulate, namely, of a knower as correlative to all this known. . . . The present psychology is in the condition of physics before Galileo and the laws of motion; of chemistry before Lavoisier and the notion that mass is preserved in all reactions. The Galileo and the Lavoisier of psychology will be famous men indeed when they come, as come they some day surely will, or past successes are no index to the future. When they do come, however, the necessities of the case will make them *metaphysical*. Meanwhile, the best way in which we can facilitate their advent is to understand how great is the darkness in which we grope, and never to forget that the natural science assumptions with which we started are provisional and revisable things."

CHAPTER II

THE PHYSICAL PROCESS

Matter and Motion perceivable only by our Organs of Sense — All Physical Phenomena due to an Unseen Force, which is not Physical — The Causal Relation of Thought to Physical Changes in the Brain — The Partition between the Known and the Unknown due to the Limitation of our Sensible Knowledge — The Virtual Identity of Heat, Light, Electricity, and Chemical Action — The Dynamical Nature of the Atom — The Nature of Ether — A New Conception of the Atom derived from Investigation of Radio-active Substances — Formation of the Molecule — The Transitoriness of the Physical Universe — Three Stages in the Development of the Organic World — Man as more than a Corporeal Being.

Can there not be in the universe a multitude of things which matter, as we know it, is incompetent to express? Is it not the complaint of every genius that his material is intractable, that it is difficult to coerce matter as he knows it into the service of mind as he is conscious of it, and that his conceptions transcend his powers of expression? — SIR OLIVER LODGE.

This little plot of physical universe which is now our temporary home has become amenable to truly spiritual control. — LODGE.

The reconciliation between opposing views (Free Will and Determinism) lies in realizing that the universe of which we have a kind of knowledge is but a portion or an aspect of the whole. — LODGE.

CHAPTER II

THE PHYSICAL PROCESS

THE term "physical world" is used by many in our day as identical in meaning with the term "universe." To such there seems to exist nothing that is not material or physical. It is true that we know nothing of phenomena except as manifestations of the activities of material things, or as coming to our experience through the action of a material organism. The energy of the physical world becomes known to us through the conduct of matter under its influence, and the phenomena of life, of consciousness, and of mental effort are associated in all our experience with material organs — the body and the brain.

Exclusive consideration of these facts has been fruitful, in more recent years, of denials of the possibility of any existence or activity whatever, except under purely physical conditions. The unconditional assertion of such a negative would,

however, be presumptuous in the extreme, inasmuch as it would imply that there is no other possible mode of being than that with which our own sensible experience acquaints us.

In the physical world unseen forces make themselves manifest in the conduct of matter. Through our senses we have knowledge of this world as phenomenal only. That which lies back of these manifestations is not the object of sense perception. What we call matter is perceived by us only as it acts or reacts upon our organs of sense.

The forms of energy — heat, light, electricity, and actinism — are modes of motion. Heat and light, as they affect us, are the striking force of the undulations of ether. As these forms of energy are so many modes of motion, there must be in each case something material that moves. The force is not the thing moving, but the power by which it moves. Through the teachings of physical science we are able to resolve the phenomena of motion into two categories, which we may call the dynamical and the material. The former is the force or power to which motion is due, the latter the material condition under which it is manifested.

Force is conceivable as active even apart from

material conditions, but cannot manifest itself to our senses except as it produces motion of some portion of matter. In common speech we certainly attach to the word "cause" the idea of power, and it is one of the recognized duties of science to give some answer to the question, "What is the power that originates and continues the motion of wave or corpuscle?" It is admitted that matter of itself cannot initiate or suspend motion. A current of electricity, for instance, may be the result of the decomposition of water by zinc in sulphuric acid, but the power by which the decomposition takes place is not an attribute or property of the acid or of the metal, but a power acting under such conditions. In like manner, if we inquire into the cause of the germination of a grain of wheat, we discover the physical conditions to be heat, oxygen, and moisture, but none of these, nor all of them, could bring about this result unless there were present the organized protoplasm capable of manifesting life.

Every physical result or mechanical activity can be traced, through a more or less extended series of cause and effect, back to a cause not accounted for as an effect of any physical cause. I enter a cotton factory. I observe a spinning machine in

operation. I trace the power by which it is made to perform its complicated movements through the mechanism and the machinery back to the expansive power of steam in the engine. The steam is communicated to the engine from the boiler where it is generated. This generation is due to a force tending to cause the separation of the particles of water in the boiler. Heat is the force, and the heat in this instance is due to the combustion of coal in the furnace. This combustion is the forcible union of carbon and oxygen. Here we pause. We cannot account for the so-called affinity which is the power tending, under certain known conditions, to bring these two elements into combination. We discover no physical cause of chemical affinity. This must be the ultimate term in the physical series.

Let us take another series for illustration. I see the hands of a great clock in a church tower moving slowly on its face. I trace the power causing this motion through the complicated contrivance back to the wound-up weight. The energy manifested in this effect is due to the elevation of the weight. In order that energy may be so stored up as to be gradually used in producing this continuous motion, a man is employed to wind the clock at certain times. This man does a definite

amount of work in thus storing up energy in the weight. The work performed by him is an expenditure of energy which is not a part or product of his body, but is derived from the food he eats. The animal organism cannot create energy, nor can it produce that combination of elements called protoplasm, the physical basis of life. In the vegetable kingdom is produced protoplasm, and the energy expended in the effort of winding up the clock was, in the last instance, derived from the vegetable organism, which is, in fact, the laboratory of animal food. Here in this laboratory we discover certain physical elements of which protoplasm is composed, and certain physical conditions under which the combination of these elements takes place. The actual power by which protoplasm is formed is beyond the sphere of our investigation, outside this physical process.

Let us take still another series. Rays of light reflected from an external object fall upon the retina of my eye and form there a picture of a table. A certain physical effect produced upon this network of nerves is carried along the optic nerve to the brain. In the brain chemical and physical changes take place. Thus far we follow along the track of physical phenomena. But when

we reach the act of perception whereby we are made conscious of the sensation, we are confronted by a phenomenon which cannot be said to belong to the physical series.

Again, I thrust forth my hand to strike an object. This thrust is due to the action of certain muscles, which action resulted from the transmission of nerve force from the brain. Back of this series of activities remains the act of will, which we regard as the initial power of the sequence; and which lies outside the region of scientific investigation.

In the several series of activities traced by us, we have followed the conduct of matter under the exertion of force, proceeding from effect to cause, never resting so long as we could conceive a physical antecedent. The fact that the mind ever works upward from effect to cause, regarding the cause of each effect as the effect of a preceding cause, shows its assent to the law of causality. In tracing this sequence we do not regard any cause within the physical series as the ultimate term from which is derived the energy of the series. The mind feels an intellectual necessity to think back all changes into sufficient causes of which they are the issues; and each set of antecedent

phenomena into which we refund new phenomena, themselves occasion a fresh intellectual demand for a preceding cause, and still the mind is left unsatisfied until it rests in a truly originative or unconditioned cause. If this intellectual need for a cause of phenomena were withdrawn, there would be no rationality in, and therefore no reasoning possible about, the physical process. This limited physical process does not offer us any satisfactory explanation of its own existence, and therefore we are forced to explain it by something above and beyond what we call the material world. It is clearly evident that beyond the sequence of cause and effect which we are able to account for within the physical process, human reason demands an efficient power, not of this same order, transcending the sphere of our investigation.

The story of Sir Isaac Newton and the falling apple affords another good illustration of the matter we are considering. Sir Isaac had seen many an apple fall before that particular one attracted his attention. On that occasion the result was marvellous. Rays of light from the descending object fall upon the eye of the philosopher, throwing upon the retina a picture of an apple at each successive point of its descent. We are able

to trace this physical experience. Some physical effect produced upon this network of nerves in the back part of the organ of vision is carried along the optic nerve to the brain. In the brain certain physical and chemical changes take place. At the same time there is the conscious perception of an external object in motion. This last term does not belong to the physical series, for we cannot here discover any transformation of physical energy. Throughout that series we can trace and account for every transformation of energy.

With the conscious perception of the falling apple began another series of activities of an altogether different nature. The mind of the great mathematician had been started upon a train of thought, and proceeded to develop a difficult and complicated mathematical calculation, resulting in the discovery and enunciation of the law of gravitation. This latter psychical series, leading up to the greatest achievement of the human mind, has no physical characteristics. In it we find no trace of the transformation of physical energy. However, along with this train of reasoning there runs a series of physical changes. These concomitant physical phenomena consist of certain vibrations of brain molecules, certain oxidations with formation

of carbonic acid, water, and urea. This process we are able to investigate scientifically. It is not at all conceivable that the act of perception of the falling apple, or rather the physical process resulting in the conscious perception, could have been the initial cause of these chemical and physical activities and changes in the organ of thought, the brain, which attended the reasoning process that at length resulted in the formulation of the grand law of gravitation. We must accept the fact, inscrutable though it be, that there exists a causal relation between the concurrent processes of thought and of the physical changes in the brain. The falling apple offered the occasion for the train of mental activities, but the latter activities caused the concurrent physical changes. In this way may we positively establish the fact that physical phenomena of an altogether different order are *caused* by psychical agency or activities. So we may conclude that, though in every series of cause and effect which we are able to trace within the physical process we reach a point where our powers of investigation cease to avail us, there is in reality no actual break in the continuity of the causal process. The break is not in the series, but at the limit of our sensible knowledge.

Sir Oliver Lodge declares: "We occasionally ignore the fact that there must be a subjective partition in the universe, separating the region of which we have some inkling of knowledge from the region of which we have absolutely none." Indeed, this demanded partition is provided in the very limitation of our sensible knowledge. What we call the physical world or process is that region of the universe in which sensible experience is possible. Sensible experience is determined by the coördination of the environment with the powers and capacities of the physical organism. That region within which certain forms of cosmic energy so act, react, and coöperate as to render the resulting phenomena capable of sensible apprehension by beings physically constituted as we are, is, to such beings, their world of possible experience, — is, indeed, their only world.

The world of our sensible experience, then, is not really partitioned off from the rest of the cosmos. There are no subjective barriers or enclosing impenetrable boundaries through which the energy of the physical process may not possibly escape. Neither are there certain furtive influences or manifestations of psychical energy from the unseen, which transgress these

imagined boundaries and trespass on our side thereof. It is quite a different case. We, inhabiting these physical organisms, are in the very midst of all the infinite forms of cosmic energy, but without sensible knowledge of any of these incessant activities, save those only which are capable of affecting one or more of the bodily senses — those avenues through which all our knowledge of our physical environment comes to us.

This present world is, then, but the phenomenal representation of some of the forces of a higher world-order. These phenomenal representations depend for their clearness and adequacy upon the plasticity or power of the material world or organism to give expression to forces of a higher-world order.

In this physical system the more subtle media give effect to subtler forces. Thus, through the grosser medium of the air sound is propagated, and through the subtler ether are produced the effects, heat, light, electricity, and chemical action. Now, of all these forces science has found a bond of closest relationship. Each of these forms of energy is capable of being transformed into the others without appreciable loss. Heat can be

transformed into motion, so motion can be transformed into heat and light and electrical energy. In fact, it appears that there is no real distinction of forces into various kinds. The apparent distinction depends rather upon the media or conditions of their manifestations than upon anything in their essential nature. All the forces of the physical process are correlated and of like origin. There is some unifying principle behind all the varying manifestations of force in the material world.

Every physical phenomenon reveals both matter and force. We cannot know matter except as active. We cannot know force except as it produces material activity. We cannot conceive of matter as existing without force; we *can* conceive of force or energy as existing without or apart from matter. Mass is supposed to be made up of molecules and atoms. The atom which can at all fulfil the conditions of the problem as at present stated must be dynamical. The vortex atom of Helmholtz and Thomson is such an atom. Professor Clifford tells us clearly what this vortex-motion is:

"Imagine a ring of India-rubber, made by joining together the ends of a cylindrical piece, to be put onto

a round stick, which it will just fit with a little stretching. Let the stick now be drawn through the ring while the latter is kept in its place by being pulled the other way on the outside. The India-rubber has, then, what is called vortex motion. Before the ends were joined together, while it was straight, it might have been made to turn around, without changing positions, by rolling it between the hands. Just the same motion of rotation it has on the stick, only that the ends are now joined together. All the inside surface of the ring is going one way, namely, the way the stick is pulled, and all the outside is going the other way."

Such vortex rings may often be seen projected in smoke from the funnel of a locomotive. They rise in the air, every particle having a motion of its own with reference to the centre of the ring, and sail away, preserving for a long while their separate motions and identity. In these instances the vortex motion owes its origin to friction.

The atoms of which all mass is composed originate in the ether, which is hypothetically a perfect, incompressible, frictionless fluid. Helmholtz proved, among other things, that this vortex-motion could not originate in a frictionless fluid, but that if such motion were once started under such conditions, it could not be diminished by any mechanical or physical force in the present world-order, but must go on so long as such fluid exists.

We are compelled to believe in the beginning of the vortex-atoms, but cannot assign their origin to any force or power within the present physical process.

But what are we required to believe regarding this ether which is conceived to fill all space, and interpenetrate all material bodies occupying the interstices among atoms? The hypothesis, as we have before said, is of a perfect, incompressible, frictionless fluid, which, to meet all the conditions of the problem, must be supposed to possess the most strangely contradictory properties. This fluid, Professor Jevons observes, might be regarded as an infinitely solid adamant. Sir John Herschel calculates the amount of force exerted at any point in space in the propulsion of waves of light, and finds it to be more than one trillion times the elastic force of ordinary air at the earth's surface, so that on this supposition the pressure of ether upon one square inch of surface must be about seventeen trillion pounds. Notwithstanding this, we are to believe that the resistance offered to the motions of the planets and other heavenly bodies is inappreciable. Professor Jevons adds: "All our ordinary notions must be laid aside in contemplating such an hypothesis; yet it is no more than

the observed phenomena of light and heat force us to accept."

The ether, we now see, is very unlike ordinary matter as known to us. It may be regarded in some respects as a liquid, in others it manifests the properties of a solid. It is both hard as adamant and at the same time perfectly elastic. It is sensitive to every slightest impulse, and a disturbance anywhere causes a tremor felt on the surface of countless worlds. Why do we accept the existence of this mode of material existence, the characteristics of which are so contradictory to those of ordinary matter as our experience reveals them to us? Because the undulatory theory of light and heat compels us to admit the existence of such a substance.

Certainly the discovery of the ether has enlarged our experience and demands a new definition of matter. The ether is a *kind of matter* and not something other than matter. As well might we say that a quantity of gas is not matter because its properties are not identical with those of a solid body. "The supposition that the ether may be something essentially different from matter is contradicted by all the terms that are used in describing it." The ether, then, may be regarded as the primitive state of matter.

How, then, are we to conceive this primitive state of matter? Professor Clifford may again give us an answer:

"It has to be supposed that even where there are no material molecules, the universal fluid is full of vortex-motion, but that the vortices are smaller and more closely packed than those of ordinary matter, forming altogether a more finely grained structure."

The dynamical or kinetic atom is, as we clearly see, the unit of all matter. May not motion in the abstract, or as a mere exertion of pure force apart from any substance whatever, be the ultimate atom, and universal vortex-motion the primitive matter, or ether? The recent investigations of radioactive substances have led to a new conception of the atom as a field of action, so to speak,—"a definite space within which are moving many thousand particles negatively charged." It has been shown, too, that electricity in motion has the properties of matter so far as inertia is concerned, and perhaps in other, if not all, respects. This discovery is a long advance toward our supposition that the ultimate atom is pure force altogether apart from substance of any kind.[1]

In his article on "The Atom" in the Ninth

[1] See *ante*, p. 45, *et seq.*

Edition of the Encyclopædia Britannica, Clark Maxwell speaks of the vortex theory as being the most promising yet propounded. "The vortex ring," he says, "satisfies more of the conditions than any other atom heretofore imagined." Passing from atoms and their nature to those supposed systems of atoms termed molecules, that philosopher asserts the production of molecules once for all, and that they are not now being manufactured. As disclosed to us by means of the spectroscope, these molecules are the same whether found in the earth, or in Sirius; whether in combination with the carbon ages ago buried in the earth, or occluded in the iron of a meteorite wandering through unknown epochs in trackless space. Then he remarks:

"The process by which the molecules become distributed into distinct species is not one of which we know any instance going on at the present, or of which we have as yet been able to form any mental representation. The formation of the molecule is, therefore, an event not belonging to the order of nature under which we live. It is an operation of a kind which is not, so far as we are aware, going on in the earth or in the sun or the stars, either now or since these bodies began to be formed. It must be confined to the epoch, not of the earth or the solar system, but of the establishment of the existing order of nature; and until, not only these

worlds and systems, but the very order of nature itself is dissolved, have we any reason to expect the occurrence of an operation of a similar kind."

Here the origin of atoms and molecules is referred to an older and higher order of things. Thus, in all our thinking we are wont to refer the origin of the things that are seen to the things that do not appear.

The temporal and transient character of the physical world is taught by many eminent scientific writers. Thus Tait declares, in his "Recent Advances in Physical Science," "All portions of our science, especially that beautiful one, dissipation of energy, point unanimously to a beginning, to a state of things incapable of being derived by present laws of tangible matter and its energy from any conceivable previous arrangement." Balfour Stewart may be quoted as one of the authorities upon this point:

"It will be seen that we have regarded the universe, not as a collection of matter, but rather as an energetic agent — in fact, as a lamp. It has been well pointed out by Thomson that, looked at in this light, the universe is a system which had a beginning and must have an end, for a process of degradation cannot be eternal. If we could regard this universe as a candle not lit, then it is, perhaps, conceivable to regard it as having always

been in existence; but if we regard it rather as a candle that has been lit, we become absolutely certain that a time will come when it will cease to burn."

These two scientists, in "The Unseen Universe," reach the conclusion that "the visible universe must have had its origin in time," and with certainty, "that process will come to an end." All this is what would take place, even if we allow the indestructibility of ordinary matter. But we may, perhaps, suppose that the very material of the visible universe will ultimately vanish into the invisible.

It may be well to quote a more recent scientific authority upon the temporal character of the physical world or process. We therefore give the words of Sir Oliver Lodge in a recent lecture. After speaking of the evidence supplied by the careful study of radioactivity that the atoms themselves are liable to decay, he says:

"For practical purposes the atoms are permanent' even as the solar system appears to be permanent; yet we know that all these systems are in reality transitory, as terrestrial structures like the Pyramids, or as the mountains and the continents themselves, are transitory; of all these things it may be said that, in any given form, they have their day and cease to be.

"If we allow ourselves to speculate, we should say

that the whole of existing matter appears liable to processes of change, and, in that sense, to be a transient phenomenon. Whether the total amount of matter in the universe is constant likewise, as much disappearing at one end by resolution into electrons as is formed at the other end by their aggregating together, is at present quite unknown; and indeed it is clear that we have now become far immersed in the region of speculation. Nevertheless it is speculation not of an illegitimate character, for it is very consistent with all that we know about the rest of the material world. Astronomy tells us that the cosmic scheme, though it looks permanent, is subject to constant flux. In the sky we see solar systems and suns in process of formation by aggregation out of nebulæ; we see them rise in brilliancy, maintaining a number of planets in health and activity for a time, and then slowly become subject to decay and death. What happens after that is not certainly known; it may be by collision a nebula may be reconstructed and the process started again, though so long as there is only a force of one sign at work (gravitation only) it would seem that ultimately the regenerative process must come to an end."

There was a moment in the course of the world's development when, without commotion or revolution, without disturbance or anarchy, a certain collocation of material elements manifested for the first time the phenomena of life. Upon this point we may quote the thoughtful words of Mr. Wallace:

"We point out that there are at least three stages in the development of the organic world when some cause or power must necessarily have come into action. The first stage is the change from inorganic to organic, when the earliest vegetable cell, or the living protoplasm out of which it arose, first appeared. This is often imputed to a mere increase of complexity of chemical compounds; but increase of complexity, with consequent instability —even if we admit that it may have produced protoplasm as a chemical compound — could certainly not have produced living protoplasm, which has the power of growth and of reproduction and of that continuous organization of the whole vegetable kingdom. Here, then, we have the indications of a new power at work, which we may term 'vitality,' since it gives to certain forms of matter all those characteristics and properties which constitute life."

The second stage is that of the introduction of sensation or consciousness, the beginning of animal life. This event he regards as still more marvellous and still more completely beyond all possibility of explanation by matter, its laws and forces. Here again we draw upon the unseen world for an explanation. "No verbal explanation, such as the statement that life is the result of the molecular forces of the protoplasm; or that the whole existing organic universe, from the amœba up to man, was latent in the fire-mist out of which the solar system was developed, can afford any

mental satisfaction, or help in any way to a solution of the mystery."

The last stage is that of the advent of man, when psychical endowments came to be of more importance than any physical power.

The present physical process, then, includes all those worlds and systems of worlds known or conceivable, existing in space or any substance or fluid having physical properties, filling all extension. It embraces the earth with all its myriad forms of existence, mineral, vegetable, and animal, constituting what we call the natural kingdom.

Man as an animal is a natural being and lives in the material world; but as a loving, thinking, feeling, and willing spirit, he is supernatural and has his being in the unseen world. Man as a corporeal being is known to us through our senses. The color of his hair or eyes, the contour of his face, his bearing and general personal appearance, are the marks by which we recognize a friend through the sense of seeing. The tone of his voice conveys to our minds through the ear the knowledge of his presence. But as a personal being, as a thinking, loving, and purposing soul, he is revealed by his perceptible conduct and actions.

These are the symbols or indices of what he is; his desires, his aims and character are revealed to my conscious soul in this way. I read off, in his outward acts, those spiritual experiences which I myself have known, thus extending my knowledge beyond the things that are seen into the world of things not seen. Words, the signs of ideas, and sentences, the symbols of thought, speak to our spirits of the inner life and its experiences. The habitual expressions, and the tones with which they are wont to be uttered, portray to us the personality unseen within. Then, too, in the products of human genius which the race cherishes through the centuries, we are brought into acquaintance with the great souls long since departed from among men. Every line and column that entrances the beholder in the masterpieces of art or architecture was born of the human soul, begotten by some mighty impulse from the Unseen.

For out of thought's interior sphere
These wonders grew to upper air.

The physical process and all these subordinate processes are matters of fact; so far as science can discover, there is included in them nothing of

agency. If there is agency anywhere, it is not in the selective process, nor the evolutionary process, nor in the physical process, but behind them, antecedent to them, and independent of them.

CHAPTER III

EVOLUTION

Creation-Myths — Harmony of the Mosaic Cosmogony with the Theory of Evolution — Ancient and Modern Cosmologies — Preparations for the Establishment of the Evolution Theory — Evolution of Man from the Moneron — Coöperation of the Various Organs in Man — Psychical Evolution not Inferable from Physical Evolution — Specific Structures in the Thought-Centres of the Brain of Man not found in the Brains of Anthropoid Apes — Weismann's Theory of Heredity — No Discoverable Difference between Dead and Living Protoplasm — Haeckel's Assumptions with Regard to Psychical Phenomena.

We find that the Darwinian theory, even when carried out to its extreme logical conclusion, not only does not oppose, but lends a decided support to, a belief in the spiritual nature of man. It shows us how man's body may have been developed from that of the lower animals under the law of natural selection; but it also teaches us that we possess intellectual and moral faculties which could not have been so developed, but must have another origin, and for this origin we can find an adequate cause only in the unseen universe of Spirit. — ALFRED RUSSELL WALLACE.

CHAPTER III

EVOLUTION

"THE greatest, vastest, and most difficult of all cosmic problems," says Professor Haeckel, "is that of the origin and development of the world — the question of creation, in a word." He further tells us that evolution is the key to this all-embracing problem. Men of thought have in all time sought to find out the beginnings of things. Whence came this world in which we live? By what means and methods has it become what it is now? From the very earliest periods of which we have any record of men's thoughts we find an almost universal belief in creation. This belief has come down to us in thousands of cosmogonies, world-myths, and poems — creations of the imagination in the childhood of the race. All these creation-myths referred the creation to supernatural power. God, or the gods, brought all things into being in the beginning. In almost all these theories of the origin of things

the Creator is supposed to have made all things as a great artificer or architect. He follows a definite plan and makes a world as a skilful mechanic would build a house. However, the creation-myths generally represent the marvellous power and wisdom of the Creator as displayed in the fact that he makes all things out of nothing.

Among the primeval cosmogonies, those of the Semitic races — the Phœnicians, Babylonians, and the Hebrews, as set forth in the first chapter of *G*enesis — are alone worthy of any particular consideration. In all these the universe is represented as existing in chaos and darkness before the creation of the world as known to us. The earth is without form, and void. Darkness hides the abysm of chaos, and only the breath or spirit of *G*od broods with fecundating power over the broad expanse of the watery deep. The Phœnician form of this myth may be thus briefly given: At the beginning of things nothing existed but limitless chaos and spirit. Then entered Desire, born of the spirit and love. Another child or product of this union was *Mot*, the impregnated watery abyss out of which sprang all the seeds of creation. The sun, the moon, and the stars also came forth from the water, and were

endowed with intelligence and set in the heavens as the watchers and guardians of the world. Soon air and land and sea were heated by the sun, and winds arose and clouds. Then followed violent storms of wind and rain and thunder. By these thunder storms animated shapes, male and female, began to stir in sea and on the land.

The Babylonian myth is less poetic and more supernatural. It starts with the same primal abyss of darkness and water. Out of this abyss are generated men of all sorts of grotesque shapes, and gods innumerable. Every student of these ancient creation-myths must be far more impressed with the broad contrast in their details as compared with the Hebrew form, in *G*enesis, than by the general agreement. In *G*enesis there is offered no genealogy of *G*od. In His sublime majesty He exists before all things, and by the word of His mouth He calls all things into being. At His presence the darkness disappears, and light springs forth. At His word the earth brings forth the grass and the green herb. The rising continents are covered with vegetation. At His command the waters give birth to the fishes and creeping things and fowls of the air. There is here nothing of the architect, the artificer, or the engineer. It

is not fanciful to interpret in terms of evolution this beautiful account, which, in the order of its days of development, is wonderfully in accord with the geological periods of modern science. There is here no attempt to represent in grotesque forms the mighty forces which, obedient to the divine command, bring forth and develop all forms of life upon the face of the earth.

