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ORDINARY GENERAL MEETING.*

ARTHUR W. SUTTON, ESQ., F.L.S., IN THE CHAIR.

The Minutes of the previous Meeting were read and confirmed, and the following Candidates were elected :—

ASSOCIATES :—Mr. Sim Boon Kwang, Singapore; Miss Caroline Mary Longdon, Derby. Mr. J. Townsend Trench, Walham Green.

LIBRARY ASSOCIATES :—Birmingham Free Library; Nottingham Free Library.

The following paper was then read by the author :—

PHILOSOPHY AND "EVOLUTION": AN INQUIRY.

By Professor H. LANGHORNE ORCHARD, M.A., B.Sc.

WHAT is *Philosophy*? What is "*Evolution*"? Is "Evolution" a Philosophy?

Let us compare them, and see whether, in logical language, the two terms "agree" or "disagree."

Definition of Philosophy.—If *Philosophy* be defined as the study of first principles, its function is

1. To investigate the Origins of things.
2. To Explain facts.
3. To Unify knowledge in accordance with our intuitions.

Definitions of "Evolution."—What is "*Evolution*"?† Diverse answers are given. It is a change, say, of form and configuration, as in an army or a fleet. It is development—the growth and passage to maturity and end of the structures and functions belonging to living organisms. Instead of a life-history it may be any other kind of history, *e.g.*, of another "evolution," the "evolution" of an "evolution." We may have

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* Monday, February 17th, 1908.

† Dr. Walter Kidd has pointed out (*Difficulties of Evolution*) that "it is the nebulous character of the doctrine of Evolution which constitutes its strength."

"the evolution" of an invention, say, of a watch, or of a steam-engine, or of a telescope (see *Nature*, September 27th, 1906), and (to quote from the *Journal of the Royal Microscopical Society*) we may speak of "the evolution of the fine adjustment of the microscope." In these uses of the term the basic idea appears to be that of progression, *i.e.*, continuous change attended by improvement.*

More serious attempts at a definition tell the bewildered inquirer that Evolution

"is the theory that the condition of things at any moment is the result of the condition of things at the previous moment . . . a series of orderly changes, the condition of things at any moment being the result of the condition at the previous moment" (Wilson).† "We know, of course, that Evolution means the passage from the more general to the more special, and that although as the general result an onward advance has taken place, yet specialization does not always or necessarily mean 'highness' of organization in the sense in which the term is usually employed" (Traquair). Evolution is "the law of the *continuous re-distribution* of matter and motion," or, more formally, "Evolution is a change from indefinite incoherent homogeneity to a definite coherent heterogeneity, through continuous differentiations and integrations" (Spencer). Evolution is an "indefinite and confused movement of the mind of the age" (Wiegand).‡ "A series of orderly changes," a "passage," a "law," a "change," an "indefinite and confused movement."

Modern "Evolution" theories.—Of modern Evolution theories the most influential are the monistic and atheistic doctrine of Haeckel, the practically agnostic doctrine of Spencer, and the theistic doctrine of Le Conte. Differing in many and important features, they agree in a common postulate—the transmutation of species, and *deny* the axiom that like causes produce *like results.*

Why some people accept the "doctrine."—That so unnatural a theory should have been welcomed by many able men, may at first sight seem surprising. In truth it has been taken on *its own profession.* It offers an excuse to some for disbelieving the Genesis record of creation, and hence throws the shadow of doubt

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* In *Nature*, August 22nd, 1907, we read of "the evolution of wound treatment during the last forty years."

† *Problems of Religion and Science*, p. 51.

‡ "Darwinismus." Some of the disagreements of evolutionists are interestingly set out in "Vertebrate Morphology." (See *Nature*, April 30th, 1903.)

across the whole Bible. It professes to be a great unifying principle, whereby, apart from Divine revelation, men may solve the "Riddle of the Universe." Thus it appeals to their love of power, and ministers to their pride. Not in infidelity and pride only does the theory find allies. A nebulous *indefiniteness* attracts minds illogical or wearied, especially when this indefiniteness clothes itself with novelty. Some people, trying to conceive of creation and failing in the attempt, have thoughtlessly adopted the evolution hypothesis as an alternative *easy* as compared with the "difficulty" of creation. The philosophical imagination is captivated by a principle claiming identity with the great "law of continuity" illustrated in the development of all living organisms—a principle commended to, not to say enforced upon, younger men, by the advocacy, thorough-going, determined, not always scrupulous, of professors and lecturers occupying positions of active influence.

Few, if any, of the leaders of thought are evolutionists.—Whilst the seven arguments enumerated have singly or collectively exercised on many minds powerful influence toward acceptance of "evolution," it is fair to point out that its motley adherents* include few, if any, of the leaders of thought. Tyndall, though partial to "a fiery cloud," was careful to say that he adopted it as "a provisional hypothesis" only. Huxley, though enamoured of "some form of the doctrine," refused his adhesion to any of the current theories. Among anti-evolutionists we recognize the great names of Sir George Stokes, Lord Kelvin, Lionel Beale, Carruthers, Agassiz, Cuvier, Lyell, Miller, Sedgwick, Owen, Dana, Sir J. William Dawson, etc., etc.

Evolution and Origins.—We shall now investigate (1) whether "Evolution" accounts for the *Origins* of things; (2) whether "Evolution" *Explains* facts; (3) whether "Evolution" *Unifies* knowledge in accordance with our intuitions. We propose to give frequent quotation from Evolutionists.

1. Evolution and Origins.—In many forms of the evolution hypothesis, the aim has been to arrive at *one primary basis*, which by the Brahmins was held to be spirit, and by others to be matter. The British Museum contains a coloured facsimile

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* Professor Packard (of America) considers that "we have evolutionists divided into Lamarkians, and Darwinians, with a further subdivision of them into Neolamarkians and Neodarwinians, while the latter are often denominated Weismannians. Some prefer to rely on the action of the primary factors of evolution, others believe that Natural Selection embraces all the necessary factors, while still others are persuaded of its inadequacy." (See *Nature*, April 6th, 1899.)

of the Ani Papyrus, a Theban recension of the very ancient Egyptian *Book of the Dead.* In it the god speaks thus of himself and of creation :—

"I am he who evolved himself. I, the evolver of the evolutions, evolved myself, the evolver of all evolutions and developments which came forth out of my mouth . . . " . . . "I developed from the primeval matter which I had made."*

According to Sakyamuni (Gautama Buddh) the basis of the universe is matter, and, in modern times, a similar idea has been advanced by Buchner. De Mallet (in the eighteenth century) claims to have had a revelation that all things came from water. An unknown gentleman named Higgins, described as "the Inventor of Evolution," affirmed (in 1798) his belief that "the filament of organization" is protoplasm. Andrew Lang says

"that Higgins, with unequalled modesty, put forth his epoch-making conjecture in a periodical publication, and in a mere foot-note to a poem." Protoplasm is introduced as "the filament of organization." "This filament, after an infinite series of ages, would begin (why not?) to ramify, and its viviparous offspring would diversify their forms and habits so as to conform themselves to their various incunabula (or environments)." . . . "Upon this view of things," continues Higgins, "it seems highly probable that the first effort of nature terminated in the production of vegetables, and that these, being abandoned to their own energies, by degrees detached themselves from the surface of the earth, and supplied themselves with wings or feet. . . . Others would become men who in time would restrict themselves to the use of their hind feet. Their tails would gradually rub off by sitting in their caves or huts. They would invent language."

