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THE EVOLUTIONARY FAD.

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DARWIN'S theory of the origin of species through natural selection was not a theory of general evolution. Indeed, it differed as widely as possible, both in itself and in the arguments supporting it, from the crude theories of evolution which are now running rampant among the popular expounders of all departments of human thought. Darwinism was simply an attempt to show that Nature had not necessarily exhausted herself in producing species any more than man had done in the production of varieties. According to Darwin, species occupy the same relation to genera that varieties do to species. In other words, species were but accentuated varieties.

But, at about the same time that Darwin was establishing his theory of "the origin of species by means of natural selection," Herbert Spencer was propounding a thoroughgoing theory of evolution of everything. According to him, "Evolution is an integration of matter and concomitant dissipation of motion; during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation."[1] That is, through the integration of matter and the dissipation of motion, there have appeared such transient phenomena as Abraham, and Moses, and Homer, and Alexander, and Cæsar, and Jesus Christ, and the long roll of saints and martyrs; and the mariner's compass, and the theory of

[1] First Principles, ¶ 145.

gravitation, and geology, and the steam-engine, and the telegraph, and the telephone, and the whole social and political condition at the beginning of the twentieth century.

Mr. Huxley's definition of evolution represents the process as scarcely less thoroughgoing. According to him, "The hypothesis of *evolution* supposes that in all this vast progression there would be no breach of continuity, no point at which we could say, 'This is a natural process,' and 'This is not a natural process'; but that the whole might be compared to that wonderful process of development which may be seen going on every day under our eyes, in virtue of which there arises, out of the semi-fluid, comparatively homogeneous substance which we call an egg, the complicated higher organization of one of the higher animals. That, in a few words, is what is meant by the hypothesis of *evolution*."[1]

When Huxley was pressed hard, he met the difficulties of his theory without wincing very much. He had to acknowledge that the origin of life was in a mysterious realm beyond the reach of human experiment and observation. But, like the consistent philosopher that he was, he was nothing daunted by his lack of sight. He ventured boldly forth on the wings of faith, and declared that he *believed* that somewhere in infinite time, and amid the infinite series of changes through which matter has been called to pass, life with all its possibilities did somehow originate from material forces. He labored, also, to prove that both animals and men are automata, denying to man free-will, and doubting whether animals had any sensation of pain; their cries indicating pain being, perhaps, as devoid of meaning as is the noise produced by the grating of a file upon iron. Nevertheless, because this theory was subject to a certain measure of doubt, his common sense got the better of his scientific judgment, and he advised against

[1] Huxley, American Addresses, p. 10.

promiscuous vivisection, on the principle that where no clear gain to man was to result, and where so much was at stake with the animal, the victim should be allowed the benefit of the doubt.

It requires only a slight amount of attention to perceive that the form of the theory of evolution which is coming to prevail in the magazines and lighter literature of the period, and which is so seriously affecting theological thought, is of the Spencerian variety, whose proof depends upon deduction, rather than induction. Its web is like that of the spider, which he spins wholly from his own bowels. One of the best illustrations of the process was that of Tyndall, when, in his Belfast address, he began to look with his "mind's eye" into the abysmal recesses of the infinite past, and see Shakespeare and Milton and Napoleon and Grant and Cuvier and Darwin emerging by natural processes out of Huxley's "*comparatively* homogeneous substance which we call" not an egg, but the original whirling, fiery, star-dust. In passing, it is worth noticing the significance of the qualifying word "comparatively," introduced by Huxley, for it really gives away his whole contention. A perfectly homogeneous substance would undergo no change of itself. What is *comparatively* homogeneous is not homogeneous at all. It is the doctrine of evolution obtained by this deductive, *a priori* process which constitutes the evolutionary fad of the present time, and which is working such havoc and confusion in the thought of the age, and leading so many into intellectual positions whose conclusions they dare not face and cannot flank, and from which they cannot retreat, except through a valley of humiliation, which to the unregenerate heart is worse than death.

