

# SCIENCE AND REVELATION:

& Their Distinctive Provinces.

WITH A  
REVIEW OF THE THEORIES  
OF  
TYNDALL, HUXLEY, DARWIN, & HERBERT SPENCER.

BY  
J. L. PORTER, D.D., LL.D.,  
PROFESSOR OF BIBLICAL CRITICISM, ASSEMBLY'S COLLEGE, BELFAST.



BELFAST:  
WILLIAM MULLAN.

1874.

mem

7193968

BL  
240  
537  
1874

## SCIENCE AND REVELATION.

---

NO one be able to define the exact province and limits of each branch of knowledge under investigation, is one of the best evidences of intellectual power and logical training. Until the student can do so he is not a safe guide. And farther, the man who, knowing the limits of any particular branch, deliberately attempts, by alleged deductions or specious theories, to pass beyond them, is, in so far, unworthy of trust ; and his conclusions, even on other points within his proper sphere, must be received with caution, for a lax method of reasoning, when once indulged in, has a tendency to become habitual. No matter how profound a man may be in his knowledge of any one department, he is not thereby warranted in attempting to make that knowlege a passport for theory and speculation, nor for dogmatism in another department. It is of the very essence of science that the mind form accurate conceptions of what is submitted to it ; that it be able to draw round each subject a clear line of demarcation, separating it from all others, and making it stand out in its distinctive individuality. Then only will thought be restrained from what is vague and indefinite, and rigidly confined to what is real and true.

I admit that the several departments of knowlege in some respects overlap each other, and that all have certain mutual relations ; yet this fact does not tend to confuse the boundaries of mathematics and psychology, or of science and theology, as fields of research and thought ; nor does it warrant the student of one department to intrude his views and theories into another so as to overthrow its legitimate deductions. No psychological belief, for example, can affect a mathematical demonstration, and no theological

dogma can annul a fact of science ; but, on the other hand, psychology has a sphere in which mathematics has no place, and theology has a sphere into which science must not intrude. The method of investigation in each department is specifically different. The mathematician has a problem which he works out in accordance with certain fundamental axioms, until he arrives at a demonstration which cannot be disputed. The scientist examines natural objects through his senses ; his mind interprets the observations thus made, compares them, and frames generalisations to which he gives the name of " laws ;" and these, though never attaining the absolute certainty of mathematical demonstrations, are yet, as a rule, readily comprehended and accepted as facts of science. In the departments of psychology and natural theology a different method is followed, because the grand subjects with which they are concerned are, for the most part, presented directly to the mind, and not to the senses or the logical faculty. They can only be grasped and comprehended in their entirety by abstract thought and profound reflection—quickened and guided in the case of theology by Divine illumination. It consequently happens that minds trained to scientific research alone, and habitually occupied with the severe and exact demonstrations of geometry, or with the palpable forms of matter, encounter an almost insuperable difficulty when they attempt to enter the field of abstract thought. They cannot place the problems of metaphysics and theology under the microscope, nor can they apply to them the test of the mathematical axiom, and, therefore, they cannot always comprehend and will not receive them. And yet to those who are intellectually qualified for this higher department of knowledge, and thoroughly trained in it, the sublime truths which it embraces become as definite and as convincing as the truths of physical science. It is a well-known fact that " each man is strong in that he is trained in, weak in other regions—so much so, that often the objects there seem to him non-existent."\*

\* Shairp, " Culture and Religion," p. 80.

All this shows the necessity in these days of determining the exact provinces, and defining the precise limits of Science and Revelation. The attempts in times past, and even yet on the part of the Church of Rome, to fetter science by ecclesiastical shackles, have brought discredit upon Christianity at large. We hear scientific men now complaining loudly, but not very logically, that all theologians are despots; and they whine as if they were martyrs to free thought. I would, therefore, warn all Christian men not to betray, or give the appearance of betraying, any opposition to science. Let us look upon it as a friendly territory—a province of God's universe, where His footsteps can be traced by every unprejudiced scientific observer, and where His wisdom can be seen by every philosophic mind. But then, on the other hand, it is plain to all educated men that science is at this moment committing the very error which it charges on theologians—it is striving to invade the province of Revelation, and to sweep away its most sublime doctrines, not by established facts, but by crude theories and wild speculations. There can be no peace between them until each is rigidly confined to its own sphere; there they are in harmony, and they mutually contribute to the solution of the highest problems. As a theologian I have no desire to fetter science. I willingly accord to it the utmost freedom, and bid it "God speed" in its own field. There it does noble service to my cause, enabling me to reason with the unerring rigour of logic from palpable manifestations of design in every department of nature, to the existence of an Omnipotent Designer. But when science leaves its legitimate field to assail Revelation; or when the scientist, to use the words of the distinguished president of the British Association, having reached the limits of experimental evidence, attempts to prolong the vision backwards into the unknown,\* so as to solve a problem which science cannot solve, and thus to overthrow theological truth, then, as a theologian, and in the name of science itself, I place an arrest

\* Tyndall, "Address," p. 56.

upon him as he would do upon me; and if he will not desist, I shall ever feel it my duty to warn the public that his conclusions so arrived at, however skilfully framed and eloquently expressed, are no more worthy of belief than the splendid creations of a poet's fancy. In this course of action I am virtually sustained by Professor Tyndall, who says—"The profoundest minds know best that Nature's ways are not at all times their ways, and that the brightest flashes in the world of thought are incomplete until they have been proved to have their counterparts in the world of fact. . . . His experiments constitute a body, of which his purified intuitions are, as it were, the soul."\*

By science I here mean *Physical or Natural Science*, which has for its field the universe of matter, and which, by observation and experiment on its various parts and organisms, endeavours to gain a knowledge of the facts and phenomena of matter, with their relations and laws. The field of science being the material universe, it follows that our knowledge of it must be obtained through the senses; so that scientific evidence is evidence addressed to, and apprehended by, the senses; so far, then, as science is concerned, the only knowledge we can obtain is through the senses, or through legitimate deductions from facts thus perceived.

In investigating the province of science I shall proceed as follows:—I shall critically examine the attempts made by scientists to solve certain great problems which naturally force themselves upon the attention of thoughtful men in every age.—I. The origin of matter and of the existing material universe. II. The origin of life. III. The origin of species. IV. The origin of mind; and, connected with it, the conceptions formed by mind of a God and of a future state. I shall then turn to Revelation, sketch its purpose, and define its province. The field before me is, as you may see, a very wide one; it is a field, too, which embraces most momentous questions, bearing alike on time and eternity, on man's happiness here and on

\* "Fragments of Science," p. 111.

his state hereafter. It is difficult to treat it at all within the scope of a single lecture ; and I can only promise to give you, with as much clearness as is in my power, the results of anxious thought and laborious research, extending at intervals over many years.