A somewhat similar commencement is assigned to man in Mr. A. R. Dewar's recent book, *A Magnetic Theory of the Universe.* Here we are told that

"Man's first progenitors . . . probably appeared on the earth as spontaneously produced protoplasmic cells or ovules, hundreds or thousands in number, developed by sexual and magnetic affinities from a flux of the chemical elements in some ambrosial inlet of water."

Multiple Origin.—The theory just outlined may be regarded as an example of an endeavour, more or less plausible, to trace all things to a *multiple,* generally dual, origin. About 600 B.C.

* See *Budge*, p. 99, and note

Anaximander, the Greek philosopher, expounded his theory, which seems an Egyptian in Greek costume. According to Anaximander, the earth was a muddy ocean. The solar heat, acting on this muddy ocean, caused the mud to swell up, by means of the included air, into numerous little bladders. These little bladders acquired horny shells and spines; then somehow they became alive; then they burst their shells and then they came on dry land. After this they grew larger, and went on somehow to develop into higher forms of life, forms which culminated in man.

Chu-Hi's theory.—One of the most complete of these theories is that connected with Chu-Hi. Chu-Hi was a commentator of Confucius, and probably contemporary with Anaximander. Here we have anticipated the modern hypothesis of matter and force. Assuming in his cosmogony the eternity of matter and associated powers, Chu-Hi says

"Under the whole heaven there is no primary matter (*li*) without the immaterial principle (*ki*), and no immaterial principle apart from the primary matter."

He thinks that, strictly speaking, prior existence belongs to the immaterial principle, but that this immaterial principle

"is not a distinct and separate thing. It is just contained in the centre of the primary matter; so that were there no primary matter then this immaterial principle would have no place of attachment."

"Primary matter" consists of the four elements of wood, water, metal, and fire, while the "immaterial principle" (which is, so to speak, its soul) is no other than the four cardinal virtues of benevolence, righteousness, propriety, and wisdom.*

"The primary matter," says Chu-Hi, "can concrete and coagulate, act and do, but the immaterial principle has neither will nor wish, place nor operation; but only where the primary matter is collected and coagulated, then the immaterial principle is in the midst of it. . . The primary matter can ferment and coagulate, collect, and produce things."

To Chu-Hi's system succeeded, some five hundred years after, that of the Latin poet Lucretius, who looked upon nature as resulting from the co-operation of soil, sun, and rain.

In our times we are familiar with Tyndall's fancy that in the remote past everything was latent in a "fiery cloud" of matter

* Williams's *Middle Kingdom.*

and heat. In this, as in other speculations, notably that of Herbert Spencer, is seen the dominant influence of Laplace's nebular hypothesis.*

To explain "The Riddle of the Universe" as to origin and otherwise, Haeckel and H. Spencer have elaborated theories skilful, ingenious, and illogical.

Haeckel's† is *atheistic*, and postulates the eternity of matter and force, which, in his view, is the true meaning of spirit. Matter and force he regards as different aspects or attributes of one and the same thing to which is assigned the name of "substance." "Substance" is supposed to be uncreated and eternal. All things are imagined to have developed, or rather evolved, through the working of force or forces residential in eternal matter, matter being either ponderable (or ordinary) or appreciatively imponderable, this latter termed "ether."

"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 substance. These modes are material things when we regard them under the attribute of *extension* (or 'occupation of space'), but forces or ideas when we consider them under the attribute of thought (or 'energy')."‡

Living organisms are, by Haeckel, asserted to have originated from *monera*, "protoplasmic compounds" developed out of "inorganic carbonates." He insists that this must have been by spontaneous generation, and entirely agrees with Naegeli's assertion that "to reject abiogenesis is to admit a miracle"; § but a miracle must at all costs be excluded.

"The fundamental idea," he says, "which must necessarily lie at the bottom of all natural theories of development, is that of a gradual development of all (even the most perfect) organisms out of

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* Moulton has shown that the actual distribution of moment of momentum in the solar system is inconsistent with Laplace's hypothesis—a hypothesis at variance with other physical facts.

† Buchner's system is similar. "Matter," says Buchner, "is the origin of all that exists." "All natural and mental forces are inherent in it (*Matter and Force*, p. 12). There is, however, much more to be said for the idea that philosophy should have as its starting-place the man and human experience. (See *Humanism*, by F. C. S. Schiller, Oxford.)

‡ *The Riddle of the Universe*, p. 77.

§ *Idem*, p. 91. Every form of the Evolution Hypothesis, except the theistic, denies Miracle. Obviously, if Miracle, and therefore Creation, be inadmissible, it is an easy inference that Matter must be eternal. But what sort of reasoner is he who silently assumes as a premise the very thesis which is in dispute!

a single or out of a very few, quite simple and quite imperfect original beings, which came into existence not by supernatural creation but by spontaneous generation or archigony."

Concerning these monera he remarks further that

" . . . as all trace of organization—all distinction of heterogeneous parts—is still wanting in them, and as all the vital phenomena are performed by one and the same homogeneous and formless matter, we can easily imagine their origin by spontaneous generation."

(Note this word "imagine." It is the key-word of Haeckel's system.)

H. Spencer.—Agreeing with Haeckel that the organic has somehow arisen from the inorganic, and the living somehow from that which had itself no life, and holding with him that the existing universe is the outcome of matter and force, Mr. H. Spencer propounds an evolution system which yet differs in important respects from that of the Jena biologist.

The system of Spencer (although practically agnostic) recognises, behind matter and force, the absolutely certain existence of a great Power—asserted to be unknown and unknowable, a Power of Whose energy, force, as we know it, is but the display and the phenomenon, a Power whose manifestations, vivid or faint, meet us as material objects or as states of consciousness, respectively.

Spencer imagines that, in a dim and distant past, force emanating from the unknown and unknowable Power, Cause, and Reality, began to act upon matter then existing as a homogeneous diffused nebula. Through this action, "successive condensations and concentrations" took place in the nebula, "leading to progressive integrations, and accompanied with corresponding dissipations of motion,"—which process he calls "evolution," though he admits that it were more correctly called "involution."* He attempts to trace out his process successively in the sidereal systems, the earth's geological history, the development and growth of plants and animals, the varieties within species, the physical and social features of communities; also in language, the fine arts, and the various occupations in civilised societies; and draws the general conclusion that

"along with the passage from the incoherent to the coherent, there goes on a passage from the uniform to the multiform." "Such at

* *First Principles.*

least," says he, "is the fact wherever evolution is compound . . . the entire mass is integrating and simultaneously differentiating from other masses, and each member is also integrating and differentiating from other members."*

Le Conte.—In the *theistic* system† of evolution advocated by Le Conte, nature is a manifestation of GOD, is a garment wherewith He has clothed Himself. There are various planes of being, each plane governed by its own characteristic laws. The laws are modes of Divine action working through resident forces, and varying according to the plane of being. According to this able American geologist, beings are continually modifying into different beings, *i.e.*, undergoing evolution, evolution being defined as "a law of continuity," "a universal law of becoming," "continuous progressive change," "a law of derivation of forms from previous forms." Man is "something more than a higher species of animal,"—His spirit is "a spark of Divine energy individuated to the point of self-consciousness and recognition of his relation to God." "Spirit-embryo, developing in the womb of Nature through all geological time, came to birth and independent spirit-life in man." Whence Le Conte concludes that "if God operates on Nature only by regular processes which we call *natural laws*, then He *must* operate on spirit in a different and a more direct way, and this we call *revelation*."