It must be admitted that none of these cosmogonies gives us an account of the origin of the universe. There is in existence when the curtain is run up on this scene of creation the formless watery abyss, and over it the concealing darkness, and above all *G*od calling the *new* world into existence. There is here no suggestion of the creation of the physical world out of nothing. The story reveals mind bringing order out of material chaos and calling into activity physical forces bringing forth the conditions of life, growth, and development. The first chapter of Genesis is much more easily interpreted upon the theory of evolution than upon that of special creations. It recognizes the origin of the physical process out of a preëxisting order of things, which to our bodily senses was but chaos and darkness. This cosmogony does not attempt to account for the

origin of the universe. God and the universe, so far as Genesis teaches to the contrary, are eternal and infinite.

Among the earliest cosmologies given us by the Greek mind is that of Empedocles. This philosopher combats stoutly the hypothesis of absolute generation. He urges that nothing which previously was not can come into being. That which is generally regarded as coming into being results in reality only from the commingling of previously existing elements. He declares there is no meaning to the term *origination*. Empedocles, no doubt, was the earliest philosopher who held and taught the hypothesis of evolution. Accordingly, he teaches: "Since the higher forms of life can arise only out of the lower, these latter must be the lower stages through which the former must pass." Anaxagoras, one of the greatest of the early Greek philosophers, "reduced all origin and decay to a process of mingling and unmingling," assuming as elements an unlimited number of substances, which he called the seeds of things. Originally there existed an orderless commingling of these primitive substances. The divine mind — simple, unmixed, passionless reason — brought order out of chaos and formed a world.

Anaxagoras finds the moving and shaping force of the world in a world-ordering mind. Mind is the finest of things, and brings into motion matter which is inert and without order, and so creates out of chaos an orderly world.

Plato declares that the world, or cosmos, is not eternal, but generated; that matter without form or quality existed from eternity, and was in disorder, assuming a variety of distorted and meaningless shapes, until at length *G*od came forth as a world builder and transformed all for ends of good. The Creator formed first the soul of the world, and to this soul joined its body. Thus were order and proportion brought to the chaotic mass, causing it to assume determinate mathematical forms.

The Stoic cosmology teaches that whatever is real is material. Matter and force are the two ultimate principles. Matter is, of itself, motionless, inert, and unformed, though capable of receiving all motions and forms. Force is the active, moving, and plastic principle. It is inseparably joined with matter. The originating and directing force of the universe is *G*od. God is the breath or spirit permeating the universe and containing the rational germs of all things. *G*od forms the world by the transformation of the

original divine fire into air and water. This water is separated into three parts, — a part becoming solid earth, a part remaining water, and a third part being changed into air. Earth and water are inert or inactive principles, air and fire are forceful and active. There is a periodic change in the world. At the end of a certain cosmical period creation is absorbed into the Deity, and again takes its rise from the divine.

Among the mediæval theologians and philosophers, Maimonides, Albertus Magnus, Thomas Aquinas, and others less illustrious, held that the world is not eternal, that it was called into existence out of nothing by *G*od's almighty power at a determinate instant of time, with which instant time began.

Until very recent times the most advanced thinkers, excepting some few distinguished philosophers, believed in the origin of the world and of all forms of life on earth by special creation. Some such cosmogony as that given us in *G*enesis was universally accepted and held by scholars as well as by people at large, until within the last forty years. In the latter part of the eighteenth century, when the great awakening occurred, and was followed by the wonderful progress in science

which glorified the last century, Goethe, who was as acute as a scientist as he was great as a poet, adopted a theory of evolution, and set it forth in two profound treatises in 1790. But among the most illustrious of the scientists of the early years of the nineteenth century Lamarck alone can be named as an able exponent of a theory of development. In his "Philosophie Zoologique" this scientist entirely rejected the notion of special creations, and pointed out some of the important factors in the evolution of life. The distinguished anatomist, Cuvier, and the no less distinguished embryologist, Baer, however, with many other able men in the several branches of biology, resisted any inference from their works in favor of any general theory of evolution.

It was not possible to establish a theory of evolution upon a firm basis until a more adequate classification of plants and animals could be effected, and until a more exact and extensive knowledge of geology was acquired. The grand classification of Cuvier provided the first desideratum, and the investigations of the great geologist, Sir Charles Lyell, furnished the second. Just as the laws of the movements of the heavenly bodies eluded the search of the profoundest and keenest

intellects until a science of dynamics was discovered and formulated and the laws of terrestrial movements were divulged, so was it impossible to formulate the principles of the evolution of the world and living organisms until the special sciences had been so far developed as to furnish the data necessary therefor.

The marvellous development of the several branches of science, especially of biology, during the first half of the nineteenth century furnished the data and created the conditions for the formulating of a definite and rational theory of evolution as the method of creation. Kant and Laplace had offered and developed the nebular hypothesis, affording a satisfactory account of the development of all celestial systems and bodies out of a universal nebulous condition. These two philosophers, however, did not attempt to derive this universal condition from a more primitive one, nor did they offer any suggestion as to the origin of motion in this homogeneous mass.

The French anatomists, among whom Cuvier was chief, gave to the world a classification based upon a careful study of the internal structure of organisms. "Cuvier himself, about the year 1817, brought palæontology and zoölogy into systematic

relation, effecting a grand classification of all animals in time and space, and thus most effectively prepared the way for a general theory of evolution." Another illustrious forerunner of evolution was the embryologist Baer, who, in his memorable treatise published in 1829, showed the development of the ovum *in utero* to "consist in a change from homogeneity to heterogeneity through successive differentiations." Though Baer thus reached the very boundary line of the law of evolution, he never became an evolutionist. In the hands of later evolutionists that which he discovered and described became a complete epitome of the whole process of organic development.

The physical world, as science now reveals it to us in all the ages of the past, is a process of development. Excepting the materialists, nearly all scientists to-day believe, with Emil du Bois-Reymond:

> The divine omnipotence, unthinkable ages ago, created all this raw material of the world in such wise that it should be endowed with inviolable laws to control the origin and progress of all forms and beings, inorganic and organic; that all worlds and systems of worlds should come into being, evolving through all phases of development from this all-pervasive nebula up to the solid earth, the fit abode of life; that here on earth rudimentary organisms should arise, from which, without

further assistance, the whole of living nature could be evolved, from a primitive bacillus to the graceful palm-wood, from the primitive micrococcus to Solomon's lovely wives, or to the brain of a Newton."

The process of evolution is identical with the the physical process. The atom, as we have seen, is the initial product of evolution, and its first creation was the beginning of the material world. The famous scientist and philosopher, Clark Maxwell, as we have before quoted, declared that atoms and molecules are not products of forces now known to be operative in the physical world, but such as must have prevailed at the beginning of the present order of things. The molecules are combinations of atoms, having the general properties of matter, each, however, having its peculiar characteristics. The molecular forces, cohesion, adhesion, and chemical affinity, operate among these small combinations of atoms. Out of these the mass of matter was evolved, and in the beginning stretched in perfect homogeneity through space. The second great world enigma, as stated by Emil du Bois-Reymond, here presents itself; that is, the origin of motion. How came this universal homogeneity to enter upon the process of differentiation into ever-increasing heterogeneity?

We have hereinbefore set forth briefly the theory of Kant and Laplace concerning the origin and development of the heavenly bodies. First, the rotation of the universal nebula, then the throwing off of immense rings, themselves becoming vast globes of incandescent gas. These, in turn, shrink off smaller equatorial rings, which become the nebulæ of the several bodies of a solar system. Heat, light, electricity, and all the molecular forces are operative, and the developing world moves on, multiplying the evolving bodies in every state of development from the nebula to the solid earth. Here the torch of investigation is passed by astronomy into the hands of geology, and through the many periods of the earth's development we pursue the process of evolution in its orderly course. The incandescent globe, filling space beyond the orbit of the moon, condensing, casting off a ring out of which the moon is formed, shrinks at length into its present dimensions. Forces with which we are now familiar are at work, and slowly and in beautiful order the earth is fitted for the abode of life.

Another world enigma here confronts us, namely, the origin of life. At a certain instant a definite chemical compound, which in all its physical

properties can be chemically accounted for, manifests the phenomena of life. This globule of protoplasm can hardly be said to be an organism, since it has no organs, not so much as a nucleus, yet it contains, at least, the promise of all subsequent life. Thence in orderly advance the evolution of organic nature proceeds.

The ultimate unit of life in the vegetable kingdom is the cell, and the distinguishing characteristics of the living are here revealed. In animal life the same origin of the organism is established. The phylogeny as well as the ontogeny of the human body shows that organism to have had its origin in a primordial germ. The unorganized *moneron* is the first parent of man considered as the end of the whole process of organic evolution, and the individual man begins his physical being in an impregnated ovum. Every step of this marvellous process has been minutely investigated by modern scientists, and it is seen to be the complete account of the origin and development of physical man. We find no break or chasm interrupting this process of evolution through the many ages of the past. There appears no intervention from without in all this advancing course, nor any need for such intervention.

Science traces the long and ever-widening course of the process of evolution from the simple cell through the more and more complicated organisms, and investigates the function of each persistent variation in figure or organ, each new departure from the type which results in some advantageous differentiation. The unorganized *moneron* develops, at length, a nucleus, then pseudopodia as means of locomotion, which evolve into legs and wings. The jelly-like plasma develops also a firm frame of cartilage and bone for the greater protection of vital organs, which are evolving and differentiating into numerous contrivances for the many functions of the living organism. This division of labor among the various organs necessitates some contrivance for unity of action, lest there be schism in the body; so coöperation is developed in the nervous system, uniting all parts of the multicellular body into a great cell commonwealth, each cell coöperating with every other cell for one common purpose. These innumerable cells are divided into many classes for the performance of certain definite functions, in all of which the welfare of the whole organism is the supreme object. Now, as science studies these cells, they are seen to be only so many little contrivances subserving

so many physical purposes. They construct tissue; they develop organs on an invariable plan; they secrete and excrete juices and effete substances; they form and operate lines of communication among all the little cell communities in the corporate commonwealth. They act as if endowed with intelligence, which unerringly directs their remarkable skill toward the realization of their several purposes. The actions of these cells and organs, so far as they effect physical results, are the legitimate subjects of scientific investigation. When, however, the scientific method is employed to discover the psychical cause of vital phenomena or those of mind, the quest must prove fruitless, because irrelevant.

When scientists of materialistic predilections, like Haeckel, predicate "cell-souls" to account for otherwise unaccountable phenomena of mind and intelligence, their inference transgresses the boundaries of scientific investigation. They have a right to speculate regarding the physical cause of any physical result, but when they come to attribute some cause not of the material order to account for phenomena, they indulge in conjecture. If, however, this conjecture accounts for all the known facts without violating the laws of reason, such conjecture becomes a probable theory.

Along with the progressive evolution of higher and higher organisms and the improvement of physical organs has proceeded an ever-increasing intelligence. From this fact Romanes concludes that as we accept the theory of physical evolution, so must we believe in a concurrent mental or psychical evolution. The acceptance of the former compels the acceptance of the latter. To this we take decided exception. The theory of the evolution of the whole physical process and of every physical organ and organism is impregnably established. The evidence of the truth of evolution as the mode of creation is overwhelming. The world of thinking men to-day unquestioningly accepts it as proved. But in the whole course of this development from the aboriginal fire-mist to the wonderful organism which we call the physical man, with all its perfected organs, there is no trace of the evolution or development of the intelligence or mind more and more clearly and marvellously manifested in the advancing course of physical evolution. We do not know in what this intelligence or mind consists. We cannot weigh or measure it. We cannot discover or investigate any of its properties. We cannot transform any of the forms of physical energy into thought,

which we regard as the differential attribute of the psychical. Huxley, as elsewhere quoted, declares that in the name of science he knows nothing, and never expects to know anything about the psychical phenomena which are connected with certain known physical activities. And Professor Clifford says, "The physical phenomena go along by themselves, and the psychical go along by themselves." He cannot as a scientist discover any causal relation between them. In his "Riddle of the Universe," Professor Haeckel reminds us that thirty-three years before he had published a theory to the effect that "every living cell has psychic properties, and that the psychic life of the multicellular animals and plants is merely the sum total of the psychic functions of the cells which build up their structure." Such declarations, uttered as upon the authority of demonstration, are at least misleading. There is no evidence in the world to the effect that living cells have psychic *properties*. All the authority of science and of philosophy, as well as the common-sense of mankind, is arrayed against such a declaration. Where are these psychic properties to be found in the living cell? Do they belong to certain of the elements of which protoplasm is composed, or are

they properties of the compound? Do they inhere in dead matter, or are they rather the products of vital activities? If these properties belong to the cell as such, as would appear from the fact that the psychic life in the lower groups — the Algae and sponges — is shared equally by *all the cells* of the body indiscriminately, how can certain cells be relieved of these properties so that all psychic functions may be performed by a select portion of them in the higher groups which have a nervous system and a brain? It is inconceivable that essential properties could be dispensed with without destruction of the cell itself. The invention of cell-souls to explain psychical phenomena is simply a product of the imagination. The cell-soul must, then, be explained, which is a no less difficult task than the explanation of the phenomena themselves. To state that a certain organic change in circulation of nutritive matter, such as distinguishes the animal life from that of the plant, implies a psychological advance, is simply to utter sounds without sense. All the change we can have any knowledge of in this instance is simply physical. The fact that this physical improvement in the organism is accompanied by a radical change in psychic life does

not force upon us the conclusion that psychic life has taken the same long step in evolution. "We find the highest development of the animal cell-soul," says Professor Haeckel, "in the class of ciliata, or ciliated infusoria. When we compare their activity with the corresponding psychic life of the higher multicellular animals, we find scarcely any psychological difference." This fact strongly opposes the theory of psychic development, for if no advance is observable in the psychic life of higher multicellular animals, there certainly has been no psychological evolution. If Professor Haeckel means only that the cells of the infusoria and the *corresponding* cells of the higher organism manifest identical psychic phenomena, then the so-called psychological development must be due to the development of differentiated cells.

It is altogether in accord with our purpose to accept all that science has shown to be true concerning the evolution of the physical organism, and also to insist upon the correctness of the view that along with this development there is ever a higher and higher manifestation of the phenomena of mind. We further insist that with every decided progressive change in the physical machinery of intelligence, there is manifest a

correspondingly distinct advance in mentality. In each of the numerous stages into which Professor Haeckel divides the long period of development of the nervous centre, he points out the well-marked advance in the manifestation of intelligence.

With the *cyclostomata*, the earliest group of the *craniota*, we find the beginning of brain evolution. In the modern representatives of this primitive group, the petromyzontes, "we have the fore-termination of the cord expanding into a vesicle, which then subdivides into five successive parts — the great brain, intermediate brain, middle brain, little brain, and hind brain: these five cerebral vesicles form the common type from which the brain of all *craniota* has evolved, from the *lamprey* to man."[1] The subsequent evolution of the brain is characterized by the more distinct division of the five cerebral vesicles until the mammalia are reached. In the order of mammals the brain development is marked by a "preponderant development of the first and fourth vesicles, the cerebrum and cerebellum, while the third vesicle, the middle brain, disappears altogether." It is during the Tertiary period that we observe the "typical development" of the cerebrum which

[1] Haeckel, "Riddle of the Universe," p. 167.

emphatically distinguishes the later from the earlier mammalia. In the brain of the anthropoid apes is observed the "special development of the cerebrum, so prominent a feature in man, and which is the root of his preëminent achievements."

We are informed by Professor Haeckel that "the differences of brain structure which separate man from the anthropoid apes are slighter than the corresponding interval between the anthropoid apes and the lower primates." Then, without warrant of the facts he has just before adduced, proving the slow and steady development of the nervous system and brain, Professor Haeckel illogically states his conclusions as follows: "Consequently the historical gradual evolution of the human *soul* from a long chain of higher and lower mammal souls must, by application of the universally valid phyletic laws of the theory of descent, be regarded as a *fact* which has been scientifically proved." It is clearly evident that the proof of the development of the physical organ of mind cannot be regarded as proof of the evolution of mind itself. The fact that ever fuller and fuller manifestations of psychic phenomena are concurrent with this development in no way affords evidence of the development of mind.

Above we have quoted Professor Haeckel to the effect that the differences of brain structure which distinguish man from the anthropoid apes are comparatively slight. Paul Flechsig, however, proved that in the case of man very specific structures are to be found in one part of the so-called thought centres. No other mammals possess these, and they, therefore, afford an explanation of the vast superiority of the mental powers of man. It is proved by careful observation that the cerebrum is the organ of consciousness and mental action, whether in man or the lower order of animals. The pathology of brain diseases has been most fruitful in results regarding the locality of certain faculties of the mind. Familiar facts furnish positive proof that the phenomena of consciousness are dependent upon chemical or other physical changes in the substance of the brain, for instance, the well-known effects of certain beverages. Tea and coffee stimulate thought, wine and beer intensify feeling, while chloroform and other drugs put the brain to sleep.

If Weismann's theory of heredity shall be established,— and it now seems to be gaining acceptance with many eminent scientists,— it will be required of us to believe that only congenital

variations are hereditary. If this is true, any departure from the typical form of a species whereby the individual is improved cannot be accounted for by effects of environment, or by use and disuse, or in fact by any other physical cause. Let us examine this important theory of Weismann as we find it briefly stated for us by Mr. Wallace.

"The fact that the germ cells do produce with wonderful accuracy, not only characteristics of the species, but many of the individual characteristics of parents or more remote ancestors, Weismann thinks can be accounted for on two suppositions only which are physiologically possible. Either the substance of the parent germ cell, after passing through a cycle of changes required for the production of a new individual, possesses the capability of producing new germ cells identical with those from which that individual was developed, or the new germ cells arise, as far as their essential and characteristic substance is concerned, not at all out of the body of the individual, but direct from the parent germ cell. This latter view Weismann holds to be the correct one, and on this theory heredity depends on the fact that a substance of special molecular composition passes from one generation to another. At every new birth a portion of the specific germ plasm which the parent egg cell contains is not used up in producing the offspring, but is reserved unchanged to produce the germ cells of the following generation. Thus the germ cells, so far as regards their essential part, the germ plasm, are not a product of the body

itself, but are related to one another in the same way as are a series of generative unicellular organisms derived from one another by a continuous course of simple division. A portion of the very same germ plasm from which the germ cell, then the whole organism of the parent, was developed, becomes the starting-point of the growth of the child."

Now, it is very evident that, upon this theory, no characteristics in the offspring can appear differing radically from the ancestral type, and thus uniformity in species is secured and accounted for. But if any variation is manifest in the individual tending toward its improvement and elevation above its species in the scale of being, it cannot be accounted for on this theory; and since this theory claims to offer the "only supposition physiologically possible," we must look for the cause outside the physical system.

To escape the question of the origin of the atom, and of the initiative impulse of universal motion, Professor Haeckel denies any beginning in time and space of this physical process. Yet his very language refutes his claim and his logic. He speaks of mass and ether as filling all space. Is it conceivable that an infinite space could be filled? Does not the very idea of "filling" inevitably imply finite limits and bounds of that which is

filled? Is not extension — the attribute of the material world — a term of limitation? Nothing having extension as a property can be without metes and bounds. To attain to any veritable conception of the infinite and eternal, we must rise into an order of things of which not extension but thought is the differential attribute. Descartes divides the universe into two distinct parts, that of which extension is the differential attribute and that of which the differential is thought, and declares that between these two there is no community of nature whatever. Infinite extension is inconceivable, infinite thought and infinite wisdom are at least thinkable.

There is a prevalent tendency in the thought of to-day to conceive of the universe as essentially material. Very often, when the psychical is admitted, it is assumed in some way to be the ultimate product of a process of physical evolution: the world of matter comes first; the spiritual is developed from it. Or, as we have seen, it is held that, as there is manifest in the physical world an orderly development, so there is also a spiritual evolution going along, *pari passu* therewith; as there is an advancing movement toward the more perfect in this finite material world, so must we

believe in another finite, spiritual universe going on in development.

We have traced the process of evolution which science has discovered through all the material world in time and space. It starts with the creation of the atom and the initial impulse of all physical energy. The next phase of evolution is the primary division into mass and ether. The mass arises out of the ether, and henceforth all the progress of evolution is manifest in the mass. Mass does not occupy all space, ether is the universal fluid. Mass is set in motion, and through millions of ages this motion results in the evolution of innumerable larger or smaller aggregates. These aggregates are subdivided into systems of rotating bodies — suns and attendant planets. These bodies — at first spheres of incandescent gas — cool and solidify. During this process of advancing change gravitation, cohesion, chemical action, heat, light, and electricity are the forces in operation. We have traced the origin of these forms of energy back beyond the physical process into a higher world-order.

At length, by the operation of these forces, under favoring conditions of environment, a collocation of molecules becomes a chemical compound

resulting in a primitive unicellular organism, in which vital phenomena are manifested and also the phenomena of intelligence. This progress advances through the continued development of the physical organism. The unicellular organisms develop into the multicellular organisms, each group of cells manifesting a peculiar quality of intelligence. The higher manifestations of life and intelligence are concomitant and correlated with a greater and greater complexity of organization and constitution of matter. The so-called natural forces are continually bringing forth and improving organisms.

The primordial germ from which all organisms of life and intelligence are evolved is a certain definite quantity of protoplasm or matter of life. This protoplasm is a chemical compound of a certain definite character. Its constitution is the same, whether dead or alive, as far as chemical analysis can as yet determine; nor can the highest power of the microscope distinguish between dead and living protoplasm. In the multicellular organisms we have many groups of these primordial cells, performing various functions, manifesting life and intelligence. The specializing of these various groups and the division of labor among them mark

the development of the living organisms; and the higher organisms show greater complexity of structure and chemical constitution. This is all that physical science can positively assert. Science, as such, has nothing to do with inferences from the facts it discovers.

A physiologist is intently studying the human brain. Suppose him to be endowed with absolutely perfect senses, which he has cultivated so that every change of whatever sort taking place in the brain-substance may be clearly perceived by him. What would his careful investigation reveal to him? Obviously nothing but molecular changes — physical and chemical. To the outside observer there is absolutely nothing else to be seen. The brain, engaged in some sublime speculation, or taking its part in carrying into effect some mandate of the will, can reveal to the outside observer nothing but these molecular changes and movements. Every act of the mind, itself beyond our power of investigation, is accompanied by a series of physical phenomena complete in itself. These concomitant physical phenomena consist of certain vibrations of brain molecules, certain oxidations, with formation of carbonic acid, water, and urea. This physical process is all that we are capable of

scientifically investigating; indeed, it is the whole of evolution. There is nowhere any evidence of any other development. Organic evolution is capable of accounting for all the progress of life. Those scientists who would derive all the phenomena of mind by evolution from lower psychical activities, can, as we have seen, furnish no evidence whatever of any such process of development.

If we pause here and reflect that evolution gives us a complete account of the *whole physical process* from the origin of the atom to the highest product of its ongoing — the brain of man, — if we contemplate the course of development through all its marvellous phases, we observe a mighty process without one break or interruption in its orderly movement toward the goal of its predestined purpose.

We have given an account of the method by which Professor Haeckel, out of the abundance of his knowledge of the phenomena of life, traces accurately the development of the living organism from the primordial germ up to man. All that he has given us as the facts of science we accept as such. These facts are the results of most painstaking and skilful observation and experiment. It is the part of ignorant folly to question them at

this day. All this evolution has gone on toward its supreme result, the perfect human organism. Then, too, this same eminent authority gives an account of the ontogenetic growth of the individual from the copulation of the male and female cells — the spermatozoon and the ovum — to the perfection of the animal organism, showing, as he himself claims, the whole course of the individual from its absolute beginning to its ultimate ending in utter extinction. But Professor Haeckel asserts that the physical phenomena which he is able to investigate are not the whole story of the phylogenetic and ontogenetic development of man. Besides those facts of science which we must accept, he dogmatically declares that all the higher psychical phenomena are but products or properties of matter. The soul, to which he denies any concrete or actual existence, but which he considers "merely a collective idea of all the psychic functions of protoplasm," he calls also a "physiological abstraction." To that part of the protoplasm which he regards as the "indispensable substratum of psychic life" he arbitrarily gives the name "psychoplasm." Of course, he does not point out that all the physical and physiological activities are accounted for by the expenditure of energy in

their production, which fact we are able to investigate; nor does he state that in every series of physical phenomena concomitant with a series of psychical phenomena, there is nowhere discovered any loss of energy that might be accounted for as having been used in bringing about the correlated psychical phenomena. Yet, he declares that what we commonly call the soul is only the activity of a certain portion of the protoplasm called psychoplasm. This is an altogether gratuitous assumption, not so much as suggested by the results of observation. While we concede that "in all cases, in the lowest as well as in the highest stages of the psychological hierarchy, a certain chemical composition and a certain physical activity of the psychoplasm are indispensable before the soul can function or act at all in the physical process," we see no reason to believe that the soul's functions or acts are the effects of physical causes — in fact, such a thing is inconceivable.

Let me state the conclusions of an evolutionist as he reviews all that has been established by the distinguished investigators whose work has added resplendent lustre to the reputation for advance in knowledge made during the nineteenth century.

"Life *appears* to have been a *necessary* and *inevitable* result of inorganic or cosmic evolution. It came into being on our planet in the most natural way as soon as the temperature of the originally superheated planetary mass became sufficiently lowered, and the gaseous matter had been condensed into a universal sea. It arose by the action of physico-chemical laws through what we call spontaneous generation, the materials for the formation of the first bit of *living* protoplasm being ready at hand. When once formed, motion, change, and the action of the primary factors exerted through a great length of time resulted in the differentiation or divergence of characters; and specialization went on, conditioned by and dependent on the increasing changes in the internal structure and physical geography of the globe.