One point I think it right to notice at the outset, because much has been made of it. Professed scientists complain that their conclusions are criticised by many who have never examined nature for themselves, who have never conducted a single investigation, physiological, chemical, or anatomical ; and they denounce, in no measured terms, such presumptuous criticisms. The charge is plausible, but not very logical. Let me show this in a sentence. The scientist, by his researches, long, minute, laborious, and complicated, establishes certain facts. He explains these facts in intelligible language, so that all, scientific and non-scientific alike, can understand them. Then he proceeds to deduce from them conclusions with regard, say, to the origin of matter, or the origin of life, or the origin and nature of mind. Now, I take his facts as established and explained by himself ; and I maintain that I am as competent to examine and test the accuracy of the general conclusions he professes to deduce from them as he is. It is not practical science which is here required, it is logic ; and scientific men cannot lay claim to a monopoly of this gift. So then, in prosecuting my critical examination, I shall not attempt to enter the domain of the professional student of nature. I shall simply accept his observations and demonstrations ; not his theories, however, nor his speculations, nor his guesses, but those phenomena which he has established by observation ; and then I shall place them side by side with the conclusions to which they are supposed to lead, and submit the whole to a searching logical analysis. Surely this is not presumption ; and if fairly carried out, no real scientist will venture to take exception to it.

## I.—THE ORIGIN OF MATTER AND OF THE EXISTING MATERIAL UNIVERSE.

The teachings of scientists on matter and the material universe are not uniform ; were they so they would have much greater weight. Nearly every scientific man has a theory of his own, which he propounds with all authority, not to say dogmatism ; and it so happens that these theories are, for the most part, inconsistent with each other—and indeed in some cases mutually destructive. Democritus, a Greek sage, who lived about B.C. 400, propounded a theory of the structure and origin of the material universe, which he appears to have derived from Leucippus, its founder. It was substantially adopted by the Latin poet Lucretius, whose prime object in adopting it was thereby to banish from the mind of man all idea of a creating and superintending deity. It has received its latest development or exposition in the address of Professor Tyndall before the meeting of the British Association in Belfast. Its leading principles are as follows :—Matter is eternal ; it has two characteristics—1. Quantitative relations, which are original ; 2. Qualitative, which are secondary and derived ; and thus the distinction between matter and mind is abolished. Matter consists ultimately of atoms, which were at first distributed through empty space ; the atoms are homogeneous in quality, but heterogeneous in form ; motion is the eternal and necessary consequence of the original variety of atoms in the vacuum ; the atoms are impenetrable, and, therefore, offer resistance to one another ; all existing forms—the stars, the planets, the earth, plants, animals, mind itself—evolved from these atoms ; the process of evolution began by the atoms striking together, and the lateral motions and whirlings thus produced were the beginnings of worlds ; the varieties of things depend on the varieties of their constituent atoms ; the first cause of all existence is necessity, that is, the necessary succession of cause and effect. To this succession they gave the name “ chance,” as

opposed to the "mind" (*νοῦς*) of Anaxagoras.\* There are many differences in details among atomic philosophers, but the leading principles are embodied in the foregoing propositions. Many of the modern atomists admit that matter was created, as I shall show in the sequel.

As this theory is now put forward in the name of science, we naturally ask—What are its scientific proofs? We cannot admit theories. They have no weight in our present critical investigation. And first—What proof is advanced that matter is eternal? There is none; and from the nature of the case there can be none. All that science can prove is, that matter has existed so long as man has existed to observe it. We all admit this; and farther science cannot possibly go. To affirm that it is eternal is a pure assumption, which has no logical connection with observed facts. Herbert Spencer rightly says that the eternity, or self-existence, of matter is unthinkable; and he argues, with true philosophic insight, that "the assertion that the universe is self-existent does not really carry us a step beyond the cognition of its present existence; and so leaves us with a mere re-statement of the mystery."† And, besides, while science cannot advance one step towards the proof of the eternity of matter, some of the most eminent scientific men of the present age affirm that this atomic theory affords the strongest proof of the existence of a Creator. At the meeting of the British Association in 1873, Professor Clerk Maxwell said, "We are unable to ascribe either the existence of the molecules or any of their properties to the operation of any of the causes which we call natural." On the other hand, the exact equality of each molecule to all others of the same kind gives it, as Sir John Herschel has well said, "the essential character of a *manufactured article*." And in the seventeenth century, the celebrated French philosopher and mathematician, Gassendi, enunciated views substantially the same. So much then for the teaching of science as to the eternity of matter.

\* Tyndall, "Address," p. 4. Brandis, *Geschichte*, i., p. 293, sq.

† "First Principles," p. 32.



But we now return to the atoms. Democritus, following Leucippus, held that they were originally scattered throughout empty space, and that they combined in obedience to mechanical laws. Empedocles, a Sicilian philosopher of the same age, could not believe this possible, and he suggested that the atoms possessed original and elementary powers or sensations, some of love and some of hate, and that influenced by these sensations they combined or separated. Lucretius conceived the atoms falling eternally through space, and their interaction throughout infinite time forming the worlds; it was a truly poetic conception, worthy of its author. Professor Clerk Maxwell supposes the atoms to have been originally created, and endowed with certain powers, under the guidance of which they gradually evolved those complex forms now presented to the eye of the observer; and Tyndall, though he speaks with hesitation, appears to think that the material atoms possess some inherent energy or life; and hence he discerns in "molecular force the agency by which both plants and animals are built up," though he does not tell us whence this molecular force has come.

I do not profess to reconcile these discordant theories; nor is it necessary for my purpose, even were it possible. My sole object is to submit them to the test of scientific proof. As to the atoms themselves, they have never yet been discovered. Scientists have searched for them; the highest powers of the microscope, and the utmost skill of the chemist, have been tried in vain. "Loschmidt, Stoney, and Sir William Thomson have sought to determine the sizes of the atoms, or rather to fix the limits between which their sizes lie,"\* and they have failed. Their very existence, then, is a theory—a theory, too, which has no logical connection with any observed fact. And besides, the idea of an atom is inconceivable, or, as Herbert Spencer would say, it is unthinkable. To conceive of a piece of matter, having necessarily, because it is matter, length and breadth, and yet being indivisible, is an absurdity. And if we adopt the

\* Tyndall, "Address," p. 26.

view of Faraday, that atoms are "centres of force," the difficulty remains. A centre of force must be either material or immaterial; if material, the absurdity is as before; if immaterial, then no aggregate of the immaterial could form the material universe. Science is thus completely at fault regarding these imaginary atoms.

And when we proceed to test the atomic theory in its development, difficulties and absurdities accumulate at every stage. It is held that atoms, whether eternal or "manufactured articles," whether inert or gifted with love and hate, or possessing inherent potency, have arranged themselves, by chance friction and spontaneous interaction, throughout the infinite past, into those forms of wondrous beauty, and delicate and complicated mechanism, which we now see in every part of the universe, and which appear to be guided by wise laws, and adapted to wise ends. What is the scientific proof of this theory? There is none, and there can be none. No scientist professes to have seen atoms building up worlds. The nature of the theory places it beyond the range of science, away in the infinite past. And farther, the theory of matter arranging itself spontaneously into systems governed by exact law, and organisms exhibiting the most exquisite design, is not only unsupported by scientific observation, but is opposed to the whole analogy of scientific observation. Spontaneous action is, as Huxley rightly says, action without a cause, which is unscientific and impossible. It is impossible to conceive of a change taking place without a cause, and action necessarily involves change, so that spontaneity in matter is an absurdity.\* It is not one of those physical theories which, as Tyndall says, lies beyond experience, but is yet derived by a process of abstraction from experience. No process of abstraction can derive from experience a thing which is contrary to experience. Take as an illustration of the impossibility of conceiving mere matter capable of evolving an object familiar to us all, the structure of the eye; and I here borrow the words of one of the most distinguished of living

\* See H. Spencer, "First Principles," p. 32.