Remarks regarding the ultimate Origin.—Reviewing these various evolution theories as to the Origin of things, our verdict will be that the unity of nature demands that the ultimate origin be not multiple but single. Theories which assume the past eternity‡ of matter are confused, incongruous, inadequate,—confused, for, when analysed, they affirm that, in the last resort, matter and spirit are identical; incongruous with experience and the causation intuition which tells us that matter cannot originate force, and that, since every change is an effect, what is always and perpetually undergoing change must itself have had a cause; inadequate, for the observed facts and phenomena cannot be traced to their supposed original ante-

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* *First Principles.* In pursuing an interesting argument, Spencer falls not infrequently into the well-known fallacies of *petitio principii* and *ignoratio elenchi.* Spencer quietly assumes that, by proving change and development, he has thereby proved "evolution."

† *Evolution and its Relation to Religious Thought.*

‡ The fact, pointed out by Clerk Maxwell, that the material atom bears the stamp of a *manufactured* article, is alone sufficient to prove that matter is not eternal.

cedent. If the evolutionist thinks to bridge over difficulty by assuming a past eternity for *force* as well as for matter, he may be reminded that force is not an entity, but exists only as the action of spirit. Hence, the supposed dual origin—matter and force—is found to be triple, namely, matter, force, and spirit. Thus, even the hypothesis of evolution must logically recognise *Spirit* as the ultimate Origin of all things; or the "theistic"* is the only evolution theory which supplies any intelligible account of origin.

Emil du Bois-Reymond's Seven World-Problems.—Emil du Bois-Reymond propounded† in 1880, the famous "Seven World-Problems" which, from that time to the present, have received no true solution from evolutionists. These "seven great enigmas" are:—(1) The nature of matter and of force; (2) The origin of motion; (3) The origin of life; (4) The manifest proofs of design in nature; (5) The origin of simple sensation and consciousness; (6) Logical thinking and the origin of language; (7) The freedom of the will. "Believe in God, and all these problems are readily solved. Ignore the Creator, and the demands made on your credulity are numerous and some of them stupendous." The truth of this is illustrated by Haeckel's attempted reply. He would evade the difficulties connected with matter, force, motion, consciousness, and sensation by the easy assumption that they are forms or qualities of a something called "substance," supposed to have had no beginning, but to have existed from all eternity, and that therefore further investigation is superfluous. The origin of life, design in nature, logical thinking and language, are, he says, "decisively answered by our modern theory of evolution." Life is imagined to be explained by "cellular physiology,"‡ cells being supposed endowed with souls. Design in nature is complacently shelved in favour of Darwin's principle of "Natural Selection." Logical thinking and language have resulted, through adaptation and heredity, from "psychic reflex activity," carried on into the further stages of the instincts, intelligence, and definite sounds, of the lower animals.

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* Even the "theistic" system (though less irrational than the agnostic and the atheistic) is in hopeless conflict with the Divine record in Genesis, and with the testimonies of our intuitions and our experience.

† In the Leibnitz session of the Berlin Academy of Sciences.

‡ Sir Oliver Lodge, however, draws attention to the fact that Life is a something which "can exercise guidance and control" over these cells. (*Life and Matter.*)

With regard to the seventh great enigma—freewill, Haeckel conveniently disposes of all difficulty by asserting* that our belief that we are free is an illusion begotten of our arrogance and presumption. He considers will to be a universal property of living protoplasm, but to be unconscious in the lower animals. Man's inclination is said to be† determined by *heredity*, and the way in which he acts in any given instance is determined, as an "adaptation to the circumstances of the moment," by the "strongest motive." Such are the answers, I will not call them solutions, made by atheistic evolutionists to the Seven World-Problems.

2. *Does evolution explain facts?*—Is evolution more successful in answering the How and the Why than in answering the Whence? Can evolution explain facts? According to the admissions of ardent evolutionists, it cannot explain all.

Evolutionist Admissions.—Some would restrict the empire of the "law" to the inorganic kingdom; others (with Wilson) confess that this limit even is too wide. Speaking of water and its unique and unchangeable properties, Wilson says,‡ "No one imagines that water is an evolved product . . . " As to *life*, *consciousness*, *sensation*, and man's *intellectual* and *moral* qualities, a large consensus of evolutionist opinion agrees with Russel Wallace that no evolution conjecture is able to explain them. But what sort of philosophy is that which is thus abandoned by its supporters?

Evolutionist Affirmations.—The theory professes to explain body, soul, and spirit; and hold the mirror to their development. It affirms that the organic has come from the inorganic, and then species from other species by (*a*) direct generation, or (*b*) transmutation; the inorganic itself deriving its various forms through the action, long continued, of mechanical force upon what was originally quite simple homogeneous matter, probably in a nebulous condition.

The hypothesis of Simple Homogeneous Matter.—If we inquire as to the How, the explanation is itself nebulous. Although this simple homogeneous matter is *not* met with in nature, except in connection with other matter, or as result of decomposition,§

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* With H. Spencer.

† *The Riddle of the Universe*, p. 47.

‡ *Problems of Religion and Science*, p. 105.

§ The spectroscope shows that the nebulæ are *not* constituted of simple homogeneous matter. Lockyer's investigations do not go to prove that the stars were formed out of only one kind of matter, but merely that the number of elements is less than had been supposed.

we are not permitted to dismiss the idea as a myth; but are told to believe that it *might* have existed, and that in truth it "must" have existed, for otherwise the hypothesis built upon it would fail. Then a force, operating upon this "homogeneous matter," would, say evolutionists, produce in it varying degrees of condensation and thickness, whence would result the various chemical elements. To the objection that the differences among the elements are other than relative degrees of condensation, *e.g.*, that condensing hydrogen does not turn it into nitrogen, oxygen, chlorine, or any other element, the evolutionist gives no reply except the assertion that the thing did somehow! so "take place" or "arise."

How and *Why* certain portions of inorganic matter should become Organs—eyes, ears, etc., and the one part become an eye, whilst the other part becomes not an eye but an ear, the evolutionist fails to tell us; all he can say is that it "took place," "it arose," probably in some mysterious way, through condensations and thickenings (!)*

We may, however, be permitted to think that this hypothesis of original simple "homogeneous matter," rests upon an unstable foundation. Nature presents to us objects of great diversity—not of degree only but also of kind. On the assumption that they are all fashioned out of one homogeneous material, how did they acquire this diversity?

Diversity of effect implies diversity in the material or in the cause, or in both material and cause. Were one and the same homogeneous matter acted on by one and the same cause, then, even if the amount of action vary on different parts of this material, the differences in effect can be in *degree* only, *not in kind.*

Is Transmutation of Species possible?—The supposed change of Species into new species was inferred from the circumstance that *varieties* can be changed into new varieties, but the hasty generalization is unproved. Vines testifies before the British Association,† that "it cannot be said that the study of Palæobotany has as yet made clear the ancestry and the descent of our existing flora." Huxley candidly tells us that "we know of no animal now living which in any sense is intermediate." Dana, referring to the absence of geological genetic links, does not hesitate to declare that "if the links ever existed, their

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* We may decline to accept subjective imaginations for objective facts.

† See *Nature*, September 27th, 1900.

annihilation without trace is so extremely improbable that it may be pronounced impossible."* Lamarck's idea that, through its own effort, a creature changed into another of different species, has been exploded by its inherent absurdity. A frog does not *suo motu* turn into an ox, however he may swell himself. The idea that species transmutation may be effected by changing the environment, is refuted by Lyell,† and more recently by Dr. Dallinger's classical experiments on monads; and heredity, reversion, and hybridism, corroborate the testimony of experience. The same refutation applies to the hypothesis that one species came out of another by direct immediate generation—a "grotesque conception" which retains whatever difficulties are connected with "special creation," whilst destitute of the reasonableness which harmonises them.

