

II. DARWIN AND DARWINISM.

No writer has exerted a greater influence on the current of scientific thought in the last half of this nineteenth century than Charles Darwin. No one can read his writings, and they are somewhat voluminous, and not award him a chief place among the naturalists of our day. For careful observation of facts in the several departments of natural history to which he devoted his attention, for an explicit and honest statement of the facts observed, and for acuteness of judgment in devising methods of investigation and indefatigable industry in following out these methods, he deserves, as he has received on all hands, the highest commendation. This on the one hand.

On the other hand. When he has turned from the record of facts to reasoning upon those facts, from what is distinctively called science to philosophy, as in his "Origin of Species," and "Descent of Man," no writer has provoked more controversy, no hypothesis has awakened more discussion than the one now popularly known as Darwinism, advanced and defended in these books. His "Origin of Species" was published in 1859, and his "Descent of Man" in 1871, scarce thirty years ago, yet the literature of Darwinism will to-day form a library of very respectable dimensions.

In such circumstances, thoughtful men naturally desire to know something more of Charles Darwin than can be learned from the study of his works alone. To all such the publication of his "Life and Letters," by his son, Francis Darwin—the American edition which is before me is from the press of Appleton & Co.—is a very welcome event. The work is made up largely of Mr. Charles Darwin's own letters, written at various times during the course of his public life as an author; letters received by him in reply to these; and of an autobiography, begun in 1876, when he was sixty-five years of age, and completed in 1881, the year before his death. Respecting the last-mentioned of these, the autobiography, "written originally for his children without any thought of its publication," the author says: "I have attempted

to write the following account of myself, as if I were a dead man in another world, looking back at my own life. Nor have I found this difficult, for life is nearly over with me." (Vol. I., p. 25.) A marked characteristic of this autobiography is the evident candor with which it is written; indeed, candor is characteristic of all Mr. Charles Darwin's writings, even those somewhat controversial in their character. The selection of letters contained in these volumes, both those written by Mr. Darwin himself and those received by him from his friends, has been made with excellent judgment, and so as to supplement the autobiography. After reading the two volumes of "Life and Letters" through, one feels as if Mr. Darwin had been a personal acquaintance, and that of long standing.

I. DARWIN'S WORK IN THE LIGHT OF HIS PERSONAL CHARACTER.

I have already referred to the fact that Mr. Darwin's work as a naturalist has met with universal acceptance. His statements of fact are received as of the highest authority, and I do not think I exaggerate when I say that his contributions to science in this department are not equalled by those of any other naturalist of our day. But when we turn to his writings in the department of the philosophy of science, more especially to his advocacy of the hypothesis of the origin of species by natural selection—what is distinctively called Darwinism—all this is changed. No hypothesis of modern science has provoked more controversy than this, and if we may accept the judgment of a writer in the *Edinburgh Review* for April, 1888, "this theory, about which, before he passed away, he sometimes spoke in vacillating tones, is already on its way to the lumber-room of discarded theories."

When we turn to his biography, we find, I think, an explanation of this. In his autobiography he tells us that when eight years old he was sent to a day-school at Shrewsbury, and adds:

"By the time I went to this day-school, my taste for natural history, and more especially for collecting, was well developed. I tried to make out the names of plants, and collected all sorts of things, shells, seals, franks, coins, and minerals. The passion for collecting which leads a man to be a systematic naturalist, a virtuoso, or a miser, was very strong in me, and was clearly innate, as none of my sisters or brothers had this taste." (Vol. I., p. 26.)

An amusing illustration of the strength of this passion he gives us in writing of his life at Cambridge :

"One day, on tearing off some old bark, I saw two rare beetles, and seized one in each hand; then I saw a third and new kind, which I could not bear to lose, so that I popped the one which I held in my right hand into my mouth. Alas ! it ejected some intensely acrid fluid, which burnt my tongue so that I was forced to spit the beetle out, which was lost, as was the third one." (Vol. I., p. 43.)

Towards the close of his autobiography he gives this estimate of himself :

"I think that I am superior to the common run of men in noticing things which easily escape attention, and in observing them carefully. My industry has been nearly as great as it could have been in the collection and observation of facts. What is far more important, my love for natural science has been steady and ardent." (Vol. I., p. 83.)

Mr. Darwin was evidently a "born naturalist;" and naturalists, like poets, are "born, not made." When we take into account the fact, in connexion with all this, that five years of the prime of his life—from his twenty-second to his twenty-seventh year—were spent in a voyage around the world, in H. B. M. ship *Beagle*, as naturalist of a scientific expedition, the great excellence of his writings on Natural History are fairly accounted for.