"Variation was most probably neither fortuitous nor by chance, but was due to changes in the environment, and therefore was in direct relation with such changes, resulting in the wonderful adaptation, variety, beauty, and harmony reigning through the organic world.

"Putting together all the facts of geology and biology observed during the past century, a few of the more observant and thoughtful naturalists have, by the inductive method, to some extent worked out the *mechanism* of evolution. . . . Still we *know only in part* the guiding, controlling cause. There *seems* to be *something more* than the action of the physical factors and natural selection, which we cannot fathom." [1]

(The italics are ours.) It is impossible to suppress the question as to what is that mysterious

[1] See article on Evolution, "International Encyclopædia."

"something more than the action of physical factors," whose agency we must allow, the nature of which we cannot fathom. Though the "more thoughtful naturalists" have indeed "worked out the mechanism of evolution," have traced the steps of the phylogenetic and the ontogenetic development of the human race and the individual man, there yet stand the unsolved riddles of the origin of motion, of life, of intelligence, of consciousness. The most intimate and minute knowledge of all the physical process does not bring us one step nearer the solution of these inscrutable mysteries of nature. The writer above quoted can speak only doubtfully of the origin of the organic out of the inorganic. 'It *appears* inevitable that it should be so, but how the inevitable is realized he cannot presume to say. Life "came into being in a most natural way." If a natural product manifesting itself in a "most natural way," it should be most easily accounted for. It could not present any difficulty if it came naturally into the world. When the physical environment was prepared for the advent of a physical organism, then "by the *action* of physico-chemical *laws*, through what we call spontaneous generation," life appears in the "first bit of *living* protoplasm ready

at hand." Of course this begs the question, for it is *living* protoplasm in the first instance we are trying to account for. To talk of the action of physico-chemical laws as producing life is a strange misuse of terms. How can a law act? A law is a rule of action and cannot be the act itself. An action in accordance with physico-chemical laws would be an exertion of physical energy, and, as we have said just now, should not present much difficulty of solution. But it is here admitted that there is something besides physical force in the process of evolution. On the hypothesis of an infinite, eternal, infinitely energetic, psychical universe, of which the physical world or process is the phenomenal representation, we readily discover the key that unlocks all these mysteries, which have grown darker and darker as the light of the science of the physical process has become brighter and brighter.

CHAPTER IV

THE COSMOS

The Dependence of Physical Phenomena on Psychical Activities — The Spiritual Universe regarded as the Objective to God — The Doctrine of Divine Immanence in the World — Pantheism — Relation of the Spiritual Universe to the World of Sense — Not Mental Evolution, but Progressive Manifestation of Mind Power — Instinct and Reason — The Law of the Conservation of Mass, and the Law of the Conservation of Energy — Haeckel's Defence of His Monistic Theory — The Absolute Reality a Necessary Postulate — Sir Oliver Lodge's View of Life — The Phenomena of Genius due to Physical Conditions.

We cannot think of any of the facts of external nature, without presupposing the existence of a mind which thinks them; and therefore, so far at least as we are concerned, mind is prior to everything else. It is for us the only mode of existence which is real in its own right; and to it, as to a standard, all other modes of existence which may be inferred must be referred. Therefore, if we say that mind is a function of motion, we are only saying in a somewhat confused terminology, that mind is a function of itself. — G. J. ROMANES.

If spiritualism be unsatisfactory and materialism impossible, is there yet any third hypothesis in which we may hope to find intellectual rest? In my opinion there is. If we unite in a higher synthesis the elements both of spiritualism and of materialism, we obtain a product which satisfies every fact of feeling on the one hand, and of observation on the other. The manner in which this synthesis may be effected is perfectly simple. We have only to suppose that the seeming duality is relative to our modes of apprehension; and therefore that any change taking place in the mind and any corresponding change taking place in the brain are not really two changes but one change. . . . We may suppose that a vibration of nerve strings and a process of thought are really one and the same event, which is dual or diverse only in our modes of perceiving it. The great advantage of this theory is, that it supposes only one stream of causation, in which mind and motion are simultaneously concerned. This theory, therefore, escapes all the difficulties and contradictions with which both spiritualism and materialism are beset. — G. J. ROMANES.

CHAPTER IV

THE COSMOS

WE come now to the statement of our hypothesis. Science compels us "to refer to the spiritual world the marvelously complex forces which we know as gravitation, cohesion, chemical force, and electricity, without which the material universe could not exist for a moment in its present form, and perhaps not at all, since without these forces and others which may be termed atomic it is doubtful whether matter itself could have any existence."[1] Unless we declare that this material world-process is all of the universe, or that it came from nothing and into nothing returns, we are compelled to accept as the postulate of science that there exists another world-order or universe, or many such, evolved one from another from all eternity.

We postulate a purely psychical universe, the differential attribute of which is thought. We

[1] Alfred R. Wallace.

further conceive of this spiritual universe as infinite, eternal, infinitely energetic, and perfect.

Being driven by the deductions of science above stated to assume the existence of a higher world-order as the source of the material and energy of the present physical process, we deem it more philosophical to conceive this higher world or universe to exist from everlasting to everlasting, than to regard it as an infinite succession of world processes.

This higher and eternal universe "does not consist of ethers, gases, or ghosts, but of purely psychical relations akin to such as constitute thoughts and feelings when our minds are least solicited by sense perceptions."[1] In thus marking off the unseen universe from the material world of which we have knowledge, "our line of demarcation would at least be drawn in the right place." The distinction we draw between physical and psychical phenomena immeasurably transcends all others. No possible experimental skill or logical deduction can determine the weight or measure of thought, nor in any way can the things of the spiritual world be made like the actual or *possible* objects of sense-perception.

[1] Fiske, "Unseen World," p. 40.

"Notwithstanding the positive assertions of Haeckel and other materialists, modern discovery has tended to make the distinction between mind and matter absolute, and an unseen world consisting of purely psychical or spiritual phenomena would be marked off from what we call the physical world by the boundary line of absolute dissimilarity in nature and constitution, and yet, not necessarily dissociated from those psychical phenomena which we now find manifested in connection with the world of matter."

Those phenomena, which in our present experience we designate as psychical because manifested apart from material conditions, are not the only spiritual phenomena of the present world-order. Every effort of force, in its origin, must be a psychic fact, and the so-called physical phenomena but the manifestations, under certain material conditions, of psychical activities. You can no more investigate force apart from the material manifestation of its activity, than you can thought or feeling, by any of the methods by which physical phenomena are investigated.

It is, indeed, true that, "when we survey the net results of our experience up to the present time, we find evidence that cannot be disputed that what are commonly called psychic phenomena in the physical world have begun to be manifested

only in connection with certain complex aggregates of matter. As these material aggregates have age by age become more complex in structure, more complex psychical phenomena have been exhibited." We can readily agree with Mr. Fiske in the above statements, but it is not certain that those phenomena which we regard as psychical are the only phenomena of spiritual significance. It may be that every physical phenomenon is of psychic origin. To this supposition we are inclined to give assent. We have traced several series of cause and effect back to this higher world-order.[1] Two of the series traced in the first chapter led us through the activities of the human body and brain back to the same inscrutable terms in the psychical world. In the perception of an external object, we traced the process through a concatenation of physical activities, and at last reached the act of mental perception, whereby we are made conscious of the presence of a visible object; an act which cannot be scientifically regarded as the result of the last activity in the physical series, though concomitant with it. In the case of a series originating with the will we meet with the same break in the concatenation. I thrust

[1] Chapter I.

forth my hand to strike an object. That act is due to a series of activities which we trace back to the initiative in the will, an act which is outside the physical world.

There seems to be no other conceivable character to be ascribed to this higher world-order than that of the psychical. To regard the unseen world as a larger, more attenuated, more energetic physical universe, would not be logical; for if of the same order with the present physical process, there would not be this inevitable break which we meet with in every long series of cause and effect, when we reach the limit of the physical world.

Scientific evidence of the character of such a universe we cannot produce, except in the nature of necessary inference, for, as we have seen, the suggestion of this higher sphere of existence is derived from the fact that at a certain point in our investigations we reach the limit of sensible phenomena, and are yet assured that there is something beyond. Either there is a world of energy from which the present world emanates and by which it is supported and sustained, or else we must admit that from nothing something comes.

On the other hand, the fact that no evidence can be adduced in this instance — that is, evidence of

a scientific character — does not count against the hypothesis of a spiritual world, but rather in its favor. For our supposition is that such universe transcends our present experience, and therefore, conditioned as we are by the limitations of sense perception, we could have no experience of its phenomena.

"Since our ability to conceive of anything is limited by the extent of our experience, and since human experience is very far from being infinite, it follows that there may be, and in all probability is, an immense region of existence in every way as real as the region which we know, yet concerning which we cannot form the faintest rudiment of a conception. An hypothesis relating to such a region of existence is not only not disproved by a *total failure* of scientific evidence in its favor, but the total failure of such evidence does not raise the slightest presumption against its validity."[1]

This hypothesis cannot be regarded as irrational, but may be logically entertained without violating our scientific habit of thought or invalidating our scientific conclusions.

We have argued throughout the preceding pages that the power manifest in physical phenomena is not physical in origin, but similar to the mental part of ourselves, and also independent of

[1] Fiske, "Unseen World," p. 48.

our consciousness. We do not contend that this power is God, as do all theistic writers, but the energy of an infinite, eternal, and infinitely energetic psychical universe. This Spiritual Universe has existed from everlasting as the infinite objective to God. God cannot stand as the sole and absolute term in the realm of uncreated being. From everlasting there must exist somewhat objective to Him. Absolute subject there is not and cannot be. The absolute subject is a contradiction in thought no less than a "single-termed equation or an uncaused effect." A subject implies and requires an object, and all existence in this respect must be relative. The very conception of subject, or of any subjective activity whatever, involves the conception of something other than subject as engaging its activities. With all being there must be a sphere of being. The innumerable temporal phases and phenomena of existence pass away, and there must remain an eternal, infinite universe, coeval with the Eternal Mind and inseparable from it, — a field of possible experience, supplying the requisites indispensable for any form of thought or spiritual activity.

In Christian thought this physical world has always been regarded as temporal in duration as

well as finite in extent. We have shown in preceding pages that recognized authorities in every department of science also declare that this present finite world came into being in time, and will in time pass away.[1] Because of the finite and temporal limitations of the material world the Christian philosopher has been unwilling to regard matter as the objective to God. In theology the physical world has ever been thought of as sinful and imperfect, and hence it would be sacrilegious to conceive of Deity as immanent in such a world. Evil could not find place in an order of things in which *G*od dwelt. So *G*od has been put outside His creation — a *Deus ex machina.* Having framed the world and set it going, He took up His abode in some remote part of unoccupied space, where He has been a somewhat interested spectator of its ongoing, content from time to time to pay it a visit to repair some of its fractures and to supply some of its inevitable deficiencies. "An absentee *G*od," as Carlyle remarks, "sitting idle ever since the first Sabbath, at the outside of His universe, and seeing it go."

The doctrine of the Divine Immanence, taught in the Christian Scriptures and by the early *G*reek

[1] Chapter I.

fathers of the Church, then lost sight of by the Latin theologians, is gaining wide acceptance in the thought of to-day. What this Divine Immanence in a temporal and evolving world might be, no one has ventured to declare. How God could be present for millions of years in the incandescent globe of gas rolling through all space, and through untold ages watch and energize in the womb of nature, bringing forth the ever-advancing forms of life until at length a being was developed that aspired to kinship and communion with its God, we are not told. If this developing world be regarded as the objective to God and the only environment upon which He could act and realize His purposes, then there were ages in which this objective was *more* than during other ages. Periods there were, during its primal state, when it gave the faintest utterance to His will and purposes. If we should admit the eternity of matter, or the stuff of the material world, lying inert and lifeless throughout all space until at length the mighty movement began which has gone on through all the developing ages, then doubtless through an eternity of the past this formless void was the only objective to God.

Pantheism admits of nothing objective to God.

In this system of belief God is all and all is God, and certainly the *all* can have nothing outside of or apart from itself. In His causal relation God is then the inner side of nature, and for Him there is no beyond on which any transitive action can pass, no way out of Himself to deal with what is the *other*, "but only an eternal weaving of the tissue of phenomena from some focus within toward some circumference that is not without." Pantheism "by making the consciousness of God identical with that of all sentient beings, has predicated of God every error and weakness belonging to His creatures, and made Him not alone the cause but also the subject of all the sin, sorrow, and suffering of the world."

By the hypothesis which it is the purpose of this book to present and establish, God is not excluded from, nor yet included within, the material world. The spiritual universe, which we regard as infinite, eternal, and infinitely energetic, in which God dwells, upon which and through which He acts, gives perfect expression to His will, and unfailing and unvarying fulfilment of His wise and holy purposes.

The relation of this spiritual universe to the present world of sense may be imperfectly

represented by that of a cloud to the atmosphere on which it rests, out of which it comes, and into which it vanishes. The cloud does not manifest all the energy of the physical world, nor can one learn all the laws of matter from an exhaustive study of this mass of vapor. So this present physical world does not and cannot manifest all the infinite forms of psychical energy. Only a few of these forms, and they only as they so act and react as to become capable of being appre-hended by the bodily senses, constitute and compose the material world-order. All physical energy, every exertion of force, every sensible activity, every phenomenon in this present world-order, is derived from, or originates in, the spiritual world. The atom, the ultimate unit of matter, is a manifestation of certain psychical forces — forces originating beyond the region of our scientific knowledge.

Accepting the theory of the vortex-atom, it is conceivable that such atom is a motion of a certain kind capable of manifesting physical properties. This motion is due to energy of another order. The ether has been regarded as a "universal fluid full of, or rather composed of, vortex-motion, these vortices being smaller and more closely packed

than in ordinary matter." So, the difference between (gross) matter and ether is reduced to a mere difference in the size and arrangement of the component vortex rings. Molecules are combinations of vortex-atoms or motions manifesting under new forms and varying properties energy from the unseen. As matter advances in composition, constitution, and organization, it affords loci for the manifestation of ever higher and higher forms of psychical energy or power. Throughout the physical world, during its primordial period, the forces of the mineral kingdom could alone manifest themselves. *G*ravitation, cohesion, chemical affinity, heat, light, and electricity were the forms of energy then operative, and all these we have hereinbefore shown to be traceable back into the unseen universe. These names by which we designate the forms of physical energy are really applied solely to the sensible manifestations of force, force itself being beyond our power to investigate or designate.

Mr. Wallace, as we have already seen, indicates three great crises in the evolution of the world, at each of which a new form of energy must have entered the physical process from the unseen. The first of these was the advent of life. By our

hypothesis no invasion of the physical order is demanded. Every particle of matter in the material world is embraced and interpenetrated by the infinitely energetic unseen universe. Like an exhaustless, mighty stream this tide of psychic energy sweeps through matter, touching every atom, and seeking points of manifestation in physical activities. Whenever and wherever matter presents a sufficiently complex organization, and affords thus a *locus*, then and there the manifestation of life occurs in the primordial germ. Every advance in the evolution of life in the world is to be accounted for simply by the increase of complexity in the organism. Every slightest variation in the organ is seized upon and becomes a locus for a peculiar manifestation of life. So comes forth species after species, and so the myriad forms of living things appear in ever higher and higher organization.

With the appearance of animal existence we find psychic forces clearly in evidence. The elemental cell called the *moneron*, being just an unorganized jelly without a nucleus, manifests intelligence in self-preservation and reproduction. The supposition that a definite quantity of *divine* intelligence has been, as it were, farmed out or deposited with

this infinitesimal and unorganized cell borders on the absurd. Yet this is the generally accepted view, except among the materialists, who regard the manifested intelligence as due to material organization. How much more reasonable to suppose that the ever-present psychical energy of the spiritual universe, finding matter sufficiently organized to afford a locus for its activity, immediately manifests itself.

Professor Huxley says: "I know nothing, in the name of biology, and never hope to know anything, of the steps by which the passage from molecular movement to states of consciousness is effected." And Professor Clifford adds: "The two things are on two utterly different platforms; the physical facts go along by themselves, and the psychical facts go along by themselves." But we have shown that there is some sort of causal relation between psychical force and physical fact. What we call mental evolution and development is but the constant and progressive *manifestation* of ever higher and higher forms of psychic energy. The increasing glory and splendor of the physical process, as it advances toward the "one far-off divine event to which the whole creation moves," is a transfiguration of the material world, whereby it is

irradiate with that "light which is not on sea or land," but comes streaming in with dazzling brightness from the universe unseen.

The third crisis in the evolution of life on our globe, which Mr. Wallace declares marks the beginning of a new order of beings in the physical world, is the advent of man. "A wonderful moment," as Mr. Fiske describes it, "silent and unnoticed even as the day of the Lord, which cometh as a thief in the night." Here are the beginnings of self-conscious personality. Intelligence dawned with animal life, as we have seen, long before a brain existed, and has gone on manifesting ever more marvellous powers. This progress and development on its physical side has been the increasing complexity of organization. The appearance and the development of brain, not in size only, but in delicacy of organization, marked an epoch in the so-called evolution of higher intelligence. Those peculiar manifestations of reason and intelligence which are characteristic of particular species we term "instinct." We marvel at the intelligence exhibited by lower animals, approaching very near, if not altogether reaching, human reason, and we see in man — especially in man in his primitive state — the survival of many so-called

instincts. There seems to us no ground for insisting upon any real distinction between instinct and reason. The only distinction we might be willing to draw would be between instinct as the characteristic of a species, and reason as a quality of the individual mind. The inerrancy of instinct might be contrasted with the fallibility of reason. Again, instinct is not acquired, nor is it capable of education. Generations after generations of bees, birds, and animals of every species live over the same routine of instinctive existence, exhibiting no individual excellencies or deficiencies. Through generations the birds of any particular species build their nests on the same plan, never devising a single new or advantageous improvement. The instincts that are essential to the preservation of life and reproduction of kind are almost inerrant. The homing instinct in pigeons, in many other animals, and some primitive races of men never fails, where the developed human reason would be an erring guide.

Upon our theory, the origin of instinct, its permanency, its inerrancy, are all easily accounted for. Every progressive variation in the organ of intelligence, no matter how infinitesimal it may be, affords a locus for the manifestation of another

and higher form of psychical energy. In any species the brain morphology in general is identical in every individual. So every individual of any species will exhibit the same degree and quality of instinctive intelligence. In the lower animals there is no such thing as personality; hence no self-consciousness. The habitual acts of the individual are common to all members of the species. It is the same stream of psychical energy that sweeps through the whole species, waking into activity each responsive chord of being. Individual characteristics are accounted for by peculiarities of brain complexity and conformation. Physically the lower orders of animal life exhibit individuality, but psychically there is no such thing as personality with them. The transitional forms that stand midway between species are not to be accounted for by some new form of energy from the unseen entering and taking up its abode in these particular and peculiar individuals, and thereafter handed down to and through posterity forever, thus securing the perpetuity of a new species; but rather by some subtle change in the complexity of organization, some variation in physical or chemical composition of the organism, seized upon and quickened by a higher form of spiritual

energy. Infinite are the forms of psychical energy in the unseen universe, and the innumerable possible changes in the physical organism are immediately met by their corresponding spiritual forces.

We know of but two possible modes of existence: that of which the differential attribute is extension, embracing all the material world and its every form of being, and that of which the differential is thought, which cannot be cognized by the senses and cannot be scientifically investigated. If, then, we are to look for the origin of all those forces whose activities are manifested in the phenomena of the material world outside the physical process, the world of extension, it must be found in that universe the differential attribute of which is thought.

We are led directly to a psychical world-order every form of whose energy is psychical and hence intelligent. The only valid hypothesis concerning that universe is that it is infinite, eternal, and infinitely energetic. It is not a process nor a finite mode of existence, but the COSMOS, the whole universe objective to *G*od. The material world is a phase of the eternal, infinite energizing, a process of evolution and development. It may be eternal,

it cannot be infinite. It is the phenomenal manifestation of certain, we might term lower, forms of energy of the infinite, eternal, and infinitely energetic psychical universe. As the material world-order derives its energy from an eternal and infinite source, it may, as we have said, be eternal. It is not inconceivable that this process has been from everlasting and will be to everlasting. The law of the indestructibility of matter, and that of the conservation of energy are not in any respect invalidated by this hypothesis of a finite material process as the phenomenal manifestation of universal energizing. If every phenomenon is a manifestation of infinite energy determined by material conditions, then would there never be any failure of energy in the physical process. And if there were no such thing as transformation of energy, yet, in effect, the phenomena would be the same as if there were.

The New Knowledge, the development of which is to be the glory of the twentieth century, impugns the absolute truth of the law of the conservation of mass. The study of radioactivity tends to revolutionize our idea of mass. The atom is now held to be made up of a congeries of corpuscles or moving units of negative electricity

balanced by a sphere of positive electricity. There is no mass in the atom. According to this theory, the mass of a corpuscle is not material, but due to its velocity. Hence the mass of the radium atom before its explosive rearrangement would not be the same as the mass of the products of its disintegration, for the velocities of its corpuscles have changed. However, accepting the hypothesis we are maintaining in this treatise, the apparent truth of the law of the conservation of mass is explained. The atom of the new knowledge is not held to account for the tremendous force which propels the corpuscles of negative electricity, nor that mightier power by which this repulsive force is held in the grasp of the sphere of positive electricity. What really appears to be established is that the atom is a marvellous structure, contrivance, or mechanism, by which certain forms of cosmic or psychical energy can manifest themselves on the plane of our sensible experience within the physical process. And as the quantity of energy manifested in any transformation is always dependent upon physical conditions and material arrangement, the law of the conservation of energy may also be only apparently true, so much and such forms of cosmic or psychical energy being manifested as

the physical conditions make possible. We have suggested above the possibility that there is no such thing as transformation of energy other than a change of the physical conditions of energetic manifestation. A supposed transformation of heat into light may be only such a change of physical conditions as will permit the appearance of another form of psychical energy. It is not a transformation, but the appearance of a distinct form of energy under its own peculiar physical conditions.

There was a time in the history of the earth, as we have seen, when only the physical forces were manifested. At length the intensity of the heat having decreased, chemical affinity asserted itself under favorable physical conditions, a new form of energy with new and peculiar phenomena. Ages upon ages passed, and in the fulness of time, when material conditions were favorable, and an organism had been brought forth of sufficiently complex constitution, life appeared, producing a still more specialized group of phenomena. Through the advancing ages this life-force manifested itself in phenomena of a higher and higher order until finally, when the conditions were fully ripe, there appeared the self-conscious,

self-determining, rational, and moral spirit of man, a new and still higher form of energy.

Such a theistic exponent of evolution as Professor Le Conte, outlining this development, tells us that at each stage of this progress a new form of force appeared, but derived, in each instance, from that form of force operative on the plane below. So this evolutionist believed that the self-conscious, self-determining spirit of man was derived by a physical process, or a process within the physical world-order, from the lowest form of energy manifest in physical phenomena. Such a claim of spiritual descent or psychical development we have shown to be without foundation in the facts of physical science, to be unphilosophical and irrational. Other evolutionists, represented by Mr. Alfred Russell Wallace, refer these new forms of energy, as they appear in the progress of development, to the unseen spiritual universe, coming into the physical process at certain times, and thereafter developing onward and upward. Still another class of evolutionists, of whom we may regard Professor Haeckel as a representative, declare that the human soul is derived from the elemental intelligence manifested by the primordial germ — the unorganized moneron — this intelligence in

the first instance being a direct product or an essential property of matter. All these, then, differ widely as to the origin and method of development of the human spirit. They, however, agree in holding that there are distinct stages of development. All accept as facts of science the evidences of the development of the physical organ of mind in complexity of constitution and structure. All agree that there are several well marked epochs in the progress of organic evolution, when certain groups of phenomena are first manifested. In all these theories intelligence is held to exist in each intelligent being from the amœba to man, as an entity. Haeckel speaks of the cell soul, and all evolutionists regard the "nascent soul" as passing through a process of embryonic development in the womb of nature, its "gestative mother." Whether each soul is developed in this descent as an entity, or one great soul is coming to birth to be individuated at last in each separate man, is not clearly stated, if clearly conceived. It is conceded that the higher intelligence is correlated with the more fully developed physical organ, the brain. How does this happen? Either some intelligent ruler of the universe, author and superintendent of the process

of evolution, must introduce these more intelligent souls to the more highly developed organs; or each soul, in its developing course, must pass from progenitor to offspring with or in the spermatozoon and ovum out of which the physical organism is developed, or again the soul in each individual is the immediate product of the brain itself. Each of these suppositions presents insuperable difficulties, and all appear puerile and impracticable. These difficulties vanish when we assume that all the phenomena of the physical process are but manifestations of the energy of the infinite, eternal, and infinitely energetic psychical universe, dependent upon material and organic conditions. There remains, upon this supposition, no question about the origin of motion, of matter, of physical or chemical phenomena, of vegetable or animal life, nor all the psychical phenomena of the soul-life of man. All these are but the names we apply to certain manifestations of psychical energy within the physical process.

Professor Haeckel in defence of his monistic theory of substance attempts, with no great measure of success, to establish the unity of the two laws of the indestructibility of matter and the conservation or persistence of force. He admits

that this unity is "much disputed." He offers little proof of the truth of his contention, but goes back to Spinoza and his "stately pantheistic" notion of the world. In the teachings of this great philosopher he sees exhibited two different aspects of the being of the Cosmos, or two fundamental attributes, matter — extended substance — and spirit — the all-embracing energy of thought. This thought of Spinoza's, which Goethe regarded as the "loftiest, profoundest, and truest thought of all the ages," really finds no place or meaning in the philosophy of Haeckel, for the latter makes thought and all intelligence only a property of matter or substance. But Spinoza's thought is a grand foreshadowing of the theory herein presented of an infinite, eternal, and infinitely energetic psychical universe, the differential attribute of which is thought.