Attempt to derive Man from the lower animals.—The preceding considerations, negativing all species transmutation, apply to the attempt to derive man from the lower animals. Such attempt is further beset with *peculiar* difficulties, difficulties with regard to his body, with regard to his soul, with regard to his spirit. Of the *first* class are such matters as the explanation (on evolution principles) of the character and order of formation of the teeth, the upright position and the great toe, the brain and association centres, as well as this "highest animal's" young antiquity, and his sudden appearance, difficulties which are recognised, though reluctantly, by evolutionists themselves. Every attempt to prove the assumed descent of man by anatomical reasoning must be held to *have broken down.* As Mivart has pointed out, the method is radically vicious.

Man should be considered as a Whole.—

"We ought" (he says) "utterly to reject the conception that mere anatomy by itself can have any decisive bearing on the question as to man's nature and being as a whole.‡ To solve this

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* Not only are there *no genetic* links, but Lord Kelvin, Sir Robert Ball, Professor Sollas, and others have shown that the whole *time* which has elapsed since the introduction of terrestrial life, is a small fraction only (say one-hundredth) of that required by evolutionists. (See Edward Fry, in *Monthly Review*, December, 1902.)

† See *Principles of Geology* (Chapter ix of the earlier editions to the ninth). The Rev. J. T. Gulick maintains (*Evolution, Racial and Habitual*, Washington, 1905) that segregation and isolation are essential. "Isolation is an essential factor in the production and maintenance of divergent types." Does this isolation occur in nature?

‡ Professor H. Nicholson says—"The fallacy lying at the root of Evolution is in imagining that resemblance of body, or limb, or embryo, denotes affinity." (*Ancient History of the Earth.*)

question, recourse must be had to other studies, that is to say, to philosophy, and especially to that branch of it which occupies itself with mental phenomena—psychology."

Mental faculties.—How do evolutionists try to account for man's *mental* faculties? They tell us that *consciousness* is a something which somehow* "arose" out of unconscious matter,† "or has been gradually evolved from the 'psychic reflex activity;'" that the notion of *personal identity* is an illusion, as is also that of *free-will*; that human *will* is the resultant of nerve currents flowing together, or that it is produced (in its independent and higher phase) when the "tricellular reflex organ" arises, and a third independent cell—the "psychic" or "ganglionic" cell—is interposed between the sense-cell and the "motor-cell"; and so on. Leslie Stephen‡ gravely informs us that will is determined by character and circumstances, character being itself evolved from antecedent circumstances, and hence it follows that will is really the creature of circumstances.

Is our Knowledge reliable?—Do such explanations really *explain?* It was remarked in the President's Address at the British Association Meeting in 1904, that, on the assumption that our intellectual faculties have been derived from unconscious§ modifications (as evolutionists assert and affirm) of

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* So Spencer and Haeckel. While refusing to ascribe consciousness to the atom, Haeckel yet attributes to the atom will, sensation, likings, and dislikings! Buchner regards consciousness as only a molecular movement.

† Lotze has well shown the "absolute *incomparability* with one another of physical events and conscious states." We shall agree with D. S. Cairns (*The Contemporary Review*, October, 1904,) that "It is utterly impossible to explain psychic phenomena in terms of their physical conditions." And, with Sir Oliver Lodge, that "Matter is the vehicle of mind, but it is dominated and transcended by it;" and "It is intelligence which directs; it is physical energy which is directed and controlled and produces the result in time and space." (*Life and Matter*, pp. 123, 169.)

‡ *Science of Ethics.*

§ On the attempted derivation of the conscious from the unconscious, Professor E. Armitage remarks:—"Order and law are only found without as they are first conceived within the mind, and man remains for ever the measure of the universe that he knows. A science therefore that dethrones man or that presents mind and thought as a late arrival in the world, has plainly missed its way, and is putting the cart before the horse." (See "The Scientists and Common Sense," in *The Contemporary Review*, May, 1905.) Weinster, with reference to attempts to "explain" phenomena of consciousness by physical terms—attraction, molecular vibration, and the like, points out what utter folly it would be thought to "explain" in the same way the inertia of lifeless substances as caused by vibrations of the substance. (See p. 54 of *Die Philosophischen Grundlagen.*)

matter, we have no guarantee as to the validity of their conclusions, and therefore none as to the reality of our knowledge.

Are our greatest certainties illusions?—Nor is it satisfactory to be asked to believe* that things about which our certainty is greatest, *e.g.*, personal identity and free-will, are *illusions because* they are inexplicable on any principle of evolution. Assertion is *not* explanation. To say that human will "arises" as a physiological modification of matter, is a statement tending to produce in the credulous that confusion of thought of which it is an indication.

Evolutionists seek to derive the Moral and Religious from the Unmoral and Unreligious.—Is evolution more successful in "explaining" *moral and religious* faculties? These also are supposed to somehow "arise" out of that which is devoid of them, and without apparent or proved affinity. Moral intuitions, "innate perceptions of right," are said to be results of accumulated experiences of utility by the race, results transmitted by heredity through nervous modifications. According to Stephen,† "we may probably trace the germs of the moral instincts down to the associations of animals."‡ Darwin considers that "the appreciation of justice" is a factor in the "evolution" of conscience. On which it has been well remarked that for such appreciation there must be the *prior* existence of conscience.

Character is supposed to be determined by environment, moral character by social environment—"As every man is born and brought up as a member of this vast organization (the social organism), his character is throughout moulded and determined by its peculiarities, the only difference between morality and custom is in its wider application."§ The great moral basis is held to be the principle of self-preservation, whether of the individual or of society, and "Morality is the fruit of a gradual evolution of the organic instinct continued through many generations; . . . the feeling of moral obligation an abstract sentiment which has developed as abstract ideas in general do." Conduct "is virtuous so far as it is the mani-

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* Evolutionists, compelled by exigencies of their position, do so inform us.

† *Science of Ethics.*

‡ Stephen should have recognised that the difference to be accounted for is one not of degree but of *kind.*

§ *Idem.*

festation of a virtuous character," which "virtuous character" is an adapted correspondence between a man and his environment, formed not *by* him, but *for* him; "morality is simply the most important qualities of the social tissue,"* and, though "a code of personal conduct cannot be definitely formulated," an individual is to follow "the most persistent instincts," these being supposed to lead him to seek his own welfare, and (so far as coincident with this) that of others; he is "to discern that any given set of instincts corresponds to certain permanent conditions," since "human happiness is the product of a long series of processes of adaptation or adjustment acting either upon the individual or the social organism."

Evolutionist Moral "Philosophy" a failure.—With regard to evolutionist moral "philosophy," it may be remarked that it *confuses* the moral with the unmoral (*e.g.*, justice is a notion supposed† to be a result from the associations of animals, or from those of circumstances). It gives no explanation of the principles of right and wrong, of belief in GOD, of the religious sentiment and moral responsibility; and supplies no adequate practical guidance and incentive for moral and religious progress.

We conclude that evolution does *not explain* man's *bodily* structure, and does not explain his *mental* faculties, and does not explain his *moral and religious* faculties.

One of the leading facts in nature is that of Life. How do evolutionists try to account for *life*? Some (including Spencer and Weismann) *admit* frankly their inability. By others it is imagined to result somehow from physical and chemical forces. Max Verworn, of Jena, asserts that "the life-process consists in the metabolism of proteids"; because these chemical compounds are not present in non-living bodies, but are always present in living organisms. Here he appears to confuse a form of life-activity with life itself. The teaching of evolutionists is that life has resulted from "dead matter"—something entirely devoid of it.‡ This teaching is opposed to all our knowledge on the subject.

