

THE RISE AND FALL OF EVOLUTION BY MEANS OF
NATURAL SELECTION.

IN this year of grace 1900 there has come from the press of D. Appleton & Co. the second volume of the "Revised and Enlarged Edition" of "The Principles of Biology," by Mr. Herbert Spencer. The first volume of this edition was published in 1898, and both together may be regarded as the last word, or, at least, the latest on the subject of evolution. They have the advantage, too, of coming from the highest living authority on the subject. Professor Haeckel is, indeed, still with us. His theory of evolution, too, like that of Mr. Spencer, did not confine the famous hypothesis to merely biological phenomena, but extended it to the inorganic world as well. As Professor Haeckel's enthusiasm, however, could never be made amenable to reason, and as his sanguine temperament too often led him to mistake imagination for reason and fiction for fact, his authority on the new doctrine never carried as much weight as that of Mr. Spencer. It is true that neither Professor Haeckel nor Mr. Spencer has contributed as much to the spread of the new doctrine as did the late Charles Darwin and Professor Huxley, but both Charles Darwin and Professor Huxley have already passed away, and many things have come to light even in the brief space since their exit. Mr. Spencer's volumes are the outcome of the newer light, the fuller experience, the more sober second thought, and while he still clings to a theory of evolution in some form or other, he deals some deadly blows against the Darwinian hypothesis from which it is impossible for it to recover. Unconsciously, too, and even somewhat naïvely he lays bare the weakness of evolution in any form yet advocated.

Mr. Spencer's confessions of the failure of evolution in the very form of which he himself was at one time so ardent an advocate naturally calls to mind the famous conflict, so called, of science and religion in this particular field. The last half century has been lighted up with the weird and lurid glare of the strange doctrine. The men of science, as they loftily styled themselves, strove to superinduce a reign of terror in the religious world under cover of the new theory. The overwhelming destruction of revealed religion was, we were told, inevitable. The Church was patiently awaiting her impending doom. Onlookers held their breath as they gazed on the swelling portents. Mediators and reconcilers were busy proffering their kind offices of intervention. Even the late Professor Mivart once threw himself into the breach to effect a reconciliation. But the case seemed hopeless. Religion was doomed—

and doomed not so much on account of its own inherent weakness as because of the irresistible strength of the opposing science. And now that the closing year of the century has come, it is somewhat amusing to find that once more it is not religion but science that confesses its weakness. In the light of Mr. Spencer's recent volumes it is interesting to review the history of the late movement of the doctrine of evolution.

The history of speculative science for the last half century has been, as we have said, one of noisy and aggressive boasting. Not content within its own sphere it invaded the provinces of religion. The strong were surprised; the timid were alarmed; the weaklings were in terror. Even in some who should be pillars of strength a visible slackening of courage might be noticed. Fresh crops of reconcilers sprang up from time to time, with the laudable aim of effecting a compromise that might be honorable to religion. The fathers of the Church were ransacked. The Scriptures were again read over with a watchful eye to their elasticity. New meanings were discovered for old texts, and doubtful readings were carefully adapted to the new movement. Meanwhile on came the mighty movement, ominous and terrible, threatening to overwhelm revealed religion with death and destruction. Agnosticism and destructive criticism were enlisted for the attack; but they were mere auxiliaries. The great central power—alike death-bearing and indomitable—was the doctrine of Darwinism or evolution by means of natural selection. This was the wonder of the age, the marvel of the nineteenth century, the crowning glory of science, compared with which the practical and industrial sciences, such as steam and electricity, were spoken of by speculative scientists in the language of measured scorn. "They were merely utilitarian." For fully a quarter of a century the new doctrine loomed up in gigantic proportions in the scientific world. It was the fetish of speculative science. It will be instructive to note briefly the suddenness of its rise and the greatness of its fall.

Should any one be inclined to regard such a task as superfluous, it is merely necessary to refer them to our current literature, from which it can be speedily learned that, at least in some quarters, faith in natural selection seems to be gaining ground in inverse ratio to its failure. In view of the glowing eulogies on Darwinism one reads nowadays, of the eloquent tributes to natural selection from living and deceased litterateurs, of the brilliant attempts to reconcile the Genesis cosmogony—even to man's origin—with the origin of species by means of natural selection, and in view of the further fact that a profession of faith in natural selection is supposed to carry with it the strongest evidence of modernity, it is a somewhat per-

ilious undertaking to go counter to the popular current in favor of Darwinism. It is, however, just twenty years since the late Professor Huxley, celebrating what he called "The Coming of Age of the Origin of Species," gave this wholesome admonition:

"History warns us that it is the customary fate of new truths to begin as heresies and to *end as superstitions* (italics ours), and as matters now stand, it is hardly rash to anticipate that in another twenty years the new generation, educated under the influences of the present day, will be in danger of accepting the main doctrines of the 'Origin of Species' *with as little reflection, and it may be with as little justification*, as so many of our contemporaries, twenty years ago, rejected them."

Twenty years have proved Professor Huxley to be a true prophet. The new generation is accepting the main doctrines of the "Origin of Species" with just "as little reflection" and just "as little justification" as Professor Huxley foretold they would; for, assuredly, if scepticism regarding natural selection has yielded to credulity, it is not owing to weight of evidence.

