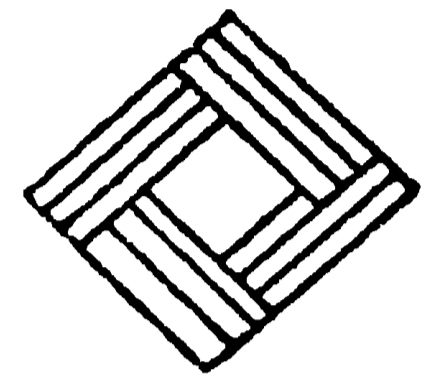


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CHARLES DARWIN

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It seems to be unquestionable that the modern doctrine of Evolution is the most important contribution made to science since Sir Isaac Newton. It is also more and more recognized that its importance is not confined to science (physical science), but that its influence, direct or indirect, is being felt, and felt in increasingly fruitful ways, throughout the whole realm of modern thought.

Evolution as understood today is not due to Darwin alone; other scientific investigators have made invaluable contributions to its elucidation since his day; but all scientific authorities agree that Darwin's name is the greatest and most important connected with it.

Darwin died in 1882. For forty years before his death he had lived the quietest of lives, so far as external events were concerned, in the outskirts of a very small and almost unknown country village in Kent, England. The place was some miles off the railroad, so that, although his death occurred on Wednesday, the news, destined to carry sorrow to all parts of the civilized world, was not heard in London until noon of Thursday. There in a spacious, comfortable, rather old-fashioned brick house, made picturesque with wild vines and ivy, and shaded with great old trees, lived and worked with steady persistence and perseverance, but with nothing external to distinguish him from the ordinary country gentleman, the man whose books went forth to revolutionize the thought of mankind.

Back of his house were fine and rather large grounds. Adjoining his house was a conservatory, and near by hot-houses, where he con-

ducted those experiments on flowers, climbing plants, and other forms of vegetable and animal life, which have shed such light on many departments of natural history.

Mr. Darwin located himself in this quiet place, partly because his health was delicate and could be best guarded in a spot like this, and partly because he had laid out for himself a life work, and was wise enough to know that in such a place, where there would be no interruptions of society and few external diversions, he could accomplish the greatest amount of labour. Here, in a delightful home, surrounded by his family, esteemed by his neighbours, loved by all the children of the district, for whom he always had a smile and a kind word, rising at the early hour of six o'clock, taking his walks in field or lane or wood regularly at seven, twelve and four, and spending usually about twelve hours a day at his work in conservatory or garden or study, he performed those patient and careful experiments and accumulated that wealth of facts, which make his books such marvels. This is the spot, which although the dust of the world-renowned scientist lies in Westminster Abbey among the great, will for centuries be visited by pilgrims from all lands as a sacred place.

Mr. Darwin was born in Shrewsbury, and lived to the age of 73 years. His father was a physician, interested in science, and a member of the Royal Society. His grand-father, also a physician and member of the Royal Society, had risen to some eminence as a botanist, and as a writer of books, one of which, the

Zoonomia, or Laws of Organic Life, plainly foreshadowed the theory of development which his illustrious grandson afterwards gave to the world.

The ancestors on the mother's side also were persons of some note, being members of the celebrated Wedgwood family. Thus, whatever influence there may be in heredity, Charles Darwin had the full benefit of it. With such an ancestry we are not surprised at his rich mental endowments, nor do we wonder that from his childhood the bent of his mind should have been in the direction of science.

His early education was received in the grammar school of his native town. At 16 he was sent to the University of Edinburgh, Scotland, where he remained two years, then went to Cambridge, England, where he studied four years, taking his degree of Bachelor of Arts at the age of 22. It is known that while at Cambridge he was specially interested in Botany and that at Edinburgh he gave particular attention to Marine Zoology.