Huxley and Lionel Beale.—Huxley affirms that the great doctrine of biogenesis is "victorious all along the line." So

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* *Idem.*

† *Idem.*

‡ Bastian (in *Nature and Origin of Living Matter*) has the temerity to assert that "Archebiosis" is continually going on now (1906). The wish is too obviously "father to the thought."

much for Haeckel's "archigony." Lionel Beale* publicly puts on record his conviction—a conviction resulting from forty years' study, with the aid of microscopes of enormous power (5,000 linear), of actual Living Matter or Bioplasm—that "Vital Power" is "distinct from all forces, potencies, and properties belonging to or derived from any kind, or resulting from any physical or chemical state, of Cosmic matter." Beale tells us that

"No matter in the *Living State* is subject to physical and chemical laws. The living constituents of living particles are even uninfluenced by gravitation." . . . "I have been unable," he says, "to discover or frame any hypothesis which could be advanced as a reasonable explanation of the facts of any kind of living matter, without admitting the influence of *Infinite Power, Prevision, and Wisdom.* All my efforts to obtain evidence which in reason could be regarded as adequate to account in some other way for the facts, have entirely failed."

Such is the testimony of an "authority" than whom it would be difficult to name one higher, or commanding more general respect. In his Address, before the British Association, on "Stereochemistry and Vitalism," F. R. Japp drew attention to the fact that the results of modern research preclude an explanation of the phenomena of life in terms of the mechanics of atoms.

Life and Enantiomorphs.—He referred, in proof, to the remarkable and entirely *unique* action of living matter in regard to enantiomorphs (opposite hemihedral crystalline forms),—it produces, or selects, one kind of enantiomorphs without the other. Professor Japp showed that

"Living matter is constantly performing a certain geometrical feat which dead matter, unless, indeed, it happens to belong to a particular class of products of the living organism, and to be thus ultimately referable to living matter, is incapable—not even conceivably capable—of performing."

To this unique property of vitalism† may be added that of

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* See Address on "The Nature of Life," given before the Philosophical Society of Great Britain, 1899.

† Of the optically active substances found in vegetable and animal tissues, Professor Japp remarks that "no fortuitous concourse of atoms, even with all eternity for them to clash and combine in, could compass this feat of the formation of the first optically active organic compound." Sir George Stokes has pointed out that Life is not known to us except as produced by the action of Spirit. Sir Oliver Lodge concurs (see *Life and Matter*).

intransmutability, and that of *directivity*—co-ordinating and arranging bioplastic movements.

We conclude that evolution does *not* explain the fact of *living* matter.*

Purpose and Design in nature.—Another great fact of nature is the apparent Purpose and Design, the suitability and suiting of means to ends, and of organism to environment and *vice versa*, which is visible everywhere. Except the theistic, no variety of evolution doctrine makes any serious effort to account for this.†

Haeckel's denial.—Haeckel,‡ with characteristic coolness, seeks, not for the first time, to evade difficulty by simply denying its existence.

"Nowhere," according to him, "in the evolution of animals and plants do we find any trace of design. . . . And there is no more trace of 'design,' in the embryology of the individual plant, animal, or man."

Nor is Spencer more illuminating. Take for example, his explanation of the backbone. He tells us that the segmentation is the inherited effect of fractures caused by bending.

Spencer's fallacy.—On which Professor W. K. Brooks (of the John Hopkins University) says that

"Aristotle has shown (*Parts of Animals*, i, 1) that Empedocles and the ancient writers err in teaching that the bendings to which

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* This is admitted by Spencer, in *Principles of Biology* (vol. i, p. 120), He writes, "We are obliged to recognise that life in its essence cannot be conceived in physico-chemical terms. . . . It needs but to observe how even simple forms of existence are in their ultimate nature incomprehensible, to see that this most complex form of existence is, in a sense, doubly incomprehensible."

† Hume testifies that "The order and arrangement of nature, the curious adjustment of final causes, the plain use and intention of every part and organ, all these bespeak in the clearest language an intelligent cause or Author. The heavens and the earth join in the same testimony." To this testimony of the famous philosophical sceptic may be added the words of that "Prince of Science," Lord Kelvin. Lord Kelvin says, "I feel profoundly convinced that the argument of design has been greatly too much lost sight of in recent zoological speculations. Overpoweringly strong proofs of intelligent and benevolent design lie around us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing us through nature the influence of a free Will, and teaching us that all living things depend on one everlasting Creator and Ruler."

‡ *The Riddle of the Universe*, p. 95. Yet, while denying "design," Haeckel inconsistently admits that there are in nature, "purpose," "contrivance," and "selection."

the backbone has been subjected are the cause of its joints, since the thing to be accounted for is not the presence of the joints, but the fitness of the joints for the needs of their possessor. . . . It is an odd freak of history that we . . . are called upon to re-consider a dogma which was not only repudiated two thousand years ago, but was even then antiquated."

Professor Brooks warns us that the tendency of exclusive laboratory teaching may be to lead us to forget Aristotle's principle; and he points out that the problem of *fitness* is the real problem which confronts the naturalist, and that it is entirely untouched by the explanation of nature as "inherited nature." This "fitness" proves Design, and Design is unthinkable apart from Mind and Will.

Hume's testimony.—

"A purpose, an intention, a design," says Hume, "is visible in everything; and when our comprehension is so far enlarged as to contemplate the first rise of this visible system, we must adopt with the strongest conviction the idea of some intelligent cause or Author.

If we believe that every effect implies a cause, and that cause an adequate cause, and that experience affirms the fact of the universe being modified and changed by the cause called "Will," we shall recognise, as behind and independent of nature, the Mind and Will of the Creator.*

Is evolution the Unifying Principle?—Our conclusion is that evolution (unless of the theistic variety) fails utterly to explain *design* in nature; and that every form of the theory is helpless before familiar *facts*.

3. Lastly, let us enquire whether evolution Unifies knowledge in accordance with our Intuitions.

The supposed unifying principle is found in the dogma that one kind of thing has arisen out of another kind of thing,—the more complex from the less complex, that from the still less complex, and so on, down to one or two simple originals.

The evolution Postulate.—The implicit postulate, regarded as a universal law, is that Similarity among things proves a

* Schopenhauer affirms that "what we are obliged to think as means is in every case the manifestation of the unity of the one Will so thoroughly agreeing with itself, which has assumed multiplicity in space and time for our manner of knowing." (*The World as Will and Idea.*) Wilson points out that "its working is perfect law and order, with absolutely no element of caprice." (*Problems of Religion and Science*, p. 109.) "There is nothing between absolute scientific belief in a Creative Power, and the acceptance of the theory of a fortuitous concourse of atoms." (Lord Kelvin.)

relation of Derivation of one from another (antiquity being measurable by simplicity), or else a Derivation from some mysterious common stem. By "theistic" evolutionists the original or originals are said to be created by GOD; by other evolutionists they are unaccounted for.

Experience negatives.—This *Derivation* hypothesis, undoubtedly essential to evolutionism, is negatived by experience.* Spencer† thought it expedient, in view of irreconcilable facts, to bolster up the "law" of progressive evolution by an opposing "law," the law of dissolution, and to suppose an alternate supremacy.

Spencer takes refuge in a Dual principle.—Hence, the real unifying principle, whatever it may be, is *not* that of evolution.