The notion of evolution had been floating about the world in one form or other from ancient times. It was, however, only towards the close of the last century, when the theory was propounded by Treviranus and Lamarck, that it began to seriously challenge the attention of scientists. Lamarck was a keen observer, and noticing that in the animal world organs became more fully developed by use and atrophied by disuse, he maintained that these characteristics of more fully developed or atrophied organs were transmissible to posterity. To this inheritance of organisms affected by use or disuse Lamarck attributed the variations from original types. In other words, the inheritance of organs modified by use or disuse held about the same place in Lamarck's theory of evolution that natural selection holds in the Darwinian hypothesis. "Floods of easy ridicule," as Professor Huxley tells us, "were poured" on Lamarck's theory; and though adopted by Erasmus Darwin, the grandfather of the famous Charles, the doctrine of evolution dropped out of sight in the early part of the present century, drowned in the floods of ridicule poured on it by the scientists themselves. Little was heard of evolution for the next half century, until in 1859 "The Origin of Species" by means of natural selection strode into the arena, like Minerva full-armed from the brain of Jupiter. Science at once discovered in the new visitor the form and features of a god. It knelt down and worshipped. Mr. Wallace, the joint parent with Mr. Darwin of the prodigy, was, it is true, slightly overlooked in the distribution of honors, but Mr. Darwin received his full meed. The Darwinian hypothesis, as all the world now knows, was, to state the

matter roughly, simply this: All species have been developed by variation from common stocks by means of the process of natural selection. This process is closely allied to artificial selection or what is commonly called selective breeding, the struggle for existence doing for natural selection what the human agency does for selective breeding.

The new doctrine was hailed with acclamations of joy from every quarter of the scientific world. Professor Huxley, as he himself tells us, acted in the capacity of "under-nurse" to the infant prodigy. Mr. Herbert Spencer hastened to offer his kind offices, and as the cognomen of "natural selection" was somewhat "caviare to the general," he suggested a substitute for it in "the survival of the fittest." Evolution filled not only the world of science, but all the rest of the world besides. Evolution was in the air. Its success was a foregone conclusion. It was to take its place alongside the great discoveries in physical science, greater than any of them, greater than all of them, greater than the heliocentric discovery, greater than the law of gravitation, while the names of Copernicus and Newton were to rank a degree lower than that of Charles Darwin. For more than a quarter of a century evolution with natural selection as its prime minister reigned supreme. Now it begins to lie like an incubus on all physical science, for, according to the very highest scientific authority, the evidence for natural selection has completely broken down.

To those who followed the divagations of natural selection for the last quarter of a century the doctrine of Darwinism had, about the middle of the last decade, ceased to be interesting, for the reason that it had ceased to be tenable. Just then there was a general commotion in the scientific world. Dogmatism suddenly ceased. An abandonment of position followed. Darwin himself had passed away. Professor Huxley was still living. Suddenly the world beheld the singular spectacle of the two foremost men of science, Mr. Herbert Spencer and the late Professor Huxley, abandoning for the moment the field of speculation and inquiry for the humiliating work of reparation and retraction. And what is more, to all appearances, both these renowned scientists entered upon this work after due deliberation and by concerted action. Repentance does not come easily to such spirits as Professor Huxley. He had too long indulged in his favorite pastime of intimidating religion to take easily to recantation. Indeed, Professor Huxley on the stool of repentance would rob the most picturesque character in the history of modern science of all its romance. Abject penitence was hardly to be expected of him. Nevertheless, while the proud, baffled spirit fought fiercely to the last, and the note of defiance would break out

occasionally, even to the end, he was too great a lover of science to permit his name to go down to history as the supporter of a theory which he knew to be inconclusive, without sounding a note of warning to his followers. It is true that only once or twice does he speak in trumpet tones of unmistakable clearness on Darwinism itself; and that it is only when Mr. Herbert Spencer interprets for us the very strongest of them we apprehend its full significance; but his warnings to his disciples are plain, unmistakable and numerous.

With Mr. Herbert Spencer the case is entirely different. His retraction is made *ex professo*. As the Duke of Argyll put it at the time: "He goes himself into the confessional." He points out where his own theory of evolution as well as that of Mr. Darwin is defective, and for both he tries as best he can to substitute something more satisfactory. Whether he has succeeded in this is not the question here. The important point—which seems, however, to be universally overlooked—indeed, the only point worth considering, is the candid avowal that evolution by means of natural selection has been a failure. In the scramble to discover substitutes for the Darwinian hypothesis the utter failure of that hypothesis seems to be completely lost sight of. Natural selection is, in some quarters, talked of as glibly and as confidently as if it had triumphantly accomplished all it had promised. He would be a bold man who would say aught against it or against evolution; and that Mr. Herbert Spencer and the late Professor Huxley were reactionists from the famous theory needs conclusive proof. Fortunately the proof is easily furnished.

We have said that Professor Huxley was a reactionist from Darwinism, and this is true; but it is only half the truth. It sounds like the wildest of paradoxes to say that Professor Huxley was never a believer in the Darwinian hypothesis at all. Nevertheless it is but the simple truth. He was the coryphæus of the movement. He was its most eloquent and zealous advocate. In season and out of season he preached the doctrine. To him more than to any one else—more than to Mr. Spencer, more than to Professor Haeckel, more, even, than to Mr. Darwin himself—is due the wide popularity of the Darwinian hypothesis; and yet he never made a profession of faith in it to the end. Like some worshipers who are regular attendants at church services in one or other of the Protestant denominations all their lives long, but who never "join the church," subscribe to its doctrine, adopt its creed, or make a profession of faith in its tenets, Professor Huxley to the end was outside the Darwinian fold. He saw too clearly the shortcomings of natural selection from the very outset, and was, from the start, one of its keenest and most dangerous critics. Here are the facts:

The first edition of the "Origin of Species" appeared on November 24, 1859, and in the April of 1860 Professor Huxley contributed his first criticism of the work to the *Westminster Review*, in which he said:

