
A table of contents for *The Churchman* can be found here:

https://biblicalstudies.org.uk/articles_churchman_os.php

than with the educated, and it can scarcely be needful to add, they are much more observed by those who have no practical religion than by those who have. To this day, some who ought to know better are alarmed to sit down thirteen at table, and do not feel altogether easy if they break a looking-glass. It will always be found that long after a heathen religion is dead as a form of faith, it remains alive as a root of innumerable superstitions, not always to be traced to their source with certainty.

EMILY S. HOLT.

ART. III.—A RESEARCH INTO ORIGINS: A SCIENTIFIC INVESTIGATION AS TO EVOLUTION.[1]

OF late, all of us, scientific and unscientific, have had evolution on the brain. The enemies of revealed truth were jubilant, hoping to be rid of a hated Book, the holiness it commanded, and the judgment of which it warned. Those who accepted revelation, and regarded evolution merely as a part of the manifold Divine process, began to be doubtful both as to the comprehensiveness and minute correctness of the sacred record; and whether, in future, physical science ought not to be considered, rather than Scripture, as the special revelation of God to man.

The growing lawlessness of men who boasted that they were without God in the world—did not know Him, would not, could not; and the evidence of common-sense and past experience that, apart from a recognised Divine authority, there can be no security for the continuance of morality nor safety of life, made thoughtful men hesitate as to accepting evolution. Scientists whom we delighted to honour, at whose feet we sat gladly as learners, and whose verified statements we were thankful for, declared, again and again, "the arguments against evolution are not worthy of thought." Nevertheless, as by instinct, most of us, charmed they never so wisely, would not believe.

Dr. Darwin, great as he was diligent and humble, told us of "The Origin of Species;" and as to "The Tendency of Varieties to depart indefinitely from the Original Type," Mr. Alfred

[1] For fuller statement of the process of reasoning, see "The Mystery of the Universe," Theme V. Kegan Paul, Trench, and Co., 1, Paternoster Square, E.C.

Russell Wallace wrote very ably—yet men generally were not convinced. The aim of this short paper is to vindicate the prudence of that reserve.

We admit, generally, that setting aside Agnosticism, which is without any claim to knowledge, there are only two available theories concerning the genesis of things: one, creative; the other, evolutive.

Evolution means (1) to evolve or to unfold one thing out of another; (2) a series or continuance of unrolling or evolving. It means that all things began in and came out from a something of which science affords no explanation; but that the general law, or mode of process, is declared by analysis, correlation, and synthesis, to be evolutional.

Two faults attend the statement: it is not comprehensive, it is not accurate. We thus reason: present physical science does not accept the dogma, "worlds are eternal;" we know, about as well as we can know, that the constitution or framework of the universe is neither eternal as to the past nor as to the future; and evolution presents no explanation of the origin. Even if we assume the eternity of matter (the physical form of it), a great assumption, we have then to endow the structureless with potentiality of struction, the dead with the essence of life, and to give a power of becomingness to things before they are things; so that evolution tacitly assumes creation as a fact, while openly denying creation as a Divine reality.

The incompetence of the theory may be further seen: the unknown has to be postulated along the whole line. We are to believe that a straight line has some tendency to be not straight, and to take any and every direction; the invisible has a tendency to become visible, and then to go out of sight again. We must think that out of some uniformity came variety; from equilibrium, unequal pressure; that from some little form of life, which at first possessed neither form nor life, came every beautiful shape with the sweet sensations and rich emotions of all existence. In some way, which was no way in particular, the first monad, unknown to itself, evolved from within itself a larger, stronger, more adventurous monad; and this by continuous stress, attaining fuller variety and development, became every living thing: even that perfection of organism—a human being. This pretentious explanation of whatever is by that which is not, in which ignorance puts on a show of knowledge, is wholly incompetent to reveal any secret as to the origin or continuance of the universe.

In opposition to a theory so erroneous, we contend that every change in the physical universe, whether organic or inorganic, and the continuance of things, are wrought by dis-

tribution and redistribution of force and of matter. The approximate theory of the universe is not that given by evolutionists; but the true formula, explanatory of all origins, may be thus stated: The differentiation in time of the primal unity of eternal form and energy.