The evolution principle is besides in discord from our *intuitions*; for it labels as "illusions" the beliefs in a conscious Self and personal Identity and Free-will—things which our intuitions tell us are facts and certainly true. The axioms—"Like (or same), Cause produces like (or same) Effect," "Like (or same) Effect is produced by like (or same) Cause"—axioms with the authority of intuitions, lying at the basis of all experimental knowledge—are denied by evolutionism.

The Causation Axioms.—The affirmation that one and the same animal has produced two such very different creatures as man and the "anthropoid" ape, denies the first axiom; and the affirmation that the particular species of creature called the horse has been produced from two (or more) very different kinds of parentage, denies the second.

Thus, evolution does *not unify* knowledge in accordance with our *intuitions.*

The Inquiry Answered.—We are now in a position to answer the inquiry with which our investigation began. Is "Evolution" a Philosophy? Does "Evolution" (unless theistic) account for *the Origin* of things? Does any theory of "Evolution" *Explain the facts of nature*? Does any theory of "Evolution" *Unify knowledge* in accordance with our *intuitions*? Taking fair note of the statements of evolutionists themselves, we have seen that the answer has, in each case, been *in the negative.* Judged by these three tests of a sound philosophy, "Evolution" must, on a fair review of the evidence, be condemned.

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* It is also of course, *illogical.* The argument is—all Derived things are (some) Similar things, therefore all Similar things are Derived.

† *First Principles.*

Indefinite and indistinct as the Spencerian nebula, it is in no true sense a *philosophy*. Blinded by devotion to their theory, its advocates have (consciously or unconsciously) magnified resemblances, and ignored or blurred over differences; some advocates reminding one of those "that call evil good, and good evil; that put darkness for light, and light for darkness; that put bitter for sweet, and sweet for bitter" (Isaiah v, 20).

Evolutionist Reasoning.—One is struck, when reading evolutionist reasoning,* by an apparent anxiety to maintain the theory *at all costs* and in disregard of inconvenient facts—the intelligence of the reader among them. A recent writer, admitting that the evidence in favour of a certain hypothesis is by no means as strong as he would desire, complacently seeks to evade the difficulty by saying—

"But the *necessity* of some such *assumption* becomes irresistible when we realize by careful reflection the inadequacy of any other theory to account *for the evolution* . . . †" (My italics).

However "irresistible" this kind of argument may appear to some minds, it is not logical, and is not conducive to the investigation and ascertainment of truth.

Discovery or Imagination?—We may remind ourselves of the wise words of a President of the British Association—

"If we strain our eyes to pierce 'a mystery' with the foregone conclusion that some solution is and must be attainable, we shall only mistake for discoveries the figments of our own imagination."

No method of intellectual procedure is more mischievous than that which, attending merely to resemblances in similar things, systematically slurs over their differences.‡

Discrimination.—The faculty of *discrimination* lies at the basis of all intellectual progress. Locke has remarked that

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* Dr. Scott (in "The Origin of Seedbearing Plants," see *Nature*, August 20th, 1903) speaking of certain plants, says "their anatomical structure proves them to have had so much in common with true ferns that there can be no doubt of their affinity with them." This is indeed to fall into the fallacy, rebuked by Mivart, that structural resemblance implies genetic affinity.

† How different was Newton's procedure, when his gravitation theory met with a difficulty through an error in the sun's distance as then accepted! That greatest of all scientists hung up his theory until (after two years or thereabout) the error had been rectified, thus giving evidence that he preferred *Truth* to *Theory*.

‡ It has been said of a famous scientist that "his lively imagination was apt to see in the facts what he expected or wished to see."

"to observe every the least difference that is in things, argues a quick and clear sight, and this keeps the understanding steady and right in its way to knowledge"; and "an aptness to jumble things together wherein can be found any likeness is a fault in the understanding . . . which will not fail to mislead it, and by thus lumping of things hinder the mind from distinct and accurate conceptions."

The first of philosophical interests is Truth.—The first of philosophical interests is *Truth*, and (to quote Sir Michael Foster):*

"the seeker after truth must himself be truthful, truthful with the truthfulness of nature. For the truthfulness of nature is not wholly the same as that which man sometimes calls truthfulness. It is far more imperious, far more exacting . . . It is not her way to call the same two things which differ, though the difference may be measured by less than the thousandth of a milligramme, or of a millimetre, or by any other like standard of minuteness. And the man who, carrying the ways of the world into the domain of science," or we may add, of philosophy, "thinks that he may treat nature's differences in any other way than she treats them herself, will find that she resents his conduct."†

That, for some time to come, "Evolution" may receive support from able and influential votaries, and consequently continue to delude minds unaccustomed to the estimation of evidence, the unwary, the ignorant, and the many who, too *indolent* or too *tired* to think for themselves, rely upon the confident assertions of certain "authorities," is possible and probable. History teaches that it is no new thing for unsound theories to be advocated by eminent partisans. Mill‡ has observed that

"a fundamental error is seldom expelled from philosophy by a single victory. It retreats slowly, defends every inch of ground, and often, after it has been driven from the open country, retains a footing in some remote fastness."

The theory of "Evolution" has failed to justify itself to Science. Is it more successful with regard to Philosophy? Being a theory which has for its chief features imaginativeness and hazy pretentiousness, a theory which, failing to substantiate its claim to be either a science or a philosophy, conflicts with the facts of nature and our primary intuitions, it cannot *ultimately* enlist the belief, as it cannot command the convictions, of thoughtful and truth-loving men.

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* See his Address as President of the British Association, 1899.
† *Nature*, September 14th, 1899.
‡ *Logic*, vol. i, p. 125.

Discussion.

Rev. A. Irving, B.A., D.Sc.—Professor Orchard has done good service to the cause of Truth in the thorough way in which he has handled this question; and, as one who of necessity represents the *theological* as well as the *scientific* aspect of it, I thank him most sincerely for the effective manner in which he has disposed of the so-called "philosophies" of Haeckel and Herbert Spencer, which have a passing fascination for many minds. I do so the more, because he has powerfully endorsed many of my own criticisms of Haeckel and Spencer in a course of sermons written four years ago for the benefit (in the first instance) of the students and staff of our Diocesan Training College. Professor Orchard, however, recognises such a thing as "theistic evolution." On this point I should like to remark that we need not go to America for that: it can be found in my paper on "Evolutionary Law, etc.," of two years ago, by those who will be at the pains to look for it. So I accept Professor Le Conte's enunciation of such a theory, as quoted by Professor Orchard, except that sentence about the "Spirit-embryo," which, I must confess, contains a proposition entirely beyond my mental grasp.

The main contention of the paper is (as I understand it) that *Evolution is not a Philosophy*: it fails to *unify* the whole range of *facts* that come within the ken of the human mind. For more than thirty years I have insisted on that, in the sixth-form class-room of a great public school, in the pulpit, and in various published papers. It fails chiefly at three points:—

(i) As to the origin of matter, its energy, and its properties;
(ii) As to the origin of physical life;
(iii) As to the origination of the higher (spiritual) life of Man—of all that raises him above the Homo of the naturalist.

Now, these are just the points at which the writer of Genesis i invokes special creation. All the rest, it may fairly be maintained, is covered by Evolution in accordance with Law, marked off as

"several phases of Creative thought realised;"* Divine volition expressing itself in *working for ends*, as implied in the repeated formula "God was saying." In this we recognise the *immanence* of creative power, ever directing the variations, which in their totality lead to cumulative results.