On the other point under consideration, the author of the article in the *Edinburgh Review*, already referred to, writes:

"Mr. Francis Darwin's careful work does not allow us to remain in any doubt as to the quality of his father's mind with respect to philosophy. Indeed, Charles Darwin himself tells us: 'I read a good deal during the two years (1837 and 1838) on various subjects, including some metaphysical books; but I was not well-fitted for such studies.' And again: 'My power to follow a long and purely abstract train of thought is very limited; and therefore I could never have succeeded with metaphysics or mathematics.' In writing to Mr. Graham at nearly the end of his life, he observes: 'I have had no practice in abstract reasoning.' Just after publishing his 'Origin of Species,' and when occupied in preparing his argument that man is as the beasts which perish, he writes to Sir C. Lyell: 'I have thought (only vaguely) on man; . . . psychologically I have done scarcely anything.' In writing to Huxley respecting some philosophical objections to his views about man, he says: 'Having only common observation and sense to trust to, I did not know what to say in my second edition of my "Descent."' To Mr. Virtue he observes: 'I find that my mind is so fixed by the inductive method that I cannot appreciate deductive reasoning.' . . . A constitutional, inherited, congenital inaptitude in Charles Darwin for the highest branch of science, or rather for the foundation of all science, was a bad preparation for constructing a permanently enduring and really philosophical theory of organic nature." (*Edinburgh Review*, 1888, pp. 429, 430.)

As further illustrating this character of Mr. Darwin's mind, let the reader take the following extract from a letter of his, addressed to Prof. Asa Gray, under date of November 22, 1860 :

"I grieve to say I cannot honestly go as far as you do about Design. I am conscious that I am in an utterly hopeless muddle. I cannot think that the world, as we see it, is the result of chance, and yet I cannot look at each separate thing as the result of design. To take a crucial example, you lead me to infer that you believe 'that variation has been led along certain beneficial lines.' I cannot believe this; and I think you would have to believe that the tail of the fantail was led to vary in the number and direction of its feathers in order to gratify the caprice of a few men. Yet if the fantail had been a wild bird, and had used its abnormal tail for some special end, as to sail before the wind, unlike other birds, every one would have said, 'What a beautiful and designed adaptation.' Again, I say I am, and shall ever remain, in a hopeless muddle." (Vol. II., p. 146.)

In the mental peculiarities, illustrated above, we have a satisfactory explanation of the fact that Charles Darwin, the first naturalist of the day, was, at the same time, "a bitter bad philosopher;" and Darwin, the naturalist, I believe, will be remembered and honored long after Darwinism has been consigned to "the lumber-room of discarded theories."

II. THE CHARACTER AND HISTORY OF DARWIN'S RELIGIOUS VIEWS.

Darwinism, as is acknowledged on all hands, stands intimately related to the Christian religion; and it is in the religious history of Mr. Darwin the readers of the *Quarterly Review* will feel especial interest. Fortunately, his biography enables us to get a clear idea of that history, from the beginning of his life to the very end. Chapter VIII. of his "Life and Letters" is devoted to this particular matter; and the subject is not unfrequently referred to in his letters to his friends given us in other parts of the work.

In his early youth his mind seems to have had a decidedly religious turn. While a school-boy at Shrewsbury he used to go home in the long intervals between "callings-over" and locking up at night, and he tells us:

"I remember in the early part of my school life I often had to run very quickly to be in time, and from being a fleet runner was generally successful; but when in doubt I prayed earnestly to God to help me, and I well remember that I attributed my success to the prayers and not to my quick running, and marvelled how generally I was aided." (Vol. I., p. 29.)

His religious views in early manhood may be learned from his statement:

"After having spent two sessions in Edinburgh, my father perceived, or he heard from my sisters, that I did not like the thought of being a physician, so he proposed that I should become a clergyman. He was, very properly, vehement against my turning into an idle sporting man, which then seemed my probable destination. I asked for some time to consider, as from what little I had heard or thought on the subject I had scruples about declaring my belief in all the dogmas of the Church of England; though otherwise I liked the thought of being a country clergyman. Accordingly, I read with care 'Pearson on the Creed,' and a few other books on divinity; and as I did not then in the least doubt the strict and literal truth of every word in the Bible, I soon persuaded myself that our creed must be fully accepted. Considering how fiercely I have been attacked by the orthodox, it seems ludicrous that I once intended to be a clergyman. Nor was this intention and my father's wish ever formally given up, but died a natural death when, on leaving Cambridge, I joined the *Beagle* as naturalist." (Vol. I., p. 39.)