This is the purest and most rational monism. The psychical universe is the whole and entire Cosmos, a phase of whose activities is this material world-order, or physical process. Every single object in the world which comes within the sphere of our cognizance, all individual forms of existence, are but special, transitory forms, accidents or modes of the energy of the spiritual universe.

"These modes are material things when we regard them under the attribute of extension, as occupying space; intelligent energy or 'ideas' when considered under the attribute of thought." By our hypothesis we save the real objective existence of the material world, and also bring forth the Cosmos as the eternal and infinite objective to God. We hold to no such meaningless fancy as that the material world has no existence outside the forms of our thought and consciousness. We do hold that the physical process is but the phenomenal representation of certain forms of psychical energy, capable of being cognized by the self-conscious personality through the physical senses. We assert a pure monism, — that there is but one eternal, infinite universe, psychical in nature, the differential attribute of which is thought, out of which the physical process arose, upon which it rests, by which it is energetically sustained, and into which it ultimately will return. Or if it be contended that this physical process is of eternal duration, then must it eternally derive its being, substance, and energy from the eternal psychical universe. The material world cannot be regarded us a universe in itself and apart from the unseen universe, or Cosmos. It is only a phase of

universal being, and may be one of many such in a series of processes.

The unity of nature, as established by modern science, is best explained upon the hypothesis of an infinite, eternal, and infinitely energetic psychical universe, the energy of which always and everywhere manifests identical phenomena under identical physical conditions. By spectrum analysis we have found that the millions of worlds and suns that swarm in limitless space are all of the same material as our own earth and sun. Then, too, throughout the physical process the same forces produce the same results or effects in developing nebulæ, in burning suns, in solid earths, and decaying moons. The physical forces and those we term chemical obey the same laws in every part of the material world, nearest or most remote. There is not a particle of matter that can escape from the grasp of gravitation. This finite world-order embraced and sustained everywhere by the infinite spiritual Cosmos must perforce be uniform and present an unbroken unity.

If we should admit the correctness of the theory of the decay and rebirth of cosmic bodies, we should in no way invalidate our conclusions, for, as we have before said, we may as reasonably admit

the eternal as the temporal character of the physical process. Indeed, if there is an eternal energizing of the eternal unseen universe, it is quite reasonable to suppose that the manifestations of that energizing in the material world will go on forever. Recent science declares that not only are there now upbuilding in the depths of space worlds and systems of worlds, but suns are growing dark and cold, and earths are hasting to decay. With prophetic vision science peers into the remotest future, sees the planets gradually narrowing their orbits, until at last with awful plunge they must leap into the cooling bosom of the sun, by terrific impact either to generate afresh the tremendous heat that expands the burning mass back into the primordial nebula, to begin again the round of evolution and decay, or to roll up as a scroll, to lie inert and cold, a mighty ember in empty space. It matters not what the *dénouement* may be, our hypothesis is equally valid and certainly verified. The universe, the Cosmos, suffers neither loss nor gain whether this be the final catastrophe or the new birth of systems of worlds to undergo the changes through which our world is passing now.

Thus do we see the relation existing between

the Cosmos and the physical process as such. The Cosmos is unknowable so far, and only so far, as it is absolute with reference to ourselves, that is, so far as it exists out of relation with our intelligence. As manifested to our intelligence, the Cosmos is the world of phenomena, which world is the realm of the knowable outside of consciousness. Underlying this realm of phenomena, we find ourselves compelled to postulate an Absolute Reality. Without such a postulate we conclude that it would be impossible to form any theory whatever, either of subjective or objective phenomena. These phenomena, whether subjective or objective, are the products of persistent power, — a power to which no limit in time or space is conceivable, and which can be known to us only through these manifestations.

If we venture to inquire what may be the nature of that inscrutable power manifested only through glimpses of the manifold phenomena of the knowable world, we shall find its "ultimate essence" to be identifiable with the ultimate essence of what we know as mind. If we conceive units of force existing objectively as of essentially identical nature with those subjectively manifested as units of feeling, we have a possible

rational hypothesis explaining the relation of mind and matter.

We insist upon the necessity of a substratum or noumenon to support the phenomena of our experience. If nothing really exists but thought and its modifications, and feeling is the only unit and measure of reality, then this substratum or noumenon must be of the nature of mind. Mind, however, is the one sort of real existence of which we have immediate experience; it is known in conscious feeling. This known kind of existence, then, will satisfy the conditions of the substratum, and we may, therefore, postulate that mode of existence of which the differential attribute is thought, as the noumenon of all objective and subjective phenomena. Thus we reach the unity and continuity of the Cosmos, which is infinite, eternal, infinitely energetic, and psychical, and is made manifest in all the phenomena of which we may be cognizant. A luminous passage from Kant's "Critique of Pure Reason" may well be studied in this connection:

"Though extension, impenetrability, cohesion, and motion, in short, everything we obtain through the outward sense, cannot be or contain thought, feeling, or the like; which in no case can be the objects of outward

perception; yet the *something* which underlies the outward phenomena and so affects our sense as to furnish it with the notions of space, matter, form, etc. this something, I say, considered as a noumenon, might well be the subject of thoughts, though we obtain from it through the outward sense no perception of ideas, will, or the like, but only of space and its modifications. This something, whatever it may be, has in itself none of the qualities of matter, such as extension, impenetrability, and the like; for statements about these qualities are statements about our perceptions. *But the qualities proper to the inner sense, namely, ideas and thought, may be ascribed to it without contradiction.* . . . I am free to assume that matter is in itself simple, and that the substance which to our outward sense is extended is in itself accompanied by thoughts capable of being represented in consciousness by an inward sense of its own. In this way the same thing that in one aspect is called bodily, would in another be a thinking being, of which we could not perceive the thought, but could perceive the signs of it in the phenomenon. Then we should no longer say that our souls think, assuming soul to be a certain kind of substance; we should say, with common speech, that men think, in other words, that *the same thing which as an outward phenomenon is extended, is inwardly or in itself a subject,* which is not composite, but which is simple and thinks."[1]

Our contention is that the inner and the outer world are not really different and parallel, but one and the same world under two distinct attributes

[1] Translated by Sir Frederick Pollock.

or aspects. In the language of Spinoza this Substance, or Thing in Itself, is God. He would say that *G*od's reality is "constituted and expressed by his determinate manifestations." This is plain and lofty pantheism, from which it seems there is no escape except through some such hypothesis as that we have offered, of an infinite, eternal, infinitely energetic, psychical universe. Here is the very essence of the universe, the infinite substance manifest under the two aspects of extension and thought. This infinite universe, — the essential Cosmos, — though not a world immediately accessible to any particular order of finite beings or minds, includes every possible consequence of infinite being, in which there can exist no real distinction between the actual and the possible.

In a former chapter we have traced the relation of the Cosmos to the phenomena of organic nature. What we call the phenomena of life we have seen to be the manifestation of certain forms of psychical energy, acting under favorable physical conditions. In the vegetable and animal kingdoms, life, as we maintain, does not act in and through material organisms, but upon them. So far as we know, this form of psychical energy does not act

at all in the sense in which the so-called physical forces, heat, light, electricity, etc., act. Life, as manifested in phenomena of the living cell, seems to direct the activities of the lower forms of energy. For, as we have said before, all the vital processes are those of Physics and Chemistry. We do not know what the nerve activities are, but we do know that every activity in the plant or animal organism is dependent upon life. Life in the tree is nourished, as we say, by the sap that rises from the roots, and by the carbon released by the decomposition of carbonic acid by sunlight in the green leaves. The animal by a chemical process derives its nourishment from the food eaten or by any means brought into its digestive organs. Another chemical process is that of the oxidation of the blood. Thus we do not discover life in these vital activities, and yet, unless life is present, none of these activities is possible. Lord Kelvin's latest utterance upon this subject is emphatically in favor of the existence of a principle of life — a vital power. This *we* maintain, that life is a form of psychical energy manifesting itself in the physical process whenever and wherever matter presents a certain degree of organization. Life does not manifest personality nor any of the characteristics of individual

being. Life is a mighty stream of energy, of the infinite, eternal, psychical universe, flowing through the material world, manifesting its presence and phenomena wherever physical conditions exist, making such manifestations possible. So we account for the manifold forms of living things, from the primordial germ cell to man. My own physical life is one with that of the lowest form of animal being. I cannot detain a portion of it and call it my own. I live so long as my body remains in a condition of healthful activity to respond to the vital stream that pours ever through it. To quote Sir Oliver Lodge:

"The view concerning life I have endeavored to express is that it is neither matter nor energy, nor even a function of matter or of energy, but is something belonging to a different category; that by some means at present unknown it is able to interact with the material world for a time, but that it can also exist in some sense independently; although in that condition of existence it is by no means apprehensible by our senses. It is dependent upon matter for its phenomenal appearance — for its manifestation to us here and now, and for its terrestrial activities; but otherwise I conceive it is independent, that its essential existence is continuous and permanent, though its interactions with matter are discontinuous and temporary." [1]

[1] Sir Oliver Lodge, "Life and Matter," p. 119.

This eminent physicist bears most valuable witness to the truth of our theory that the boundaries of the present physical world are the limits of sensible knowledge. We can know life in and through the vital phenomena which are temporal; we cannot know it in its independent existence, which is continuous and permanent.

We have shown hereinbefore that we are able scientifically to investigate the physical side — the material conditions and organs — of all phenomena manifest within the physical process, whether physical, vital, or mental, from the phenomena of light to those of the most soaring intellectual genius. We have seen also that the peculiar phenomena of genius no less than those of light are due to physical conditions. The superior intellectual and artistic powers of a Shakespeare and a Raphael are alike due to brain conformations and complexity of composition and structure, which afford loci for the manifestations of certain higher forms of psychic energy. *G*enius is not a divine gift or endowment, nor does it seem to be part of the personality, but rather, like instinct, is the result of the play of mighty unindividuated and unappropriated psychical forces. Like instinct, genius is not educable in the sense in which the

normal mind may be educated. Often have the mightiest powers of genius been exhibited by persons whose minds were utterly fallow and without culture. Genius seems not to be hereditary, the peculiar development of the organism being due to sporadic physical conditions which we are not as yet able to investigate intelligently.

Certain abnormal brain conditions seem to be attended by peculiar and sometimes most unaccountable phenomena. Somnambulism, hypnotic conditions, delirium, etc., present strange manifestations, the immediate cause of which is some abnormal brain-state developing certain peculiar conditions in cells of the organ of mind. Sometimes we ascribe these phenomena to the so-called subconscious mind, as if there were a portion of the human personality below what we call consciousness, and elevated to that plane by some unusual condition of the soul or personality. I am led to believe that the term "subconscious activities" is erroneous. They should rather be called supraconscious activities, due to the intensifying and heightening of brain and nerve action, whereby higher and extra-personal psychical forces manifest themselves.

CHAPTER V

HISTOLOGY: THE BEGINNING OF INTELLIGENCE

Unicellular Organisms — Dr. Hudson on Cell Life — Absurdity of the Recognized Phraseology of Science on this Subject — The Fortuitous Concourse Theory — Inability of Science to account for Inherited Intelligence — Differentiation of the Functions of Cells — The Nervous System of the Starfish — Testimony of Phylogeny and Ontogeny to the Hypothesis here set forth.

We do not know at present how to generate life without the action of antecedent life, though that may be a discovery lying ready for us in the future; but even if we did, it would still be true (as I think) that the life was in some sense preëxistent, that it was not really created *de novo;* that it was brought into actual, practical, everyday existence, but that it had preëxisted in some sense too, being called out, as it were, from some great reservoir or storehouse of vitality, to which, when its earthly career is ended, it will return. Indeed, it cannot in any sense be said ever to have left that storehouse, though it has been made to interact with this world for a time. — SIR OLIVER LODGE.

CHAPTER V

HISTOLOGY: THE BEGINNING OF INTELLIGENCE

THE science of Histology, as it has been developed in the past century, gives us a remarkable insight into the mode of growth and development of the physical organism. By this science of cell life and growth all living animal organisms are divisible, broadly, into two classes, namely, unicellular organisms and multicellular organisms. The former, as the term indicates, are one-celled creatures, and stand at the very beginning of animal life—the primordial germs from which all living creatures on this planet have been developed through the processes of organic evolution. The multicellular organisms are simply aggregations or associations of the single cells, and include all the forms of living organisms on the earth above the primordial germ cell.

The unicellular organism is the true type of animal life, for it displays all the functions in

miniature shown by the higher living organisms, namely, feeling, motion, nutrition, and reproduction, which together constitute the idea of animal life. "All those properties which the multicellular or highly developed animal possesses appear in each cell, at least in its youth; and we may regard this fact as the basis of our physiological idea of the elementary organism." In other words, Haeckel thus declares there is but one type of life on the surface of our planet, that is, the unicellular, and this type is preserved in all forms of organisms living.

It would be both interesting and profitable to follow the development of the cell from the moneron to man, but that would be a departure from the purpose of this book. It must suffice to say that the multicellular organisms were at the first simple aggregations of simple cells. In these original aggregations the lives of the single cells seem not to have been modified, but each retained its complete autonomy, performing all the functions of a separate life.

"Change of conditions, or mutations of environment, however, led to more permanent grouping, and compelled modification and differentiation of functions, until at length it became impossible to dissolve the

bond by which the unicellular *lives* were united. Thus the way was opened for further differentiation of functions, and thenceforward organic evolution proceeded on those lines. That is to say, the moment that an *aggregation* of cells became a confederation, with its differentiation of cell functions and consequent division of labor, every further step in advance consisted in differentiation of cell functions and still further division of labor. As a result of a long process of such differentiation, the organisms of the larger animals and of man came to be composed, as we find them, of thirty or more different species of cells. For example, we have the muscle cells, whose vital energies are devoted to the office of contraction, or vigorous shortening of length; connective tissue cells, whose office is mainly to produce and conserve a tough fibre for binding together and covering in the organism; bone cells, whose life work it is to select and collate salts of lime for the organic framework, levers, and joints; hair, nail, horn, and feather cells, which work in silicates for the protection, defence, and ornamentation of the organism; gland cells, whose *motif* in living has come to be the abstraction from the blood of substances which are recombined to produce juices needed to aid the various processes or steps of digestion; blood cells, which have assumed the laborious function of general carriers, scavengers, and repairers of the organism; eye, ear, nasal, and palate cells, which have become the special artificers of complicated apparatus for transmitting light, sound, odors, and flavors to the highly sentient brain cells; pulmonary cells, which elaborate a tissue for the introduction of oxygen and the elimination of carbon dioxide and other

waste products; hepatic (liver) cells, which have, in response to the needs of the organism, descended to the menial office of living on the waste products and converting them into chemical reagents to facilitate digestion, — these and numerous other species of cells; and lastly, most important and of greatest interest, brain and nerve cells. These cells are of the greatest interest and importance, for the obvious reason that they are the most highly differentiated of all the cells of the body, and constitute, respectively, the organ of objective intelligence and the means of communicating information from one part of the body to another.

"Without going further into details for the present, it must suffice to say that each organ of the body is composed of a group of cells which are differentiated with special reference to the functions to be performed by that organ. In other words, every function of life is performed by groups of coöperating cells, so that the body as a whole is simply a confederation of the various groups. And, to the end that the body may act as a unit, these groups are connected each to all the others, by lines of intercommunication, which, in turn, are composed of other highly differentiated and specialized cells, namely, brain and nerve cells. Not only are the various groups thus connected by lines of intercommunication, but these lines reach, directly or indirectly, every individual cell in the whole organism. This is elementary; for everybody knows that when any part of the organism is assailed, information of the fact is instantly conveyed through the nerves to the 'central office,' so to speak, and there measures for protecting the part are as instantaneously devised and the appropriate commands issued.

Thus, if one of the extremities is pricked with a needle's point, the cell thus assailed instantaneously conveys information of the assault through the nerves to the brain, which, in turn, issues its edict through the appropriate nerve cells, to all the muscle and other cells surrounding the injured cell, commanding them to unite their forces and remove the part assailed from the point of danger. . . . The time required is inappreciable to the unaided senses; but it does nevertheless require a measurable interval of time to initiate and complete the process, as scientists have amply demonstrated by means of instruments of precision. It is, therefore, a process involving in every step the exercise of intelligence and the employment of mechanism.

"It follows, *a priori*, that every cell in the body is *endowed* with *intelligence*; and this is precisely what all biological science tells us is true. Beginning with the lowest form of animal life, the humblest cytod, every living cell is *endowed* with a wonderful inteligence. *There is, in fact, no line to be drawn between life and mind*; that is to say, every living thing is a mind organism from the monera, crawling upon the bed of the ocean, to the most highly differentiated cell in the cerebral cortex of man. Volumes have been written to demonstrate that 'psychological phenomena begin among the very lowest class of beings; they are met with in every form of life, from the simplest cellule to the most complicated organism. *It is they that are the essential phenomena of life inherent in all protoplasm.*' (Binet, "The Psychic Life of Micro-organisms.")

"I have remarked that each living cell is *endowed* with a wonderful *intelligence*. This is emphatically true,

whether it is a unicellular organism or a constituent part of a multicellular organism. Its wonderful character consists, not so much in the *amount* of *intelligence* possessed by each individual cell, as it does in the quality of that intelligence. That is to say, each living cell is *endowed* with an instinctive or intuitive knowledge of all that is essential to the preservation of its own life, the conservation of its energies, and the perpetuation of its species. In other words, it is *endowed* with an intuitive knowledge of the laws of its own being, which knowledge is *proportioned* to its *stage of development.* Thus the unicellular organism is *endowed*, antecedently to, and independently of, reason, experience, or instruction, with a knowledge of the ways and means of obtaining nourishment. A mass of unorganized protoplasm, it projects portions of itself, and thus performs the act of locomotion in search of food. When food is found, it is enveloped in a mass of protoplasm, digested, and assimilated. It has the power of choice, for it rejects that which is unwholesome, retaining only that which is nourishing. It has memory, as is shown by the fact that, having once encountered danger, it will afterward avoid it when presented under similar circumstances, or having found food in one locality, it will afterwards seek it in the same direction. . . . It is susceptible to the emotions of surprise and fear, as is clearly shown by Binet's experiments with Infusoria. It has feeling, for it reacts to peripheral stimuli. (Haeckel.) It adapts means to ends, near and remote, as is shown by Verworn's experiments with Difflugia."[1]

[1] The above extended quotation from "The Law of Mental Medicine," by the late Dr. Thomson Jay Hudson, is given place

We have quoted at length this instructive and interesting account of the origin, development, and characteristics of cell life without any material omissions, and without changing a single word, except in the use of certain italics to call attention to important points now under consideration. It seems hardly necessary to review this passage minutely, as its perusal, in connection with what preceded it, must present to the mind of the reader the obvious application of our hypothesis. The generally accepted belief concerning the relation of life and intelligence to the material organism is unconsciously shown in the passage quoted by the frequently recurring use of such words as "endowed," "inherent," etc. The idea is that each infinitesimal cell has a certain quantity of vitality and intelligence deposited within it, sufficient for every need and emergency of its limited and well-ordered experience. The prevailing view is that what we call the intelligence with which the cell is endowed is indeed a divine spark set a-burning for the longer or shorter period of the cell's existence. We may picture the hand of God

in these pages because it shows the results of most painstaking investigation of the subject of histology, and the author's style lends a charm and attractiveness to the account of cell life in physical organisms that is rare in scientific writings.

"endowing" each cell in all the universe with a definite gift of spiritual or psychic energy, to be returned to the *G*iver at the end of its own brief span of being; or we may conceive of this energy being bestowed upon the primordial cell and passing on through infinite reproduction, division, and subdivision until the original endowment comprehends and quickens the innumerable forms of life on the earth. Either the primal gift of life and intelligence was all but infinite, while manifesting but a faint and feeble spark in the first unicellular organisms, capable at length of endowing all possible and conceivable organisms with psychic energy, or we must believe in a constant spiritual development concurrent with the evolution of physical nature, — an altogether gratuitous supposition.

The theory of the endowment of each individual cell with its own share of life and intelligence presupposes innumerable acts of bestowal by some living and intelligent power, and is open to the same objections that have been so justly and reasonably raised against the belief in special creations. With what varied gifts of intelligence must the numerous species of cells of which the human body is composed be endowed! How

different in degree, if not in kind, the intelligence of muscle cells, whose office is that of "contraction, or vigorous shortening of length," and the mentality of those cells which, with the accuracy of a chemist, "select and collate salts of lime for the organic framework, levers, and joints"! Mark, too, the rare intelligence and skill exhibited by those cells which are "the special artificers of complicated apparatus for transmitting light, sound, odors, and flavors to the highly sensitive brain cells." How marvellous the intelligence of those most highly differentiated cells which "constitute, respectively, the organ of objective intelligence and the means of communicating information from one part of the body to another"! We must, then, regard the *G*iver of these gifts not only as imparting them to all cells, but also carefully discriminating and giving to each cell or group of cells that intelligence which its peculiar functions require.

If the intelligence of all cells was latent and potential in the primordial cell, then how wasteful was the process by which so enormous a store of high-class energy was for ages upon ages kept stored up, practically useless!

Evolution is a *physical process*, and we have no

warrant whatever for extending it into the psychic universe. There is not the faintest suggestion, in our experience in the material world, of the growth and development of things spiritual.

By our hypothesis all these evident difficulties are removed. The unseen universe is infinite, eternal, and infinitely energetic. It pervades, touches, and interpenetrates every atom in the physical world. Its relations are all psychical —intelligent. Its forms of psychic energy are infinite. Every cell in every living organism is touched and embraced by the forces of this all-pervasive universe of intelligent being. That which effects the different functionings of the groups of cells is but the infinitesimal physical variations of those cells themselves, making each group respond to and manifest certain specific forms of intelligent energy. If we ever become able to investigate minutely these infinitesimal variations, we shall, it may be, then know how to classify these cells according to their functions.

Reverting again to the above quotation from "The Law of Mental Medicine," we find the following words: "Each organ of the body is composed of a group of cells, which are *differentiated* with *special reference* to the *functions* to be

performed by that organ. In other words, every function of life is performed by groups of coöperating cells, so that the body as a whole is simply a confederation of the various groups." The "differentiation" above described "with special reference to the functions to be performed" is not that of the intelligence with which the cells are supposed to be endowed, but of the physical structure of the cells themselves.

Reverting again to Dr. Hudson's statements, the following words may be quoted: "Each living cell is *endowed* with a wonderful intelligence. . . . Its wonderful character consists, not so much in the *amount* of intelligence possessed by each individual cell, as it does in the *quality* of that intelligence." Here we have a statement of the quantitative and qualitative intelligence of cells — a certain definite deposit of psychical energy. I am not criticising the language of Dr. Hudson, but calling attention to the recognized phraseology of science upon the important subject under consideration. It is clearly seen that while the presence of intelligence in the cell is taken for granted, yet science has no scientific account to give of such presence. This hypothesis of the parcelling out of certain quantities and qualities of intelligence

among the cells is not only unscientific, it is manifestly artificial, unwarranted, and absurd.

Again, it is stated by scientific writers on this subject that the cell is *endowed* with an *intuitive knowledge* of the laws of its own being, which *knowledge* is *proportioned* to the *stage* of its development. Here it is supposed that at different periods of its development, the cell receives endowment of the knowledge of the laws of its own being in its constantly changing relations and variations in structure. How much more scientific to suppose that the ever-present and active energy of the psychical universe utters itself in new manifestations, as means thereto are afforded by the development of more and more advantageous variations in the physical structure of the cell! Thus is the way made clear for the scientific study of the physical and material structure of the cell, without any supposition as to the psychical phenomena manifested concurrently therewith. Think of the enormous amount of psychical energy appropriated to the individual use of a tiny mass of protoplasmic jelly, whereby it performs acts of locomotion, of digestion, and assimilation; manifests the power of choice, rejecting from its food that which is unwholesome appropriating only that which is

nourishing; manifesting memory, as shown in that having once encountered danger, it will afterwards avoid it when presented under similar circumstances, or in that having found food in one locality, it will afterwards seek it in the same direction. It is further found to be susceptible to the emotions of surprise and fear. It has feelings reacting to peripheral stimuli. It has foresight, adapting means to ends, near and remote.

We come now to consider what the science of Psychology teaches concerning that "communal soul" of the multicellular organism, the human body. The cardinal doctrine of this branch of science is that these innumerable little minds are governed, controlled, and directed in their work by a central intelligence *resident* within the organism.

"Scientists may differ as to the proper terminology by which this central intelligence should be designated; but no one denies its existence, or its power to control its millions of subordinates. . . . Philosophers may differ in opinion as to its origin and its ultimate destiny; and biologists may not be agreed as to just what it is, — that is to say, whether it is the sum of all the intelligences of which the body is composed, or whether it is an independent entity, capable of surviving the dissolution of the confederacy which it controls. . . . The one salient fact upon which all who are acquainted with the propædeutics of experimental psychology are agreed, is

that it exists, and that it controls the functions of the confederated cells of the physical organisms of all sentient creatures." [1]

Even the great exponent of materialism, Haeckel, speaks thus confidently of what he calls the "tissue soul":

"This tissue soul is the higher psychological function which gives physiological individuality to the compound multicellular organism as a true cell commonwealth. It controls all the separate cell souls of the social cells — the mutually dependent citizens which constitute the community."

The testimony of two so widely divergent authorities must positively establish this as the generally accepted teaching of science upon this subject

It is evident, then, that the hypothesis of an infinitely energetic, psychical universe to which all these phenomena may be referred, affording a scientific, rational, and philosophical account of their origin, has not heretofore been proposed, or, at least, considered by the recognized teachers in any branch of science. For this reason we humbly, yet confidently and resolutely, give this hypothesis to investigators and thinkers of our

[1] Hudson's "Law of Mental Medicine," p. 191.

day, believing it will contribute to the progress of knowledge in every department of science and philosophy, and afford a reasonable account of many phenomena, physical and psychical, that have hitherto remained unaccountable, if not inscrutable.