naturalists, Professor Pritchard :—"From what I know, through my own speciality, both from geometry and experiment, of the structure of the lenses of the human eye, I do not believe that any amount of evolution extending through any amount of time, could have issued in the production of that most beautiful and complicated instrument, the human eye. The most perfect, and at the same time the most difficult, optical contrivance known is the powerful achromatic object-glass of a microscope ; its structure is the long unhopd-for result of the ingenuity of many powerful minds, yet in complexity and in perfection it falls infinitely below the structure of the eye. Disarrange any one of the curvatures of the many surfaces, or distances, or densities of the latter ; or, worse, disarrange its incomprehensible self-adaptive powers, the like of which is possessed by the handiwork of nothing human, and all the opticians in the world could not tell you what is the correlative alteration necessary to repair it, and, still less, *to improve it, as a natural selection is presumed to imply.*"\*

Tyndall himself is, in the end, forced to admit that the structure of the universe around us is an "insoluble mystery ;"† and Huxley, after placing the dogma of atheistic materialism in its strongest light, says, "The materialistic position that there is nothing in the world but matter, force, and necessity, is as utterly devoid of justification as the most baseless of theological dogmas."‡ This with him is, of course, the acme of incredibility and absurdity. So I am content to leave the theory of atomic materialism in the position thus assigned to it.

Here again we see that the solution of the grand problem of the origin of the universe is beyond the range of science. And, besides, the inferential teaching of science is not exhausted in this negative result. It reveals in nature everywhere the existence of *force*. However far its observations extend back, that force cannot be eliminated. It

\* Paper read at Brighton, Oct. 8th, 1874.

† "Address," p. 58.

‡ "Lay Sermons," p. 144.

is involved in the movement of a grain of sand as fully as in the circling of the spheres ; and if science here attempt to pass beyond the range of sense, and to theorise about force existing in atoms, we follow it and say—You are but shifting the mystery ; and we press the natural question—What put the force in the atoms ? Whence came it ? Thus we drive the scientist back and back through every province of his own legitimate domain ; we drive him back, too, through those regions of hazy theory and dim speculation, in which he loves to expatiate, until at last, by an inexorable logic, we compel him to admit an author of force—the Great First Cause. Tyndall has virtually admitted this in a lecture delivered at Manchester only a few days ago. I ask special attention to his words, which conclude a long argument on force :—“In my ignorance of it all, I have asked myself whether there is no power, being, or thing, in the universe whose knowledge of that of which I am so ignorant is greater than mine. I have asked myself, can it be possible that man’s knowledge is the greatest knowledge—that man’s life is the highest life ? My friends, the *profession of that atheism with which I am sometimes so lightly charged would, in my case, be an impossible answer to the question.*”\*

## II.—THE ORIGIN OF LIFE.

The origin of life is a still deeper problem than the preceding, and it is at present occupying the thoughts of the first scientists of the age. Huxley, Owen, and Darwin may be regarded as the leading men, at least in England, in physiological observation. Tyndall follows in their wake ; and Herbert Spencer is the philosopher who, systematising their observations and deducing from them general principles, endeavours, by a recondite biology, to trace life to its source and to reveal its cause. I shall try to show you the line of argument, and to test its scientific accuracy. And here again let me remind you that I do not profess to

\* “Crystalline and Molecular Forces,” p. 12.

enter the laboratory or the dissecting-room ; nor do I care to follow Professor Huxley in his curious and cruel experiments on animal organisms ; I accept his own established facts, and my only duty is to put to the test of a rigorous logic the conclusions drawn from them.

In attempting to discover the origin of life, the eye of the professional physiologist is naturally turned to the germ in which the life-power, if I may so speak, lies, and in which it begins to develop ; the ultimate object being to ascertain how it springs into operation, and what is its cause. Huxley's description is very graphic, and I must give it in full :—" Examine the recently-laid egg of some common animal, such as a salamander or a newt. It is a minute spheroid in which the best microscope will reveal nothing but a structureless sac, enclosing a glairy fluid, holding granules in suspension. But strange possibilities lie dormant in that semi-fluid globule. Let a moderate supply of warmth reach its watery cradle, and the plastic matter undergoes changes so rapid and yet so steady and purpose-like in their succession, that one can only compare them to those operated by a skilled modeller upon a formless lump of clay. As with an invisible trowel, the mass is divided and subdivided into smaller and smaller portions, until it is reduced to an aggregation of granules not too large to build withal the finest fabrics of the nascent organism. And then, it is as if a delicate finger traced out the line to be occupied by the spinal column, and moulded the contour of the body ; pinching up the head at one end, and the tail at the other, and fashioning flank and limb into due salamandrine proportions, in so artistic a way, that, after watching the process hour by hour, one is almost involuntarily possessed by the notion, that some more subtle aid to vision than an achromatic would show the hidden artist, with his plan before him, striving with skilful manipulation to perfect his work." And then, to sum up the entire results of his scientific observations, he adds :—" What is true of the newt is true of every animal and of every plant ; the acorn tends to build itself up again into a woodland giant such as that

from whose twig it fell; the spore of the humblest lichen reproduces the green or brown incrustation which gave it birth; and at the other end of the scale of life, the child that resembled neither the paternal nor the maternal side of the house would be regarded as a kind of monster. . . . It is the first great law of reproduction, that the offspring, tends to resemble its parent or parents."\*

But what light does all this throw upon the origin of life? None. Quite true, Huxley adds, "Science will some day show us how this law is a necessary consequence of the more general laws which govern matter." But this is just a gratuitous theory, a prophecy, in fact, springing from Mr. Huxley's foregone opinion, and having no logical connection with his scientific observations. The fact is, his observations tend to a widely different conclusion. They show us the guiding power which that mysterious entity we call life exercises upon matter, moulding it at will into forms of exquisite beauty and wide diversity; they show us that life cannot be a unit, that is, a thing of one essence and type, emanating from matter; for, were it so, then its operations upon matter would be uniform, and there would be but one class of organisms in the universe. Or, suppose we admit, with Herbert Spencer, that the life-principle is modified to meet the requirements of its environments, then the nature of the full-grown animal could never be predicted, as that would depend on the environments, which accident might entirely change. On the contrary, Huxley's researches prove that there are essentially distinct types of life, though they all seem to have the same elementary material basis; and that each type operates upon matter—the very same matter—with such irresistible guiding potency as to build it up into forms exactly corresponding to the parent stock. Science cannot in this respect control it, it can only observe it. Matter—all life's visible environment—can do nothing except supply what may be called the raw material. Life guides the moulding and building in entire independence alike of man and of matter; and all scientific observation

\* "Lay Sermons," pp. 261, 262.

proves that life—pre-existing life—is absolutely necessary to the building up of animal organisms.