Christian theists could have no well-grounded objections to that enlargement of the sphere of the action of secondary causes which was involved in the simple statement of

the Darwinian theory; namely, that species as well as varieties had originated through a process of natural selection acting upon the variations which continually appear in successive generations of individuals. Several serious errors, however, were incorporated into the original theory, —some of them by Darwin, but more by those who hastily took up and enlarged it.

The first serious error was one which Darwin himself entertained and strenuously contended for; namely, that the variations of which natural selection took advantage were extremely minute, rendering the process exceedingly slow, and demanding enormous lengths of time to effect visible results. In this view he was encouraged, at the time of publication of his memorable volume, by the prevalence of the extreme form of Lyell's Uniformitarian theory of geology. This theory has been aptly characterized as being "prodigal of time and parsimonious of force," and, since it proposed to account for the greatest of results by the least imaginable expenditure of force, has been fittingly styled the "Homeopathic" theory of geological dynamics.

A striking example both of the influence and of the insufficiency of this theory appears in one of the random estimates of geological time which were made in the first edition of the "Origin of Species." In illustrating the length of time which he had to draw upon, Darwin estimated that required for the erosion of the Wealden deposits in Southern England, where he resided. The calculation was made from the amount of erosion that had taken place since the original deposition of the rock. Very likely his estimate of the amount was approximately correct. But he had also to estimate the rate. This he derived from the known encroachment of the sea upon the land, taking that as the divisor. The result was 306,662,400 years,—that being the time required, on this calculation, for the accomplishment of the ascertained total amount of erosion. This

he called "a mere trifle" of what had taken place during the entire geological period. That the total amount of erosion he considered was relatively a mere trifle, nobody would deny. But it was not difficult to show that, in obtaining his divisor, Mr. Darwin had overlooked the most important agencies. He had fixed his attention upon the erosion around the circumference of the area to which the waves of the ocean could get access, but had entirely forgotten the agencies at work over the entire land surface, which is many thousand times greater than that exposed on the circumference. Over this entire area the alternating periods of heat and cold, of drought and moisture, are continually at work to dissolve the surface, while the rains and snows are as constantly at work in transporting the *débris* to lower levels. By actual collection of facts concerning this subaërial denudation, it was shown, that, unless counteracting agencies intervene, the entire surface of North America will be swept out to the depths of the sea in a little over 3,000,000 years, leaving only a few mountain skeletons to mark the spot.

As criticisms on this calculation proceeded, Darwin slowly and reluctantly retreated, modifying his calculations somewhat in the second edition, and acknowledging that he had not fully appreciated the rate of denudation; while in the third edition he expunged his calculation altogether, and contented himself with some general remarks to the effect that a million years is a longer time than most people can imagine. But clearly this shortened geological time necessitated serious changes in his theory, since, in proportion that the time is shortened, the rate of change must be increased. When he was no longer allowed to speak of hundreds of millions of years as "a mere trifle," he could maintain his theory only by enlarging his conception of the rate of change from infinitesimal gradations to steps of greater and greater length, until finally they

were strides which it was difficult to distinguish from leaps.

It is significant that Alfred Russel Wallace, the co-partner of Darwin in propounding the theory of the origin of species through natural selection, came, from his own study of the thickness of the sedimentary rocks and the rate of deposition, to the conclusion, that 30,000,000 years was about all the time that could be allowed for the drama of geological development, i. e., less than one-tenth of Darwin's original "mere trifle" of geological limit. Approaching the subject from the standpoint of physics, Darwin's son George, who is as eminent in mathematics as his father was in natural history, demonstrated that the heat of the solar system could not have allowed geological development to have begun earlier than 100,000,000 years ago, and probably not before 50,000,000 years ago; while other physicists, among them the most eminent representative, Lord Kelvin, have narrowed the time available for geological purposes down to 25,000,000 years. At the present time a portion of the geologists are maintaining a vigorous effort to secure an extension of this time to the paltry amount of 100,000,000 years.