It will be seen, too, that the "fortuitous concourse" theory, on which materialists so confidently rely, is rendered rational, at least, by our hypothesis. Wherever the concourse of atoms occurs, there immediately does some form of psychical energy display itself, according to the stage of the development of the complexity of the physical organism. The materialists' claim that the change from the inorganic to the organic, the first appearance of the *living protoplasm* in the order of organic evolution, may be accounted for by the increase of complexity in the constitution of the cell, is not wholly erroneous; but the further claim that the increased complexity is the cause and creator of the life and intelligence of the cell was never advanced except as a last resort by some desperate materialistic theorizer. Mr. Wallace, speaking of the beginning of animal life, declares that the introduction of sensation and consciousness is an event completely beyond all

possibility of explanation by matter, its laws and forces.

"No verbal explanation, such as that life is the result of the molecular forces of protoplasm, or that the whole existing organic universe, from the amœba to man, was latent in the fire-mist out of which the solar system was developed, can afford any mental satisfaction, or help in any way to a solution of the mystery."

In order to account for the intelligence of the little globule of unorganized protoplasm called the moneron, it is supposed to be endowed with or to possess a soul. This soul is almost universally regarded as an entity, in some mysterious way bestowed upon or developed in the physical organism. When in its mode of propagation this moneron divides and subdivides its substance, the subdivisions all severally reveal the same kind and quantity of intelligence as the parent. The questions promptly arise, "Whence are these separate mental entities derived? Does the same process obtain in the psychical as in the physical propagation? Does each cell-soul subdivide as the cell?"

Of course, science can only say, "I cannot tell; I know what takes place in the physical structure of the organism, I know nothing at all of any process of psychical evolution."

As we have already seen, the mental life of this primordial germ is manifested by every portion of the plasma equally, there being no differentiation of functions whatever. In the order of development there appears a grouping of these primitive cells, and the beginning of differentiation of functions is observed. At first this grouping has little coherence, and the separation of the cells into smaller groups or into individual cells takes place without danger of the life of the original group or the detached portions. The evolution of the organism strengthens the bonds that hold the confederation of intelligent cells in essential union. Very early stages of animal development exhibit nerve tissues, as the Medusæ or jellyfishes. "Whenever nerve tissue occurs, its fundamental structure is very much the same whether found in the primitive jellyfish, an oyster, an insect, a bird, or a man." The evolution of the nervous system goes on by the process of more and more complex arrangement of the cells and fibres of which nerve tissues are composed. The multicellular organism in the beginning was a mere aggregation of cells, having no essential relations to one another. Soon these associated cells became essentially organized into the tissues of the body. The starfish, an

animal somewhat higher in the zoölogical scale than the jellyfish, and possessed of a more highly developed neuro-muscular system than the latter, presents a most interesting subject of investigation.

"The ganglia, or centres of nerve activity in the star-fish, are arranged in a ring around the base of each of the five rays, into which they send, and from which they receive, nerve fibres; the ganglia are likewise connected with one another by a pentagonal ring of fibres. Now, experiment shows that in this simple and indeed geometrical plan of a nervous system, the constituent parts are able, when isolated by section, to preside over the movements of their respective muscles. If a single ray be cut off at its base, it will behave in all respects just like the entire fish, crawling away from injury, towards light, up perpendicular surfaces, and righting itself when turned upon its back." [1]

Here we trace several steps in the development of the nervous system toward a centralization of nerve activity. There are here several ganglionic centres, all related to one principal centre but having each the power of independent activity. In the unicellular organism every external stimulus affects the entire plasmic body, and the response is immediate. In the multicellular organism the stimulus acts mediately through the ganglion to

[1] Romanes, "Mental Evolution in Animals," p. 29.

which the particular afferent nerve reports, if only a member of the body is to respond; but if the whole body is to respond, then report of the stimulus must be transmitted to the principal centre of nerve activity.

Now, in certain acts, at least, of these organisms, as we have seen, there are observed criteria of mind — the conscious choice, the prevision by which the tiny cell acts with reference to the future, the memory of past experiences exhibited by this unicellular organism. We must, then, admit the presence of mind in the aboriginal organism, and as has been further shown, in every cell of the multicellular body. How are we to regard this mentality? Shall we say it is an entity having a real and independent existence? Shall we consider it a product of the organism, or constituted of the aggregate intelligence of all the separate cells? On either of these suppositions, how shall we give an explanation of the facts, that the subdivisions of the moneron have the same mentality as the undivided parent, and that all the several rays of the starfish can be cut off and at once each ray exhibits the same intelligence as does the entire fish? Are the mental powers of the moneron so subdivided as not to impair the

intelligence of the parent and at the same time afford each member or segment all powers necessary for sustenance of the individual and the perpetuation of the species? Is there a mind in the nervous mechanism of each ray of the starfish, and another in the central ganglion, so that any section thereof may not lose anything of its mentality when cut off from the main body? Romanes says:

"The beauty and delicacy of the starfish is shown when in the unmutilated animal all the nerve-centres are in communication as one compound nerve-centre. For now, if one ray is irritated, all the rays will coöperate in making the animal crawl away from the source of irritatation; if two opposite rays are simultaneously irritated, the starfish will crawl away in a direction at right angles to an imaginary line joining the two points of irritation. And more prettily still, in the globular echinus, or sea urchin (which is, anatomically considered, a starfish whose five rays have become doubled over in the form of an orange soldered together and calcareous so as to make a rigid box), if two equal stimuli be applied simultaneously at any two points of the globe, the direction of the escape will be the diagonal between them."

In all this we see the exercise of intelligence which does not seem to be accounted for upon the hypothesis of reflex action. Another question arises regarding the immediate appearance of an independent mentality in the subdivisions of the

moneron and the segments of the starfish, as follows: Does not some creative power, upon observing the origin of the separated portion, at once create a soul, or mind, and place it in this new being? To this question no satisfactory answer has ever been made. Upon accepted theories of the relation of body and mind no answer can be given.

But, accepting the hypothesis of an infinite, eternal, and infinitely energetic, psychical universe continually crowding to manifest itself in and through the physical process, whenever an organism of sufficient development in complexity and delicacy of structure and composition appears, we can readily answer these questions and afford satisfaction to the mind. When the moneron divides itself and thereby produces its offspring, the forces of the unseen psychical universe at once manifest therein that intelligence to which this elemental organism is capable of giving expression. So, too, in the case of the mutilation of the starfish, the similarity or identical character of the five rays in respect to their neuro-muscular mechanism explains the manifestation of the same quantitative and qualitative intelligence in the several rays cut off. If this hypothesis, when accepted, enables us

to explain these simple facts in these elemental forms of life, it must also give us the principle by which all the complex problems of life and intelligence in all the progress of the evolution of living things can be solved. Every fact discovered in the phylogeny of man, the long course of development by which life has passed from the amœba to the human organism, strengthens the evidence in favor of our hypothesis.

When we come to consider the established facts of the ontogeny of the individual, whether man or a lower order of animal life, we find them giving rise to the very same question to which science affords no answer and which, indeed, upon any hypothesis at present accepted, is unanswerable. We know that each human individual, like every other higher animal, is in the beginning a simple cell. In all cases this stem cell is formed by the blending or copulation of two cells of diverse origin — the ovum of the female and the spermatozoön of the male. Professor Haeckel asserts:

"Each of these sexual cells *has its own cell-soul.* At the moment of copulation or impregnation, not only the protoplasm and the nuclei of the two sexual cells coalesce, but also their cell-souls. Consequently each personality owes his bodily and spiritual qualities to both parents; by heredity the nucleus of the ovum contributes

a portion of the maternal features, while the nucleus of the spermatozoön brings a part of the father's characteristics."

In the name of the science of Embryology, Professor Haeckel cannot make such assertions as to the origin of the individual soul, for as a seientist he has no way of making the soul an object of investigation. The facts of the origin of the physical organism are empirically established, and as such we accept them; but further than that he has no warrant for his conclusions.

As we have seen, Professor Haeckel insists that, in the very act of conception, when the two sexual cells coalesce, the two cell-souls, that of the father and that of the mother, also unite and form the new individual. In this there is an assumption of a dualism. If this cell-soul is only a function or property of the stem cell, then it is already accounted for as any other function or characteristic of the elemental organism. If it is something essentially different, as he implies, from the stem cell itself, then it is no more accounted for than is the spiritual entity in the dualistic theory. The supposition of a soul in each sexual cell blending with that of a cell of the opposite sex is altogether gratuitous and grotesque. We are not permitted,

in searching for an explanation of a physical phenomenon, to overstep the boundaries of the physical process, when a natural and rational explanation is at hand. If the physical organism itself accounts for the phenomenon, we need not — we cannot — go any farther in quest of an answer.

Following out this supposition, Professor Haeckel concludes that every man begins to exist physically and spiritually at the very moment of conception. He therefore declares, "This fact destroys the myth of the immortality of the soul, and that other equally absurd myth, that man owes his personal being to the favor of *G*od." We have shown that this eminent man of science has not established the so-called facts on which to found his declaration of the utter overthrow of man's most cherished hopes and beliefs. We emphatically deny the validity of the whole theory. We refuse to allow even so eminent an authority to compel us to accept his statement that there is such a thing as a cell-soul and that the cell-souls of his supposition, included within or hovering about the sexual cells, in some mysterious way unite when the cells themselves coalesce. This is a myth of the Professor's own creation. Rather let us believe, as

pure materialists, that these cell-souls are but functions or properties of protoplasm, if we cannot accept the venerable belief that *G*od creates each soul and places it in the stem cell at the time of conception.

Again reverting to our hypothesis of an infinite, eternal, and infinitely energetic, psychical universe, we find the same ready answers afforded these urgent questions. The stem cell resulting from the coalescing of the two sex cells offers a locus for the manifestation of certain spiritual or psychical forces, which in their effects we call life and growth. With the ever-increasing development of the organism higher and higher forms of psychic energy are manifested. We can trace the minute steps of the anatomical and physiological development of the organism, but cannot investigate the correlative phenomena of psychic manifestation.

CHAPTER VI

THE HUMAN SOUL

The Unseen Universe not a Subjective, but an Objective Existence — Dependence of the Phenomena of Consciousness on Changes in the Substance of the Brain — Necessity for a New Definition of the Soul — Evidence of our Personality — The Psychical Universe not a Personality — Development of the Mind assumed, but not proven, by Evolutionists — Progressive Manifestation of Consciousness — Orthodox Views and Evolution Views of the Origin of the Soul — The Soul is individuated by the Brain out of the Unseen — Natural Morality dependent on Brain Development.

In his well-known lecture on Body and Mind, Professor Clifford adopted the hypothesis of identity which we are now considering, and from it he was led to the conclusion that if in the case of cerebral processes motion is one with mind, the same must be true of motion wherever it occurs; or, as he expressed it subsequently, the whole universe must be made of mind-stuff. But in his view, although matter in motion presents what may be termed the raw material of mind, it is only in the *highly elaborated constitution* of the human brain that this raw material is sufficiently wrought up to yield a self-conscious personality. — G. J. ROMANES.

We know by immediate or subjective analysis that consciousness occurs only when a nerve-centre is engaged in such a focusing of varied or comparatively unusual stimuli as have been described, and when, as a preliminary to this focusing or act of discriminating adjustment, there arises in the nerve-centre a comparative turmoil of stimuli, coursing in more or less unaccustomed directions, and therefore giving rise to a comparative delay in the occurrence of the eventual response. But we are totally in the dark as to the causal connection, if any, between such a state of turmoil in the ganglion and the occurrence of consciousness. Whether it is the angel that descends to trouble the waters, or the troubling of the waters that calls down the angel, is really the question that divides the spiritualists from the materialists; but with this question I have nothing to do. It is enough that we never get the angel without the troubling, nor the troubling without the angel. — ROMANES.

You may tell me that my hand and my foot are only imaginary symbols of my existence, I could believe you; but you never, never can convince me that the *I* is not an eternal reality, and that the spiritual is not the true and real part of me. — TENNYSON.

CHAPTER VI

THE HUMAN SOUL

THE quest of Psychology is to discover some unifying principle, some ground by which and in relation to which the "world of persons" may be defined. The word "nature" stands for a "constitutive idea" in which all the phenomena and individual experiences in the physical world are grouped together and in a way accounted for. So, by postulating an infinite, eternal, infinitely energetic, psychical universe, we unify all possible psychical phenomena and experiences, whether within the limits of our consciousness and comprehension or not.

We have thus far proceeded with the conception of an objective universe, psychical in nature and relations, within which exists a world of physical phenomena, which are the manifestations of psychical forces under certain specific, finite, material conditions. We have had no reference at all to God, nor to any personal beings. We do

not refer the psychical or physical phenomena of our present experience to God, but to the infinite and eternal spiritual universe forever and everywhere the objective to Deity.

A recent writer on psychology says:

"The world of material phenomena presupposes a system of immaterial agency. In this immaterial system the individual consciousness originates. To it, in some way, the sensational experiences are due which form the basis of our knowledge of the material world. It is on this immaterial system the individual consciousness acts when it produces changes in the material world." [1]

We feel confident that our hypothesis of an infinite, eternal, psychical universe furnishes, in a rational and philosophical way, in strict accordance with the facts and findings of science, this "system of immaterial agency." We have found, by a careful study of physical phenomena as they are known to science, that this system of immaterial agency is a necessary presupposition or postulate of these physical phenomena. We have made it clear that our "sensational experiences, which form the basis of our knowledge of the material world" are due to the energy of an unseen psychical universe, acting in and through matter, and that the world of physical phenomena exists

[1] Stout, "Manual of Psychology," p. 54.

for us only as a system of manifestations of spiritual forces. We must be careful to observe the objective existence of this unseen universe, and not permit it to be confused in thought with the subjective consciousness. We must maintain, not only the marked distinction between that whose differential attribute is thought, and that whose differential is extension, but also between the subject and the object. It is not inconceivable nor unphilosophical to postulate the objectivity of a psychical environment. We should also guard ourselves against assuming that the unseen psychical universe is in any sort a repetition of the physical world, involving the same sort of interactions, and similar distinctions and relations of its parts. We must divest the idea of such spiritual universe of every vestige of materialistic conception. The thought that material substance can become so attenuated in structure as to pass into spiritual existence cannot be for one moment indulged. The luminiferous ether — which some writers have sought to identify with the immaterial — physically ethereal though it be, is no more spiritual than a stone.

"Whatever we know as possessing resistance and extension, whatever we can subject to mathematical

processes of measurement, we also conceive as existing in such shape that, with appropriate eyes and under proper visual conditions, we *might* see it; and we are not entitled to draw any line of demarcation between such an object of inference and others which may be made objects of sense perception. To set apart the ether as constituting an unseen universe is therefore illegitimate and confusing." [1]

It introduces a distinction where none exists. This power which causes in us those conscious states that idealists call the perception of material qualities is none other than the energy of the unseen psychical universe. This view is in no way in conflict with anything that our study of the development of the material world has taught us.

The beginnings of animal life, as we have seen, are unicellular organisms. The so-called evolution of animal life is the development of the multicellular organisms, the ever higher and higher modifications of single cells and groups of cells, and the differentiation of functions. Thus we see the whole problem to be one of physical organization and modification. For an indefinite period of the evolution of sentient life, the so-called sympathetic nervous system constituted the physical mechanism of life. These lower animals manifest

[1] John Fiske, "The Unseen World."

all those phenomena of life which we have denominated psychical, but which are involuntary or instinctive. The most important and interesting cell-group in the higher organisms is wanting in the lower orders of animal existence. These less developed organisms have no brain, or cerebro-spinal nervous system. They are therefore incapable of those higher acts of intelligence which are exhibited by animals possessing brain even in a rudimentary stage of development. With the appearance of a brain begins a new era of evolution. Animal progress in higher intelligence is concomitant with the development of the brain. In fact, evolution, in the domain of higher intelligence, is the development of complexity in the constitution and structure of the brain. There is no such thing as the evolution of psychical powers or faculties. Professor Haeckel says:

"I share the view that true consciousness (thought and reason) is present only in those higher animals which have a centralized nervous system and organs of sense of a certain degree of development. . . . The consciousness of the highest apes, dogs, elephants, etc., differs from that of man in degree only, not *in kind*. . . . Consciousness is but a part of the higher activity of the soul, and as such, is dependent on the normal structure of the corresponding psychic organ, the brain." [1]

[1] Haeckel, "Riddle of the Universe," p. 182.

On the hypothesis of an eternal, infinite, psychical universe, it is possible, indeed, rationally inevitable, to accept these statements of the great exponent of materialism, without in any way committing oneself to materialistic conclusions. All that the careful scientific investigation of brain structure, composition, and activity has established, tends to confirm the rationality of our hypothesis. For under it, these things are just as they should be. What Paul Flechsig, of Leipzig, has *proved*, to the effect that "in the gray bed of the brain are found the four seats of the central sense-organs, or four inner spheres of sensation," we accept without qualification. He further says: "Between these four sense-centres lie the four great thought-centres, . . . the real organs of mental life." "These four thought-centres," continues Haeckel, "distinguished from the intermediate sense-centres by a peculiar and elaborate nerve-structure, are the true and sole organs of thought and consciousness. Flechsig has recently pointed out that, in the case of man, very specific structures are found in one part of them; these structures are wanting in the other mammals, and they, therefore, afford an explanation of the superiority of man's mental powers."[1]

[1] Haeckel, "Riddle of the Universe," p. 183.

In reaching the conclusions of materialism, it will be readily seen, the great materialist confirms the truth of our contention. Ever higher and subtler forces of the unseen universe manifest themselves as the organ of mind increases in complexity of structure and constitution. The "specific structures" in the human brain are seen to be the loci for the manifestation of those forms of spiritual energy which are the distinctive characteristics of man's higher mental powers.

On the generally accepted theory of mind and its processes we must suppose that some special endowment of psychical power is bestowed when these "specific structures" appear in the brain; or that these powers, being always present in the entity called the soul, are dormant until called into activity by the advent or presence of these structures; or else we must accept the conclusions reached by the materialist, that they are all the immediate products of the brain at a certain stage of the development of its complexity. Of the complete dependence of the phenomena of consciousness on chemical and other changes in the substance of the brain very familiar proofs can be readily produced. For instance, such beverages as coffee and tea stimulate our powers of

thought; beer and wine intensify feeling; musk and camphor revive the fainting consciousness; ether and chloroform deaden it. Haeckel asks: "How could this be possible if consciousness were an immaterial entity, independent of these anatomical organs? And what becomes of the consciousness of the 'immaterial soul' when it no longer has the use of these organs?"

We fail to see the pertinency of these questions, even when addressed to those accepting the theory of the soul as an ever-living entity, since the consciousness of the soul in a spiritual environment will be inconceivably different from that of a soul in a material world-order. On the hypothesis, however, of an infinite, eternal, and infinitely energetic, psychical universe in most intimate relations with every atom of the material world, we should account for these familiar phenomena by saying that every change in the substance of the brain effected by a natural or artificial cause either increases or decreases the power of the parts affected to respond to spiritual stimuli. Dr. McConnell cites an interesting case bearing upon this point:

"A lad of fifteen, suffering from epilepsy, was brought to a surgeon. He was a partial imbecile — slavering,

violent, obscene, untruthful, thievish — a foul travesty of humanity, a youthful Caliban. Certain physical symptoms pointed to a pressure upon a certain spot of his brain. An unnoticed and forgotten scar confirmed the diagnosis. The skull was trephined, the pressure was removed, and the epilepsy was cured. But that was the least part of it. His obscenity, deceit, and dishonesty were also cured. Not seven devils were cast out of his spirit, but a little point of bone had been lifted out of his brain. The result was the same. But the barest recognition of this fact renders necessary a *new definition* of soul. Nor has the matter stopped with a bare admission that the body and soul are more closely related than had been supposed. Ten thousand actual experiments have built up the firm belief that every psychic activity, every sensation, every thought, every act of will or of affection, is correlated with some definite action of the molecules of some specific portion of the nervous system."[1]

There can be no doubt that our advance in knowledge of the processes of the brain and the functions of its parts demands at least a new definition of the "soul." Upon the accepted theory, all abnormal conditions or phenomena of the mental life have been considered as, in part at least, psychical, as if the soul itself were deranged or diseased, whereas the "ten thousand actual experiments" referred to above prove such mental

[1] McConnell, "Evolution of Immortality," p. 14.

aberrations to be altogether accounted for by brain conditions. These diseases and derangements are wholly physical. Upon the hypothesis herein stated we may again say, "The facts are as they should be," for we suppose that the normal manifestations of psychical activities in the material environment depend essentially upon normal conditions in the physical organ.

As we are traversing a new road, if not a hitherto undiscovered country, it is wise from time to time to take account of our findings and draw the inevitable conclusions from the facts discovered. We have accepted the last word of science regarding the soul as being bound up with the material organ, the brain, that all the phenomena of psychic life on the physical plane are, without exception, indissolubly correlated with certain material changes in the living substance of the body, the protoplasm. All biologists, all chemists, and all physicists agree that a most intimate interdependence of mind and matter exists throughout the whole range of mundane life, and advances through all gradations of the evolution of living creatures. We have marked this interrelation from the beginnings of life in the unorganized moneron, through the whole process of organization, differentiation,

and localization. We have observed the first appearance of rudimentary organs of sense, little filaments and pigment spots, giving promise of organs of perception. A step higher, and we have a nervous system sufficiently organized to show phenomena not to be distinguished from intelligence. Finally, the highest of all psychical activities converge all sensations upon certain centres and structures in the substance of the brain. We find no break or gap in the long process of the evolution of living things. Throughout the development of life and intelligence, physical progress and psychical progress have gone on hand in hand. In the picture presented to us by science, organized matter exhibits sensitiveness not only to the physical forces, — heat, light, etc., — but to those forms of activity which we call, with common consent, psychical. As we have studied living nature we have found intelligence in ever-advancing degree manifested, so that the contention of the materialist that intelligence, as well as life, is an essential property of organized matter, seemed almost forced upon us. In every living cell we have met life and intelligence in indissoluble union. In fact, those specific portions of the brain in which we locate the highest intellectual faculties are but

aggregations, differentiations, and correlations of these primary, living, intelligent cells; so that, *prima facie*, we may say, memory and volition are faculties of the organized aggregates of primordial cells.

In our study of a world process we have discovered no yawning chasms. Not only do we pass without even a long step across the gap supposed to exist between the vegetable and the animal kingdom, but in vain have we been warned of that impassable gulf fixed between the worlds of living and dead matter. The innumerable bridges which philosophy and science have constructed are altogether useless, and may be speedily remanded to the limbo of things outworn. There is no yawning abyss. The forces of the unseen universe move ever onward without leap or bound, manifesting the forms of so-called physical energy in unorganized as in organized nature.

Thus is there provided the great unifying principle, an unbroken order of development, a changeless universe, which accounts not only for the infinite variety of phenomena and the endless changes in the physical world, but also shows each in its place to be an essential incident in a consistent world-order or process.

The infinite, eternal, and infinitely energetic, psychical universe, in which all relations are psychical, and the differential of which is thought, must be conceived as unconscious, for consciousness can belong only to the individual.

As was above remarked, we have accepted the last word of science regarding the intimate correlation between the higher intelligence and the brain, and yet insist upon the essential existence of a self-conscious soul. Of the existence of a personality which is ourself, we have, at least, as valid evidence as we have of the existence of the material world. It is axiomatic that the common-sense decision of mankind in regard to the existence of the external world is, in a practical way, worth more than all the arguments of those who in all ages have discussed this subject. This unanimous verdict of mankind is based upon the report of the senses interpreted by the intellect. The decisions of universal consciousness of the existence of the living personality are evidently still more immediate and trustworthy. We may, therefore, lay it down as another axiom, that the decision of mankind derived from consciousness of the existence of our living self or personality whereby we think, will, and act, is practically worth more than

all the arguments of all the logicians who have discussed the basis of our belief in it. To whatever extent, even to the farthest, we may be ready to admit the dependence of our mental operations upon the organization and functional activity of our nervous system, we must also admit there is something beyond and above all this, to which, in the fully developed and self-regulating intellect, that activity is subordinated.

"The hypothesis of a soul is demanded as a ground of the unity of self-consciousness, and also of the unity of the universe. Such an hypothesis is justified as the real principle of the harmony of the subjective and the objective. It seems also to be required as the subject of the changing states of thought, feeling, and volition revealed in the phenomena of consciousness." [1]

Common-sense of mankind says that *self* is a *simple*, unitary, active principle or thing which dwells within the body and directs it. This notion of *self*, however, is not verified by the results of the critical study of the mind. In empirical psychology the self, ego, or personality, is regarded as the

"subject of feelings and phenomena, plus the series of feelings and phenomena themselves, the two being in that relation to each other in which alone the one is

[1] *Soul*, "International Encyclopædia."

subject and the other is a series of feelings, phenomena, or objects. . . . The attempt to ignore one term of this relation is hopeless; and equally hopeless, even futile, is the attempt, by means of phrases such as 'consciousness' or the 'unity of consciousness,' to dispense with the recognition of a conscious subject." [1]

Here, then, we stand face to face with a new fact — a self, personality, subject, and a whole series of psychological phenomena correlated as subject and object. How, on the hypothesis of an infinite, eternal, and infinitely energetic, psychical universe, immediately correlated with every atom of the physical process, are we going to account for the "self" or "personality," a psychic entity, of the substance of the psychical universe, and yet having existence in relation both to the physical world and the psychical universe? All the psychical phenomena throughout the lower orders of animal life have been clearly and easily accounted for as manifestations of psychical energy through the functionings of physical organs as they have become more and more complex in structure and constitution. In all this we have pursued a strictly scientific method, and although we have ventured far, it may be, into the regions of the unknown, we have never got beyond hailing distance of the

[1] *Psychology*, "Encyclopædia Britannica," 9th ed.

known. Physicists, chemists, biologists, and psychologists have been our companions and guides.

It might be objected that though it is entirely true that the psychical phenomena manifested throughout the lower orders of animal life are due to the correlation between the physical world and the energy of the unseen universe, when we come to consider self-conscious, self-determining, self-controlling personality, there can be no longer identity of this personality with the unseen psychical universe.