"There is no fault to be found with Mr. Darwin's method, then; but it is another question whether he has fulfilled all the conditions imposed by that method. Is it satisfactorily proved, in fact, that species may be originated by selection? that there is such a thing as selection? that none of the phenomena exhibited by species are inconsistent with the origin of species in this way? If these questions can be answered in the affirmative, Mr. Darwin's view steps out of the rank of hypotheses into those of proved theories; *but so long as the evidence (italics ours)¹ at present adduced falls short of enforcing affirmation, so long, to our minds, must the new doctrine be content to remain among the former—an extremely valuable, and in the highest degree probable, doctrine, indeed the only extant hypothesis which is worth anything in a scientific point of view; but still a hypothesis, and not yet the theory of species.*"

This was Professor Huxley's first criticism on natural selection, written a few months after the publication of Mr. Darwin's famous work. In the same article Professor Huxley added:

"After much consideration, and with assuredly no bias against Mr. Darwin's views, it is our clear conviction that, *as the evidence now stands, it is not absolutely proven that a group of animals, having all the characters exhibited by species in Nature, has ever been originated by selection, whether artificial or natural.*"

Again, closing his objection drawn from the sterility of hybrids, he thus concludes:

"But still, as the case stands at present, this 'little rift within the lute' *is not to be disguised or overlooked.*"

And before closing his article he says:

"We have ventured to point out that it ("The Origin of Species by Means of Natural Selection") *does not, as yet, satisfy all those requirements.*" (The requirements of "scientific logic.")

Professor Huxley has, we think, left little room for doubt regarding the meaning of the foregoing extracts. They establish his position with regard to natural selection clearly. He had evidently the hope that one day the hypothesis might prove a demonstrated theory, but until that time, if a bull may be permitted, scepticism was his creed. It may, possibly, be urged that Professor Huxley changed his views as years went on, and that his scepticism was dispelled by the proofs which the next quarter of a century brought to light. He himself can best answer this question also. A short

¹ Italics throughout this article are ours, unless indicated otherwise.

time before his death, in controversy with the Duke of Argyll, defending himself against the charge of being a reactionist in evolution, he took occasion to reiterate his faith, such as it was, in Darwinism, in connection with which he used those remarkable words:

"It is only a few weeks since I happened to read over again the first articles I ever wrote (now twenty-seven years ago) on the 'Origin of Species,' and I found nothing that I wished to modify in the opinions that are there expressed, though subsequent vast accumulation of evidence in favor of Mr. Darwin's views would give me much to add."

We have just seen what those views were in which, after twenty-seven years, he "found nothing to modify." During all that time an army of scientific inquirers had been industriously at work with natural selection as their watchword and evolution as their goal. The activity of the scientific world during these twenty-seven years is unparalleled in the history of science. Willing workers and anxious seekers in every department of speculative science—in natural history, in geology, in palæontology, in biology, in physiology, in morphology, in comparative anatomy, in the newer sciences of anthropology, embryology and synthetic chemistry—had but one end in view, one Eureka as their object, namely, the lifting of evolution by means of natural selection out of the rank of hypotheses and placing it securely in that of demonstrated theories; and yet at the close of that time Professor Huxley frankly admitted to the world that he had "nothing to modify" in an article in which he had deliberately consigned to the rank of mere "hypotheses" Darwin's doctrine of the evolution of species, in which he had openly declared that this doctrine had "not yet satisfied all the requirements of scientific logic," and in which he pointed out "the little rift within the lute" that was soon to make the music of that doctrine mute.

Strange as it may seem, then, there is no doubt that Professor Huxley never regarded the evolution of species as propounded by Mr. Darwin as a scientific truth at all. But, it may be asked, this being the case, why was he so strenuous an advocate of Darwinism, and why should there be need of reparation on his part? The same answer will suffice for both these questions. While he regarded it as of little value, inasmuch as it was merely an unproved hypothesis, he regarded it as of the utmost value as a provisional hypothesis, or, as he himself put it, "as an instrument of investigation." It might have no truth in it. It might never become a demonstrated theory; but as an incentive to inquiry, as a stimulus to research, as a guide in observation and experiment—in a word, as a good working hypothesis—he regarded it as unequaled. He did not hesitate to assert

that it was far "superior to any preceding or contemporary hypothesis in the extent of observational and experimental basis on which it rests, in its rigorously scientific method and in its power of explaining biological phenomena." This was its value, or at least a portion of its value, in his estimation. A further value he thus explains:

"We should leave a very wrong impression on the reader's mind if we permitted him to suppose that the value of the work depends wholly on the ultimate justification of the theoretical views which it contains. On the contrary, if they were disproved to-morrow, the book would still be the best of its kind—the most compendious statement of well-sifted facts bearing on the doctrine of species that has ever appeared."

These were the qualities in the new doctrine which elicited his regard and enlisted his enthusiasm. This enthusiasm, indeed, he carried beyond all due limits. He expressed himself in such terms that his hearers and his readers were not to blame if they looked upon him as a firm believer in the truth of the doctrine itself. The disciples, taking the cue from the master, whose meaning they misunderstood, soon began to out-Herod Herod, until at last Mr. Spencer was forced to complain that "nowadays most naturalists are more Darwinian than Darwin himself." Professor Huxley's eyes were at last opened to the real situation, and hence the work of reparation and admonition. We shall quote two or three instances of Professor Huxley's penitential texts. In his history of "The Advance of Science Within the Last Half Century," referring to some of the advanced views in anthropology, he finds room for these pregnant words:

"Much of the speculative 'phylogeny' which abounds among my present contemporaries reminds me forcibly of the speculative morphology, unchecked by a knowledge of development, which was rife in my youth. As hypothesis, suggesting inquiry in this or that direction, it is often extremely useful; but, when the product of such speculation is placed on a level with those generalizations of morphological truths which are represented by the definitions of natural groups, it tends to confuse fancy with fact, and to create mere confusion. We are in danger of drifting into a new 'Natur-Philosophie' worse than the old. Boyle did great service to science by his 'Sceptical Chemist,' and I am inclined to think that, at the present day, a 'Sceptical Biologist' might exert an equally beneficent influence."