Of the change in his religious views he tells us:

"While on board the *Beagle* I was quite orthodox, and I remember being heartily laughed at by several of the officers (though themselves orthodox) for quoting the Bible as an unanswerable authority on some point of morality. I suppose it was the novelty of the argument that amused them. But I had gradually come by this time, *i. e.*, 1836 to 1839, to see that the Old Testament was no more to be trusted than the sacred books of the Hindoos. The question then continually rose before my mind, and would not be banished, Is it credible that if God were now to make a revelation to the Hindoos, he would permit it to be connected with the belief in Vishnu, Siva, etc., as Christianity is connected with the Old Testament? This appeared to me utterly incredible."

"By further reflecting that the clearest evidence would be requisite to make any sane man believe in the miracles by which Christianity is supported—and the more we know of the fixed laws of nature, the more incredible do miracles become—that the men at that time were ignorant and credulous to a degree almost incomprehensible by us; that the gospel cannot be proved to have been written simultaneously with the events; that they differ in many important details, far too important, as it seemed to me, to be admitted as the usual inaccuracies of eye-witnesses; by such reflections as these, which I give, not as having the least novelty or value, but as they influenced me, I gradually came to disbelieve in Christianity as a divine revelation. The fact that many false religions have spread over large portions of the earth like wild-fire, had some weight with me."

"But I was very unwilling to give up my belief; I feel sure of this, for I can well remember often and often inventing day-dreams of old letters between distinguished Romans, and manuscripts being discovered at Pompeii, or elsewhere, which confirmed in the most striking manner all that was written in the gospels. But I found it more and more difficult, with free scope given to my imagination, to invent evidence which would suffice to convince me. Thus disbelief crept over me at a very slow rate, but was at last complete. The rate was so slow that I felt no distress." (Vol. I., pp. 278, 279.)

Subsequently he writes :

"At the present day the most usual argument for the existence of an intelligent God is drawn from the deep inward conviction and feelings which are experienced by most persons. Formerly I was led by feelings such as those just referred to (although I do not think the religious sentiment was ever very strongly developed in me), to the firm conviction of the existence of God and of the immortality of the soul. In my journal I wrote that while standing in the midst of a Brazilian forest, it is not possible to give an adequate idea of the higher feelings of wonder, admiration and devotion which fill and elevate the mind. I well remember my conviction that there is more in man than the mere breath of his body. But now the grandest scenes would not cause any such convictions and feelings to rise in my mind. It may be truly said that I am like a man who has become color-blind, and the universal belief by men of the existence of redness makes my present loss of perception of not the least value as evidence." (Vol. I., p. 281.)

How complete Mr. Darwin's "disbelief" became we may learn from his letter to a German student, written in 1879, in which he says :

"I am much engaged, an old man, and out of health, and I cannot spare time to answer your questions fully; nor, indeed, can they be answered. Science has nothing to do with Christ, except in so far as the habit of scientific research makes a man cautious in admitting evidence. For myself, I do not believe that there ever has been any revelation. As for a future life, every man must judge for himself between conflicting vague probabilities." (Vol. I., p. 277.)

As throwing light upon the way in which this great change in Mr. Darwin's religious views was brought about, I would ask the reader's attention to the following statements. Mr. Darwin, in his autobiography, writes:

"I have said that in one respect my mind has changed during the last twenty or thirty years. Up to the age of thirty, or beyond it, poetry of many kinds, such as the works of Milton, Gray, Byron, Wordsworth, Coleridge and Shelley, gave me great pleasure, and even as a school-boy I took intense delight in Shakspeare, especially in the historical plays. I have also said that formerly pictures gave me considerable, and music very great delight. But now for many years I cannot endure to read a line of poetry; I have tried lately to read Shakspeare, and found it so intolerably dull that it nauseated me. I have also lost my taste for pictures and music. Music generally sets me to thinking too energetically on what I have been at work on, instead of giving me pleasure. I retain some taste for fine scenery, but it does not cause me the exquisite delight which it formerly did. On the other hand, novels which are works of the imagination, though not of a very high order, have been for years a wonderful relief and pleasure to me, and I often bless all novelists. A surprising number have been read aloud to me. . . . My mind seems to have become a kind of machine for grinding general laws out of large collections of facts; but why this should have caused the atrophy of that part of the brain

alone on which the higher tastes depend, I cannot conceive. A man with a mind more highly organized or better constituted than mine, would not, I suppose, have thus suffered; and if I had to live my life again, I would have made a rule to read some poetry and listen to some music at least once every week; for perhaps the parts of my brain now atrophied would thus have been kept active through use. The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature." (Vol. I., pp. 81, 82.)