This formula, brief and definite, is sufficiently comprehensive to contain all the processes of the universe. It postulates only that One Eternal Power, represented in all phenomena, and acknowledged by every scientist; the Power by whom things that were not passed into the ordered solidity of Nature; the Power whom it is the glory of modern science to have demonstrated. This formula renders approximately thinkable the cause and nature of origins, the advance from the indefinite diffusion of matter to the attenuated nebulæ, hence to the fire-mist, and on to the determined stability of worlds. It explains the advance from bioplasmic substance, knowing not itself, to the genius of Shakespeare and the sublimity of Milton. It accounts for uniformity in which was no change, and then every change; for the advance from equilibrium to that grand array of forces and distribution of matter, in which no line of direction as to force, and no two particles of matter, are the same for any two consecutive moments. For a process so stupendous, no narrow meaning, like that of the word "evolution," avails: the process from beginning to end is by differentiation. The verification is manifold.

i. As to matter.

Unthinkable, in some respects, as is the creation of matter; that it was not created is more unthinkable. We thus reason: all mechanical changes are by differentiation of force; all chemical operations—synthesis, analysis, affinity, repulsion—result from differentiated force. To obtain a definite base for physical science, we regard the diagram of an ultimate particle as a mathematical point which has no configuration: nevertheless, experiments in approximate vacuum and in chemistry show that the atoms are really substantial, and not mere force-points. Now, as science requires these to be as nothing, philosophy sees no difficulty in the thought, that as force-points, however infinitesimal, are a collocation of energy, so the ultimate atoms are differentiated from some one original substance, or from an indefinite diffusion which has no configuration. These particles, differentiated and aggregated by the primal energy, are the basis of the suns, systems, and constellations which sparkle in space. The process, from beginning to end, is by differentiation: all known matter—solid, fluid, gaseous, ultra-gaseous—assumes any and every form by differentiation of force.

ii. As to force and motion.

The sum-total of force and motion, so far as experiment and reasoning extend, can neither be diminished nor increased by the automatic action of any or of the whole of its parts. If we assume, as Kant did, that some parts of the chaotic mass were more dense than others, and that these gathered around them the rarer matter of the intervening spaces, this must be corrected by the fact that the nuclei, thus formed, would during time be drawn to a common centre; and then we should have—not collections of bodies like our solar systems, but a single sun formed by the aggregation of all. The only probable, not to say possible, mode by which we obtain masses moving round other masses is by differentiation of force.

iii. Formative power.

By the automatism of Nature, the energy of which science does not regard as an essence of matter, the universe is as an organism. Rivers embank themselves, sensitive but irrational creatures sustain and reproduce themselves, as if by knowing how. Energy forms, sustains, interpenetrates Nature, as to every part. Atoms and molecules arrange themselves, or are arranged, in crystal shape, living plant, intellectual man. As to the differentiation of animals and plants—at one end are monads so minute that we cannot see them with the unaided eye; at the other end are gigantic animals, and trees of more than four hundred feet in stature. The process is by differentiation of energy in manifold forces; by distribution and redistribution of matter, in displacing of old and regrouping of new molecules; the product is by a determinate regulation of structure, of form, of magnitude.

iv. The process of life.

Eternal energy, differentiated in force, converts inorganic matter into bioplasm; it lives, as in a moment; obtains a nucleus, and within that a nucleolus. The process is not evolutional, but differential; for, though every organism is the child of pre-existent living matter, not one pre-existent particle continues to live in the new organism. It dies in giving life, and the life is not given to old, to handed-down substance, but to new and ever-fresh-arriving material. The life-substance seems one and the same for all; but the life-wave of differentiation is so marvellous, that no two living things are precisely the same, are never for any two consecutive moments composed of identical particles; every living structure is unceasingly differentiated throughout its particulate substance, and during every instant of its continuance. The process by which eternal energy differentiates force in life-giving operation is so vast, that possibly, in Time's measureless course, the whole substance may be endowed with life.

The substance of all germs being the same, it is differenti-

ation of force that gives variety of form, with varying and higher activities. This accounts for adaptations of organs to functions, and their cosmical relations. We also find that the force of heredity hands down parental likeness from generation to generation; not as by evolution from an epitome; for the child is not folded within the parent, nor is the oak in an acorn; the development of the embryo being no otherwise maintained than by redistribution of matter, and by the adjunctive forces of suitable surroundings.