Sceptical biologist indeed! But who, in these days of ultra-Darwinism, will tolerate a sceptical biologist? Nevertheless, it is well to remember that we have the salutary warning of the foremost biologist of his time against overmuch faith in the new anthropology.

Again, in one of his articles on "Science and Pseudo-science," Professor Huxley says:

"As is the case with all new doctrines, so with that of evolution: the enthusiasm of advocates has sometimes tended to degenerate into fanaticism, and mere speculation has at times threatened to shoot beyond its legitimate bounds. I have occasionally thought it wise to warn the more adventurous spirits among us against these dangers in sufficiently plain language."

All of which unmistakably indicates "a change of heart" in Professor Huxley's later years from the days when he, too, was among the more adventurous spirits who seemed to think that speculation could not be carried too far and that its only legitimate boundary lines were the imagination. We shall let Mr. Herbert Spencer add one more of Professor Huxley's admonitions, perhaps the most significant of all of them. In his epilogue to "The Factors of Organic Evolution," Mr. Spencer thus quotes Professor Huxley:

"With these passages I may fitly join a remark made in the admirable address Professor Huxley delivered before unveiling the statue of Mr. Darwin in the museum at South Kensington. *Deprecating the supposition that an authoritative sanction was given by the ceremony to the current ideas concerning evolution, he said that 'science commits suicide when it adopts a creed.'*"

If language means anything, then Darwinism had, after a quarter of a century of trial, fallen into utter disrepute. The feet of the idol were found to be of clay after all. Dagon had fallen prone from the altar on which science had, a quarter of a century previous, so proudly placed him. Scientific men shrank from even the appearance of lending the dethroned idol their sanction or approval, and the consequence of their having been duped by the impostor was the utterance of the conviction that scientific creeds are dangerous things for men of science; which, put epigrammatically so as never to be forgotten, is "*science commits suicide when it adopts a creed.*" This was the bitter lesson taught Professor Huxley by meddling with the doctrine of the origin of species by natural selection. The full significance of this revolt will be understood when we remember that it is the same Professor Huxley who was once so enthusiastic an advocate of the new doctrine, who acted in the capacity, as he himself tells us, of "under-nurse" to the theory, who was the orator when it celebrated its coming of age, who was the chosen expounder of the doctrine on all public occasions, and who, even now, when a statue was being unveiled in honor of Mr. Darwin, was the orator by natural selection on the occasion; that it is the same Professor Huxley who now makes use of that occasion to stab the doctrine to the heart, and who goes even to the length of "deprecating the sup-

position that an authoritative sanction was given by the ceremony" to the doctrine of evolution by means of natural selection. Well might natural selection cry out "*Et tu Brute.*"

It would be easy to adduce other proofs of Professor Huxley's attitude towards the doctrine; but we think enough has been said to show that we have not overstated the case when we said that Professor Huxley never made a profession of faith in the doctrine of natural selection at all, and that towards the close of his life he was engaged in the work of reparation by uttering warnings and admonitions to his followers. With Professor Huxley there was, as has been said, no occasion for retraction. He had never made an act of faith in the doctrine.

With Mr. Herbert Spencer the case was different. Not only had he openly avowed his faith in the efficacy of evolution as taught by Mr. Darwin, but he had even disputed with Mr. Darwin the honor of inventing it. Moreover, Mr. Darwin did not extend his generalization beyond the domain of biology, while Mr. Spencer not only extended it to the inorganic world, but endeavored to apply it to all psychical, social and political phenomena as well. For Mr. Darwin's "natural selection" he invented the Spencerian equivalent, "the survival of the fittest," and around this as a centre as many battles were waged as over the famous Darwinian phrase itself. Mr. Spencer's advocacy of evolution was not as enthusiastic as Professor Huxley's, but it was more positive and assertive; hence the need of retraction in his case. And it must be admitted that the recantation is clear, candid and ample.

In the year 1886 Mr. Spencer contributed to the *Nineteenth Century* two articles which could not fail to be epoch-making in the history of natural selection. They were entitled "The Factors of Organic Evolution." Whatever indirection there might have been in the method of announcement, the announcement itself was unmistakable. It was the confession that the dogmatism of a quarter of a century had been a mistake. "Natural selection" and "the survival of the fittest" were both inadequate to account for the origin of species. Mr. Spencer does not, like Professor Huxley, content himself with laying down a general principle or uttering oracular epigram. He at once plunges *in medias res*. He comes at once to particulars. He puts the question plainly, even bluntly: Has "natural selection" succeeded? In the very first sentence of his first article he makes a clean breast of the whole matter. The article opens thus:

"While recognizing in full the process brought into clear view by Mr. Darwin, and traced out by him with so much care and skill, *we may fitly ask whether those are right who conclude that, taken alone, it*

accounts for organic evolution? Has the natural selection of favorable variations been the sole factor, as it is now commonly supposed to have been?"