I meet, therefore, the thrust of the hinder end of Abner's spear, by a flat denial of the "hopeless conflict" there enunciated; and I do so with the more confidence, when, on turning to a previous page, I observe the crudeness of the author's notions of Chemical Science. He seems to be oblivious of Crookes' "fourth state of matter," of the Periodic Law (as worked out by Mendeléeff) and of the electron theory of atoms, as suggested by Professor J. J. Thomson, of Cambridge, and expounded by Sir Oliver Lodge in his *Romanes Lecture* at Oxford. These have given a new departure, and have opened wide fields for the legitimate extension of the evolution-theory in Chemical Philosophy; so that it is too late in the day to quote the *dictum* of Clerk-Maxwell (though he was not the author of it) that "the material atoms bear all the stamp of a *manufactured* article." No student at all abreast of chemical science in this twentieth century could assent to that; and it "proves," therefore, nothing at all. Has Professor Orchard heard nothing of recent work on the "atom" of copper in Sir William Ramsay's laboratory at University College, or his brilliant work on the resolution of Radium?† So with the "New Geology," Professor Orchard can scarcely be said to be up to date; and he labours under the fallacy, to which Herbert Spencer had to confess in his old age, of using the term "force" as synonymous with "energy."

He might, I think, have recognised Professor George Henslow's insistence on the necessity of *directivity* in a lecture which I heard at University College‡ five years ago, upon which Lord Kelvin based the remarks which he quotes; and he seems to be unacquainted with the writings of Dr. Asa Gray, one of the most profound thinkers on

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* See *The Guardian*, October 30th, 1907; also the correspondence that followed for some weeks.

† See Professor Ramsay's communication to *Nature*, vol. lxxvii, March 5th, 1908, as indicating the latest phase that this question has assumed (March 11th).

‡ See *Christian Apologetics*. London: John Murray, 1903.

this subject, and one of the foremost scientists of his day in Europe and America.

"Darwinism" (as I contended two years ago) is "not commensurate with the facts," and therefore cannot of itself form the basis of a philosophy; but that is no reason why it should not express a generalisation true for a limited range of facts. But as Asa Gray points out,* "It must be reasonably clear to all who have taken pains to understand the matter, that the true issue is not between Darwinism and direct Creationism, but between design and fortuity; between any intention or intellectual cause and no intention or predicable first cause. It is really narrowed down to this, and on this line all maintainers of an affirmative may present an unbroken front" (p. 89).

Gray quotes Mosley thus: "Intention in Nature having once existed, cannot cease operating; the test and amount of that intention is not the commencement, but the end; not the first low organism, but the climax and consummation of the whole" (*ibid.*, p. 88). Again Gray remarks (*ibid.*, p. 77): "All appears to have come to pass in the course of Nature, and therefore under second causes; but what these are, or how connected and interfused with first cause, we know not now, perhaps shall never know." And once more (*ibid.*, p. 72): "In each variation lies hidden *the mystery of a beginning.* We cannot tell why offspring should be like unto its parent; how, then, should we know why it should sometimes be different?"

With Asa Gray may be mentioned George Romanes; two examples of men who held the theory of Evolution (*with its limitations*), and died Christian believers. In such company a Christian evolutionist may fairly resent being labelled with the vulgar conceit and the blasphemous rant of a Haeckel, or with the crude empiricism of a Spencer, the latter of which has taken in for a time a large portion of the reading public, so as to pass for a "philosophy."

Professor Orchard has done well to enumerate Emil du Bois

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* See *Natural Science and Religion* (Scribner, New York, 1891); being two lectures delivered to the Theological School of Yale College marked as much by *philosophic thought and insight* as by the knowledge of a "master" in his own science.—A. I.

Raymond's "Seven World Problems" none of which have been solved by Haeckel or Spencer; and I agree with his commentary on them.

I also agree with him that "the first of philosophical interests is Truth"; and the teaching of Sir Michael Foster's address at Dover, to which he refers, was made the basis of a sermon at the time delivered by me in All Saints Church, Brighton, and reported in the *Brighton Herald*. But Foster taught evolution-theory within limits. We shall all agree that "ultimate Truth" is synonymous with "the wisdom of God." That is many-sided; in fact, according to the inspired *dictum* of St. Paul, "many-coloured" (πολυποίκιλος): upon which the great divine, Bishop Christopher Wordsworth of Lincoln, remarks, "So is God's wisdom infinite in variety, richness, and beauty, adapting itself to the needs of man in every age, and of every creature in the world." (*Ep. ad Ephes.* iii, v. 10, and *Commentary, loc. cit.*)

Dr. W. WOODS SMYTH.—The authorities quoted by Professor Orchard as opposed to Evolution belong to the class of those who refused to accept the fact of the circulation of the blood. No physician at the time of the discovery who was over forty years of age accepted the truth of blood circulation. Professor Orchard should have given us the views of some of his authorities at a later date. Lyell and others changed their views. Thirty years after Darwin's *Origin of Species* was published, he could have quoted Wallace, Huxley, Lyell, Vogt, Lübbock, Büchner, Rolle, etc., as accepting Evolution and the Evolution of man. To-day we must adduce in the same category, the Royal Society, the Geological Society, and the Linnean Society.

We may dismiss the views of those who lived before the rise of Modern Science, or who were not influenced by Revelation, as of no value. To-day we are in the position somewhat of those who heard for the first time of Newton's doctrine of Gravitation. Voltaire and the sceptical Encyclopedists hailed Newton's discovery as showing the universe to be in the grip of natural laws and as enabling them to dispense with a Creator. What Newton did in the physical universe, Darwin has done in the realm of Life; and no wonder the same misrepresentations have arisen. Neither Gravitation nor Evolution are to blame. Darwin says:—"There is grandeur in this view of Life with its several powers having been originally breathed

by the Creator into a few forms or into one." The intellectual Fathers of the Church in the days of its early purity and power held the same view. They found it in the Bible. Do not think this strange; sometime ago an Oxford Doctor of Science, writing to the *Standard* in relief of the difficulties of another correspondent, a D.D., said, "Given one who had never read the Bible nor was biased by current views of the Bible, but who was familiar with Biology and Evolution: upon reading the first chapter of Genesis he would be struck with agreement of Genesis with these modern scientific views." Let me say, I never held any other view of the Creation but that of Evolution, and I learned it through the Bible; and have had the privilege of presenting to this Society the fact that the Hebrew verbs teach Evolution pure and simple, as also the Hebrew for *create*.

Dr. W. Woods Smyth, in reply to certain enquiries addressed to him, said: The system of Classification in Natural History is frequently adduced in support of Evolution. The difficulties of the Special Creation view are insurmountable. Would the Creator for no reason place in the animals of to-day, including man, clear evidence of their being descended from earlier and lower forms? Would He give to the human embryo thirteen ribs, as in the case of the apes? In the development of the chick, would He begin by first making an embryo fish with gill slits and their vascular supply and then undo His work and make a bird? Would He *directly* create creatures ready in tooth and claw to tear one another? Evolution requires that such creatures should come to be, but no other view does. I can assure Professor Orchard that my views of the Hebrew word translated *create* are from Dr. Samuel Davidson. We have no higher authority to-day.