Psychologists insist that "whatever not only lives, but feels and consciously acts, must have something of its own; must appropriate the impressions it receives, and have the credit for the energies it puts forth, and cannot be regarded as the mere organ through which flows a foreign power. If my thoughts were passed through me by another; if my desires, affections, resolves, were phenomena of the psychical force that came my way; if, further, the whole genius and knowledge of the human race, the moral struggles of its heroes, the literature, philosophy, and art of its cultivated nations were but the ripplings of the Divine Reason upon a world, itself the aggregate of divine powers — there would, in fact, be only

One Person in the universe, and the whole drama of our life and history would dissolve into an illusion."

To provide for this higher class of cases which culminates in *personality*, we must recognize some detachment of power from the substance or energy of the psychical universe. Or, as the psychologists further say, "we must admit the conception of a *delegated* force, lent out for a time, in order to work the conditions of a distinct existence, and relapsing when the term is over."

We have traced the ever-advancing manifestations of the energy of the unseen — each in the ascending scale more special and specializing, exhibiting distinctively the characteristics of particular natures, and gathering around centres of individuality, till, at the farthest distance from the beginning of the physical process, they emerge in the conscious *ego* of intellectual existence which finally sets up another person. Here we reach the *detachment* and *farming out* of power, and its *storing up* at single loci or foci, to be exercised and put forth from within under fixed laws of being. Here is man, not only a thinking and reflecting conscious self, but also a self-determining and self-controlling agent, in his highest development,

a being all of whose actions are performed with a definite purpose which is distinctly within his own view, and adapted to the attainment of that purpose by his own intelligence.

The infinite, eternal, and infinitely energetic, psychical universe is not only without consciousness of its activities, but also without volition or will. Self-consciousness and self-direction are characteristics of personality only. The presence of will and conscious purpose in the physical process witnesses to the existence and governance of an infinite originating Subject and Personality.

Is it too audacious to attempt to give an account of the origin of personality, consciousness, and volition as resulting from vastly increased complexity in the composition and structure of the human brain? As the atom is supposed to be a certain vortex-motion in the substance of the physical world, the primal manifestation of spiritual energy in the physical process, may we not form the hardly more daring supposition that the highest development of complexity in the brain of man may be able to effect the detachment of force and separate individual activity in the higher regions of the spiritual universe? To use language necessarily figurative, may we not liken the energy

of the unseen to a mighty flowing river, and the brain to some obstruction just beneath the surface that causes a vortex-motion on the bosom of the stream? Though the current rush along, yet the particles affected by the obstruction move constantly round and round, ever maintaining their separate activity and mutual relations. Whenever that complexity of the material organ of the mind is reached, then and there do the phenomena of self-consciousness and volition appear. Then all peculiarities of individual minds are due alone to slight variation in the structure and conformation of the brain. Education and mental development are but processes of brain culture and increasing complexity, by which higher and more potent forces of the spiritual universe are brought within the control of the self-conscious ego.[1]

The question at what time, in the course of the developing individual, from conception to the first distinct manifestation of the phenomena of consciousness, does that individual receive the endowment of a soul, is answered: "Whenever the brain reaches that degree of complexity by which it can create personality and manifest the phenomena of self-consciousness." The life of the human

[1] See note at end of volume.

infant for a period of many months is altogether instinctive, and gradually, under the educational and fostering influences of parents and its environment, at length begins to form simple ideas and to choose and guide its actions from within, in accordance with the dictates of reason. With every stage of bodily growth, further development of brain is observed, and along with it is manifested an ever-increasing intelligence and intellectuality. The will comes into command, and can, to a large degree, direct the thoughts and control the feelings of the child, and thus enable him to rise superior to circumstances and make the most advantageous use of his intellectual faculties. In proportion as he exerts this self-control does he *shape* his cerebral mechanism, which, like all other parts of the organism, *grows* through discipline to the manner in which it is habitually exercised.

The claim for evolution, that it accounts for the origin and development of all the mental faculties and endowments (which has been the chief *casus belli* between science and theology), upon our hypothesis stands forth as innocent of all responsibility for this long continued and tremendous struggle. Of course, Mr. Darwin's theory of the development of the moral and intellectual nature

of man by gradual modification from the instincts of the lower animals, under the operation alone of natural selection, must be admitted to be at least inadequate. His insistence, however, that we find the rudiments of most, if not all, the mental and moral faculties of man existing in lower animals, has been approved by the large results of subsequent investigation and careful observation. This, again, is as it should be. For wherever there exists sufficient complexity of structure and constitution of the organ of mind, there appears the manifestation of the psychic phenomena at a degree of power and vigor proportionate to the organic development. Mr. Wallace points out that, although Mr. Darwin may have shown conclusively the existence in the lower animals of the rudiments of human intelligence, that is not the same thing as proving these faculties in man to have been developed by natural selection. "Because man's physical structure has been developed from an animal form by natural selection, it does not necessarily follow that his mental nature, even though developed *pari passu* with it, has been developed by the same causes only." [1] Here we meet again the suggestion that there is a

[1] Alfred R. Wallace, "Darwinism," p. 463.

development of the spiritual nature concurrent with that of the physical organism. At least, so far as science is able to speak from the facts, such a supposition is wholly gratuitous. Of course, for the purpose of meeting the exigencies of the theory, the evolution of the psychical nature must be assumed. For as the organism is progressively evolved, so the soul, ever exhibiting higher and higher psychical phenomena, must be undergoing an evolution also. With reference to the mathematical faculty, the musical and artistic faculties, and wit, Mr. Wallace considers at length the evidence in favor of a separate and concurrent development of the intellectual nature of man, showing that these special human faculties cannot be accounted for by the law of natural selection. In interpreting all the facts set forth, Mr. Wallace emphatically declares:

"These facts taken in their entirety compel us to recognize some origin for these faculties referred to, wholly distinct from that which has served to account for the animal characteristics of man, whether bodily or mental. The special faculties we have been discussing clearly point to the existence in man of something which he has not derived from his animal progenitors — something which we may best refer to as being of a spiritual essence or nature, *capable of progressive development*

under favorable conditions. On the hypothesis of this spiritual nature superadded to the animal nature of man, we are able to understand much that is otherwise mysterious and unintelligible in regard to him, especially the enormous influence of ideas, principles, and beliefs over his whole life and actions. Thus alone can we understand the constancy of the martyr, the unselfishness of the philanthropist, the devotion of the patriot, the enthusiasm of the artist, and the resolute and persevering search of the scientific seeker after nature's secrets." [1]

We here again come upon the assumption that the spiritual nature of man is capable of and does undergo a progressive development. On what rational grounds can its advocates rest this supposition? If we regard the spiritual nature of man as an entity, we yet have no reason to believe that it is imperfect and undeveloped. In fact, it is this unchanging personality that preserves our identity through the perpetual flux of the particles of matter of which our bodies are composed. The eminent writer just quoted is concerned to overthrow the position of the materialists, and to establish the existence of a spiritual nature in man. On our theory this position is not weakened nor rendered less tenable, but is really and materially strengthened. Science demands the existence of

[1] Alfred R. Wallace, "Darwinism," pp. 473 and 474.

a higher world-order, whence the energy of this physical process is derived. The most rational account of all the phenomena, physical and psychical, within our experience is that such phenomena are manifestations of the energy of the infinite, eternal, and infinitely energetic, psychical universe, acting upon and in coöperation with a physical organ of greater or less complexity of structure and constitution.

We therefore hold that man has a spiritual nature, or rather, is a spiritual personality. This is also the universal belief. We accept all that psychologists teach regarding the content of self-consciousness. Intellect, volition, and emotion, as comprehending the psychical faculties or processes, are recognized.

We have assumed the power in the highest development of the physical organism to individuate the energy of the infinite, eternal, and infinitely energetic, psychical universe, and create personality, the faculties of which are intellect, emotion, and will. Intellect and emotion the lower animals share with man in an inferior degree. The consciousness of personal existence and a purposing will are distinguishing characteristics of man. This exaltation of man into this region of freedom,

self-direction, and self-control is attained at the cost of the intuitions and the inerrancy of instinct. As we have heretofore shown, the instinctive activities and achievements of the inferior animals are the manifestations of the psychical energy of the Unseen, and the degree of intelligence exhibited is in proportion to the development of the physical organ of mind. There is in these psychical activities no evidence of a purposing will, nor of self-consciousness, though by the remarkable simulation of self-directed, conscious action some sort of individuation is indicated. It is possible that the development of the organism may be sufficient to effect a partial individuation of psychical energy, still submerged in and controlled by the forces of the unseen.

Consciousness we would define as *the sense of individuation, of separate existence, of power self-directed, of freedom of choice.* If the lowest intelligence manifested on this physical plane be but the play of psychical or cosmic forces upon a rudimentary physical organ of mind, and if every step in the advance of intelligence is accounted for by the development in complexity of constitution and structure of this physical organ, we can readily conceive that this material organ would

react upon the psychical energy and tend to modify its activity. This reaction would, doubtless, have the effect of gradually individuating the cosmic forces. As such progress advances we should observe a dawning and ever-brightening of consciousness, as with the growing intelligence the individuation increases and the sense of such individuation and of separate existence becomes more distinct.

The rudimentary organ of mind would conceivably offer very little resistance to the stream of psychical or cosmic forces sweeping through it, and hence have little or no power to detain or individuate such forces.

Romanes, in his "Mental Evolution in Animals" tells us: "The rise of consciousness is probably so gradual, and certainly so undefined to observation, that any attempt to draw the line at which it does arise would be impossible." He therefore places the dawn of consciousness somewhere between the first development of nervous adjustments and the earliest appearance of the power of associating ideas.

This rise of consciousness and its more and more complete manifestation are coincident and concurrent with the development of the physical

organ of mind. According to our hypothesis the development of the physical organ of mind, in complexity of constitution and structure, tends to the ever more and more complete individuation of the cosmic forces, and thus the *growing* consciousness manifested in the evolution of organic nature is accounted for.

When the physical organ of intelligence has been so far developed as to manifest the faintest consciousness by its power to interrupt or modify, in the very slightest degree, the play of psychical forces, only certain acts which involve distinct relations between the psychical activities and the physical organ of mind may be said to be conscious. As Romanes says in a passage before quoted: "We know by immediate or subjective analysis that consciousness only occurs when a nerve-centre is engaged in the focusing of varied or comparatively unusual stimuli, and when, as a preliminary to this focusing or act of discriminating adjustment, there arises in the nerve-centre a comparative turmoil of stimuli, coursing in more or less unaccustomed directions, and therefore giving rise to a comparative delay in the occurrence of the eventual response."

The unorganized monera which, as we have

seen, manifest remarkable intelligence, and certain groups of cells constituting the multicellular organism, such as those employed in constructing the brain and nervous system and operating mysterious lines of intelligent communication, are wholly unconscious. The intelligence which these tiny artificers manifest is that of the psychical universe, hence very remarkable.

It is generally admitted that all reflex action is unconscious. It is altogether probable that all instinctive actions, being also habitual, are likewise unconscious. We know that many acts of our own, which in the beginning were conscious and deliberate, such as walking, or playing a musical instrument, may and do become automatic and unconscious by frequent repetition and practice. The instinctive acts of the lower animals constitute the routine of their existence. Not only are they repeated over and over again by the individual, but by generation after generation of the species. May we not suppose, that frequent repetition of an act makes a way through the physical organ of mind, so that the friction (speaking figuratively) between the current of psychical influence and that organ shall be reduced and ultimately destroyed, and hence, there being no delaying or

modifying of the cosmic forces by the organ of mind, there would be no tendency to individuation, and, obviously, no consciousness?

If the marvellously intelligent cells of the multicellular organism act unconsciously, — of this there can be no doubt, — then we can conceive that the accustomed and instinctive acts of the bee, the ant, the beaver, the dog, the horse, and other animals are also unconscious. If we can ourselves, by frequent repetition, render certain of our conscious and deliberate acts unconscious, why should we not suppose that the habitual acts of instinctive existence, repeated over and over again without variation generation after generation, should likewise be unconscious?

The brain must have something to do with consciousness. An anæsthetic, which acts upon the brain, will render it wholly unresponsive to psychical influence. A blow upon the head, a hypnotic control, a sound sleep — all physical conditions — render the subject unconscious. Under these conditions whatever intelligence may be manifested is altogether without consciousness.

Dr. Hammond, after bringing forward in a vast array the results of experience and observation on living animals and defective human offspring,

states his conclusions as follows: "From these facts and many others which might be adduced, I think it may be concluded that instinct has at least its chief, if not its only, seat in the medulla oblongata and the spinal cord."[1] If the brain must be concerned in every conscious act, and instinctive actions do not involve the brain, then must such acts be unconscious. There are certainly indisputable evidences showing, in those animals having a centralized nervous system, acts quite distinct from pure instinct, and simulating, at least, conscious actions.

After the long process of evolution has brought forth the brain of the mammal, we discover many indications of individuation in the various species ascending up to man. The dog and the anthropoid ape seem to have some faint consciousness of their own existence, though yet very far from the self-consciousness of man. We can hardly imagine that a dog knows it is a dog as a man knows himself to be a man. No other creature than man, in the rising scale of being, can have a full perception of its own individuality and personality, as separate from the rest of existence. The instinctive life of the lower animals is

[1] William A. Hammond, "Treatise on Insanity," p. 149.

doubtless unconscious, as we have seen. So we find in the instinctive life of aboriginal man. The savage would be unable to offer any account of those instincts which make up so large a part of his simple life.

Thus we trace, through the long course of the evolution of the human brain, an ever-increasing consciousness or sense of individuation, from its first faint dawning up to the full recognition of independent existence as a personality in *self-consciousness.* As we can discern the earliest beginnings of consciousness in the phylogeny of the race, so we can discover the awakening of self-consciousness in the ontogeny of the individual life. This awakening does not take place in the early instinctive life of the human infant. It is now almost universally held that the normal child gains *self*-consciousness at about three years of age.

How wonderful is the story of that line of the developing organism which culminated in self-conscious man. At first in some primordial form there was the awakening to life, when were first manifested many powers and activities before impossible. Through innumerable forms ever growing more and more complex and marvellous, uttering higher and higher psychical forces, the

organism advances toward its high destiny. Then, at length, the animal no longer is urged by forces from behind, but guided, without its conscious assent, by instincts and appetites, obeying always the strongest motive, almost like a mechanical automaton. Further on it becomes conscious, looking before and after, learning from the past and planning and hoping for the future. The organism has reached the estate of man. He has gained the knowledge of good and evil, can choose the one and reject the other, and feels resting upon him the burden of responsibility, "Heavy as frost and deep almost as life." This is the birth of good into the world, the awakening from thoughtlessness and innocence — a state in which there could be no real and deliberate moral good — into the possibility of the highest goodness, through the truceless struggle with the powers that strive ever to draw the aspiring soul back into bondage to fleshly appetites and passions.

Let us contrast our theory of the origin of the human personality with that at present universally held. The orthodox view of the origin of the human soul may be stated as follows: That at the moment of man's creation *God* bestowed upon this primeval Adam a soul, a spiritual entity, a

portion of the Creator's own being, perfect and free. (Of course, in the development of the race, this individual soul had no part. It departed at the death of the organism into a higher realm of existence, and transmitted naught of itself to posterity.) In the life of every man, at some unknown moment, in some inscrutable way, the soul is injected from outside into the body, there to remain imprisoned and burdened by the weight of the flesh until liberated by death.

Evolution states the problem thus: "The soul is derived from *G*od, but not directly; created, indeed, but only by natural process of evolution; that it preëxisted, but only as embryo in the womb of nature, slowly developing through all geological times; and finally coming to birth as living soul in man." [1]

Unqualified assent to the former of these views is becoming less general day by day. The story of creation as found in the Jewish Scriptures has lost much of the authority in former days accorded it. This arbitrary though loving endowment of a portion of the Deity upon a highly developed animal organism does not comport with our advanced conception of *G*od and His relation to this

[1] Le Conte, "Evolution and Religious Thought," p. 326.

finite physical process. Is the supposition rational that *G*od bestows thus upon each individual man a portion of Himself, endowed with marvellous undeveloped powers, to grow on toward perfection *pari passu* with the development of the brain? That at some time in the fœtal or infant life of each individual, this self-existent entity is injected into his body to grow gradually through instinctive into self-conscious life, and thence onward to the exercise of the highest powers of the human intellect, cannot be regarded as altogether rational. As we have before shown, there is no evidence whatever of an evolution of intelligence, or of psychic being. We *can* trace an evolution of the physical world or process. No thoughtful person can be found to-day who does not accept the findings of science on this question. But to maintain that the spiritual or psychical nature of man is also evolved is, indeed, without the warrant of sound reason. The materialism involved in the theory that the world of matter, after a long period of gestation, brought to birth the "living soul of man" must condemn such a theory. That the *material* world, through a long process of physical evolution, should eventually bring forth an immaterial, psychical product, is

unscientific and irrational. Then consider the hypothesis we are endeavoring to establish. The physical evolution has gone onward and upward from the beginning of this process, ever manifesting higher and higher forms of energy as the organism gains new powers of expression of the forces of the unseen. No question is raised as to the adequacy of the theory of evolution to account for the facts of physical science. All psychic phenomena are rationally accounted for, whether in the animal world or in man, without demanding a restatement of the discovered laws of nature. Difficulties arising from the inexplicable presence and intrusion of psychic phenomena disappear upon the hypothesis herein considered. Psychic forces and phenomena are hereby eliminated from the perplexities of scientific problems. All the subordinate questions and problems of science are by our theory brought into a clearer light more favorable to their ultimate solution. We have seen that on our hypothesis there are no missing links, no impassable chasms in the uninterrupted progress of the evolution of the physical world from the creation of the atom to the most highly developed brain of the greatest of the human race. Out of the infinite, eternal, infinitely energetic, and

perfect psychical universe the physical world emanates, upon it rests, by its energy is sustained, and into it may at length return. The one unchanging, unifying principle of force that binds together all the phenomena, physical or psychical, of the present world-order, is this infinite, unchanging universe unseen.

We have already suggested a rational conception of the origin of the soul created or individuated by the highly organized brain out of the intelligent energy of the unseen. This individuation may be regarded as less and more complete in the higher animals and in man, dependent upon the less and greater complexity of constitution and organization of the organ of the mind — the brain. We have also offered a rational explanation of the loss of the instinctive power and activities by the separation from the eternal and universal energizings of the unseen psychical universe. But while we conceive the soul as in this way coming to personal, self-conscious, self-directing existence, we do not conceive of this self-existent spirit as removed from the psychical universe. While no longer flowing on in the great stream of being of the unseen, but having a being and innumerable independent activities of its own, it is now related to

the infinite and eternal psychical universe as a *subject* to its *object*. Through the highly developed organism, the human body, this spirit entity is also *subject* to the physical *objective*. As man, being as to his body included in nature, is surrounded by a physical environment which is continually acting upon him and presenting itself to his consciousness, so man as a spirit is surrounded by a psychical environment, which is constantly acting upon him and presenting itself in his consciousness. Thus there are presented in this two-fold consciousness both the things of the flesh and the things of the spirit.

According to our supposition, while the individuation is complete in man, the human personality, the natural man, is still submerged in, and washed by, the infinite sea of being, the universe unseen, and may or may not attain unto a complete separation therefrom by the development of the powers of its personal being. In his personality every man is individual and alone. Others can come near to the bounds of this solitude and "send intelligence, influences, and sympathy, but no man can scale the barriers into the personality of another, to think, or feel, or determine, or act for him, or

to take his responsibility, or to participate in his consciousness."

> Yes, in the sea of life inisled,
> With echoing straits between us thrown,
> Dotting the shoreless watery wild,
> We mortal millions live alone.
> The islands feel the enclasping flow,
> And then their endless bounds they know.

The fact of man's personality stands out in clear, definite, and certain knowledge. And his personality necessarily implies that he is a moral and spiritual, self-conscious, self-directing being. By community of nature and common origin, the souls of men hold communion and fellowship one with another, and aspire to kinship and communion with the Father of all spirits.

The varying degrees of intellectual power exhibited by the men of any or all races are accounted for by differences in stage of brain development. That a whole race, like the *Greeks* in ancient times and the French in modern days, should exhibit intellectual superiority to all other contemporary races is due to some peculiar functioning of the brain or to variation in the brain structure and complexity. Genius, too, is not to be explained and accounted for by some special endowment of intellectual power by the partial

hand of the Creator, but by some peculiar conformation or functioning power of the brain of an individual, by which it is capable of manifesting higher forms of the energy of the unseen.

We are coming now to believe that there are various degrees of natural morality, from that of the noble man of high ideals and pure and holy purposes to that of the criminal insane. Upon the orthodox view of the soul as a divine gift bestowed upon each individual at some unknown moment during his early life, we should be compelled to believe that the giver of every perfect gift bestowed upon certain individuals perverted souls, inclined by nature to that which is evil. If, however, certain variations and conformations of brain, due to causes and influences to us at present neither known nor understood, will adequately explain and account for the phenomena, then have we reached not only a more rational, but also a more moral hypothesis.

The innumerable implications and applications of our hypothesis to the facts of our knowledge we have but hinted at. It would be beyond the purpose and scope of the present work to enlarge upon these interesting questions.

Free-will is the very essence of personality. In

man we first find personality. By self-consciousness and free-will man is brought into conscious and moral relations with other personalities, and puts forth activities and exerts influences originating in himself. He determines his conduct, and presides over his own emotions, motives, and impulses. The difference between man and the beasts of higher intelligence is a difference of constitution. Man as a self-conscious, self-directing being is the subject of rational sensibilities inciting to action in spheres entirely closed to the brute.

"He is able to compare all motives and their objects in the light of rational truth, and of moral law, and of ideals of perfection, and of good estimated by reason as of true worth, and of his relations to God. Thus he is able to rise above his nature and determine his ends and his actions. The motives incite, but they do not determine. The brute, on the other hand, is determined by the impulses of its nature. It refrains from following an impulse only when impelled otherwise by a stronger impulse."[1]

A man's ends and actions are determined by himself in his free-will; those of the brute are determined for it by its very nature. Man is personal; the brute, no matter how high and marvellous its intelligence, is impersonal. Man rises to separate and conscious existence; the

[1] Harris, "Philosophical Basis of Theism," p. 393.

brute exists only as a series of special manifestations of the infinite energizing of the unseen universe. The brute sustains relations with the world of sense only, but man has consciousness of his relations with both the physical and spiritual worlds. Man knows himself as nature and spirit, knows himself as connected with both spheres, and finds the powers of both these grand systems of the universe meeting in and sweeping through his being. There is also a higher relationship than the higher of these, and that is the relation of rational and moral beings to one another in a rational system or order of existence, and in common relations to *God* under a universal law of love. This rational and moral world-order could not exist without *God*. Without *God*, nature expresses no rational thought, conforms to no rational law, realizes no rational end. Our hypothesis assumes an impersonal, intelligent universe, without consciousness and without volition. This psychical universe is governed and ordered by the absolute will of *God*. The dramatic tendency in the evolution of the physical process is an ever fuller manifestation of that one increasing purpose which runs through all the ages.

CHAPTER VII

THE INDIVIDUALIZING PRINCIPLE IN THE PHYSICAL PROCESS

Conflicting Views of the Atom — Individual Atoms, Stars, Planets, and Systems — Universal Tendency to Individuation in the Inorganic World and the Organic — Tendency of Dualism toward Materialism — Causal Relation of the Brain to Genius — Action and Reaction between Individualities and their Environment — Struggle of the Psychical Forces to manifest Themselves in All the Kingdoms of Nature — Special Manifestations of this Desire among Animals and Men — Perfect Freedom of Expression necessary for the Development of Creative Powers.

CHAPTER VII

THE INDIVIDUALIZING PRINCIPLE IN THE PHYSICAL PROCESS

THE most readily observed fact in the physical process is the tendency to individualization. The atom, of which all things commonly called material are composed, is distinctly individual. This is true, whether the former theory of the atom as an indivisible entity, or the later view of it as a congeries of energetic corpuscles called electrons, be entertained. As individuals, the atoms act and react upon one another, each after the manner of its kind. The idea of a mass not composed of separate units is inconceivable. There is this inevitable conception of the human mind that any body or mass of matter may not be infinitely divided, but that there must be an ultimate unit that cannot be rent asunder — an infinitesimal, absolute individual.

More recently this conception of the atom has been threatened with utter revolution. The modern views on matter represent this material unit

as made up of any number of corpuscles of negative electricity held in the embrace of a sphere of positive electricity. If this is the correct view, then is the atom, as a system, an individual, composed of lesser individuals, sustaining relations to other atoms, "each a centre from which various sorts of control proceed by means of vibrations, passing now to the atom and again forth from it."

One thing we certainly know about the atom is that, as we descend through the orders of magnitude of individualities of the material world, we finally come upon a very permanent kind of individual, through the boundaries of which we have found no means of making a breach.

Above these, in this veritable hierarchy of being, appear individualities composed of two or more of these atoms, grouped together in some inscrutable way. These individualities, still far beyond the limits of vision, we call molecules. These units or individuals are systems of atoms sustaining peculiar relations to one another such as they do not sustain to other systems, or to the members of other systems. To their environment they sustain, in some sense, the relation of the subject to the objective world. The system holds

itself and its members apart from the world at large.

Again the individualizing is discerned in the formation of the crystals. These combinations of atoms are governed in their formation by geometrical laws and exhibit definite mathematical proportions. It is suggested as probable by Professor Shaler that:

"Every atomic or molecular aggregate has its normal crystal form, the order in which the units group themselves in the state of apparent rest which we associate with solidity. . . .