And his answer comes promptly:

"On critically examining the evidence, we shall find reason to think that *it by no means explains all that has to be explained.*"

Mr. Spencer immediately adds what he believes must be regarded as a necessary supplemental factor:

"Unless that increase of a part resulting from extra activity and that decrease of it resulting from inactivity are transmissible to descendants, *we are without a key to many phenomena of organic evolution.*"

To those who had pinned their faith to Darwin and Spencer and who had long regarded, on the authority of these scientists, evolution as the solution of all biological and even of all cosmical problems, this announcement came like a thunder-clap from a serene sky. What did it mean? That natural selection and the survival of the fittest had been failures? Of a surety this and nothing else. Mr. Spencer asks the question plainly: Does "natural selection" account for organic evolution? And he answers without hesitation that, on critical examination, "it by no means explains all that has to be explained;" that it leaves us "without a key to many phenomena of organic evolution." Nay, what is more, recognizing this utter failure of "natural selection" to "explain all that has to be explained," he at once casts about for some other means of explanation; and, strange to say, of all others, he selects as a worthy coadjutor of natural selection the effete hypothesis of Lamarck, which, as we have seen, was, about the beginning of the century, rejected by the scientists with scorn and drowned in floods of ridicule. This obsolete doctrine he rakes up from the rubbish of a past age, tries to galvanize it into new life and places it as the head of the corner. He tells us in cold print that while "the hypothesis of the inheritance of functionally produced modifications" (the Lamarck theory) is "utterly inadequate to explain the major part of the facts, . . . yet there is a minor part of the facts, *very extensive though less, which must be ascribed to this cause.*" He then proceeds to describe three classes of difficulties which cannot be explained by natural selection, but "which disappear if the inherited effects of use and disuse are recognized."

Whether Mr. Spencer makes good his contention regarding the solution of those different classes of difficulties by the rehabilitated factor does not come within the scope of this article. All that is necessary here is merely to recognize the fact—too often lost sight of—that Mr. Spencer has recorded in the strongest way his loss of

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faith in natural selection and the survival of the fittest as a solution of the problem of evolution. This is all the more remarkable, too, coming from Mr. Spencer at a time of life when, as he himself once said about Mr. Darwin, "the natural tendency is towards fixity of opinion;" and coming from Mr. Spencer, of all others, for whom the failure of evolution is equivalent to drawing the pencil of cancelation throughout the pages of his colossal life work. But this is not all. Mr. Spencer, having entered on the work of demolition, pursues it unrelentingly to the end. He has shown the failure of the Darwinian theory of natural selection "to explain all that has to be explained," and he has supplemented it by the Lamarckian theory of the inherited effects of use and disuse, as a necessary auxiliary. But he does not stop here. He tells us that even both these together are inadequate to explain all the facts; that there is still need of a third. And he tells us this quite as bluntly as he told us there was need of a second. Here is how he puts the question:

"But now, supposing the broad conclusion above drawn to be granted—supposing all to agree that from the beginning, along with inheritance of useful variations fortuitously arising (the Darwinian theory), there has been inheritance of effects produced by use and disuse (the Lamarckian theory), *do there remain no classes of phenomena unaccounted for?*"

And, as before, the answer comes promptly and unhesitatingly:

"To this question I think it must be replied that *there do remain classes of organic phenomena unaccounted for*. It may, I believe, be shown that *certain cardinal traits of animals and plants at large are still unexplained.*"

Well might the devout evolutionist exclaim: "Mercy on us! What is going to happen next? Has catastrophism not only reasserted itself, but overtaken the doctrine of evolution, too?" For the world had been filled with the resounding echoes of Darwinism. It was to account for everything. It had just begun to be regarded as almighty and irrefragable. And just in the supreme moment of its exaltation the foremost living evolutionist suddenly calls a halt and declares it an ignominious failure. Nor were Mr. Spencer's reasons for his abrupt interruption of the apotheosis of Darwinism calculated to reassure the ardent evolutionists. Important and far-reaching as were Mr. Spencer's articles, they were still more significant in the spirit that prompted them. He told the world plainly that the articles were written for the express purpose of stemming the tide of credulity. What could be stronger than these words?

"Along with larger motives, one motive which has joined in promoting the foregoing articles has been the desire to point out that already among biologists *the beliefs concerning the origin of species*

have assumed too much the character of a creed. . . . There seems occasion for recognizing the warning uttered by Professor Huxley as not uncalled for."

The warning here referred to as coming from Professor Huxley was that already quoted, in which he said that "science commits suicide when it adopts a creed." And Mr. Spencer concludes his remarkable articles—perhaps the most memorable articles on the subject since Mr. Darwin's "Origin of Species" appeared forty-one years ago—with these pregnant words:

"Whatever may be thought of the arguments in this article and the preceding one, they will perhaps serve to show that *it is as yet too soon to close the inquiry concerning the causes of organic evolution.*"

We have called these articles of Mr. Spencer's a work of reparation and retraction, and we think that, as in the case of Professor Huxley, we have here, too, made good our claim. Coming as they did from the foremost of living evolutionists, they produced immediately a profound impression in the scientific world. The tide of opinion at once began to turn from the belief in natural selection as the sole cause of evolution, and scientists began to cast about for new factors to take its place, since that had proved inadequate. The revolt of Professor Huxley with that of Mr. Spencer, and, to all appearances, according to a mutual understanding, shook the doctrine of natural selection to its very centre, and the temples of the long-cherished idol were soon destitute of worshipers. Of the vast multitude that fifteen years ago bent the knee before Darwinism as the true and only deity of the scientific world, perhaps not more than two of any note—Professor Weismann and Dr. Romanes—have maintained the faith in natural selection pure and unadulterated—if, indeed, panmixia and special determinants can be conceived as non-adulterating. Some have openly repudiated the doctrine altogether and adopted the inheritance of functionally produced modifications as their creed instead. Others, still, profess a sort of divided faith, acknowledging a sort of dual divinity as supreme in the evolutionary world. This amphibious deity is part Darwinian and part Lamarckian, for it is a combination of "natural selection" and the "inheritability of functional modifications." Outside of these anarchy reigns supreme. The tendency is towards independent views. Each scientist shows an inclination to set up his own little Bethel for himself. Hence we have not only panmixia, which is, to be sure, only an offshoot of natural selection, and determinate evolution or orthogenesis as it is called; we have not only the "isolation" resulting in "monotypic evolution" and the "isolation" resulting in "polytypic evolution," besides the "physiological selection" recently elaborated by Dr. Romanes; but Mr. Spencer, himself not dismayed or dis-