In a letter to his intimate friend, Sir J. D. Hooker, he writes:

"I am glad that you were at the 'Messiah;' it is the one thing I should like to hear again, but I dare say I should find my soul too dried up to appreciate it as in old days; and then I should feel very flat, for it is a horrid bore to feel as I constantly do, that I am a withered leaf for every subject except science." (Vol. II., p. 273.)

His son, in the work before us, tells us:

"It was a sure sign that he was not well when he was idle at any time other than his regular resting hours; for as long as he remained moderately well, there was no break in the regularity of his life. Weekdays and Sundays passed by alike, each with their stated intervals of work and rest. It is almost impossible, except for those who watched his daily life, to realise how essential to his well being was the regular routine that I have sketched, and with what pain and difficulty anything beyond it was attempted. Any public appearance, even of the most modest kind, was an effort to him. In 1871 he went to the little village church for the wedding of his eldest daughter, but he could hardly bear the fatigue of being present through the short service." (Vol. I., p. 104.)

In giving an account of his father's religious views, Francis Darwin makes the following quotation from a manuscript of his father:

"Another source of conviction in the existence of God, connected with the reason and not with the feelings, impresses me as having much more weight. This follows from the extreme difficulty, or rather impossibility, of conceiving this immense and wonderful universe, including man with his capacity of looking far backwards and far into futurity, as the result of blind chance or necessity. When thus reflecting I feel compelled to look to a first cause having an intelligent mind in some degree analogous to that of man; and I deserve to be called a Theist. This conclusion was strong in my mind about the time, as far as I can remember, when I wrote the 'Origin of Species'; and it is since that time that it has very gradually, with many fluctuations, become weaker. But then arises the doubt, can the mind of man, which has, as I fully believe, been developed from a mind as low as that possessed by the lowest animal, be trusted when it draws such grand conclusions?" (Vol. I., p. 282.)

Of similar import with the above, in a letter to W. Graham, written in 1881, the year before his death, he writes:

"I have no practice in abstract reasoning, and I may be all astray. Nevertheless, you have expressed my inward conviction, though far more vividly and clearly than I could have done, that the universe is not the result of chance. But then with me the horrid doubt always arises whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any one trust in the convictions of a monkey's mind, if there are any convictions in such a mind?" (Vol. I., p. 285.)

Such is the account which Mr. Darwin himself gives us of the great change in his views on questions of religion of which he was the subject; and I have quoted from his "Life and Letters" at much greater length than I otherwise would, that those of my readers who may not have access to the work itself may yet be able to judge for themselves of the extent of that change and of the way in which it was brought about. Attempting a brief summary of the truth in this case, I remark:

1. From a person of a decidedly religious turn of mind in childhood, and one who in early manhood "did not in the least doubt the strict and literal truth of every word in the Bible," he came in his later years utterly to reject the claim of the Bible to be the "word of God," so as to declare, "I do not believe that there ever has been any revelation," and to lose all faith in the existence of a personal God and all confidence in man's immortality. From a thoroughly Christian man, in the wide sense of the word Christian, he became an atheist, a man "without God in the world." He preferred, as his son tells us, "the unaggressive attitude of an agnostic." (Vol. I., p. 286.) And certain it is Mr. Darwin never became a blatant atheist, seeking to propagate his atheism among his fellow-men. But such is the relation which man sustains to God that an agnostic, *i. e.*, one who does not know whether there is a God or not, is, for all practical purposes, an atheist, *i. e.*, "without God in the world."

2. This great change in Mr. Darwin's religious views did not occur as the result of a vicious life, as in very many cases such a change does. As to his course of life, he writes, in a note added to the manuscript of his autobiography in 1879:

"As for myself, I believe that I have acted rightly in steadily following and devoting my life to science. I feel no remorse from having committed any great sin, but have often and often regretted that I have not done more direct good to my fellow-creatures." (Vol. II., p. 530.)