"From what we know of crystallization, we conclude that if all the matter of the universe were made free to run its natural course from the original diffused state to that of a complete solid aggregation, each kind of itself, it would enter finally, as it lost heat, upon the stable condition of the crystal form, which, so far as we can see, is the most fixed of any state." [1]

The crystals, belonging to many species, have the characteristics of their respective species, and possess also the distinctive qualities of the individual. Each has an individuality of its own. "Thus in many, if not all, of their species the process of etching brings out on the clearage planes curious microscopic pits, the forms of which are in general characteristic of the species,

[1] Shaler, "The Individual," p. 7.

while the details of their arrangement appear to be in a measure peculiar to the individual."[1]

We pass on to the larger individuals of the physical world — the stars and planets, as well as the individual systems the members of which, bound together by the mysterious bond of gravitation, observe orderly movements and sustain relations among themselves apart from all the rest of the world. In previous pages we have stated the general belief of astronomers that the matter now composing the innumerable heavenly bodies was at the beginning diffused throughout and beyond the realm of the fixed stars, the remotest and still invisible suns. Then the portions of this mass had no individual characteristics. All was uniformity and chaos. The process began, which has ever continued, the evolution of the individual. We observe these individualities emerging from this original and simple estate and winning their individual isolation.

All this world of individualities — bodies and systems — is in broad contrast with the undifferentiated ether, which may possibly be a portion of the physical or material world which has not yet entered on its way towards individualization.

[1] Shaler, "The Individual," p. 9.

Our point is that the inorganic world reveals a universal tendency to individualization, an individualizing principle. We might, without exaggeration, say that in this individualizing process all the real work has been done within the material world.

When we pass upward in the order of complexity from the inorganic into the organic world, there can be no doubt whatever of the universal tendency to individuation. Two millions or more species of insects and hosts of species of birds and beasts and higher animals are crowded with individuals, all conforming to the laws of their own peculiar morphology. Each individual is a ripple on the surface of the species' stream of life. These individuals alone manifest the energy of the species. All progress is but the development of the individuals which appear, have their day, and pass on the results of their experience to those that come after. All the characteristics of the individuals in the organic as in the inorganic world are physical. The accumulated effects of experience are all written in the physical organism. Even in man all that is transmitted from parent to child by the way of heredity is some principle of brain-conformation, whereby the organ of mind of the child is made to reproduce certain peculiar

characteristics of the father's and mother's brains. It is inconceivable that anything like thought could be handed down as an inheritance. How often the son manifests the disposition and mental traits of the father! Yet we cannot believe that this psychical resemblance is a direct inheritance from the parent. Of course, the brain, which is the instrument of our thinking, is to the utmost detail of its conformation determined by heredity, at least until the individual life begins to shape it. These inherited brain-features must afford the way to thought to manifest itself as in and through the ancestral brain. We are not, on this supposition, placing ourselves under necessity to believe that thought in any way may be a secretion of the brain-cells. We must recognize the indisputable fact that there is some immediate connection between the state and condition of the organ and the thought that is manifested by it in consciousness. From wherever thought may come, its coming forth must be in some way determined by the peculiar state of the brain, such as may be altogether due to ancestral influences. Every distinct brain condition or state may, indeed, we insist *must*, determine and give rise to a definite mental process.

It is clearly evident that all these varieties of inorganic and organic individualities differ widely from what, in man, we term personality. Man physically is an individual like these others we have been talking about. But man as a self-conscious, self-determining soul or personality, is quite beyond our powers to investigate. We may, however, suppose that, as all the material individualities are or have been formed from the material or stuff of the physical world, so the soul, personality, or conscious self, in some way altogether inscrutable to us, rises out of the substance or energy of the Cosmos or psychical universe. If there is in the physical process everywhere manifest an individualizing principle, then may we not legitimately infer that this same principle is cosmic in its application?

On the hypothesis that this present physical process is but the phenomenal manifestation of some forms of the infinite energy of the psychical universe, or Cosmos, we may legitimately reason from the things that are seen to those that are not seen. We may legitimately conclude that, by some action of the normal human brain at a certain stage of its development, the soul or personality of each human individual is individuated

out of the substance or energy of the infinite, eternal, and infinitely energetic, psychical universe. This is much more rational than the materialistic theory that the brain produces mind and thought.

Professor Shaler thinks he finds some evidence that concrete thought may be inherited, in the nature of the actions where the mind, for any reason, becomes so disordered that it is the prey to delusions. This evidence is furnished by the fact that "the control of the individual consciousness over the mental process is lost, and . . . accidental suggestions, such as can hardly rest on experience, rule the mind." This is most questionable evidence of anything whatsoever; and certainly has no bearing on the problem of the heredity of thought, concrete or abstract. The author quoted, after offering the above evidence, proceeds to assume the position of the materialist, and declares it to be "evident that the physical mechanism of the brain of itself may *produce thoughts* which are not the *product* of *personal* experience." To establish this assertion, he further declares that "it is in accord with the common empirical judgment which men of all races and ages have made as to the nature of insanity, which is, in effect, that the afflicted are possessed by

ideas not truly their own, but suggested by some other personality — as by evil spirits."

It seems impossible to escape materialistic implications in investigating any question concerning the relation of mind to matter or of mental to brain changes upon any hypothesis now generally accepted. The author above quoted has no desire to pose as a materialist, but is forced into this position by the exigencies of his cosmic theory. Accepting the doctrine of the soul as an entity making use of the brain as its organ and coming into the body at some particular moment in the life of the organism, he is perplexed at finding, under certain conditions, such as insanity, somnambulism, etc., that "unaccountable seeds or norms of thought come in an entirely sporadic manner, and not in any way connected with the ordinary mental occupations of the observer." In other places he calls these "spontaneous thoughts." Again they are described as outside the ordinary experience and not regulated by the "balance wheel of consciousness." He accounts for these as "products of the mechanism of the brain itself," while the normal mental activities of the personality are termed "products of personal experience," whatever that may mean.

I am not criticising these statements as the errors of the Harvard Professor, but as the inevitable conclusions of those who hold a dualistic view of the universe or Cosmos. All through the preceding pages of this book I have taken occasion to point out the numerous inconsistencies and inextricable difficulties into which those who hold such views must fall. If, as Romanes said, "materialism is conspicuously inadequate to account for the facts," and spiritualism is "beset with difficulties of a necessary and fundamental kind," and these are now the only views of the universe generally accepted, then can there be no possible escape from illogical and inadequate conceptions and theories by any attempt, no matter how skilful, to combine these irreconcilable cosmic hypotheses.

Only a monism that hypothesizes an infinite, eternal, and infinitely energetic, psychical universe, of which the physical process and all conceivable or possible processes are but phases, is able to offer any satisfactory explanation of the whole of experience and the observed facts of the physical world. Without resort to demonology, or "spontaneous products of the brain," we are able to afford a solution of these perplexities, at once

reasonable and satisfactory. The normal brain, at each stage of its development in the individual, affords the means of the soul's normal activities. If the brain be diseased or mutilated so that its powers of psychical expression be enfeebled, we have the phenomena of imbecility. If by any means the cellular, neurotic, or elemental activities of a normally developed brain become deranged and disordered, we have the phenomena of one of the many types of insanity. In these instances forms of psychical energy, not belonging to the ordered and regulated forces of the individuated soul, break violently upon the physical organ of mind and awaken strange and unusual phantoms and fancies — furtive thoughts, evanescent and Protean visions flitting about the soul outside of the normal consciousness.

These mental or psychical activities, not always or at first subject to the will's control, like the sub-tones in music, which, unheard indeed, make all the difference between the tinkling of some paltry instrument and the supreme tone of the violin, enrich and glorify the life of the human soul. They are the play of the higher psychical forces, which, with larger liberty of action than that of the individuated powers of the personality, touch

and waken to supreme activity certain highly developed portions of the brain.

*G*enius may thus be accounted for as the manifestation of higher and unindividuated psychical forces through some abnormally or excessively developed functioning powers of the brain. As we have before said, to regard genius as due to some rare spiritual gift bestowed upon the mind in some unaccountable and miraculous way, is to presume that there is a beneficent Bestower of these superior powers, who, with unmistakable partiality, makes a chosen few the beneficiaries of this rich dower. As genius is not hereditary, it could not have been evolved from lower forms of intelligence. It is sporadic and thus far unaccountable. One thing has been experimentally established regarding men of genius and of unusual mental powers, that such persons have abnormally developed brains and certain special functioning powers of the organ of mind. This being so, we must accept the fact that all the phenomena of genius are due to specially developed brain powers.

I cannot but regard individualization as revealing the constant struggle of the unseen to utter itself in all possible modes. This revelation of psychical

or cosmic forces is most significant, and is shown in innumerable ways.

The individualities belonging to the lower groups, those of the mechanical order — the atoms, molecules, crystals, and the heavenly bodies — exert a certain action upon their environment corresponding exactly to the reaction of the environment, and *vice versa*. Even in the higher organic groups the same law holds good. Within the body, the inorganic units of which it is composed act and react among one another much in the same way they would if not belonging to an individual system.

At length there is manifest a gradual change taking place in the mode of discharging the energy received from without, so that a new element enters in, and action and reaction after a mechanical mode cease to account for the whole relationship between the organism and its environment. The sound of an insulting word or epithet falls upon the ear. Immediately all the powers of the body are called into activity, — the face flushes, the eyes flash, the fists clinch, and with mighty force the body is thrown upon that of the offender. There is something here quite different from the action and equivalent reaction of the lower groups,

something widely different from mere reflex action of muscles to a particular stimulus. Here is action from within — impulse or will-effort — in response to something more than the mere physical effect of sound-waves breaking upon the organ of hearing. There has taken place an interpretation of the sound-effect, which is made by the soul. The utterance of the insulting word was the result of a desire of the person speaking to make known his contempt for or bitterness toward his enemy, and the response was prompted by a similar motive on the latter's part, or rather by a feeling of resentment or revenge. The magnitude of the importance of such an incident is largely due to the subjective or psychical element entering into it.

As we have before said, all these individualities, from the lowest inorganic group to the highest among organic forms, reveal the constant struggle of the psychical forces of the unseen to give expression to their activities. The corpuscles tend to form the atom, the atoms have a tendency to unite and form the molecule, and with irresistible impulse the elements seek to unite in innumerable compounds. Thus energy from without continually impels to individuation as one mode of its self-expression. The tendency of atoms to enter

into the crystal state is yet another effort of energy to manifest itself in doing work.

In the vegetable world the same tendency is strongly in evidence. The force that expands the seed, that pushes the tender blade through hard surface of the ground, that lifts the stalk ever higher and higher against gravitation, that develops blade and ear and the full corn in the ear, is an effort of self-expression or self-revelation. The bud, the expanding flower, the forming and ripening fruit, all manifest the same strong inclination of the psychical and hidden forces to utter themselves. Is it not more than a fancy that the grace of the palm tree and the pine, the beautiful symmetry of other kinds of forest and shade trees, the chaste elegance and beauty of the lily and the rose, are due to a tendency in the forces of nature to give proper and adequate expression of their activities? This is not an evidence of will in nature, but a sort of intelligent impulse or tendency.

When we enter the animal kingdom, this tendeney is accentuated, and is gradually modified in form until *will* is clearly manifest. The fishes, the birds, the mammals, even the animalculæ which the microscope reveals, are seen to disport

themselves as if eager to make known their inmost feelings.

It may be a vain fancy to regard chemical affinity as due to the affections and aversions of the elements, but it is not at all fanciful to suppose that all the individuals of the higher organic group have a decided inclination to give utterance to the feelings and impulses which belong to and arise in the inner life. These utterances and responses among the lower animals create and cement the social bonds. The sportive gambols and antics of these individuals are almost always social performances. The general good feeling and playfulness among members of the same community or species, and the antagonisms and antipathies between members of different communities and species, are striking facts due not altogether to external or physical relations, but to invisible friendly or unfriendly impulses.

This instinct (for such it is in birds and many domestic animals) of self-revelation is exhibited in the strut and pluming of certain birds, the prancing of the proud steed, the actions of dogs in the company of strange dogs. Innumerable instances might be given in which this instinct is undoubtedly revealed.

But in primitive man we see a distinct advance in this irresistible impulse or instinct of representation. The adornment of the person with gaudy colors and fanciful head-gear and striking apparel is an attempt at self-revelation, showing many distinct traits of individual character and taste. Then the song and the dance serve to meet the need. Very early in human development the practice of the plastic arts appears, and by rude drawings and carvings expression is given to the dreams of the soul. At length, abler minds, filled with speculations, conjectures, creations of the imagination, and forms of thought, find help to representation in inventions and literature. Thus did man, instinctively and in obedience to a commanding need of expression, develop the powers of the brain to manifest the activities of the human personality.

We have, then, in this brief study discovered and traced through inorganic and organic individualities a cosmic tendency toward representation of psychical activities in physical phenomena. In all the groups of inorganic individualities this is very evidently only the tendency, the inclination, the direction of these cosmic forces. In the lower organic groups, where the individuation is

altogether physical, we have the universal instinct of representation. The expression of these inner moods and experiences is invariable in all animals below man, where first we meet with the element of will in controlling these impulses to utterance. As man advances in civilization, we find him bringing the motive of expression more and more under the dominion of the will, and by so doing restricting the scope of individual growth in creative powers. This development can be promoted only by perfect freedom to exercise the instinct of representation. Communities of reticent and undemonstrative individuals can never be progressive communities. The self-sustained character of Puritanism, closing almost abruptly the brilliant age of Queen Elizabeth, brought also to an end the greatest creative period of English literature. The English character has since then borne the impress of this Puritan spirit. The extreme development of this spirit in the Quaker has created an almost immovable conservatism in Quaker communities. The golden age of every race or nation has been that period when the creative motives found freest and fullest expression in literature and art.

CHAPTER VIII

IMMORTALITY

Recapitulation — Inability of Science to give Demonstration of a Future Life — Probability that even the Highest Animals have no Future Life — The Time at which the Soul begins to Exist — Two Essential Factors of Life — Professor Le Conte's View of Evolution as a Gestative Process for the Birth of Spirit — The True Meaning of So-Called Mental Growth — The Identity of Knowledge and Life — The Senses as Gateways of Knowledge — The Purely Spiritual Nature of the Soul's Relations.

Suppose some Platonist were to urge upon us that all this process of material development, with the discovery of which our patient study has been rewarded, may be but the temporary manifestation of relations otherwise unknown between ourselves and the infinite Deity. Suppose he were to argue that psychical qualities may be inherent in a spiritual substance which under certain conditions becomes incarnated in matter, to wear it as a perishable garment for a brief season, but presently to cast it off and enter upon the freedom of a larger existence; what reply should we be bound to make, bearing in mind that the possibilities of existence are in no wise limited by our experience? Obviously we should be bound to admit that in sound philosophy this conclusion is just as likely to be true as that of materialism.—JOHN FISKE.

CHAPTER VIII

IMMORTALITY

THE supreme question which the soul of man has asked with infinite reiteration, "If a man die, shall he live again?" presses as urgently now as ever for a satisfying answer. Any hypothesis offered to account for the origin, destiny, and meaning of the human race must essay to make answer to this interrogation. We have formulated an hypothesis, cosmic in its comprehensiveness, and affecting the very foundations of all philosophy, science, and theology. Certainly this fundamental hypothesis must have something to offer regarding the soul's destiny. We have traced the evolution of the physical process through an unbroken progress from primordial chaos, or rather from its origin in the infinite, eternal, infinitely energetic, psychical universe, to the development of the last and highest product in the human organism. We have seen this evolution to be entirely physical, and the

ever more and more marvellous manifestations of psychical phenomena to be due to the development in complexity of structure and constitution of the organs of life and intelligence. We have conceded the most intimate relation possible or conceivable as existing between life and intelligence and organized matter. This intimate relation, which has been to the spiritualist a source of great perplexity, and to the materialist his point of vantage, we have shown to present no difficulty to the one and no advantage to the other. The concomitance of the physical and psychical phenomena in the long process of development is rationally accounted for also. The completeness in itself of the physical process is exhibited. On the material side we discover the beginning, the becoming, the maturing, and the decaying of all things. There is nothing abiding. Change and decay are visible on every hand. The type, the species, endures; the individuals come and go. Every form arising, going on in development to maturity, then passing gradually down the pathway of decay and death, at length falls into dissolution, the body returns to the dust, and the great stream of psychical energy sweeps on unabated in strength. Nothing is lost, — only one

locus of psychical manifestation has disappeared. When at length the ever-developing organism has reached the limit of its improvement; when the personal being, man, appears, and the brain is no longer simply played upon by the mighty stream of intelligence, but detaches and detains spiritual forces creating a personality, we find along with the dawning of self-consciousness the beginning of the possibility of a higher, more enduring life. We conceive of the soul as becoming more and more a distinct entity, yet still immersed in the great stream of psychical energy. It has motions and activities peculiarly its own, while not yet separated from the universe unseen. As we have before seen, the human soul as a personality possesses certain attributes which bring it into relations with *G*od and with other finite persons, and also set the soul and the psychical universe over against each other as subject and object.

Science has not been able to formulate or authorize any doctrine of even the *probability* of the continuance of the life of man after death. All it has been able to do is to clear the way for the *possibility* of a future existence. It has afforded man a standing-point, whence he may see the beckoning hand of hope, and without irrationality

embrace and hold fast the faith that the Creator and Sustainer of the universe will not, by the utter wreck of the physical world, put His intelligent children to inextricable intellectual confusion. "Perhaps in our ignorance certain analogies may help us to realize the *possibility* that steadily developing ephemeral conscious life *may* reach a critical point where it suddenly puts on immortality." Such are almost the last words publicly uttered by that most hopeful and optimistic exponent of the teachings of Herbert Spencer, Mr. Fiske, and support our statement that present-day science and philosophy have no aid to offer us in our search for another life. Upon the hypothesis of an infinite, eternal, infinitely energetic, psychical universe, the manifestations of certain forms of whose energy constitute the physical world, we must regard the question of survival after death as entirely outside the range of physical science. If the whole process of evolution is within the material world, and its highest product is the brain of man, then it in no way concerns itself with anything spiritual, or any mode of existence outside the physical process. But if this is true, any other evidence that may be produced in behalf of the soul's survival after death is not invalidated or impaired by any possible

advance of science or any discoveries that may be made in the phenomena of the material world.

The physical process, as it bears no witness to God, His existence and attributes, so does it offer no evidence or even suggestion of the soul's immortality. All those analogies so commonly employed as affording proof of man's future life are now seen to be altogether without evidential value. The imagery of the egg and the butterfly will not bear scientific examination. That which dies does not live again in the physical world. We need not pause to consider any intimations of immortality in the physical process, but finding the way clear, we may pass on to those "general considerations of philosophic analogy and moral probability" which may afford us some help in our eager inquiry. Here has arisen in the minds of almost all former writers upon this subject the question as to the scope of the argument for a life after death. Are all conscious beings embraced within the range of the argument? Are we to believe that there is a future life for certain higher animals? Our answer has already been made. We have shown good reason for withholding self-consciousness from even the highest animals. There is no possible reason why we should believe

that consciousness and the possibility of a future life for the individual are coexistent and co-extensive. Then we sometimes hear the further perplexing question asked, "How could immortal man have been produced from an ephemeral brute?" The relevance of this question is shown to have been removed when we confine all development to the physical process, and accept the theory that in its constitution the soul is immortal, and the only question is as to the endurance of the personality. The existence of the human personality is based upon the irrefutable testimony of self-consciousness, and cannot be questioned. There is no evidence whatever of the existence of personality in the highest brutes.

Mr. Fiske tells us that Voltaire asked questions, to which, he declares, the "most proper answer is a frank confession of ignorance." These are the questions. "When does the immortal soul of the human individual come into existence? Is it at the moment of conception, or when the new-born babe begins to breathe, or at some moment between, or even, perhaps, at some era of early childhood when moral responsibility can be said to have begun?" To these questions there is one answer which upon our hypothesis is at once

adequate and inevitable. Those higher psychic forces which in man we call "mind" are operative just at that moment when the brain of the embryo or new-born infant reaches the degree of complexity of organization in structure and constitution that affords a *locus* for the manifestation of these higher spiritual or psychic forces. In the phylogenetic evolution of man the same is true. The developing organism grows on toward perfection, manifesting, at every step, higher and higher forms of psychic energy until at last the self-conscious soul appears, not as the product of the physical evolution, but incidental to this highest stage of development. Some scientists regard it as a maxim that "nature makes no leaps." Others deny the truth of this statement, and declare that "nature's habit" is to make prodigious leaps. Upon our hypothesis the "maxim" is true, but to the observant student of nature the latter statement appears to be true also. The development of the physical organism goes on without gap or interruption, but suddenly, at the moment when the conditions are perfect, the new psychical phenomenon is manifested. The illustration used by Mr. Fiske is clear and luminous. "Slowly grows the eccentricity of the ellipse as you shift its position in the cone,

and still the nature of the curve is not essentially varied, when suddenly, presto! one more little shift, and the finite ellipse becomes an infinite hyperbola, mocking our feeble powers of conception as it speeds away on its everlasting career." There is no leap here, only that which we could not perceive in its gradual development suddenly bursts upon us.

Life, whether mortal or immortal, has two essential factors: a living organism, and a fit environment in which to live. Life has been properly defined as the action of an organism upon its environment, and the reaction resulting therefrom. We must have, then, something that lives, and a place or conditions in which to live. If we are to live after death, we must live somewhere, and carry on our conscious existence in relations and under conditions of which we can have knowledge. Correspondence and knowledge are identical terms in respect to conscious being.

Upon our hypothesis, the living spirit, by its constitution capable of unending existence, and an eternal, perfect environment, are at hand. The living entity and the conditions of living are provided. In this life, the living body with all its powers unimpaired must be capable of corresponding

constantly and without interruption with its essential environment. A failure on the part of the body to correspond with the air through the lungs by any outward interruption would result in death through poisoning of the blood. One falling unexpectedly into deep water and being unable to keep his head above the surface would die of drowning because unable to adjust himself to his sudden change of environment. Sometimes disease attacks the lungs and renders them incapable of properly oxidizing the blood, and death again results — this time from impairment of the organism. It cannot be contended that this physical body is capable of continued existence for an indefinite period of time. The forces of life and death are too nearly equal in strength in these mortal bodies for an extension of existence indefinitely. Then, too, the physical environment in the midst of which man finds himself is subject to startling and sudden changes, which are constantly endangering the equilibrium of these contending forces. The force that makes possible man's living upon the surface of earth may at any time cause his death by falling. The vital air may, by a change of temperature, endanger his life by a draught. Heat, cold, and dampness — all essential

to his temporal well-being — may be causes of his death. The food he eats may also imperil his life, and his very pleasures are often quaffed form a cup whose dregs are deadly poison to the body. Under favorable circumstances he may prolong his days beyond the narrow limits of three score years and ten, but then is his strength but labor and sorrow. We have not, then, in the human body an organism capable of long-continued physical existence, and our changeful environment ever threatens to cut us suddenly short in our career upon earth. Perfect life is perfect correspondence with an enduring and perfectly conditioned environment. Either the environment must be changelessly fixed or there must be a perfect correlation between changes in environment and adaptations in the organism. Upon our hypothesis we have an environment perfect, infinite, and infinitely energetic, with which an organism perfectly adjusted may continuously correspond forever. We then have the spiritual organism and the environment, the essential factors of the problem of future existence.

It is further evident that the soul, being what it is upon our supposition, and sustaining such relations to the material organism as we assume, cannot depend upon that organism for the continued

existence of its powers. Bodily death of an animal is, so far as the higher psychical phenomena are concerned, but the destruction or removal of the material *locus* of certain psychical manifestations. By impairment of any of the vital organs the whole body at length becomes incapable of manifesting the forces of life and intelligence from the unseen. Death, as we know that dread catastrophe, has nothing whatever to do with the continuance of those psychical forces, the manifestations of which in the physical process we call life and intelligence. The assertion that death ends all is at once ruled out of consideration by our hypothesis. If, however, we conceive the soul as "nascent" in the womb of nature, its gestative mother, then, of course, at every step of its developing existence it is dependent for its being upon matter and the physical forces. But we have seen that not a single fact discovered by science can be advanced as affording any evidence that there is any such thing as an evolution of spiritual or psychic forces. The psychical are the true phenomena, being, as known to us, the *manifestations* of psychical energy. Hitherto, science has not repudiated the statement of Professor Le Conte as hereafter quoted:

"Thus, then, Nature, through the whole geologic history of the earth, was gestative mother of spirit, which, after its long embryonic development, came to birth and independent life and immortality in man. . . . All evolution has its beginning, its course, its end. . . . I repeat: Without spirit-immortality the Cosmos has no meaning. Now mark: It is equally evident that, without this gestative method of creation of spirit, the whole geological history of the world previous to man would have no meaning. If man's spirit were made at once out of hand, why all this elaborate preparation by evolution of the organic kingdom? The whole evolution of the Cosmos through infinite time is a gestative process for the birth of spirit."

Such an hypothesis raises all sorts of unanswerable questions, and stands squarely in the way of any argument for immortality. Think of the infinite travail of the eternal Cosmos to bring forth at last the human spirit. Here we have a struggling, developing, material universe, with the burden of gestation and the pangs of parturition endured through an infinite past, giving birth at length to a spiritual being that is to endure forever in a psychical environment. The less brings forth the greater, the ephemeral is "gestative mother" to the eternal.

It would, indeed, be inconceivable that all the elaborate preparation by evolution of the organic

kingdom should have been made without reference to the bringing forth of an adequate result — some product worthy of the infinite effort. But would the birth of a single, or of several human souls be an adequate result of the infinite gestation of the material world? If in this way the first human soul came into existence, how did it pass by heredity down the ever-widening stream of human beings? Or had the process of evolution, at the very beginning of the human race, already brought into existence an innumerable company of souls designated for all the bodies of men to be born during the subsequent ages of the existence of the race? We cannot accept the theory of the descent of the soul. Each soul has its own history and its own destiny. The stem cell out of which the human body is developed through the stages of embryonic existence does not contain any portion of the soul of the parent. On the universally accepted theory, every individual man receives, at some period of his early development, a spirit "made at once out of hand," to use Professor Le Conte's expression. Either the Deity is forever creating these souls as the millions of human beings are entering upon their earthly existence, or nature is constantly bringing them forth by the

gestative process of which Professor Le Conte speaks. Mr. Fiske, too, speaks of the "nascent human soul," and regards it as developing concurrently with nature's upward progress. But this seems to be only a tacit acquiescence in the accepted theory. No one attempts to prove such an evolution of the spiritual, — it seems to be taken for granted, — and no one heretofore has questioned it. The materialist, of course, believes in, or at least asserts, the development of the soul out of the material world by the forces of the physical process. The hypothesis we are considering takes the universe out of the hands of the materialists, and relieves men like Fiske, Le Conte, and Wallace of the necessity of defending untenable positions.