heartened by the failure of the survival of the fittest, has undertaken to find new factors for evolution. He had adopted natural selection under the cognomen of survival of the fittest; but found, as we have seen, that "it by no means explains all that is to be explained." Next he supplemented natural selection by "the inheritance of functionally produced modifications," and still, again, found that there remained "many classes of organic phenomena unaccounted for." He then introduced a third factor, which he called "the direct action of the medium"—using the word medium—as including "all physical forces falling upon them (living organisms) as well as matters bathing them." But Mr. Spencer had already opened wide the flood-gates of revolution. Rebellion is now in the air. The humblest scientist refuses longer to call any man master. Regard for high authority, so long sacred and so edifyingly carried out towards Mr. Darwin and his scientific offspring, has fled the school of evolution. Lawlessness reigns supreme. Mr. Spencer sowed the dragon's teeth, and he has lived to witness and bear the dire results. And so when he tries to raise his voice above the din and confusion no one listens, or, if they do, it is but to question and argue as if with one without authority. Indeed, a special creationist—supposing a specimen of the extinct race still left upon the earth—beholding Darwinism dethroned, natural selection a mere *magni nominis umbra*, anarchy and chaos supreme in the world of evolution, might well believe that retributive justice had at last overtaken his once proud oppressor and that all the woes and tribulations of his brethren were being amply avenged.

So far we have seen Professor Huxley's revolt against the doctrine of natural selection. We have seen how Mr. Spencer first adopted the doctrine, found it insufficient, then how, instead of promptly rejecting it, he undertook to strengthen it by introducing the hypothesis of adaptive changes, as one undertakes to strengthen a flawed timber by adventitious methods. We have seen, from Mr. Spencer's own confession, how both these together, still showing structural weakness, he was obliged to buttress them by a third—the direct action of the medium. This piece of evolutionary engineering took place in 1886, fourteen years ago. It is interesting and instructive to inquire how the doctrine has fared during that period. Up to that time there was unity of faith throughout the world of evolution. The creed was one, the discipline was one, the worship was one. No one had been rash enough to question the divinity of the scientific deity, much less to dare lay sacrilegious hands upon it. But in an evil hour Mr. Spencer unveiled the prophet and laid bare its infirmities to the scientific world. Disunion and dissension naturally ensued. Evolution, following its own law of variation,

has branched out into many varieties—so many, indeed, that it would not be at all surprising to find it in its own personality cutting the gordian knot and solving the sphinx's riddle for good and all by originating a new species. It would be a profitless task to follow out the different varieties into which evolution has evolved itself. The main branch is still that advocated by Mr. Spencer. Mr. Spencer still stands without a rival in the school of evolution, and we shall follow him as still by far the ablest exponent of the doctrine. Meanwhile, however, we must not forget the fact that there is no longer a theory of natural selection ruling far and wide, arbitrarily and autocratically exclusive, as in the days before the revolt. Not even in the Neo-Darwinian school of evolution is natural selection regarded as a competent cause of evolution without support of some kind. Before examining the main branch of the doctrine held by Mr. Spencer let us inquire into the fate of natural selection within the last decade.

Since Mr. Spencer's revolt against the once famous doctrine he has been fiercely assailed and an internecine warfare has ensued. In the strife Mr. Spencer has done irreparable damage to the cause of which he was once so staunch a supporter. The cause of natural selection has received at his hands many bloody wounds—some of them even fatal. Indeed, all that is necessary in order to see how utterly natural selection has broken down is to read Mr. Spencer's portion of the controversy with the Neo-Darwinians during the last six or seven years. The enemies of natural selection need go no further than Mr. Spencer's recent writings for the most deadly weapons against the hypothesis that had once come to be looked upon as impregnable. Mr. Spencer found himself in two somewhat difficult rôles. In the first place he found himself in the awkward position of assailant and defender of natural selection at one and the same time; hence it was inevitable that he should give it some ugly stabs. Then we find that without wholly discarding natural selection he took to himself a new favorite in the inheritance of functionally produced modifications, and in the clashing claims of the two favorites the old one received at his hands scant courtesy. Hence we find him referring to natural selection as "the fashionable hypothesis." We hear his sharp retort to the Neo-Darwinians that "*they admit that there is no direct proof that any species has been established by natural selection.*" He tartly tells them that in certain cases he rejects natural selection because "*When to uncertainties in the arguments supporting the hypothesis we add its inability to explain facts of cardinal significance,*" he is compelled to do so. And he enumerates three distinct classes of problems—the coadaptation of co-operative parts, the possession of unlike powers of discrimination

by different parts of the human skin and the question of rudimentary organs—where natural selection utterly fails, and sums up by saying, "Failure to solve any one of these problems would, I think, alone prove the Neo-Darwinian doctrines untenable; and the fact that we have *three* (italics Mr. Spencer's) unsolved problems seems to me to be fatal." With this parting blow from Mr. Spencer, we think Natural Selection—once written with capitals—may safely be left in the hands of its friends as incapable of further good or evil. We can now turn to the examination of evolution in Mr. Spencer's own hands.