But scientists have tried to go deeper, and we must follow them. The material germ or *protoplasm*, as it is now technically termed, has been subjected to the keen scrutiny of the microscope, and the searching analysis of the chemist. Its constituent elements have been discovered and described. Huxley says, "All the forms of protoplasm which have yet been examined contain the four elements, carbon, hydrogen, oxygen, and nitrogen, in very complex union."\* In whatever form it appears, "whether fungus or oak, worm or man," its elements are the same; and when life in it becomes extinct, it "is resolved into its mineral and lifeless constituents."† It is admitted that carbon, hydrogen, oxygen, and nitrogen are lifeless bodies; and that they all exist previous to their union; "but when they are brought together," says Huxley, "under certain conditions they give rise to protoplasm, and this protoplasm exhibits the phenomena of life."‡ Would it not, at first sight, appear from these words as if science had at length succeeded in solving the grand mystery of the origin of life. It knows all the elements of protoplasm; and there is no lack of them in nature. They exist everywhere around us. "With my own hands," writes Professor Pritchard, "a quarter of a century ago, I obtained all the elements which I found in an egg and in grains of wheat out of a piece of granite and from the air which surrounded it, element for element. It has been one of the most astonishing and unexpected results of modern science that we can unmistakably trace these very elements also in the stars."§ So, then, the elements are known, and are at hand; science can put them together; and Professor Huxley says, "I can find no intelligible ground for refusing to say that the properties of protoplasm"—that is, of course, life—"result from the nature and disposition of its molecules."|| Yet he cannot produce life from those materials. Science here utterly fails. Its

\* "Lay Sermons," p. 130.

† *Ibid.*, p. 131.

‡ *Ibid.*, p. 135.

§ Paper read at Brighton.

|| "Lay Sermons," p. 138.

field, alike of potency and of knowledge, is at this point shut in by an impassable barrier. Huxley confesses that *pre-existing living matter* is absolutely requisite to the development of the phenomena of life, and he admits that its influence "is something quite unintelligible;" while Pritchard affirms that "no chemist, with all his wonderful art, has ever yet witnessed the evolution of a living thing from those lifeless molecules of matter and force."\*

So far, then, as science is concerned, we are as remote as ever from the solution of the problem of the origin of life. Scientists have tried to produce life from its so-called physical basis, but every trial has been a failure. They have tried also to trace it to its origin; but they have only been able to observe its phenomena—they cannot reach its source, nor can they reveal its nature. They see motion and development in the living protoplasm; but these are the effects of a life already existing, not the essence or principle of life itself. Herbert Spencer describes life as "a continuous adjustment of internal relations to external relations;" but this Delphian utterance, if it have any meaning at all, can only refer to the phenomena of life; it does not touch its essence, nor does it throw one ray of light upon its origin. That the life is inherent in, or evolved by, matter is inconceivable, for the living protoplasm often dies, and then, though all the material elements are still there, development ceases at once; the power which moulds and builds has gone mysteriously as it came, and no human agency can again vitalise the dead mass, which now obeys the ordinary laws of matter, and is resolved into its mineral constituents. "The living body resists the chemical agencies that are ready to attack it; the dead body at once succumbs to these agencies." Life is the power which moulds and builds up organisms, and preserves the matter of which they are composed from the dissolving force of the ordinary laws to which mere matter is subject. The teaching of science, therefore, is, that life is something apart from matter; but what it is—whence it comes and whither it

\* Paper read at Brighton.



goes—science cannot tell. Its operation on matter is wonderful. It guides the chemical forces already existing, so as to arrange inert matter into shapes of the most exquisite proportions, and organisms of the most delicate and complicated mechanism—all of which are entirely distinct from those normal forms which the constituent elements would assume, if uncontrolled by the life-principle. And then again, when the life departs, the very matter in which it existed, and which it moulded with such mystic power into bodies of matchless grace and beauty, speedily becomes a mass of loathsome rottenness, and dissolves into its original elements. Professor Huxley is, in the end, forced to admit all this, when he speaks of the “living protoplasm” which preserves and builds up organic forms, and the “dead protoplasm” which is resolved into its mineral constituents; but he tries to save his favourite theory by affirming—not in accordance with, but in spite of logical sequence—that the phenomena presented by protoplasm, living or dead, are its properties;\* and that all vital action may be said to be the result of the molecular forces of the protoplasm which displays it. How, I ask, can vital action be the result of molecular forces alone, when, according to the Professor’s own admission, the influence of pre-existing living matter is shown by scientific observation to be necessary to vital action? The vital action is clearly the result, not of molecular forces, but of the life-principle operating on the protoplasm. In denying this, Huxley sacrifices his logic to his theory; and he would do well thoughtfully to read Tyndall’s striking words:—“There is in the true man of science a wish stronger than the wish to have his beliefs upheld—namely, the wish to have them true. And the stronger wish causes him to reject the most plausible support, if he has reason to suspect that it is vitiated by error. Those to whom I refer as having studied this question, believing the evidence offered in favour of spontaneous generation to be thus vitiated, cannot accept it. They know full well that the chemist now prepares

\* “Lay Sermons,” p. 137.

from inorganic matter a vast array of substances which were some time ago regarded as the sole products of vitality. They are intimately acquainted with the structural power of matter as evidenced in the phenomena of crystallisation; they can justify, scientifically, their belief in its potency, under the proper conditions, to produce organisms; but in reply to your question they will frankly admit their inability to point to any satisfactory experimental proof that life can be developed save from demonstrable antecedent life.\* Tyndall's final conclusion is contained in these words:—"In fact, the whole process of evolution is the manifestation of a Power absolutely inscrutable to the intellect of man. As little in our days as in the days of Job can man by searching find this Power out. Considered fundamentally, then, it is by the operation of an insoluble mystery that life on earth is evolved."†

This is enough for my purpose. The limits of the province of science are here drawn definitely by the President of the British Association. Science shows that life is an entity, a power, apart from and above matter, but that in its essence it eludes the keen eye of the philosopher; that it cannot be discovered by the researches of the physiologist; that it will not emanate from the retort of the chemist, however skilfully he arrange and manipulate the elements of its physical basis; that, in fact, it lies hid among those sublime mysteries of nature which human wisdom utterly fails to penetrate, and which the Infinite Wisdom of the Great Creator can alone reveal to the yearning spirit of His faithful creatures. The whole teachings of science are, so far as they can go, in harmony with that simple but sublime record—"And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul."‡

\* "Address," &c., p. 56.

† "Address," p. 57.

‡ Gen. ii. 7.

## III.—THE ORIGIN OF SPECIES.

Darwin is the apostle of the doctrine of development, though the idea was broached long before his day. To the naturalist, Darwin's book on "The Origin of Species" is one of the most important contributions to modern science; to the logician, it is an utter failure. As a scientific observer, an acute, laborious, skilful, profound student of nature, Darwin has perhaps no equal; but his reasoning faculty seems to have been completely overwhelmed by the force of one preconceived idea. The range of his research has been wonderful; he has roamed over the world to sift and amass materials; he has recorded the results with a lucidity that leaves nothing to be desired; and yet one can, with perfect logical consistency, admit the whole of his observed facts, and reject the whole of his theories. He has a strange way of overlooking what logicians call the middle term; that is, the connecting link between the fact established by scientific observation, and the conclusion which he professes to deduce from it. Professor Huxley—whom Tyndall characterised, and rightly too, as Darwin's ablest interpreter—virtually acknowledges this when he says, "that notwithstanding the clearness of the style, those who attempt fairly to digest the book find much of it a sort of intellectual pemmican—a mass of facts crushed and pounded into shape, rather than held together by the ordinary medium of an obvious logical bond." Yet he attempts, in his own peculiar way, to account for this, and in some measure to remove its damaging force. "From sheer want of room," he suggests, "much has to be taken for granted which might readily enough be proved; and hence, while the adept, who can supply the missing links in the evidence from his own knowledge, discovers fresh proof of the singular thoroughness with which all difficulties have been considered and all unjustifiable supposition avoided, at every re-perusal of Mr. Darwin's pregnant paragraphs, the novice in biology is apt

to complain of the frequency of what he fancies is gratuitous assumption."\*

Well, I presume Professor Huxley himself is not a novice in biology. I have no doubt he would lay claim—and, in fact, he does lay claim—to be an adept of sufficient skill to supply any missing link, when possible; yet even he does not hesitate, in the end, to admit that Darwin's theory of the origin of species is only "a hypothesis."† It has not, therefore, in Huxley's estimation, any real scientific basis.