Differentiation is the principle that explains the process by which unity of substance and the oneness of plan, observed in Nature, passed into universal variety. On one side we have the kinship of all life; then observing that lungs are modified from a swim-bladder; that our arm or fore-limb is similar to the arm or fore-limb of a bat; that the hand of a man is formed for grasping, that of a mole for digging; the leg of the horse, the paddle of the porpoise, and the wing of a bat, include similar bones in the same positions—we begin to know somewhat of the differentiated scheme of life. Our latest science confirms the statement of the Old Book, that Eternal Energy brought from the ground, by means of heavenly influence, all that delights our every sense, making it full of promise as to more light, order, and beauty.[1]

All known life, substance, force, is one life, one substance, one force. By a differentiating process, we have in every embryo a modern recapitulation of ancient transformations in the history of species—and are able to speak rightly of their origin. Differentiation is the key to those leaps, sports, surprises in Nature; and to the coming of double flowers, or a dwarf, or a giant; showing that Nature is never more normal than when abnormal. Touched with a new force, she springs more joyfully and alertly forward, or, as if hindered, turns back.

v. Differentiation may be further illustrated by philology.

Take a word, say, in the Arabic language, and in changing its form by prefix or by suffix, a new and definite meaning is acquired. In Hebrew, by insertion of a letter, or by alteration of a vowel point, you may play with a word. As to Gilead, see Genesis xxxi. 46-48; as to Jezreel, Hosea i. 2. Every language affords instances; our own language is full of them.[2]

vi. History affords like facts.

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[1] For specialities as to the origin of man, see "The Supernatural in Nature," pp. 134-136, 141, 192, 193, 289, 290, 302, 303, 320-324. Kegan Paul, Trench and Co.

[2] "The English Language." R. G. Latham, 1841. "Forms in *ster*," p. 201; and "Forms in *en*," p. 261, etc. "Elements of Comparative Philology." R. G. Latham, 1862. Part II.—Language in General Stages, 697-701.

Take the marvellous cities of Bashan: they are not the oldest, but their origin lies in remote antiquity; the Emim and Rephaim began to build them, or earlier giant architects.

On the earliest simple ponderous workmanship is raised Jewish masonry, graven with Jewish names. Later were the Greek temples and inscriptions. Then came Roman roads, Christian churches, Saracenic mosques, and now—Turkish desolation. These are not evolutions, but differentiations effected by physical, vital, mental forces.

vii. Climate, weather, the surface of the earth, are subject to the same law.

The morning may dawn bright and clear as an Italian or an Eastern sky. Soon a breeze is felt, then a cloud is seen; it spreads, it covers the sky; the darkness is felt; out of that darkness speeds lightning, intermittent or in continuous stream; and from the open windows of heaven torrents flood the earth. The raising or lowering of islands and continents, heat and cold, dryness and moisture, are by differentiation of forces, not by evolution. The wind, the flame, the rain, are the product of forces differentiated by the energy of the universe.

viii. Our natural senses are and act by differentiation.

Even in the time of Democritus it was thought that our senses are specialized modes of a primordial common sensibility; and the philosophical biologists of our own day are coming to a general agreement that the organs themselves were formed by a gradual differentiation and adaptation of those parts in which common sensibility was most frequently called into action. The sense of touch being taken as the mother sense. These senses are by means of nerves co-ordinated to transmit external impressions, the impressions themselves being the resultants of differentiated forces.

This can be verified: Light is ether in motion; the colours are by differentiation of that motion in the greater or less amplitude of the waves, so that they variously strike the optic nerve. Sound is by the impingement of differentiated atmospheric forces and waves on the acoustic nerve. Feeling, taste, smell, pass into peculiarities of sensation by differentiation of atomic forces. None of these are evoluted; for, though intensity of heat generally produces light, there is light without heat, and heat without light; and though dull sounds may grow sharp, and noise become music, the process has nothing to do with evolution, but is one by which differentiation of force intensifies and quickens the vibrations.

ix. Differentiation covers every phenomenal process, accords the varieties of science, sufficiently accounts for all change, and indicates the mode by which all forces, forms, substances, sciences, are brought under one principle.