His case was not unlike that of the young nobleman of whom we read in the gospel, who, when our Lord said to him, "Thou knowest the commandments, Do not commit adultery, Do not kill, Do not steal, Do not bear false witness, Defraud not, Honor thy father and mother," answered and said, "Master, all these have I observed from my youth up." (Matt. x. 19, 20.) It has been truly said: "*Integer vitæ scelerisque purus* might emphatically be the epitaph of this simple and kind-hearted naturalist."

3. Nor can the change in Mr. Darwin's religious views be attributed to the logical force of objections to Christianity carefully examined. In reply to Dr. Abbott, requesting him to become a contributor to *The Index*, he wrote:

"I have never systematically thought much on religion in relation to science, or on morals in relation to society; and without steadily keeping my mind on such subjects for a long period, I am really incapable of writing anything worth sending to *The Index*." (Vol. I., p. 276.)

In his own account of this change, already quoted at large, the objections to Christianity which he tells us influenced him, are, as he admits, "without the least novelty," are all objections which have been answered time and again in a way to satisfy the ablest and most careful thinkers of our times. Had Mr. Darwin studied the claims of Christianity with half the care with which he studied questions of science, his conclusions would have been, I believe, very different from those which cast their dark shadows upon the later years of his life.

4. The change in Mr. Darwin's religious views was a very gradual one, and began with the rejection of the Bible as the word of God—first of all, of the Old Testament Scriptures. In his words, "Disbelief crept over me at a very slow rate, but was at last complete. The rate was so slow that I felt no distress," and "I had gradually come by this time, *i. e.*, 1836 to 1839, to see that the Old Testament was no more to be trusted than the sacred books of the Hindoos," and because of the intimate connexion in which the New Testament stands to the Old, in rejecting the one he felt bound to reject the other also. Just in what way he came to see that "the Old Testament was no more to be trusted than the sacred books of the Hindoos," he does not tell us; but I think

it fair to infer from what he does say, it was because of what seemed to him to be irreconcilable discrepancies between certain of its statements and what he considered established truths of science. Many scientists have in this way reached the same conclusion with Mr. Darwin. On the other hand :

“At the time of the meeting of the British Association, in 1865, some six hundred and seventeen scientific men signed a paper containing the following declaration, viz. : ‘We conceive that it is impossible for the Word of God, as written in the book of nature, and God’s word, written in holy Scripture, to contradict one another, however much they may appear to differ. We are not forgetful that physical science is not complete, but is only in a condition of progress, and that at present our finite reason enables us to see as through a glass, darkly; and we confidently believe that a time will come when the two records will be seen to agree in every particular.’”—*Current Discussions in Theology for 1883*, pp. 7, 8.

5. This slow and gradual, yet ultimately complete change in Mr. Darwin’s religious faith and feelings is to be attributed, in large measure, to the fact that for years together, beginning with his preparation of the scientific reports of the voyage of the *Beagle*, he occupied his thoughts and attention with scientific matters, to the practical exclusion of all others. His early religious beliefs seem quietly to have dropped out of his mind, rather than to have been distinctly rejected; and hence his atheism assumed the form of agnosticism rather than that of a positive denial of the existence of a God.

It was not in the department of religious faith and sentiment alone that the effect of such a course of life was manifested. In his taste for poetry and music it was equally apparent. “As a school-boy,” he tells us, “I took intense delight in Shakspeare, especially in his historic plays. . . . But now, for many years, I cannot endure to read a line of poetry. I have tried lately to read Shakspeare, and found it so intolerably dull that it nauseated me.” And there is something pathetic in the tone in which he speaks of his loss of taste for music when, writing to an intimate friend, he says: “I am glad that you were at the Messiah. It is the one thing I should like to hear again; but I dare say I should find my soul too dried up to appreciate it as in old days; and then I should feel very flat; for it is a horrid bore to feel, as I constantly do, that I am a withered leaf for every subject except science.”