My limits forbid an attempt to analyse Darwin's whole theory; I can only glance at one or two leading points. The essence of his theory is, that all forms of life, from the humblest zoophyte up to man, have evolved from one primordial germ. His theory, while it may admit a primal act of creation, yet sets aside the Bible narrative, and assigns to man a common parentage with the monkey and the worm. The line of proof is, that species may be originated by selection; that natural causes are competent to exert selection; and that the most remarkable phenomena exhibited by the distribution, development, and mutual relations of species, can be shown to be deducible from the general doctrine of their origin, combined with the known facts of geological change; "and that, even if all these phenomena are not at present explicable by it, none are necessarily inconsistent with it."‡

It will be easily seen that the crucial point is the first. We naturally ask—What are the proofs of this startling assertion that species may be originated by selection? Does it rest on any sound scientific basis? Have we evidence that any distinct species has been originated? I have not space to examine Darwin's observed facts. I admit their accuracy; but I deny that any or all of them satisfy the requirements of logic, as proofs of the truth of his theory. No man has ever seen a species originated. The impossibility of submitting the theory to a scientific test is admitted, for the process is relegated away into the infinite

\* "Lay Sermons," p. 257. † *Ibid.*, p. 295. ‡ *Ibid.*, p. 293.

past. Thus Darwin writes, "Nature grants vast periods of time for the work of natural selection." Again, "The chief cause of our natural unwillingness to admit that one species has given birth to another and distinct species is, that we are always slow in admitting any great change of which we have not seen the intermediate steps. The mind cannot possibly grasp the full meaning of a hundred million of years. It cannot add up and perceive the full effects of many slight variations accumulated during almost an infinite series of generations." All this, and there is much in the book of a like character, is very striking and very original; but any one can see that it is not scientific. Science has its basis in observation; and the things here mentioned are all outside the field of observation. The facts which Darwin's own observations establish are insignificant modifications of race, most of them under man's guiding skill, and which confessedly tend to disappear again when man withdraws and nature resumes its sway. In fact, it appears to me that the fundamental error in Darwin's reasoning is, his accepting slight variations of race as a proof of transmutation of species.

Darwin draws largely upon an infinite past. Countless ages form the basis of his theory. Without these, development could not have reached its present stage. But Sir Wm. Thompson, one of the greatest of our natural philosophers, "has dissipated all speculation regarding an infinite series of life-forms, by proving that they could not extend over millions of millions of years; because, assuming that the heat has been uniformly conducted out of the earth, as it is now, it must have been so intense within a comparatively limited period, as to be capable of melting a mass of rock equal to the bulk of the whole earth."\* What would have become of Darwin's half-developed animals under such circumstances?

It may possibly be said that I am no scientist, and that, therefore, my opinion on this point is worthless. I should not wonder if some person with a great name, or with no name'

\* Frazer, "Blending Lights," p. 4

at all, would charge me with presumption, in attempting to criticise such a book as "The Origin of Species." Now, while maintaining that I am just as competent to test the character and soundness of a logical sequence as any scientist—and that is the sole point here at issue—I am, at the same time, in order to avoid the possibility of cavil, content to adopt the conclusion of one whose scientific eminence will not be questioned. Professor Huxley says:—"After much consideration, and with assuredly no bias against Mr. Darwin's views, it is our clear conviction that, as the evidence stands, it is not absolutely proven that a group of animals, having all the characteristics exhibited by species in nature, has ever been originated by selection, whether artificial or natural."\* This is clear, and ought to be conclusive. I could say nothing more damaging to Mr. Darwin's theory. Another distinguished scientist, M. Flourens, strikes at the very root of the theory in a single sentence—"Natural selection is only nature under another name . . . it is nature personified; that is, nature endowed with the attributes of God."† I conclude, therefore, that Darwin totally fails in his attempt, by science, "to banish the belief in the continued creation of new species."

One other point in Darwin's theory I must notice. In answer to the question, How do groups of species arise? he says—"From the struggle for life. Owing to this struggle for life, any variation, however slight and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relations to other organic beings and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring. The offspring, also, will thus have a better chance of surviving; for, of the many individuals of any species which are periodically born, but a small number can survive. I have called this principle, by which each slight variation, if useful, is preserved, by the term Natural Selection, in order to mark its relation to

\* "Lay Sermons," p. 295.

† See "The Darwinian Theory Examined," p. 135.

man's power of selection."\* The essence of this theory is, that all the wonderful adaptations which we find in the physical structure of the various species of animals, to the conditions in which they are placed, to the work they have to do, to the wants they have to supply, have sprung from a long and fortuitous sequence of natural events, to which Mr. Darwin gives the scientific name, Natural Selection. If this be true, then the most beautiful and complex organs of animals—the heart and veins, the nervous system, the human hand, the eye, the mind itself, with all its wondrous faculties—have been constructed, not by the infinite wisdom of an Almighty Creator, adapting every part and organ and faculty, with requisite skill, to the office it was designed to fill; but from a medley of blind chance, countless blunders, and innumerable minute accidental modifications, which occurred in the struggle for existence during myriads of past ages. The fish was not designed for the water; the bird was not designed to fly; the ear was not designed for hearing; the eye was not designed for seeing; all these, says Darwin, are just the fortuitous products of organised matter pushing its way at random, and after incalculable instances of trial and failure, during incalculable ages, at last hitting on what was best.†

And what is the evidence on which he bases this theory, which to every thoughtful man must, at first sight, appear incredible? Nothing short of actual observation of the whole alleged process could, in such a case, satisfy the requirements of science, or make the theory even credible. There has been no such observation, and no such observation is possible, because the process of development is supposed to have extended over an "almost infinite series of generations." It thus lies outside the province of science, and has therefore no claim upon the belief of scientific men. Darwin himself only advances it as a theory: "By the theory of natural selection," he says, "all living species have been connected with the parent species of each genus, by

\* "Origin of Species," p. 61.

† See "The Darwinian Theory Examined," p. 286.

differences not greater than we see between the varieties of the same species in the present day.”\* And here, as it seems to me, is the fundamental logical fallacy which takes away its basis even as a theory. He argues from the existence of slight varieties in the same species to the entire transmutation of species. The former is admitted on all hands; the latter has no logical connection with it, and is, besides, opposed to scientific observation. Yet Professor Huxley records his conviction that Darwin’s theory has given a “death-blow” to teleology; that is, to the grand doctrine of design in nature. Huxley’s critique on this point is inimitable. I do not believe there is anything comparable to it in the whole range of literature. To do it justice, I must give it in full and in his own words:—“The teleological argument runs thus: an organ or organism is precisely fitted to perform a function or purpose; therefore it was specially constructed to perform that function. In Paley’s famous illustration, the adaptation of all the parts of the watch to the function or purpose of showing the time, is held to be evidence that the watch was specially contrived to that end; on the ground, that the only cause we know of, competent to produce such an effect as a watch which shall keep time, is a contriving intelligence adapting the means directly to that end.