This seems to solve the cause and origin of things. The dry details of physical experiment, of biological investigation, of sensational and emotional organs and functions, when touched by scientific philosophy, are as stars to show the pathway of life. The whole is not so much an act as a process. The tendency of matter is to integration as worlds; their progress leads to life, their decay destroys living beings; yet from the dust of the tomb of suns and stars, new spheres are raised.

The whole is natural; but by a something beyond Nature, in Nature, and by which all Nature is. There is no confusion of the Eternal with the finite, of the Fixed with the transitory, of Cause with effect, of Infinity with space; but we discern some glimmer of a far-off light, a struggling to some far-off end; life seeks life—more and fuller; intellect and emotion press onward and upward.

x. It may be said: "Differentiation is a somewhat uncouth word." In reality it is better than evolution, being more comprehensive, more accurate, and is already in use; nevertheless, it seems desirable that we recall into scientific use the old word "creation."

That word has been laid aside because in pre-scientific times בָּרָא, create, was erroneously interpreted to mean a series of fiats which were instantaneously effected. There is no real warrant for that interpretation.[1] The real and original signification is to cut, to form, to shape. In application to God's work, it is of transcendental meaning to express those transcendental operations which are peculiar to the Divine Being.[2] It means things made creatively, בָּרָא לַעֲשׂוֹת, wonderfully, great works, literally new things (Isa. xlviii. 7). It is used as to the Incarnation (Jer. xxxi. 22). In the first chapter of Genesis בָּרָא, create; עָשָׂה, make; יָצַר, form, interchange in use (i. 1; ii. 2; i. 26, 27; ii. 7). The word is used as to being born (Psa. cii. 18); and as equivalent to forming for glory (Isa. xliii. 7).

The same kind of misuse led to the laying aside the word "fiat." We use it rightly, however, as the initiating and performing that process by which matter is drawn from the invisible and aggregated; by which light appears; by which the expanse, or firmament, is freed from diffused matter; by

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[1] "Non habet producendi ex nihilo vim."—"Concordantiæ Hebraicæ atque Chaldaicæ," Julio Fuerstio.

[2] "The Hebrew word is limited, in its primary meaning, to the working of God, and is never used in Scripture (where it is used in Kal thirty-five times) to describe the works of man, and presents an instance of the exactitude and precision with which the Holy Spirit writes."—"Wordsworth's Commentary."

which, in progress of time, the sea and land are formed; and by which the sea and land differentiate their force to produce life.

In using the words "create" and "fiat," as to the operations of Eternal Energy, we pass beyond the limit and scale and manner of human performance, to the highest sense which our faculties afford, and the nature of the work required. The following reasons may be urged for use of the word "create":

1. It declares the transcendental action and effect of Eternal Energy in that differentiation of force by which things that are not are made—matter, life, sensation, emotion.

2. It states that the configuration, motion, life of the worlds are begun, continued, determined or limited, by that same Energy, even as by Infinity they are contained.

3. It manifests that the Eternal Energy, unlike all else that we know, is not contained by the universe; for, though present in every part, it transcends the whole, being that by which every part exists.

4. No other word—not evolution, nor even differentiation; not adaptation, nor natural selection—indicates, as the word "creation" does, that process which is wrought by something that is necessarily above Nature; a process that is a continual becoming by means of omnipresent Might present in every moment, in every force, in every point of space; Might not merely mechanical, but vital, intellectual, moral.

5. The word "create" is in common use to express the works or creations of genius in fiction, in poetry, in music, in any great operation. It denotes with due accuracy all that the man of science needs; it satisfies the piety of the devout; for it refers all phenomena to that supreme Energy, whom it is the glory of accurate science to have discovered as the "Be all and In all." In the presence of this Might we stand in freedom, with open face, and say: "We know, and know how we know; we believe, and know why we believe."

JOSEPH W. REYNOLDS.

ART. IV.—DIOCESE OF RUPERT'S LAND.

NINETEEN years have passed since the Rev. Robert Machray, now, as then, a Fellow of Sidney Sussex College, Cambridge, was appointed Bishop of Rupert's Land in succession to the first Bishop of the Diocese, Dr. Anderson. We expect that only a few of our readers realize the marvellous results of those nineteen years of labour.

There lie before us the Report of the Synod of the Diocese of Rupert's Land, held in the spring of last year; the Journal