The effect of such a course in the case of his religious faith and emotions was doubtless aggravated by the fact that, as his son tells us, "there was no break in the regularity of his life. Week-days and Sundays passed alike, each with their stated intervals of work and rest." He who made us and best understands our nature, at the very beginning "blessed the seventh day and sanctified it." In the copy of the moral law, written on tables of stone by God himself, the commandment, "Remember the Sabbath day to keep it holy; six days shalt thou labor and do all thy work; but the seventh is the Sabbath of the Lord thy God," stands side by side with, "Honor thy father and thy mother"; and no man can persistently disregard either the one or the other without his religious nature suffering deterioration thereby. Writing of the effect of his exclusive attention to science upon his taste for poetry and music, Mr. Darwin writes: "If I had to live my life over again, I would have made it a rule to read some poetry or listen to some music at least once every week; for perhaps the part of my brain now atrophied would then have been kept active through use. The loss of these tastes is a loss of happiness; and may possibly be injurious to the intellect, and more probably to the moral character." Would that he had early in life adopted some such rule; and in the same spirit and for the same, if not for higher reasons, made it a rule to suspend all scientific work on the Sabbath, and to devote its sacred hours to the all-important subject of religion. Then would he not have found himself in his old age "without God in the world." Eminent scientists have pursued such a course as this, and as a consequence their early piety has ripened with a blessed fruitage. Sir Isaac Newton was an eminently pious man; or to mention cases nearer our own time, Sir Humphrey Davy, in England, and Prof. Joseph Henry, in our own country, lived as distinguished for their Christian faith as for their eminent attainments in science and their great discoveries.

6. The finishing touch to Mr. Darwin's atheism was given, according to his own statement, by the doctrine of evolution, in the form in which he adopted it. According to his view, man is as truly and as naturally the product of evolution from the ape, as the ape is from some animal occupying a still lower position in

the scale of being. As M. Mivart has well said: "The essential bestiality of man is an integral part of the system." In view of this fact, it should cause us no surprise to find him writing to Mr. Graham, the year before his death: "You have expressed my inward conviction, though more vividly and clearly than I could have done, that the universe is not the result of chance"—or, as he expresses the same idea on another occasion, "I feel compelled to look to a First Cause, having an intelligent mind in some degree analogous to man. But, then, with me the horrid doubt always arises whether the convictions of a man's mind, which has been developed from the mind of the lower animals, are of any value, or at all trustworthy. Would any one trust in the convictions of a monkey's mind, if there be any convictions in such a mind?" Granted the premises, and this conclusion does not seem an unreasonable one. But does it not seem strange that Mr. Darwin should see so clearly this consequence of his doctrine of evolution when applied in the department of religious thought, and not see that it must, of necessity, apply with equally destructive effect in every other department of human thought? If the human mind, because of its "essential bestiality," cannot be trusted in the matter of the existence of a God, for the same reason it cannot be trusted in the matter of "the origin of species."

Such is, in brief, the history of Mr. Darwin's change in religious belief and sentiment, as gathered from a careful study of his "Life and Letters." Turn we now to an examination of the hypothesis of genetic evolution as held and taught by him—what is popularly termed

DARWINISM.

On first reading "The Origin of Species," shortly after it was published, the impression made upon my mind was that Mr. Darwin did not hold the hypothesis of evolution in its atheistic form. This opinion was based upon the fact that he speaks of evolution as "a mode of creation"; and postulates the existence of certain "primordial forms," as the starting point for the evolution of all higher forms for which he contends. A careful examination of his letters satisfies me that on this point I was mistaken. In a letter to Sir C. Lyell, bearing date October 11, 1859, he writes:

"We must under present knowledge assume the creation of one or of a few forms in the same manner as philosophers assume the power of attraction without any explanation."

And again:

"I would give absolutely nothing for the theory of natural selection if it requires miraculous additions at any one stage of descent. I think that embryology, homology, classification, etc., etc., show us that all vertebrates have descended from one parent; how that parent appeared we know not." (Vol. II., pp. 6, 7.)

And writing to the same person under date of October 20, 1859, he says:

"I have reflected a good deal on what you say on the necessity of continued intervention of creative power. I cannot see this necessity; and its admission, I think, would make the theory of natural selection valueless. Grant a simple archetypal creature, like the mud-fish or lepidonsiren, with the five senses and some vestige of mind, and I believe natural selection will account for the production of every vertebrate animal." (Vol. I., p. 528.)

Prof. Sedgwick, a personal friend of Darwin, and the one under whom he studied geology at Cambridge, in a review of "The Origin of Species," published in 1860, certainly takes this view of the matter, for he writes:

"I cannot conclude without expressing my detestation of the theory, because of its unflinching materialism; because it has deserted the inductive track, the only track that leads to physical truth; because it utterly repudiates final cause, and thereby indicates a demoralized understanding on the part of its advocates. Not that I believe that Darwin is an atheist, though I cannot but regard his materialism as atheistical. I think it untrue, because opposed to the obvious course of nature and the very opposite of inductive truth. And I think it intensely mischievous. Each series of facts is laced together by a series of assumptions and repetitions of the one false principle. You cannot make a good rope out of a string of air-bubbles." (Vol. II., pp. 91, 92.)