Concurrently with these criticisms of Darwinism from without, there was an equally significant line of criticisms from within. It was easily shown that many of the variations assumed to have been preserved and accumulated because they were advantageous to the organism must have been far from minute, in order to be of any advantage to the species, and to furnish any basis for selection. For example, suppose it is a disadvantage to a species of birds that they cannot fly across the Straits of Dover. It will be of no benefit to them to have their powers of flight increased sufficient to fly three-quarters of the way across; for they cannot get the advantage of the opposite shore until they are able to fly the whole distance. The water three-quarters of the distance would drown them as surely

as that half the distance across would, should they fall into it.

One of the most striking illustrations of this point is found in the case of the protective coloring in various species of insects and butterflies. In the tropics certain species of butterflies which are attractive food for birds come to look so much like the leaf of a tree that the birds cannot tell the difference; hence, since they do not eat leaves, the butterfly that looks like a leaf is unmolested. But this imitation of the leaf is brought about by a very complicated arrangement of colors upon the wings of the butterfly. The imitation does not appear on the wings singly and when spread out for flight, but only when they are folded together over its back while the butterfly is resting on a twig. Now any one can see that these peculiarities can be of advantage only when they are complete. The imitation must have been a sudden development or it could not have been preserved by natural selection. The only alternative hypothesis is, that the final stage of perfect resemblance was secured by a slow process which had been set in motion and continued by an external force, not of natural selection, but of design, which would be a complete abandonment of the Darwinian hypothesis, unless, with Weismann, we suppose the ultimate monads which enter into the composition of the butterfly's wings were themselves capable of design, and actually displayed method in their madness.

The result of these criticisms of the Darwinian theory of evolution has been the re-introduction of the old ideas under a new name, and we have now what Clarence King and Professor Le Conte aptly call "paroxysmal evolution," in which it is difficult to tell the difference between the paroxysms of evolution and the creative acts of the older theories. It is significant in geology that the progress has not been by uniform stages, but by alternating stages of

varying degrees of intensity. For long ages the Mississippi basin and its outlying areas underwent gradual subsidence, and maintained an elevation not far from the sea-level, permitting the long-continued and enormous growth of the vegetation from which the coal-beds of the region were derived, and the successive deposition of the widely extended strata of clay, sand, and gravel which now separate these beds. But the close of this period is well denominated by Dana the "Appalachian revolution," when, by some combination hitherto ineffective, the forces came into operation which reversed the order, and have made this region, ever since, one in which the elevating forces have been predominant. To existing species this change was a wide-spread catastrophe. The old species could not keep pace with the physical changes, and they were destroyed by the wholesale, and their places taken by new species. And so, the close of the Tertiary period, during which the Alps and the Pyrenees and the Himalayas and the Rocky Mountains rose from the sea to their present heights, was a period of wholesale destruction of species and an introduction of new ones in their place. We do not need to say that these changes were *actually* rapid, but merely that they were *relatively* so. Nor do we mean to say that there was any break in the continuity of the species. But we do mean to say, that, in order to secure continuity, there must have been an inherent capacity for variation in existing species largely in excess of what the original Darwinian theory assumed. From this it follows, that our reasoning from present experience of the rate of change in species is from very imperfect data. We are not justified in limiting the past by the measures of the present.