Very soon after his graduation an event occurred which proved to be of prime importance in his career and in the history of modern science. I refer to his going on a voyage of scientific research around the world. About the time he was finishing his Cambridge studies, His Majesty's exploring ship "Beagle," returned from a four years' survey of the coasts of Patagonia and Terra Del Fuego. Soon another voyage, more extended and of longer duration, was to be undertaken. Captain Fitz Roy of the "Beagle" advertised for a naturalist to accompany him. Young Darwin applied for the place, and through the influence of friends who knew his scientific attainments and great promise, obtained it. Accordingly in the November following his graduation, while yet less than 23 years of age, he set out for a tour and cruise or original observation and study on many of the waters of the world, and also in such important lands as Brazil, Patagonia, Chili, Peru, the Galapagos and Society Islands, New Zealand, Australia, Mauritius, St. Helena, and the Cape Verde Island. On this voyage he was gone almost five years, gathering and bringing back with him extensive botanical, zoological, and geological collections, and an immense store of scientific information.

To start out upon his career as a scientist with five years of such travel, observation and experience, was simply invaluable. It gave him an important advantage to begin with over nearly or quite every other scientific investigator of the age. Without this preparatory experience,

and wide survey of the physical phenomena of the earth, it seems likely that he never could have reached a clear conception of that magnificent generalization known as Evolution (at first largely called Darwinism) by which the scientific thinking of the world has been so radically changed; or, if he had reached it, at least he could not have brought to its support such a remarkable array of facts from all provinces of nature and all parts of the world as he did bring to its support. Indeed it was while he was at the Galapagos Islands, as he tells us, prosecuting his researches in connection with that memorable voyage in the ship Beagle, that the great thought of development by natural selection, or by survival of the fittest, which is the vital principle of the whole development theory, first took shape in his mind. Immediately he saw that the thought was one of almost unparalleled scientific importance, if it proved to be true. He determined almost from the first, therefore, to devote his life to the investigation and elucidation of his great conception.

Accordingly, soon after his return from his years abroad, having married, he bought the country place which I have already described, and set out upon the prosecution of his long and arduous life work here.

The first ten years in this quiet home he devoted mainly to the laborious task of publishing the scientific results of his voyage, giving to the world in that connection no less than five works of importance, coming under the general heads of Geology, Zoology, and Natural History.

It was not until the year 1859, when he was fifty years old, that he issued his greatest and epoch-making book, *The Origin of Species by means of Natural Selection; or the preservation of Favoured Races in the Struggle for Life*. And even then, though he had been at work upon the book fifteen years, he was compelled to publish it earlier than he intended, to prevent the ground which he had covered from being pre-empted by another, namely, Mr. Alfred Russell Wallace, who had prepared a paper on the same subject and sent it to Mr. Darwin to read as the one scientist in England most likely to understand and appreciate what he had written.

The conception of Evolution was not original with Darwin. The general idea of nature as a "development," or of the world as having grown or "evolved" by slow degrees from the simple to the complex, from the homogeneous to the heterogeneous, until from a primitive condition of water, or air, or fire,

or unorganized matter, or matter and force, it had at last unfolded or transformed itself into what we now see, this idea in a more or less vague form had been in the world from as far back almost as human history extends. There are many traces of it in ancient Hindu and Buddhist writings. Some of the earliest of the Greek philosophers entertained the conception, speculated much concerning it, and even made it the basis of their philosophical systems. A number of eminent German thinkers of the eighteenth century and the early part of the nineteenth, Immanuel Kant perhaps being foremost among them, took up the thought and gave it strong support. Goethe advocated it in his conversations with literary men and in more than one of his writings. The naturalists Lamarck, Oken, and St. Hillaire approached in their theories very near to Darwin's view. What is worthy of note, Darwin's own grandfather had written in support of the development theory. Moreover a striking book of anonymous authorship entitled *Vestiges of Creation* appeared in England in the year 1844 (after several of Darwin's earlier books had been given to the world, and only fifteen years before his *Origin of Species*) and made a great stir by advocating with much skill and ingenuity the doctrine of creation by law, genetic continuity, progressive development.

However, all this was only preparatory. All that had been written before Darwin's *Origin of Species* had only ploughed ground, or at best sown seed. It had set men thinking in the direction of the development theory; but all the thought that resulted, up to the time of Darwin's great book, was vague and inconclusive. One thing was wanting to give the theory solidity and a scientific foundation. That wanting thing Darwin brought to it. It was, as already stated, the thought of natural selection. Darwin came before the world not simply urging that species had originated from natural causes, but setting forth the manner in which and the means by which he believed them to have originated, and at the same time spreading before the scientific world an astounding array of carefully observed, and fully described, facts in support of what he urged. From that moment the foremost, the all-overshadowing, question in the scientific world became, and became inevitably, Is Darwin right? Does natural selection or the theory of the survival of the fittest in the struggle for life, wholly or in large part account for the origin of species in the vegetable and animal world? At once it became clear to all thinking men that his theory was revolutionary, not only throughout the

whole realm of science, but also in social, political, ethical, and theological thought.