“Suppose, however, that anyone had been able to show that the watch had not been made directly by any person, but that it was the result of the modification of another watch which kept time but poorly; and that this again had proceeded from a structure which could hardly be called a watch at all, seeing that it had no figures on the dial, and the hands were rudimentary; and that, going back and back in time, we came at last to a revolving barrel as the earliest traceable rudiment of the whole fabric. And imagine that it had been possible to show that all these changes had resulted, first, from a tendency of the structure to vary indefinitely; and, secondly, from something in the surrounding world which helped all variations

\* “Origin of Species,” p. 281.



in the direction of an accurate time-keeper, and checked all those in other directions ; then it is obvious that the force of Paley's argument would be gone. For it would be demonstrated that an apparatus thoroughly well adapted to a particular purpose might be the result of a method of trial and error worked by unintelligent agents, as well as of the direct application of the means appropriate to that end, by an intelligent agent.

"Now, it appears to us that what we have here, for illustration's sake, supposed be done with the watch, is exactly what the establishment of Darwin's theory will do for the organic world."\*

Well, if Paley's argument remain in force until we are able to produce "a developed watch," my impression is it will last a long time ; and if Darwin's theory must wait for support until that watch be discovered, then the process of proof will reach at least as far into the future as the process of the evolution of species reaches into the past. True, Professor Huxley puts his evolved watch forward as a supposition ; but is it not monstrous to propound such a supposition in the name of science ? It reads more like a broad joke from a corner in "Punch" than an extract from a scientific lecture. Professor Huxley is an unsparing antagonist. He uses every weapon which irony and ridicule and vituperation can furnish to overwhelm his opponents. He exposes with unmitigated contempt every weak point, real or fancied, in their reasoning. He does not hesitate to question the motives, especially of Christian men, and to charge them with downright dishonesty. I recommend him in future to store up all these special gifts of his for home use, because I feel convinced that no writer, lay or clerical, ancient or modern, so richly deserved their full and concentrated force, as the author of the theory of a developed watch.

Teleology remains in its high seat, absolutely unmoved by theories which one can only rightly describe, in the graphic words of Carlyle, as "diluted insanity." We have heard

\* "Lay Sermons," pp. 301-2.

Huxley's opinion ; but how very differently men of the highest scientific attainments interpret the observations of Darwin may be seen from the following eloquent words recently uttered by Professor Pritchard :—"I know of no greater intellectual treat—I might even call it moral—than to take Mr. Darwin's most charming work on the 'Fertilisation of Orchids,' and his equally charming and acute monograph on the Lythrums, and repeat, as I have repeated, many of the experiments and observations therein detailed. The effect on my mind was an irresistible impulse to uncover and bow my head, as being in the too immediate presence of the wonderful prescience and benevolent contrivance of the UNIVERSAL FATHER. And I think such, also, would be the result on the convictions and the emotions of the vast majority of average men. I think the verdict would be that no plainer marks of contriving will exist in a steam-engine, or a printing-press, or a telescope." Design in nature can be seen by every unprejudiced man who observes nature, or who thoughtfully studies the recorded observations of others. Every fresh discovery in physiology ; every searching glance of the scientist into the wonderful mechanism of the animal frame ; every minute inspection of the marvellous adaptation of insect organisms to the complicated structure of flowers ; in a word, every new achievement of the scientific mind in exploring the vast domain of nature, reveals more clearly, and establishes more firmly, the presence everywhere, and in everything, of an infinitely powerful and infinitely wise designing Mind. Unseen by human eye, undiscoverable by scientific observation in the mystery of its working, we yet discern the impress and recognise the beneficent control of that Infinite Mind in earth and sea and sky.

#### IV.—THE ORIGIN OF MIND, AND THE CONCEPTIONS FORMED BY IT OF GOD AND OF A FUTURE STATE.

This is the highest problem with which science has ventured to grapple ; and even the most daring of scientists

approach it with feelings akin to awe. Democritus, as we have seen, held that the soul consists of fine, smooth, round atoms, like those of fire. Huxley says, "Even those manifestations of intellect, of feeling, and of will, which we rightly name the higher faculties, are not excluded from this classification, inasmuch as to everyone but the subject of them, they are known only as transitory changes in the relative positions of parts of the body."\* In another place he says somewhat more clearly, "And what do we know of that 'spirit' over whose threatened extinction by matter a great lamentation is arising, except that it is also a name for an unknown and hypothetical cause, or condition, of states of consciousness? In other words, matter and spirit are but names for the imaginary substrata of groups of natural phenomena."† Tyndall is a little more explicit when he thus writes:—"Not alone the mechanism of the human body, but that of the human mind itself—emotion, intellect, will, and all their phenomena—were once latent in a fiery cloud." All this reads like "Material Atheism." I am not alone in this opinion. But as the language is somewhat hazy, and as Tyndall and Huxley seem indignant that they should be charged with holding such a dogma, I leave them to explain their meaning, and to give to the world their scientific creed in intelligible language. One thing, however, is clear: whatever view of the origin and nature of the human mind the words of each are intended to give, they do not attempt to establish it by scientific evidence. It is confessedly outside the legitimate province of science. No observation has ever yet reached, or can ever reach, the development of a fiery cloud into emotion, intellect, will, and all the phenomena of the human mind. It is a daring theory, and nothing more. Tyndall himself seems to shrink from it in moments of thoughtfulness, when fancy is restrained by judgment—"What baffles and bewilders me, is the notion that from those physical tremors things so utterly incongruous with them as sensation, thought, and emotion can be derived;" and then he puts the problem in its true

\* "Lay Sermons," p. 122.

† *Ibid.*, p. 143.

light in a single sentence : "You cannot satisfy the human understanding in its demand for logical continuity between molecular processes and the phenomena of consciousness. This is the rock on which materialism must inevitably split whenever it pretends to be a complete philosophy of life."\* Herbert Spencer is right in asserting that of the substance of mind nothing is known, or can be known, by science. Even the faculties of the mind are outside the field of science ; for we get our knowledge of them, not through the senses, but by introspection or consciousness. Science looks outward for its proofs, psychology inward. It is quite true that the phenomena of mind are exhibited to all, except the individual himself, in one way or another through a material medium, and are apprehended by the senses ; yet, in the case of the individual himself, they are apprehended in a different way. Consciousness alone, therefore, has direct access to the mind ; and it is the ultimate source of all mental knowledge. So, then, science can throw no light on the great problem now before us.