Nature is full of critical points at which changes proceed at a rate which is out of all analogy to the ordinary progress of things. Water as vapor has no resemblance to water as a fluid; water as a fluid has little resemblance to

ice, and the transition from one form to the other is paroxysmal. At 33° Fahrenheit water is a fluid; at 32° it is a solid; different degrees of heat above and below these points do not change the character of the phenomena presented. The periods in the life of every individual are equally marked off by critical points at which changes are produced with a rapidity which is paroxysmal in its results. It is by no means certain that the beginning of the existence of a human soul is not in every case an act of direct creation. The production of each individual human being is dependent upon the union of sexual elements which do not come together by any law of nature, but by the combined action of two free personalities. Science has absolutely no explanation of the dependence of the beginning of individual life upon the union of the two sexual elements. The birth of the individual is another critical point. Before birth, the lungs, the brain, and all the organs of sensation are totally without use to the fetus. At birth, they all of a sudden spring into exercise in conditions that are entirely different from those that had existed up to that point. And during life there are several periods in which changes proceed with phenomenal rapidity. Of these, the age of puberty is perhaps the most marked. The instantaneousness and completeness of the transition from life in the body to life out of the body is the chief difficulty in believing in immortality.

To the theologian who is familiar with the best scientific thought at the beginning of the twentieth century, it is humiliating to find that the cast-off clothing of the evolution philosophy of fifty years ago is now extensively being picked up and put on by many of the religious philosophers and biblical critics of the day. The spectacle is by no means a pleasing one, nor is it complimentary to the educational methods and other influences which are determining the character of the dominant scholarship of

the new century. Misapplying the saying of Christ, that the kingdom of heaven is characterized by a law of progress according to which there appears first the blade, then the ear, then the full corn in the ear, many are using an *a priori* theory of evolution from which to construct systems of history. In fact, the theory is a kind of car of Juggernaut for which way must be made, regardless of consequences. Among the subjects to which it is applied is that of the antiquity of the human race. Reasoning from a narrow range of experience, and shutting their eyes to a multitude of the greatest events of history, they infer, that, at the rate at which changes are now going on in the characteristics of races, and in the modifications in language and social conditions, hundreds of thousands of years were necessary for the human race to emerge from that simple state of savagery which is assumed to have been the original condition of mankind. This extreme antiquity of the human race is made the basis for discrediting the biblical doctrines of primeval revelation and of the fall of man.

But close analysis of the fact reveals little ground for such an easy solution of theological problems. Our observations are limited to periods of human history where the conditions are relatively stable, and can give us as little light upon the progress of things during the infancy of the race as observations upon the experience of a full-grown man would give us upon the probable development of a new-born babe.

In speculating upon this point, it is profitable to consider the forces which had free play in the infancy of the race, but which are now so limited in their activity as to be almost unnoticed. Prominent among these is the law of geometrical natural increase of population. If we suppose the human race to start with a single favored pair, and to double once in twenty-five years, which is far from being

an impossibility, there would be at the end of five hundred years a million living descendants from this single pair. If they should go on increasing at the same rate another five hundred years without check, there would be five hundred thousand million; or, if, instead of taking so large a ratio, we assume the ratio of increase which would double the population once in fifty years, which is less than that which is taking place in the United States independent of immigration, we should then have our one million people in the world at the end of one thousand years, and our five hundred thousand million people at the end of two thousand years. But as that number of people is about three hundred times more than can now be found in the world, we are compelled to consider the counteracting agencies which secure slower growth.

In the first stages of human existence the whole world was before the race, and we can easily imagine that they spread out in quest of food and adventure, so as to become widely dispersed at a very early time; thus incurring special liability to isolation which would be likely to lead to new dialects and even to totally new languages. At this period of the history of species, the colonies would also be subjected to those new conditions of climate and modes of life which would rapidly fix the racial peculiarities.

It needs but little reflection to reveal the tremendous significance of this Malthusian law during the primitive period of human history. Then the whole world was open and colonization was free. Colonies penetrating new regions would easily be isolated, and subjected to new conditions under which the physical, linguistic, and social characteristics could develop in adjustment to new conditions without anything to hinder. But now there is no such opportunity. There is no longer room for sweeping experiments with the human race. Humanity will not permit us to isolate a company of children and compel

them to work out the problems of language and social government by themselves. The restrictions of existing languages and social order are rigidly imposed upon every human being that is born into the world; while the racial characteristics are so firmly established that, when one conquering people invades the province of another, it carries with it all the modern appliances for resisting the influence of adverse climatic conditions. To the far north the civilized man carries with him his marvelous inventions for producing artificial heat and light. In going to the tropics, he burdens himself with artificial refrigerators, and everywhere takes with him his physician with his improved *materia medica.* There is now no chance for the formation of a new language or for the development of a new race. Nothing can be more misleading than to use the experience of the present for determining the rate at which the peculiarities of language and race characteristics developed in primitive times.