We see, then, that the whole problem of a future life is lifted above scientific support and beyond the need of it. It is, in a way, a transcendental problem. Science in its farthest development can neither prove nor disprove it. But we are not, for all that, destitute of cogent and convincing arguments for humanity's abiding hope. Mr. Fiske has formulated a most impressive argument in favor of the everlasting reality of religion, which is quite as potent in behalf of the future life of the

soul. It is something as follows: As we look back over the life history of our planet, we trace the course of an "infinitely slow series of adjustments of inner relations to outward relations." The upward advancement toward humanity has been characterized by an ever-widening environment with which the living organism is brought into correspondence. "Every stage of enlargement has had reference to actual existence outside." There was an actual environment in every instance to which the living organism ever more and more perfectly adjusted itself. A supreme moment arrived "when love was beginning to play a part hitherto unknown, when notions of right and wrong were germinating in the nascent human soul, . . . a moment when the process of evolution was being shifted to a higher plane, when civilization was to be added to organic evolution, when the last and highest of creatures was coming upon the scene, when the dramatic purpose of creation was approaching fulfilment." Then we see the "nascent" human soul reaching out toward something akin to itself outside the realm of fleeting phenomena, seeking adjustment of its internal relations in correspondence with external relations in the unseen universe. It was the primal effort

of the mind of man to put itself in relation with a world with which it had no sensible contact, but of which it was conscious. This was the birth of religion coëval with the origin of humanity, which has played a dominant part in all the evolution of human society, so that without it, what the race's history would be is quite beyond imagination. No one can deny that religion has been the "largest and most ubiquitous fact connected with the existence of man upon earth." Now, that in this relation between the soul and the unseen universe only the subjective or inner term or member should be real and the outward or objective term should be non-existent, is something for which we can find no precedent whatever in the whole course of creation's history. Everywhere the correspondence is between actual inner relations and actual outward existences. There could be no life or being without a *reality* within adjusting itself to a *reality* without. If one term in the relation be real, the other term *must* be *real* also. By all the analogies of evolution we are compelled to posit the reality of the unseen world in relation with the human soul. We are driven inevitably to the conclusion that "the unseen universe, as the objective term in a relation of fundamental

importance that has coexisted with the whole career of mankind, has a real existence."

We have based our hypothesis upon the fact that the deepest fundamental postulate of science is the reality of an unseen universe, whence is derived the energy and the very existence of this present physical process. This universe unseen exists as an eternal reality, and man has always sustained relations of adjustment thereto. This continuous adjustment of inner relations to outward relations is life. Therefore man lives here and now in spiritual relations. Religion is this continuous adjustment of the soul of man to the spiritual environment, therefore religion is spiritual life. "This relation of fundamental importance, coexisting with the whole career of mankind," between the soul and the spiritual universe, suggests the possibility of its continuance after the termination of physical existence. The earthly life of the individual is an ever-increasing correspondence of the soul with the external environment — the physical world. "The more specific and accurate, the more complex and extensive is the response to environing relations, the higher and richer we say is the life." The whole course of the mental development is the increasing of the points of intelligent contact with

the physical environment. There is no education or evolution or development of the psychical nature of man in physical relations. The so-called mental growth is but the development of the powers of the physical organ, the brain, with the organs of sense, through which the soul derives its knowledge of the outside world, and by which it manifests its own activities and purposes. All this intellectual growth is correlated to and concurrent with a constant and vast increase of cerebral surface. So, too, when civilized man is contrasted intellectually with savage or primeval man, we discover an enormous development of brain complexity and cerebral surface. The soul, then, constituted of the substance or energy of the infinite, eternal, and infinitely energetic, psychical universe, comes to know more and more of the physical world and its variety of living relations as the developing physical organism brings it into ever wider correspondence therewith. As was shown long ago by Professor Drummond, correspondence and knowledge are identical, and correspondence and life are one. Therefore, knowledge is life. This is certainly true of this present life in physical relations. The wider our correspondences, the profounder our knowledge and the

deeper and richer our life. We thus see the practical and philosophical significance of the profound utterance of Jesus: "This is life eternal that they may *know* Thee, the only true God, and Jesus Christ whom Thou hast sent."

Through our senses we are brought into correspondence with our material environment. These senses are powers of perception by five physical organs. We are able to study and investigate minutely the constitution and structure of each one of these organs. We can examine in detail the peculiar arrangement of nerves as well as the origin and termination of each nerve. We are also able to trace the course of every sensation from the presence and action of some external object to the chemical or physical activity in the brain. What we know of the world without us is through these five avenues of communication. The infant is born with these bodily organs of sense. The world without begins at once to send its messages into the brain through ear and eye and the sense of feeling. The different portions of the brain are thrown into agitation, and there we bring our investigation to a close. But these brain movements are interpreted, and the mind of the child gradually comes thereby into acquaintance

with the phenomena of the outside world. The form of a man sends innumerable rays of light into the infant's eyes, a picture of the man is formed upon the retina, certain effects are transmitted along the optic nerves to the brain, and at length after many repetitions of this experience the idea *man* is formed in the mind. At first the notion is a general one, and no distinction is made between one man and another. For a comparatively long period of time the child regards every man as its father, and even after having acquired the ability to talk will call any man "papa." It will at times show preference for its father, because it learns to associate him with its pleasant experiences. All the growth of the mind of the infant is, then, only a fuller and more perfect understanding of these sensations caused by the action of the outer world upon the brain.

The sound of a human voice falls upon the ear of the infant. A train of activities is initiated which results again in movements in the brain. The child starts at the shock of the sound, but no idea is awakened. The message from the outside world is not understood. It has no significance. At length you observe that there is some perception of the sound and that some meaning is

attached to it. The eyes open wide and a movement is made as if the child were endeavoring to learn from which direction the sound comes and what it signifies. A little later, and the sound of the mother's voice is recognized, and when that voice is heard you observe the face beam with pleasure, and the whole body seems to thrill with delight. A step further, and the different moods or feelings of the mother are associated with the tones of the voice. The mother is angry, the tone of voice betrays it, and the child trembles with fear at the sound. All this comes from the ever more and more perfect interpretation of movements of the molecules of the brain. At length the child has learned to talk, and can understand the speech of those about it, but this understanding is but the interpretation of molecular movements in the brain caused by waves of the air originating with a human voice. The child learns to read, at length. The words of an author are conveyed through the sense of sight to the brain, causing certain molecular movements in the brain, and the mind acquires knowledge of the author's thought by the interpretation of these movements. So, as the sensual experience of the child grows ever wider and more varied, the knowledge

acquired by the mind is the result altogether of the interpretation of chemical and physical effects produced in the brain. Thus does the objective world come to the knowledge of the spiritual "subject." The more highly organized and hence the more sensitive the brain, the more intimate and profound the knowledge of the world without.

When we come to study the manifestation of the soul through the organism, all we are able to investigate scientifically is that series of phenomena beginning with molecular movements in the brain and issuing in some outward act or expression. Thus, I will to rise from my chair and go to my library shelves to get a book treating the subject about which my mind is engaged. The act of my will starts physical and chemical effects in the brain and then the series of outward acts all follow in their natural order. Or I will to meditate upon some abstract subject, and my mind by its spiritual activities sets in motion innumerable and concomitant activities in the brain, which may result in speech or in writing or some other form of expression. So far as we can investigate these phenomena, they originate in brain activities. The will, by thus inaugurating these activities, develops the powers of the brain, and all that we call mental

education is but the development of the brain to receive external impression, and to give utterance to subjective activities.

As we have seen, the soul stands as an observer, interpreting certain subtle molecular movements and associating them with certain objects in the outside world which were the original causes of the movements referred to. Hereby it is desired to show that evolution in the development and improvement of the highest individual, as in that of the race, is entirely physical and never enters the domain of the spiritual.

If the soul is constituted, as our hypothesis makes most reasonable, out of the substance or energy of the spiritual universe, and has relations to the physical world only through the brain and the sensory organs, then its real life is in correspondence with the psychical environment, and its essential relations are with spiritual realities, or may become so. The life of the soul is absolutely independent of its physical relations and correspondences. The soul employs the organs of the living organism to bring itself into acquaintance with the physical process. We may, therefore, maintain, as heretofore, that the question of the soul's future life, which is but the continuance of

its present life, is one that altogether transcends investigation by any possible methods of physical science.

NOTE. — Some years ago Professor Le Conte startled the thinking world by setting forth in the form of a striking illustration a novel theory of the origin of the immortal spirit of man. His illustration was as follows:

"Nature may be likened to a level water surface. This represents unindividuated physical and chemical force. On this surface some individuating force pulls up a portion of the water into a commencing drop. This represents the condition of spirit in plants. Or by greater force the surface may be lifted higher into a nipple-like eminence simulating a drop, or into an almost complete drop with only a neck-like connection with the general surface. This represents the condition of spirit in the higher animals. In all these cases, even though the drop be nearly completed, if we remove the individuating or lifting force, the commencing drop is immediately drawn back by cohesion and refunded into the general watery surface. Once complete the drop, and there is no longer any tendency to revert, even though the lifting force be removed. This represents the condition of spirit in man."

If we should substitute "the infinite, eternal, psychical universe" for the word "nature," and "psychical energy" for "physical and chemical force" in the above, the illustration would be an apt one of our theory of the origin of personality. We have assumed the power in the highly developed brain to individuate the substance or energy of the psychical universe and thus

create the soul or personality. It must be borne in mind that the figure given in the text is not intended at all as a scientific statement of the results of experiment or actual observation, but simply as affording a conceivable and reasonable account of the soul's origin. Such a supposition must be accepted as a product of the scientific use of the imagination. It may be very far from an exact description of the mode of the origin of personality, and yet it is legitimate and warranted by the facts before established. We are not obliged to discover and state the exact method of the soul's origin, or to give the *modus operandi* of its creation. It is sufficient, accepting the human personality as an actual, existent entity, to show this fact to be conceivable in accordance with our general hypothesis. Upon the hypothesis that the highly developed brain of man is capable of individuating the substance or energy of the psychical universe and thus creating personality, it may be objected that a soul created by a brain that is doomed soon to perish must itself cease to be when that catastrophe overtakes the physical organ of mind. So far as we can show by our present method, this may be so. Taking our illustration literally, it would seem that the vortex-motion on the surface of the stream must cease when the submerged obstacle is removed. But we are not warranted in straining an illustration to such a length. We cannot say what other forces may come into play tending to further individuate the incipient soul. As Helmholtz has shown that, in the case of the vortex-atom created in a perfect fluid, such motion could not be arrested by any force known to us, so the individuated energy constituting the soul may be eternal in its activities.

CHAPTER IX

GOD

The Psychical Universe the Objective to God, though in itself without Consciousness — Why Theologians at first antagonized Evolution — Beneficial Effects of the Evolution Theory on Theistic Belief — God not the Immediate Source of Physical Phenomena — Evidence of Intelligence in Nature, without Conscious Purpose or Volition — The Law of Natural Selection *versus* the Argument from Design — The Dramatic Tendency in Nature toward Certain Ultimate Purposes — Two Conflicting Ideas of God, hitherto accepted in Christian Thought — Insufficiency of the Teleological Argument for the Being of an Adorable God — God revealed in Man.

I am in full agreement with Professor Clifford in believing that Monism is destined to become the generally accepted system of things, seeing that it is the only theory of things that can receive the sanction of science on the one hand and of feeling on the other. But I disagree with him in holding that the theory is fraught with implications of an antitheistic kind. In my opinion this theory leaves the question of Theism very much where it was before. — ROMANES.

No man climbs to God by the pathway of the stars who has not first faced Him in the inner sanctuary of his own soul. — ST. AUGUSTINE.

The conclusion, then, is again on this ground irresistible, that the one power that appears under guise so various must, in order to be adequate to its highest demands, include all that its supreme phases display, and must be thought of not as the gravitation that answers to our weight, not as the undulation which reaches us in the form of heat, not even as the vital current of our life, but as the soul of our soul, the fountain and prototype of our thought and conscience, with whom our relation rises at once from convertibility of force into communion of spirit. — MARTINEAU.

CHAPTER IX

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OUR conception is of an infinite, eternal, infinitely energetic, psychical universe, in which things of sense have neither place nor meaning, the differential attribute of which is thought or intelligence apart from its physical manifestation, in which things or beings sustain only spiritual or psychical relations. So far as the energy of this infinite and eternal unseen universe is revealed in the physical and psychical phenomena of the physical world, there is no evidence that consciousness and volition are attributes, properties, or characteristics of this unseen universe. We further conceive of this universe as the perfect objective to the Eternal, Self-existent Subject, through which and in which His omnipotent will acts and executes His beneficent purposes. This unseen universe is the all-embracing and all-producing universe — the Cosmos. The physical world and all possible worlds are but temporary

phases of the manifestation of the infinite forms of the energy of the unseen. All possible or conceivable worlds or processes arise out of the unseen, are sustained and energized by it, at length return into it, bearing all the enduring products of their progressive development. *G*od is immanent in this infinite and eternal Cosmos. Only in a secondary sense is the Deity immanent in the physical world. In the unseen, *G*od's will is perfectly done without possibility of failure or variation, because its infinite energy is adequate to utter the Divine Mind. Through the physical process we observe the eternal spiritual energy giving expression ever more nearly adequate and perfect to the Divine purposes.

We have seen that a necessity of thought requires us to hypothesize somewhat as objective to God. If *G*od is eternal (and if He is not eternal, He is not God), then must that which is objective to Him be eternal also. *G*od is infinite, and only an infinite universe could be ever in objective relations to *G*od.[†] Our hypothesis of an infinite, eternal, and infinitely energetic, psychical universe meets this logical necessity fully, and by it all the phenomena of the physical world are adequately accounted for.

Evolution removed Deity from immediately behind phenomena, and was at first antagonized by theologians as banishing God from his universe. Natural Theology was arrayed against the monstrous atheistic theory that proposed to originate and develop a world without a *G*od. For a long period of time the advocates of evolution were regarded as the enemies of theism, because that doctrine placed secondary agencies and causes between phenomena and the great First Cause. Subsequently it became clear that the theory of evolution did not push Deity out of the universe, but opened the way to discover where *G*od is in a developing world. The Darwinian theory of natural selection overthrew the argument from design; yet, as Mr. Fiske says, when thoroughly understood it will be found to replace as much teleology as it destroys.

"The doctrine of evolution points to an evident dramatic tendency, a distinctly marked progress of events towards a mighty goal. . . . The story which we can decipher is sufficiently impressive and consoling. It clothes our *theistic* belief with moral significance, reveals the intense and solemn reality of religion, and fills the heart with tidings of great joy. . . . Since the Darwinian theory has been fully studied in its application to the genesis of man, a wonderful flood of light

has been thrown upon the meaning of evolution, and there appears a reasonableness in the universe such as had not appeared before.

"As to the conception of Deity, in the shape impressed upon it by our modern knowledge, I believe I have now said enough to show that it is no empty formula or metaphysical abstraction which we would seek to substitute for the living God. Practically there is a purpose in the world whereof it is our highest duty to learn the lesson, however well or ill we may fare in rendering a scientific account of it. When from the dawn of life we see all things working together toward the evolution of the highest spiritual attributes of man, we know, however the words may stumble in which we try to say it, that God is in the deepest sense a moral being." [1]

This long quotation from one of the most eloquent expounders of the doctrine of evolution will be pardoned by the reader, as it shows the attitude of the scientific mind toward the belief in *God*. Since our theory does not in any way modify the doctrine of evolution, as now stated and accepted, whatever evidence that theory affords of the existence and attributes of *God* would be quite as valid, if not, indeed, of much greater value, on the hypothesis it is herein sought to establish.

God is not to be regarded as the agency to

[1] John Fiske, "Idea of God."

which phenomena of the physical process are due as a source, in accordance with the present view. The immediate source of phenomena is the infinite and eternal psychical universe, and phenomena themselves are manifestations of the energizings of the unseen. The direction of these activities toward the realization of ultimate purposes is by the absolute Will and Wisdom of *G*od. Thus only is *G*od manifest in nature.

The formal declaration of Mr. Fiske, as a representative Spencerian, that "the infinite and eternal power manifested in every pulsation of the universe is none other than the living *G*od," we have shown strong reason to reject. We have offered a more rational account of the origin of the power manifested in the phenomena of the physical world. We have seen that "intelligence of a very high order can exist without conscious purpose or volition." Such intelligence we have found in the unicellular organism, and in every separate cell of the multicellular organism. Such intelligence is seen in a high degree of power in the instincts of the animals nearest man, which possess no self-directing will.

In the physical organism of man there are innumerable intelligent activities constantly going on in

the cells and vital organs which are not only not directed by the human will, but of which the mind is not conscious, and over which the will can exert no control whatever. These unconscious, involuntary activities proceed with the same intelligent precision in the body of an unconscious idiot as in the strong and healthy body of the man in full possession of all his mental powers. So is God related to the universe as the Ultimate Will directing all activities toward the accomplishment of His own purposes. Then the forward and upward progress of development points to an originating and governing personality. *G*od is revealed in the dramatic tendency of the world's evolution. The one far-off, divine event, toward which the whole creation moves, witnesses to the omnipotent presence of *G*od in the universe.

The innumerable, unconscious, and involuntary activities taking place continually in the human body do not afford any evidence of the presence and attributes of the personal, self-conscious spirit. No more do the phenomena of the physical world furnish any evidence of *G*od's presence in the world. The argument from design has been shown to be incompetent. Paley's reasoning has been invalidated by the law of natural selection. The

time is now past when Diderot's declaration, that one could slay an atheist with a butterfly's wing or the eye of a gnat, can be regarded as anything but the statement of a vain fancy. The marvellous ingenuity displayed in the construction of the eye does not afford us any evidence whatever of the wisdom of God, but shows the wonderful intelligence manifested in the germ cells the duty of which it is to construct the organ of sight. We have seen that a most rational account can be given of this intelligence as a manifestation of the infinitely intelligent energy of the unseen acting through highly organized cells as *loci* of its activities.

Man's voluntary acts reveal his personality and character. Virtue, benevolence, and integrity are shown in a man's conduct ordered by a self-directing will. His wisdom is also evinced in his direction of his activities toward the realization of his purposes and plans. In the attainment of determined ends in the world without, he employs forces and agencies whose use he has discovered. He generates steam, and has learned to apply its expansive force to the moving of machinery and to locomotion. He has discovered electricity and has learned to make use of it for the accomplishment

of innumerable purposes. Many forms of chemical and physical energy he has mastered and made the ready servants of his will, directed by his wisdom. These forms of physical energy do not reveal man in their activities, but only as those activities manifest the ordering and control of a designing and purposing mind. So the infinite forms of energy in the physical universe do not in every instance of their activity reveal God, but only as they exhibit a dramatic tendency, and a progress of events towards the realization of some ultimate and worthy purpose. Man comes by slow degrees and painful effort to knowledge of the physical forces and their application to the realizing of his purposes, but God knows and controls all the eternal forces of the unseen which do His will without failure and accomplish unerringly His beneficent purposes.

Mr. Fiske; in "The Idea of *G*od," has very much that is both pertinent and wise to say about the conflict between two ideas of God which have been more or less widely accepted in Christian thought. The one — that of Clement of Alexandria, Origen, and Athanasius — represented Deity as immanent in nature or in the universe; the other — that of Augustine — regarded *G*od as a creator and ruler of the world from the outside.

The former idea was vague, general, and closely related to pantheism. The latter, artificial, anthropomorphic, and leading to atheism, because it gives the ongoing of the universe over to blind physical forces.

"It is interesting to note that this atheism (of the ancient Latin world) follows directly from that species of theism which placed God outside of His universe. We shall find the case of modern atheism to be quite similar. As soon as this crude and misleading conception of God is refuted, the modern atheist or positivist falls back upon his universe of blind forces and contents himself with it, while zealously shouting from the housetops that this is the whole story." [1]

This latter theory is older than Christianity. Plato, contemplating the wickedness and misery of the world, pronounced the material universe essentially evil, and so could not think of a pure and holy Deity as manifested in it. He therefore separates the Creator from creation by an infinite abyss. The followers of Epicurus regarded the gods as altogether indifferent to the woes and sufferings of men, dwelling apart in a state of undisturbed bliss. The world was therefore left under the sway of blind forces, as we find depicted by Lucretius, in "De Rerum Natura."

[1] John Fiske, "The Idea of God," p. 92.

In the teachings of St. Augustine not only is the material world separated from God, but sin, original and actual, has cut off man also from his Creator. To bring about access to God and to reëstablish the divine and human relationship the mediation of the offices of an organized church is necessary. This doctrine of God, sustaining these external relations to his creation, gives rise, as we have said, to anthropomorphic conceptions of God, representing Deity as actuated by human passions and purposes, localized in space and far removed from the world of His creation. From His far distant abode He could invade the world only by violating the laws of its orderly ongoing. His every appearance in the midst of the world's activities was attended by miraculous and unaccountable consequences.

By the theory of the Divine Immanence, God is regarded as omnipresent, as standing back of and directing every activity in the physical process. Then we must conceive of the Divine Mind or Will as immediately responsible for the fungus and the parasite. The claw and the talon and the fang are his creatures. The infinite intelligence brings forth through a long process of evolution the multitudes of imperfect and ill-developed creatures

in every species of vegetable and animal life that perish before maturity is reached. It is *God* who acts in every manifestation of physical force, all phenomena are the immediate revelations of Divine Agency. Theoretically *God* is conceived as a personal Being, distinct from the objective universe, but practically the subject and object are identified; or the world is regarded as a simple substance in mass, acted upon by this everywhere present Deity. In this conception, Nature is the body and *God* is the animating soul. Upon the hypothesis we are presenting, the Divine Agency stands back of the infinite energy of the perfect psychical universe. In the eternal Cosmos of spiritual relations the will of Deity is perfectly done. There are no failures of His purposes, no imperfection in the products of the infinite energy. In the finite world of sense, in which a few of what might be called the inferior forms of psychical energy are manifested, only the larger plan, the ultimate purpose are of *God*. God, as revealed in the material world, has neither personality nor free-will. Mr. Matthew Arnold goes as far as is warranted by all the discoveries of science, if not a step farther, when he represents God as the "Power not ourselves that makes for righteousness." Mr.

Huxley, too, goes a great way into the region of pure speculation when he defines God as the "Power behind phenomena — the same which wells up in us in self-consciousness." This quasi-pantheistic conception of the Divine Immanence is too vague and evasive to form a basis for ordinary religious belief. It empties the idea of God of all significance for the human soul. It may lend a degree of rationality to the thought of God as He is held to be revealed in nature, but offers a unifying principle utterly void of any attributes of personality. But by our hypothesis the principle of unity is provided without the sacrifice of the Infinite Personality.

The teleological argument for the being of God yields no God of value for religious uses. What care we in those hours of aspiration and adoration that our Deity has exhibited consummate skill and ingenuity as an Architect or an Engineer? What we yearn for is a Being who can respond as a person to our spirits' loves and cravings. Intelligence and Power are alone revealed in the physical process, and these the soul cannot affectionately adore. In this process the "Power back of phenomena" shows no divine attributes. We cannot guess whether it is well or ill disposed toward

us. We may feel awe, dread, or wonder toward such a Power; we can never worship it.

The philosophy which has dominated largely the thought of to-day bids us pause in our search for God, because the quest must be in vain, for the Power we call God is "unknowable." We cannot comprehend Him, we cannot formulate any rational statement of His being and attributes. Nature, indeed, affords us data quite too meagre for the forming of any conception whatever of the Divine Being.

Man, however, reveals God, as he alone is able to receive the revelation of God. The human personality cannot exist without the Divine Personality. It is the personal man who worships and holds communion with the Personal God. Man does not know God as revealed in the phenomena of nature, but as speaking into the ear of the soul. The very existence of finite personal beings demands the being of the Absolute Person. We have before shown it to be beyond all doubt that personal beings exist. The conclusion is inevitable that the absolute Being exists, in whose thought and purpose all things consist.

It would not come within the scope of this book to draw up in full array the evidences which have

been formulated for the being and attributes of *G*od as revealed in man. Suffice it to say, that whatever argument for this truth is valid upon the prevailing hypothesis of God in relation to the physical process, is rendered more powerful upon the hypothesis here suggested and maintained.

The subordinate hypothesis, that the brain of man, having reached an advanced degree of complexity in structure and constitution, individuates forces of the psychical universe, does not account for those qualities or attributes of personality as characteristics of the unconscious, though intelligent energy of the unseen. Self-consciousness and freedom of the will must be distinctive characteristics and powers of personality as such, whereby relations are created and maintained among personal beings. These relations, existing among finite persons, we term moral or ethical; between the finite personality and God, we call them religion. All these relations are entirely apart from physical correlations. *G*od is revealed in the constitutional religiousness of man. Religion may be defined as the consciousness of the soul's relation to *G*od. This consciousness of *G*od is the highest distinctive characteristic of man, and shows his individuation from the infinite,

psychical universe. It is in this consciousness there arise

> Those obstinate questionings
> Of sense and outward things,
> Fallings from us, vanishings;
> Blank misgivings of a Creature
> Moving about in worlds not realized,
> High instincts, before which our mortal Nature
> Did tremble like a guilty thing surprised;
> Those first affections,
> Those shadowy recollections,
> Which, be they what they may,
> Are yet the fountain light of all our day,
> Are yet the master light of all our seeing;
> Uphold us, cherish, and have power to make
> Our noisy years seem moments in the being
> Of the eternal Silence: truths that wake,
> To perish never.

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