Such is Darwinism, by which is meant evolution as held and taught by Darwin himself. Burdened as it is with all the objections to atheistic materialism, to refer to no other objections, it has never had many advocates in Great Britain or America. Prof. Asa Gray, under whose supervision the first edition of "The Origin of Species" was republished in this country, though adopting evolution in a distinctly theistic form, never did adopt it in the form in which Darwin proposed it, as is abundantly evident from his letters contained in the volumes before us; and later ad-

vocates of evolution, almost without exception, distinctly repudiate it in its atheistic form. Darwinism, having lived out the brief life usually enjoyed by such speculations, is now, beyond all question, "on its way to the lumber-room of discarded theories."

That a theory of evolution, *accounting for the origin of species*—and it is such evolution alone which has ever been in controversy—distinctly theistic in its character, can be constructed, will not admit of question. The conception of evolution as but "a mode of creation," in the proper sense of the word creation, is perfectly intelligible. Evolution is not necessarily atheistic.

The question whether or not a Christian theory of evolution can be constructed, *i. e.*, a theory of evolution which will be in harmony with the teachings of Scripture considered as the "Word of God," is an entirely different question. The attempt to construct such a theory, has been made by men of high standing in science and philosophy, but as yet—to say the least of it—with very indifferent success.

Professor Drummond has made the attempt, but finds such discrepancies between evolution and the plain statements of Scripture—especially statements contained in the earlier chapters of Genesis—that he feels constrained to substitute what he calls "the Bible of modern scientific theology," for "the Bible accepted by our fathers;" of which two books he tells us: "The chapters, the verses, and the words are the same in each, yet in the meaning, the interpretation, and the way they are looked at, they are two entirely distinct Bibles." (*Popular Science Monthly*, 1886, p. 107.)

Professor LeConte, in his lately published "Evolution in its Relation to Religious Thought," seems to have encountered the same difficulty, and disposes of it in a very similar way:

"There is, and in the nature of things there can be, *no test of truth but reason*. We *must* fearlessly, but honestly and reverently, try all things, even revelations, by this test. We must not regard, as so many do, the spirit of man as the passive amanuensis of the Spirit of God. Revelations to man must of necessity partake of the imperfections of the medium through which it comes. As pure water from heaven, falling upon and filtering through earth, must gather impurities in its course differing in amount and in kind according to the earth, even so the pure divine truth, filtering through man's mind, must take imperfections characteristic of the man and the age. Such filtrate must be redistilled in the alembic of reason to separate the divine truth from the earthy impurities." (Pp. 310, 311.)

What all this means is abundantly evident from the writings of the "advanced thinkers" of the present day. From the fact that adopting the theory of an unbroken evolution from the lowest to the highest forms in nature has led such men as Mr. Darwin, Prof. Drummond and Prof. LeConte, either explicitly or impliedly to reject the claim of the Bible to be received as the "Word of God," it seems fair to infer that the construction of a Christian theory of evolution is exceedingly difficult, if not impossible.

Dr. McCosh in his "Religious Aspect of Evolution," seeks to give the theory a Christian character in an entirely different way. Reverently accepting the Scriptures of the Old and New Testament as the Word of God, and "the only rule of *faith* and obedience," he modifies the theory of evolution as held by Darwin and Drummond and LeConte, by introducing divine agency, in the form of creation, at different points in the course of progress by which our world has reached the position it now occupies. The points which he specifies are: (1), The origination of matter, and (2), The introduction of light, (3), Life, (4), Sensation, (5), Instinct, (6), Intelligence, and (7), The moral sense. Of these he says: "No mundane power can produce them at first, and it is reasonable that we should refer their production to God, to whom all power belongs, even the power of evolution. As evolution by physical causes cannot do it, we infer that God does it by immediate fiat, even as he created matter, and the forces that are in matter. We certainly know of no other power capable of doing it. This seems a legitimate conclusion. It calls in a power known otherwise to work, and to be competent to produce the effect. . . . God may be a continuous creator as he is a continuous preserver." (*Religious Aspect of Evolution*, p. 54.)