Rev. Professor G. FREDERICK WRIGHT, D.D.—It is interesting to notice that the speaker has had very little to say about Darwin; which leads to the observation that Darwin rarely uses the word Evolution, and, in fact, was not an evolutionist in the sense that Spencer was. Indeed, he said of Spencer, that if he had observed more and written less, he would have conferred a favour upon the world. Darwin's method of investigation was the opposite to that of Spencer. Spencer's method was *a priori* with an unproved and impossible assumption to begin with, from which he attempted to unfold the whole universe. Darwin's method was *a posteriori*. Beginning with the known variations in individuals and in species,

he reasoned backwards to see if there were definite limits to variation. This conclusion that species may have originated by variation from generic types, as varieties have from specific types, was a legitimate process of reasoning from the known to the unknown. But every step back of that leads into increasing mist and darkness and needs to be made with increasing caution.

Philosophically the reasoning of Darwin involves merely the theory of secondary causes, and the extent to which it is possible to conceive them to be endowed with resident forces. Theistic philosophers generally agree that in the process of creation, God has imparted a large extent of inherent power to secondary causes. The seed of the original cabbage had the latent power to develop into a great variety of forms in response to the varying conditions to which it was subjected. The ultimate supposition of Darwin was that the Creator had originally endowed four or five forms of life with the power of developing into existing species in response to the conditions enveloping them. This is not atheistic nor agnostic, and should not be confounded with the theories of Haeckel and Herbert Spencer. The speaker has done excellent service in showing that there were narrower limits to the power of developing by resident forces than even Darwin inferred. Life is more than motion, and cannot have originated from mere motion. The animal has a self-directing power that cannot have come from the vegetable's inherent forces. The spirit of man, with its regard for the moral law, is on a higher plane than that of animals.

Theologians have the same philosophical difficulties to deal with in their theories concerning the origin of individual souls, that biologists have concerning the origin of species. Theologians are divided into two antagonistic camps upon this very point—the Traducianists and the Creationists. The Traducianists hold that the souls as well as the bodies of Adam's descendants are derived from him; while the Creationists hold that each soul is a fresh creation from the hands of God, put into a body which has been propagated from the first through resident forces. It is as difficult, on either theory, to tell when the individual man becomes a living, responsible soul in the image of his Creator, as it is for a Darwinian naturalist to tell when a variety passes into a species.

The doctrine of design is not discredited by Darwinism as it is by the theories of Haeckel and Spencer. The origin of species

through natural selection, simply throws the designer back a step or two, when he is responsible for a broader and deeper system of design, than is involved in the hypothesis of a direct creation of species.

We should be careful not to set too narrow limits to God's power of accomplishing His designs through combination of secondary causes.

Rev. JOHN TUCKWELL, M.R.A.S.—Mr. Chairman,—There are processes of Evolution which none of us question, such as the evolution of the flower from the bud, of the animal from the embryo, and of the solar system from the nebula. But what we do question is the evolution of one species from another. The theory is beset with difficulties, and we want those difficulties removed before we commit ourselves to it. For instance, the theory supposes an ascending series of living beings from the most primitive to man, but no classification has ever yet been propounded that will meet the requirements of the theory. Such classifications as we have are simply those of the most eminent naturalists. But we have no guarantee that these classifications are in the true historic order of created life, and the classifications of to-day will be changed to-morrow. For instance, the Mollusca have sometimes been placed above the Arthropoda; but if you adopt that order, then you place the oyster above the bee or the ant. Can that be right? But if you place the Arthropoda above the Mollusca, then you place the barnacle, which towards the close of its life sinks to the level of a degraded parasite, above the beautiful and complicated air-breathing nautilus. Can that be right? Whatever system of classification you adopt, and whether you classify according to habit or morphological structure, or on any other principle, you cannot avoid these anomalies. Yet we are asked to believe in the theory of an ascension by a ladder which cannot be found or made.

Again, do what you will you cannot make the theory fit with the Geological record. You have, say, some thirty miles of stratigraphical rock in which life appears. The first of these is the Cambrian, having an estimated maximum thickness of 18,000 feet. But there are four divisions of the system, the first of which is some 8,000 feet thick, and in this 8,000 feet you have eight out of ten of the principal forms of animal life—all, indeed, except the Chordata and the Vertebrata, many of these forms swimming together in the same seas and even preying upon one another. Of

course, we shall be told of the possibility of denuded strata which *may* have contained many missing-links, but to establish a theory upon the unknown is not science.

There is another difficulty. So far as we know, no new species are being evolved now. The differentiation of form is quite another thing. Hence there is no opportunity given us of watching this supposed evolutionary process. If evolution is possible, or ever has been possible, it must be due not only to outward conditions but to innate biological tendencies; and we have no proof that such tendencies exist. If in the growth of the same embryo different forms are assumed—the form of a fish and then the form of a bird—there is not the least evidence that there is no vital difference between fish-bioplasm and bird-bioplasm, or that fish-bioplasm can produce a bird. But I think the advocates of the theory have failed to pay sufficient attention to the fact that there is reason to believe that in the earlier ages of the world's history a process was taking place which is not taking place now. If we believe in a Divine Creator with a Will as free as our own, we cannot deny to Him the power of acting paroxysmally as well as gradually, and it is not unscientific to believe that He has done so. Indeed, when we carry our thoughts up into the religious sphere, I suppose none of us will doubt that He has done so in our own experience. If we have become regenerated it was not by a process of evolution that, "we passed out of death into life." Nor will any of us, I hope, be prepared to apply the theory to the Incarnation of our Lord Jesus Christ. As yet the theory is undemonstrated, and we ought not to have it forced upon us upon the authority of great names; and we are only exercising a true scientific caution in requiring that our difficulties should be removed before we receive it.

The AUTHOR'S Reply.—I wish to express my sense of the uniform courtesy and general agreement with which my paper has been received. A special interest attaches to Dr. G. Frederick Wright's remarks upon Vitalism. The inability of evolutionists to account for the fact of Life is of no little significance.

I ought, perhaps, to answer some friendly criticisms, which were not altogether unexpected. Mr. Woods Smyth has already had his contention corrected by Mr. Rouse. Mr. Woods Smyth appears to be misinformed in thinking that the Hebrew in the Creation narrative of Genesis lends support to evolutionism. Some time ago,

in this room, he enunciated the same opinion. Being diffident of my own Hebrew, I consulted a reliable Hebraist, who had no hesitation in declaring that Mr. Woods Smyth was mistaken. The criticisms of Dr. Irving embrace the great and the minute, Asa Gray and the atom. He wishes that my paper had quoted the former, and discussed the latter. Then it would have been still more up to date. I cannot agree with him. Had the subject before the Society been "Science and Evolution," a quotation from Asa Gray would have been appropriate enough, and have deservedly carried weight; but I am not aware that the eminent scientist has any claim to be regarded as an authority in philosophy. And where are quotations to *end*? Is there to be no limit? Most readers will be of opinion that the list given in the paper is sufficiently long, and that, when they are brought up to within a few months of this present day, the paper is well up to date. As to the constitution of the atom, there was not time to discuss it; nor would the discussion have been very relevant, if there had been time. Dr. Irving can hardly be ignorant that scientists are by no means unanimous on this matter. Personally, I hold with Clerk-Maxwell; but even if matter were electricity, this would not affect my argument. I am thoroughly in agreement with Dr. Irving that "the 'accepted conclusions' of mere critics and scholars (based to a large extent on negative evidence) can have *to the scientific mind nothing of the nature of finality*, and that deductions drawn from them can have no surer value than the nebulous data upon which they too often rest."*

To any one here who may with little consideration have adopted some theory of Evolution, may I commend Bacon's wise counsel—"The Lord St. Alban would say to some philosophers, 'Gentlemen, nature is a labyrinth, in which the very haste you move with, will make you lose your way.'"

* Dr. Irving, *Transactions of the Victoria Institute*, vol. xxxix, p. 216.