Mr. Spencer's new gospel of evolution is, as we have seen, a species of eclecticism. It is indeed a strange conglomerate of species grafted on species, adaptive changes grafted on natural selection and the direct action of the medium grafted on both. It is, indeed, possible that the weakness of the Darwinian hypothesis and the weakness of the Lamarckian hypothesis when put together make for strength, but it is not quite reassuring to find that this strength Mr. Spencer finds it necessary to buttress by a third hypothesis admittedly no stronger than either. In fact, there seems to be a little danger that the doctrine of evolution may prove to be something of a monstrosity, inasmuch as it seems to be developing heads as rapidly as the Lernæan hydra. For first we had at least a symmetric doctrine in natural selection, whatever else it might be wanting in. But natural selection being lopped off, two other heads instantly spring up in its place, and every new excision seems to develop another and still another. A quarter of a century ago Mr. Spencer seemed to be a firm believer that natural selection was sufficient to account for all biological phenomena. To-day he stoutly insists that not one, but three are necessary, and even shows a willingness to look with some degree of favor on still other coadjutors, such as isolation, physiological selection, etc. The question, therefore, naturally arises: how has Mr. Spencer's experiment succeeded? If in a multitude of counselors there is much wisdom, in a multiplicity of factors we might expect some solvent potency. But Mr. Spencer does not seem to be any nearer the solution of the problem evolution started out to solve than when he attempted the solution by means of natural selection alone.

The inquirer cannot fail to be struck by several strange features of Mr. Spencer's new formula of evolution. We shall briefly call attention to five, the first and last being especially striking. The first of these is its openly acknowledged failure. We ask: With all these new factors is the problem solved? Does evolution at last explain all that is to be explained? And Mr. Spencer still answers: No. He candidly, as before, says: "*But now let it be confessed there*

remain many unsolved problems." And as if to impress us with the fact still more strongly, he adds: "*Thus the process of evolution is far from being understood.*" This then is the result after forty-one years of trial with not only natural selection as a key, but with whatever else scientific ingenuity could devise by way of new hypotheses. In this year of grace, 1900, it is again confessed that with all modern appliances and after countless attempts "many problems remain unsolved," and that "the process of evolution is far from being understood."

We have said that the first and last features of Mr. Spencer's new theory of evolution are especially striking; but in some respects the second is the most striking of all. It is nothing more or less than the attempt to "ignore" the distinctions of species as mere "technical ideas" and merely "incidental phenomena." But one asks naturally: Was not this the question precisely which evolution started out to solve? the all-important question? And scientists can only reply: Yes, it was the question of questions. Indeed, in the face of the agitation of the last half century scientists cannot answer otherwise. What, then, must be thought of this latest variation of evolution? One reads a second and a third time to be sure that his senses do not deceive him. Desperate indeed must be the cause which is forced to fly to such a refuge. To solve a problem by ignoring it altogether as merely technical is indeed the newest feat in the scientific world; but what, when this is the problem on which the whole question at issue hinges, indeed when it is the problem of problems itself? As we expect to return to this question later on, we may pass to the third feature to which we wish to call attention. It is this:

The process of evolution was to be strictly scientific. Science admitted nothing in the way of explanation which did not fall within the sphere of our conceptions. Conceivability Mr. Spencer himself set up as the test of truth. Whatever did not fall within the limits of conceivability was to be rigorously excluded. This was why special creation was so summarily ejected. It introduced an inconceivable element into its account of phenomena, and this science could never abide much in the same way as Mistress Quickly tells of Falstaff that "A could never abide carnation." But now Mr. Spencer tells us quite candidly that the theory of adaptive changes which he has formally installed as a coadjutor to natural selection, and without which he tells us "an extensive part of the phenomena cannot be explained," is not conceivable in thought at all. The process, he admits, is wholly inconceivable. In plain words he says: "At last, then, we are obliged to admit that the actual organizing process transcends conception. It is not enough to say that we

cannot know it; we must say that we cannot even conceive it." Nevertheless, dispensing himself from the rigorous test he imposed on others, he introduces the theory of adaptive changes. Yet even with this explanation, which is inconceivable, and with the distinction of species—the main problem—thrown in, he tells us still that "there remain many unsolved problems." The fourth feature to which we wish to call attention is but a corollary of the third. Mr. Spencer, finding the theory of adaptive changes inconceivable, yet loath to part with it, undertakes to symbolize it, and what is even worse the symbolic conceptions of it which he undertakes to introduce belong to what he himself has long since designated as "the illegitimate order;" that is to say, they belong to that class upon which, in religion, Mr. Spencer has over and over again pronounced anathema. Now, however, fronting the difficulty of solving problems which are insoluble by conceivable processes, he takes refuge in the very method which he has so severely censured. Finding that the process of adaptive changes is inconceivable, that here "imagination, whatever license may be given, utterly fails us," he concludes: "Thus all we can do is to find some way of symbolizing the process so as to enable us most conveniently to generalize its phenomena." In other words, he adopts precisely what he condemned special creation for adopting and recalls the method which he visited with Anathema Maranatha. And yet with all this he admits "there remain many unsolved problems." But this is not all.

The fifth and last feature to which we will direct attention remains to be seen. We have seen how science started out to solve the problem offered by phenomena in general, or, if you prefer it that way, by biological phenomena in particular, by means of natural selection alone, and, according to the testimony of the evangelists of natural selection, how egregiously it has failed. We saw how it then asked to be permitted to use as an additional key to the problem the theory of adaptive changes, and how there was still failure. We saw how a third key was added with no better results; residual phenomena there remained still which yielded to no solvent. We saw how various other factors were called in to assist in the solution, with failure still as the result. We saw how, in its desperation, science then attempted to throw out the very question at issue—the origin of species—but that even still many kinds of phenomena remained unaccounted for. We saw how science did not scruple even to adopt unscientific methods and transgressed its own canons by introducing inconceivable processes where legitimate scientific methods failed; but yet with no better success. We saw how as a last resort it betook itself—like Macbeth to the weird sisters—to "symbolic conceptions of the illegitimate order," of which it had expressed so