The philosophical ground on which Dr. McCosh breaks up the continuity of evolution, and introduces the creative agency of God at the seven points mentioned above, he states in the words: "It is a law of causation anticipated, as can be shown, from an old date, that a cause—I am speaking only of physical causes—can give only what it possesses. Causation cannot create anything new; it cannot give what it has not within itself. There is nothing in the effect which was not potentially in the cause, that is, in the agent

which constituted the cause." (*Religious Aspect of Evolution*, p. 52.) This is certainly sound philosophy; and when on this ground he demands the introduction of the creative agency of God, at the introduction of life, for example, the demand is a reasonable one. Dead matter does not possess life, even potentially. This is proved by universal observation, and by elaborate experiments which have been made more than once to test the matter.

Let us apply this sound philosophical principle to the question of "the origin of species." Has any lower species of plant or animal within itself, even potentially, the next higher species? *e. g.*, Has the ape within itself even potentially, the man? I know of but one way to answer this question in accordance with the settled laws of scientific research; and that is, either by observation of what is actually going on in the world around us, or by direct experiment. True science deals with facts, not fancies. It seeks to ascertain, not what might be, but what is. I ask, therefore: Has any one ever seen a new species produced from an old in the ordinary course of nature? Has any one, by experiment, succeeded in producing a new species from an older one? Both of these questions must be answered in the negative. The two well-established laws of "the infertility of hybrids," and "reversion to type," have preserved, in so far as we know, all natural species of plants and animals such as they were at the beginning. In the words of the Duke of Argyll: "That any organism, therefore, can ever produce another which varies from itself in any truly specific character, is an assumption not justified by any known fact." (*Primeval Man*, p. 46.) New varieties of plants and animals often spring out of the old naturally; and, by way of experiment, man has produced many new varieties in our day. But varieties differ essentially from natural species; and, the fact that the needful changes are so often and easily produced in the one case, only makes their entire absence in the other the more noteworthy and significant.

The question respecting the permanence of species, by which naturalists mean, not the continued existence of species throughout all time, for many species of both plants and animals which once existed have disappeared, but the permanent retention by natural species of their specific characters, so that one species is never

transformed into another, is not a new question which has first arisen in connexion with the controversy about genetic evolution, but one which, in connexion with other questions, has engaged the attention of naturalists for more than a hundred years. And there are few questions in the whole range of natural science which have been more carefully and thoroughly examined than this. The result of this protracted examination Prof. L. Agassiz, the highest authority in such matters as this, gives us in his words: "Breeds (*i. e.*, varieties) among animals are the work of men; species were created by God." (*Study of Natural History*, p. 147.) Knowing all this, Mr. Darwin writes: "The belief in natural selection must at present be grounded entirely on general considerations. . . . When we descend to details, we can prove that no one species has changed (*i. e.*, we cannot prove that any single species has changed)." (Vol. II., p. 210.) From time to time particular instances of the change of one species into another have been reported, like that which Dr. McCosh mentions as having been observed by a Russian naturalist bearing the unpronounceable name of Schmankewitsch, (see *Religious Aspects of Evolution*, p. 26,) but in every instance, when scientific men have thoroughly sifted these cases, the changes have been found to be varietal, and not specific; so that it remains true to-day, after an examination protracted through a hundred years, that "we cannot prove that any single species has changed."

In view of all this, the permanence of species ought, in the present state of our knowledge of nature, to be considered a settled matter, and the conclusion a sound one, that a higher species does not exist, even potentially, in a lower. On Dr. McCosh's own principle, then, we must break the continuity of the progress by which our world has reached its present condition, and introduce the agency of creative power, not at the seven points alone which he mentions, but wherever a new natural species has come into being. And so we are brought back to just the old theory of creation—nothing more, nothing less. All the evolution there is about the case is simply the evolution (in the literal sense of that word, an unfolding) of a plan of creation by God; like all other plans of God, a wise plan, its wisdom appearing conspicuously in

this, that each particular natural species of plant and animal has been brought into being as the environment which the earth presented became suited to its life.

Now, if in addition to this, we limit what Dr. McCosh calls "continuous creation" to the age—I know not how long that age lasted—which closed with the creation of man, and was immediately followed by a day (or age), in which "God rested from all his works which he created and made," we get a theory of evolution, but it is the evolution or unfolding of a divine plan only, which is in harmony with the ascertained facts of science, and with the plain teachings of the Word of God as well; in other words, a Christian theory of evolution, if any one chooses to call it so. For myself, I prefer the old name, creation; and this, I believe, is the only Christian theory of evolution which will ever be established.

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