But, besides, it is by mind the scientist obtains his knowledge of nature. The senses are only the material avenues through which the mind apprehends physical phenomena. The senses observe, but to the observations thus made must be added primary beliefs or intuitions, ere any intelligible interpretation, even of the simplest phenomena, can be given. It is from intuition we derive our knowledge of the reality of the external world and everything in it ; for sensation is only the apprehension by the mind of an impression made on the sensorium, and it is the mind itself which intuitively forms the conception of the reality of the object that made the impression. So, in like manner, from intuition we get our knowledge of the properties of matter, such as weight, extension, and force ; it is by intuition we form comparisons ; and it is from intuition we obtain our ideas of cause and effect. The senses, on whatever object exercised, and though aided by the utmost experience of the physicist, and the utmost precision of instruments, merely

\* "Address," p. 33.

make certain impressions on the mind ; and those impressions must be interpreted by our intuitions ere they can be of use in science. So then, after all, our primary beliefs, or the intuitions of our mind, form the foundation of all scientific reasoning. Dr. Carpenter, in his address as President of the British Association in 1872, set this matter in its true light. "Even in astronomy, the most exact of the sciences, we cannot proceed a step without translating the actual phenomena of nature into intellectual representations of those phenomena."\* It is this great fact which lies at the foundation of all those differences which exist among scientists themselves.† The minds of some are warped by theories ; others entertain strange views regarding primary beliefs ; and consequently their interpretation of the very same natural phenomena differ as widely as the poles. Darwin, for instance, interprets certain observed phenomena so as to support his theory, that all the species of animals are derived from one primordial germ ; while Professor Kölliker, a German naturalist of equal eminence, interprets the same phenomena in a way totally different.‡ A more remarkable illustration is the following :—Rude flint implements have been found in gravel-beds in France. It has been argued with great force that, because they exhibit evidence of design, they must have been formed by human hands, though their age is believed to extend thousands of years beyond the Mosaic period. But some members of the very same school of science, who point to these flints as triumphant refutations of the Bible, refuse to recognise any evidence of design in the structure of plants and animals, because thereby they would be compelled to acknowledge the existence of a God. I have not time to dwell upon this instructive phase alike of scientific scepticism and credulity ; but there can be no doubt we have here, in the fact that the individual mind is the interpreter of all natural phenomena, the fruitful source of many of those errors which have ap-

\* "Report," p. 73.

† See Tyndall, "Crystalline and Molecular Forces," p. 7.

‡ Huxley, "Lay Sermons," p. 300.

peared under the name of science, as well as of those wild theories which have not even a shadow of logical connection with scientific observations.

There is one point to which I must ask attention ere I close this part of my subject. Among our primary beliefs is that of "cause and effect," and, what is embodied in it, "force." Believing in these, we must carry them back and back, until at length, compelled by an inexorable logic, we believe in a First Cause, the primal origin of force. Herbert Spencer enunciates the same truth with much clearness:—"We cannot think at all about the impressions which the external world produces on us, without thinking of them as caused; and we cannot carry out an inquiry concerning their causation, without inevitably committing ourselves to the hypothesis of a First Cause."\* Science, of itself, does not reveal, because it cannot reach, that First Cause; but science reveals phenomena which, being rightly interpreted, lead by sound logical sequence to a belief in that First Cause. Here, then, is borderland between Science and Revelation.

And farther, the mind which, as we have seen, embodies those primary beliefs that constitute the foundation of all scientific reasoning, has other beliefs, equally definite, connected intimately with the doctrine of a Great First Cause, or, to speak plainly, of God. There is in the mind of every man, from the rudest savage to the most gifted philosopher, the belief that he is dependent on some superior Being; that he owes allegiance to Him; that there is a moral law; that we are responsible for obedience or disobedience to it; and that there is a future state. This latter especially we cannot quench. Do what we will, reason as we will, our higher nature looks away onward with earnest, irrepressible, unceasing yearning, to immortality in another sphere. The belief is brought out dimly, but beautifully, by Tennyson:—

"Thou wilt not leave us in the dust :  
 Thou madest man, he knows not why ;  
 He thinks he was not made to die ;  
 And thou hast made him ; thou art just.

\* "First Principles," p. 37.

“ We have but faith ; we cannot know ;  
 For knowledge is of things we see ;  
 And yet we trust it comes from Thee,  
 A beam in darkness : let it grow.”

Science opens no field to which these beliefs belong, or in which they can find a resting-place. Science cannot satisfy them. It leaves us in the dark, helpless and hopeless, on those very points which, constituted as we are, with yearning affections and boundless aspirations, are of supreme importance. That very theory of “ the survival of the fittest,” propounded with so much learning and ingenuity by Darwin, is here completely at fault ; for it would represent a series of beliefs to have been developed in the mind which are yet useless and deceptive. No power of genius, no perverse skill of sophistry, can ever, even seemingly, reconcile these beliefs with any theory of evolution ; for if this be the ultimate result of the latest combinations of atoms, if this be all nature has done or can do for us, then this ultimate result is human life without adequate motive, “ affections with no object sufficient to fill them, hopes of immortality never to be realised, aspirations after God and godliness never to be attained ; and thus, too, myriads of myriads of other nebulæ may still be the potentials of delusions, and their outcomes the kingdom of despair.”\*

But a sounder and a higher philosophy gives far other teaching. It tells man that those grand intuitions were not implanted in vain. It leads him to look beyond the material universe for the satisfaction of his profoundest thoughts and the realisation of his most earnest longings. It sees, exhibited in one form or another, by every nation, tribe, and family of mankind, a feeling of dependence on some One greater than man, and of moral obligation to some One holier than man. This feeling appears with the earliest development of consciousness, and it grows and strengthens with our mental vigour. We cannot repress it ; and the mind which is forced to interpret the impressions

\* Pritchard, “ Address at Brighton.”

received through the senses, as proofs of the reality of a material world, is in like manner forced to interpret the intuitions of dependence and moral obligation, as proofs of the reality of a spiritual world. And thus "in the universal consciousness of innocence and guilt, of duty and disobedience, of an appeased and offended God, there is exhibited the instinctive confession of all mankind, that the moral nature of man, as subject to a law of obligation, reflects and represents the moral nature of a Deity by whom that obligation is imposed."\*

We now see the legitimate province of science, in which it reigns supreme, and beyond which it cannot pass. Science observes, compares, and classifies natural phenomena. It lays the whole material universe open to the mind. It reveals the constituent elements of rude matter, and the plan in which its multitudinous combinations are effected. It shows the wondrous structure of vegetable and animal organisms, and the evidences of design in them all. It unfolds the mechanism of the heavens, and the sublime simplicity of those laws which guide the stars in their spheres. It indicates, besides, a harmony and a unity pervading nature, adapting each particle of matter—each insect, plant, and animal—each planet, star, and constellation—to its own place, and making it fulfil its own mission in the grand scheme of the Universe. It shows that nothing is defective, nothing redundant. Scientific investigation tends to establish the fact of oneness of design and plan in everything. And thus, as one of the greatest of living naturalists tells us, we are led to the culminating point of man's intellectual interpretation of nature—his recognition of the unity of the Power of which her phenomena are the diversified manifestations.†

All nature's phenomena, wherever and however observed, direct towards a Supreme Designer and Lawgiver, whose existence is also recognised, as we have seen, in the primitive instincts of universal humanity. We hail Science,

\* Mansell, "Bampton Lectures," p. 113.

† Carpenter, "Presidential Address."



therefore, as a most powerful ally ; we bid her God-speed in her vast field of research. But we see at the same time that it is not within the province of science to solve any of those great problems which I have mentioned. They lie beyond her ken. The dogma of materialism which, it has been supposed, science confirms, utterly fails to answer the questions put by the philosophic mind, or to satisfy the longings of the human heart. Tyndall himself has been obliged to confess the fact. With touching pathos he says, in the preface to the expurgated edition of his now famous "Address":—"I have noticed, during years of self-observation, that it is not in hours of clearness and vigour that this doctrine (of material atheism) commends itself to my mind ; that in the presence of stronger and healthier thought it ever dissolves and disappears, as offering no solution of the mystery in which we dwell, and of which we form a part." These remarkable words, the results evidently of much and even painful reflection, convey a solemn warning to all students and teachers of science. They show the folly of reckless speculation, the futility of dogmatic assertion, and the danger of attempting to prolong the vision backward beyond the well-defined line of rigid observation. They show, too, the absolute necessity of calm, thoughtful, exhaustive investigation, ere we venture to suggest a doubt, or propound a theory, which would have the tendency to unsettle earnest minds, or overthrow cherished beliefs.