dread an abhorrence ; and still here failure is written in glaring characters over the broad face of evolution. And now with the solution of one portion of the phenomena claimed by one hypothesis, with the solution of another extensive portion of the phenomena claimed by two antagonistic hypotheses, and with a large realm of the phenomena yet unaccounted for by any hypothesis, we are further told that the mysteries which science started out to solve by means of evolution remain with us as mysteries still. We are no better off than when we set out. We are not a single step in advance of special creation. We have mysteries as numerous and perplexing as before. Mr. Spencer tells us life is a mystery. Its origin is a mystery. There is a mystery in its functions. There is an inconceivable element in its workings. Mr. Spencer is in a quandary as to whether he can hope that the mystery will one day be solved, or whether "We must conclude that since life itself proves to be in its ultimate nature inconceivable, there is probably an inconceivable element in its workings" also. "What then are we to say—what are we to think?" Mr. Spencer asks. And he answers: "Simply that in this direction, as in all other directions, our explanations finally bring us face to face with the inexplicable. The ultimate reality behind this manifestation, as behind all other manifestations, transcends conception. It needs but to observe how even simple forms of existence are in their ultimate natures incomprehensible to see that this most complex form of existence is in a sense doubly incomprehensible."

This then is the last word of evolution. The mystery which it set out to solve remains a mystery still. The flourish of trumpets was a false alarm. The science that condemned religion because of symbol and mystery finds itself in turn forced to fall back on symbol and mystery in the last resort. But why symbol and mystery should be regarded as intolerable in religion where they are rational and logical, while they are regarded as desirable in science, where they are illogical and absurd, is one of the paradoxes which, like some biological phenomena, defy all explanation. But this may be passed over here. The matter of deepest import is that, according to the very highest authority on the question of evolution, evolution by means of natural selection has utterly failed. And as evolution by means of natural selection has been the only theory of evolution which has ever been regarded by the world at large as worth considering, it follows that there is no theory of evolution before the world that is worth a single moment's consideration. Mr. Spencer's disproof of natural selection as a competent cause of evolution threw the subject back a full century—to Lamarck's time. And the admission that the theory of adaptive changes cannot account for all the facts, and further, that natural selection and adaptive changes

taken together—even with the addition of all the new-fangled doctrines—cannot account for all the facts, leaves the doctrine of evolution in any sense utterly baseless.

Every one knows that when a man undertakes a piece of work which he does not succeed in accomplishing he has simply failed. When he undertakes to solve a problem by certain means, and after repeated attempts tells us that much is left yet which cannot be satisfactorily accounted for, we do not hesitate to pronounce his attempted solution a failure. If the method he adopted has been properly applied the failure evidently lies in the method. We do not see why scientists should be treated with greater indulgence than their fellow-men, or why their methods should be entitled to larger exemptions. The evolutionists undertook boldly to solve the problem offered by phenomena and dismissed with contempt all previous attempts at solution. They challenged the world to come and witness the solution of the puzzle. The world stood by breathless to see the miracle. Science was to solve the riddle by natural means. We were to be shown that there was no mystery, nothing supernatural at all. The scientific magician approached the work. The necromancer was evolution with natural selection as his magic wand. The whole merit, however, lay in the fact that the process was not magical or supernatural at all; it was simply natural—scientific. All the world looked on intently while the wizard performed the wondrous feat. The wizard—evolution by means of natural selection—tries; fails. It tries again; fails again. It tries repeatedly; fails repeatedly. It asks to be allowed other means; they are granted. It tries again; again fails. It requests to be allowed still other means. Again granted—again failure. Again another means is requested, and another and another. They are all permitted; failure each time. It begs to throw out the whole central problem, which is almost the entire problem. It does so; still failure. It requests permission to use means which it loudly condemned in its competitors. Granted; failure once more. Illegitimate symbolic conceptions? Can they not be permitted, just for a trial? They are introduced—failure as great as before. Realms of facts are still unaccounted for; mysteries as inscrutable as before remain. In real life the necromancer would be hissed off the stage; in science we call it success.

Indeed, the world owes a debt of gratitude to Mr. Spencer for his unconscious aid in unmasking the impostor. He has thus in a measure atoned for the colossal folly of the Synthetic Philosophy. In spite of all his faults, Mr. Spencer is still the brightest intellect in the English-speaking world of speculative science, and it is something that he has lived to cancel some of his mistakes. Certainly no one has pointed out more clearly than he the utter failure of evolu-

tion by means of natural selection. The best that can be said of evolution as it stands before the world to-day is that it is but a pieced, patched, botched theory; that even so it fails to account for all the facts it undertook to explain; that it has already abandoned all hope of being able to explain them in the future, and that to the eternal disgrace of science it is forced to take refuge in symbol and mystery. For the honor of true science the more quickly it were decently buried out of sight the better. One begins to understand why so many eminent French scientists have steadfastly refused to lend countenance to the doctrine. It is not altogether, as Mr. Spencer opines, owing to the surviving influence of Cuvier. Everlasting fame is yet awaiting the scientist who can give to the world a satisfactory theory of evolution. Can it be done? Meanwhile in our schools, colleges and universities pupils are wading through the deeps and shallows of ignorance, vainly imagining they are studying science. What is glibly called science is what Professor Huxley twenty years ago called "superstition."

In view of the admissions of the scientists themselves, may it not be pertinently asked: Would not so many of our learned and distinguished Catholic professors be more profitably employed—not only from a religious, but even from a scientific standpoint—in examining the evidence for evolution than in trying to force its acceptance on the world? One longs for even a brief season of the late Dr. Brownson's vigorous and healthy thinking.

In the foregoing pages we have shown the failure of evolution by means of natural selection from the testimony of the scientists themselves. This failure can be even more conclusively demonstrated by a critical examination of the doctrine in the light of the forty-one years during which it has been before the world. This, however, will require another article.

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