Nor has the course of human history run so smoothly that any natural law of evolution can be used either in forecasting the future of the human race or in interpreting the records of the past. The only ground of hope that the world is to continue to improve arises from the evidence, dimly written in the past and clearly revealed in the Christian revelation, that there is "a power above us working for righteousness," and that there is a divine plan of progress with which we are permitted to coöperate, and a divine spirit who is ready to coöperate with us. If there is anything which history teaches, it is that man, left to himself, degenerates; that the light which is shining brighter and brighter in our advancing civilization is borrowed light.

The whole pathway of human history is strewn with the wrecks of civilizations which have risen to flourish but for a day, and leave behind them monuments to re-

mind us of their folly more than of their wisdom. Civilization arose in the Valley of the Euphrates. But it was not imparted by direct descent to the inhabitants of that valley. Historians are coming more and more to see that Egypt borrowed her light from Mesopotamia. But she did not preserve it perpetually. The monuments of Egypt testify to lost arts, amid a native population that is abject in the extreme. Greece in turn borrowed from Egypt. But, alas, her glory too soon departed, and the light that glanced from her marble temples lighted up for a short time only the center of the Roman Empire.

During all this time the nations of Western Europe were groping in idolatry and barbarism to be lifted into their present preëminence, not by inherent natural forces, but by contact with Christian missionaries. Indeed, the evolutionary forces imparted by this contact are as far as possible from being those inherent in human nature. Christianity is a supernatural force. Abraham left the Valley of the Euphrates, by divine command, to found a nation who should be separate from the world. Moses was a leader under the guidance of divine wisdom rather than of that of Egypt. Jesus Christ is of supernatural birth, and imparts a spiritual power which is incapable of being procured by any natural process. The church is in the world not as an evolutionary, but as a *revolutionary* force. Like the first missionaries Paul and Barnabas, the missionary of the present time succeeds by turning the world upside down. India and China and Africa are to be saved for the future, not by cultivating and enriching the original stock, but by grafting upon the old stock the new ideas of the gospel. The Roman Empire was saved by grafting. The Anglo-Saxons if left to themselves would to-day be producing nothing but thorn apples. By no other process than grafting can the heathen world be saved.

This is the view of history which is taught both by na-

ture and by revelation. The animals most useful to man are the domesticated animals. Man has been set in the world to rule over nature. He chains the lightning. He harnesses the waterfall. He makes a bond-slave of the force stored up in the beds of coal. He is the lord of creation, and is exalted by his Creator to a position but little lower than the angels. The effort either to write human history fully or to interpret natural history in accordance with any *a priori* theory of evolution is a failure. God has had plans of his own in both departments, and those who are wise content themselves with following closely the facts and the inferences which are clearly based upon them. Those who fall back on evolution, as their dependence for saving the world, misinterpret history, and trust to a broken reed. What we need in this nation is statesmen who shall lead public sentiment, and not merely try to follow it. What we need in the church is preachers who shall convert men, and not merely trust to the development of the natural instinct of their hearers. The history of the chosen people and of the church cannot be treated like ordinary history, nor the Bible like an ordinary book. The animating purposes of those who have been born again, and in whom the Holy Spirit dwells, is above the comprehension of the mere naturalist. Our inspiring hope is that we are moving along the lines of development laid down by divine wisdom, and made clear to us, not in the dim twilight of the natural creation, but in the written history of the chosen people, and by the continued illumination of Him who is the light of the world.