#### V.—THE PROVINCE OF REVELATION.

Little time now remains to me for considering the *Province of Revelation*. Fortunately, lengthened discussion is here unnecessary, for the Bible is its own best exponent. The one grand purpose of Revelation is to communicate to man those truths, a knowledge of which prepares him for a full discharge of his duties in life, and for an entrance into the kingdom of heaven. Scientific teaching does not come within the province of revelation. It is true, however—and the fact should not be lost sight of—that revealed truth

touches on scientific truth at many points ; and in all such cases, while we are not to expect from Revelation pure scientific treatment, we are warranted in looking for strict accuracy. God's truth, as revealed, can never be at variance with the phenomena of God's world. So, then, the theologian must not attempt to intrude his dogmas into the field of science, so as to stifle free thought, or limit independent and legitimate research. Free as the air we breathe, free as the light of heaven, must the scientist be left to prosecute his noble studies in the vast realms of nature.

Revelation does not give a scientific cosmology. That lies outside its province. But then, just where science stops short, unable to solve one of the grandest problems of nature—the origin of matter and of the material universe—Revelation steps in to supplement its teaching. Science, as we have seen, points to the great truth that there must be a Creator, though it cannot of itself reach to it ; Revelation confirms and crowns that truth with the simple and sublime declaration, " In the beginning GOD *created* the heaven and the earth."

Revelation does not treat systematically or philosophically of "force" and "motion ;" but it indicates that solution of their ultimate origin, in a living omnipotent Being, which the highest philosophy points to. We read in the first chapter of Genesis, " The Spirit of God *moved* upon the face of the waters"—representing, as it seems to me, that Almighty Being as the quickening principle of the Universe.

Revelation does not touch on geology ; but it leaves room for the fullest development of the successive strata of the earth's crust, even though it could be proven that millions of years had been occupied in their formation. " *In the beginning* God created the heaven and the earth." No date is given. The simple fact of *creation* is affirmed, in opposition to any idea of development or material atheism ; but myriads of ages may have intervened between that "beginning" and the creation of man. Then, again, the historical record of creation which follows seems to have a

scientific basis, as if the writer, by a Divine prescience, had anticipated the results of modern research. He tells us how the lowest forms of life were first made, and how there was a gradual progression up to man, the last and lord of all.

Revelation does not enter into the mysteries of molecular physics, or the development of the life-germ, or the way in which it operates on material organisms. All these it relegates to science, whose function it is to investigate them. There is, however, one mystery which science cannot reach—the origin of life; and here again Revelation makes a clear and full discovery. That brief account of the creation of Adam, given in the second chapter of Genesis, assumes a new significancy when read in the light of the most recent discoveries of science. Chemistry has demonstrated, as we have seen, that the whole constituent elements of our bodies—in fact, of all organised bodies—are identical with those in the material world around us; and science, as we have also seen, indicates that the life-principle must be something entirely different from those material elements. The record contained in Genesis is here in complete accord with science, so far as science can go:—“And the Lord God formed man *of the dust of the ground.*” Had the writer of these remarkable words heard the recent statements of those eminent scientists, Professors Pritchard and Huxley, he could not have been more scientifically accurate. Huxley says of the matter of our bodies, that it is “the clay of the potter; which, bake it and paint it as he will, remains clay, separated by artifice, and not by nature, from the commonest brick or sun-dried clod.”\* Again, the sacred writer records man’s inevitable doom—“In the sweat of thy face shalt thou eat bread, *till thou return unto the ground: for dust thou art, and unto dust shalt thou return;*” and Professor Huxley, all unconsciously no doubt, re-echoes the words of the inspired scientist—“Under whatever disguise it takes refuge—whether fungus or oak, worm or man—the living protoplasm ultimately dies and *is resolved to its mineral*

\* “Lay Sermons,” p. 129.

*and lifeless constituents.*"\* And the sacred writer does not stop here. He goes on to add what science might infer, but could not reach, as to the origin and implanting of life itself—"The Lord God . . . breathed into his nostrils the breath of life: and man became a living soul."†

Revelation gives no detailed or systematised account of the various species of animals that exist on the earth, nor does it profess to enter into questions of structure, descent, or development. All this is outside its province; and it never interferes with the researches of the naturalist. It authoritatively declares a great general truth, however, which all the recondite theories of Darwin cannot overthrow, and which the profoundest studies of the physiologist tend to indicate and confirm—that each species was brought into existence by the distinct fiat of the Almighty Creator.

In approaching the highest problems which occupy human thought—the origin, duty, and destiny of man, and the existence and nature of God—Revelation becomes fuller and clearer. Where science utterly fails to satisfy our wants and aspirations, where philosophy sheds but a faint and flickering ray, Revelation shines with a greater than noon-day splendour. The origin of intellect and conscience, with all their mysterious conceptions of law, obligation, a future state, and a holy God, is embodied in one pregnant sentence—"So God created man *in His own image*."‡ Here are revealed the essential personality and omnipotence of God; and, as flowing from them, the personality, knowledge, self-consciousness, moral feeling, and immortality of man, who was made "in the image of God." Of these sublime truths, in all their wondrous development, Revelation becomes the complete and sole exponent; and every new phase of truth set forth by it—whether of law, or morals, or worship, or faith, or love,—finds such a responsive echo in our own deepest feelings and loftiest aspirations, that we instinctively bow before it as a message replete with the infinite wisdom of God. While science disappoints our

\* "Lay Sermons," p. 131. † Gen. ii. 7. ‡ Gen. i. 27.

most momentous inquiries, while philosophy leaves an aching void in the human heart, Revelation fulfils all our wishes, and satisfies all our hopes.

By the testimony of some of the greatest men who have shed the lustre of genius upon the walks of science—Newton and Herschel, Guizot and Pritchard, Brewster and Chalmers—the Bible has been shown to be in full harmony with the facts of science. But it has a far higher claim upon our faith than even scientific testimony can give it. It develops an ethical code, purer and nobler than ever emanated from the schools of the world. It inspires man with a holy ardour, a self-denying, self-sacrificing love, such as philosophers never dreamt of. It reveals to the eye of faith that other world after which our higher nature longs. It shows us that the consciousness of immortality, which haunts us here like a dream, is not a delusion, but a glorious reality. It enables us to look through the gloomy vista of this earth's labours and sorrows, to another, where labour shall have its full reward, and sorrow shall be unknown. It shows, away beyond the tomb, a life, peaceful, happy, glorious, for which the life on earth, with its limitations and disappointments, its ceaseless struggles and unfulfilled desires, is only the school of preparation. It opens before us a sphere where the perfect knowledge after which we here vainly toil, and the perfect happiness after which we here as vainly strive, shall be fully and for ever realised. There is nothing in science or philosophy like this. There is no power in them to make man so wise, so useful, so holy. There is no discovery of science which can bring life and immortality to light. There is no scientific agency which can conquer death, and throw wide the gates of Paradise to the disembodied spirit. In breadth of true knowledge, in sublimity of discovery, in ennobling, quickening power, philosophy and science sink into complete insignificance before this grand Revelation of God.