The immense increase of fame that came to Mr. Darwin did not for a moment take him off his feet. The tremendous scientific and theological controversy that arose over his teachings did not draw him aside from the straight line of quiet work that he had laid out for himself and pursued steadily for so many years.

He followed up his volume on the *Origin of Species* at longer or shorter intervals with some ten other works, namely:

- The Various Contrivances by which Orchids are Fertilized by Insects*, 1862.
- The Movements and Habits of Climbing Plants*, 1865.
- The Variation of Plants and Animals under Domestication*, 1867.
- The Descent of Man, and Descent in Relation to Sex*, 1871.
- The Expression of Emotions in Man and Animals*, 1872.
- Insectivorous Plants*, 1875.
- The Effects of Cross and Self Fertilization in the Vegetable Kingdom*, 1876.
- The Different Forms of Flowers and Plants of the Same Species*, 1877.
- The Power of Movement in Plants*, 1881.
- The Formation of Vegetable Mould through the Action of Worms, with Observations on Their Habits*, 1882.

All of these works were in the same general line with the *Origin of Species*. Each gave the record of the writer's careful, patient, exhaustive examination of some department or province of nature, with a view to finding out what light it had to throw upon the great central thought of development through natural and regular causes. Each work revealed the master. Any one of the number would have made the fame of an ordinary scientific writer.

Having now glanced over Mr. Darwin's life and work, we are ready for a brief inquiry regarding his influence, first in physical science, and then in other realms, particularly those of ethics and religion.

Darwin was not distinctly a geologist; only during the early years of his scientific career did he give extended attention to geological study. Yet the science of Geology was profoundly affected by his investigations. His work on Coral Reefs is regarded as one of the most important monographs in the whole history of

geological science. His chapter on the "Imperfection of the Geological Record" in the *Origin of Species* startled geologists as if it had been a clap of thunder. His two chapters in the same work on "Geographical Distribution" threw a flood of light on the whole realm of geological inquiry. It was soon perceived that if his theory of organic development is true, and if the life of the world has been from the beginning continuous, it affects profoundly the whole geological story. This is the reason why geological science has had to be reconceived and re-written since Darwin came on the scene.

The two sciences, however, which have felt the influence of Darwin's thought most, both directly and indirectly, are Botany and Zoology. These were the sciences in immediate connection with which his main work was done, and to which his theory first of all applied. When he began his investigations, all organic species, whether animal or vegetable, were supposed to be fixed and unchangeable; and every distinct form of life, past or present, was believed to be a special creation. With such a theory in the minds of scientists, both Botany and Zoology were full of discords and confusion. Thousands of facts were pressing on the attention of careful observers, which could find no explanation under such a theory. But with Darwin came a change. His theory of descent (to use the words of Professor Romanes) was the influence that "created organization out of confusion, brought the dry bones to life, and made all the previous dissociated facts of science stand up, as an exceeding great army."

If Darwin made it important to re-write or lay aside all works on geology written before his day, still more imperative did he make it to recast all textbooks and all treatises on Botany and Zoology. Biological science in its whole range, both vegetable and animal, has been created anew by his thought.

But not with physical science in any of its departments can we stop. He is the most superficial of observers who does not recognize that Darwin's influence has extended, and very powerfully, far beyond the limits of the physical realm, into those of society, mind, morals, and religion.

Not that Darwin himself pushed his investigations much into these realms, or in his writings traced the bearing of his thought far beyond the physical or at most the lower forms of the mental, as the intelligence of animals. Yet occasionally he went further, as in certain chapters of his *Descent of Man*, and his interesting paper published a year or two before his death on the mental development of one of his

children. But however closely he himself may have kept in his investigation and writing to organized physical life, his theory is one that necessarily goes out and affects the whole realm of man's life, mental, social, moral, and spiritual.

"Darwinism" is only partially identical with Evolution, but it is its backbone; and Evolution is the thought that throws more light than any other upon man's whole past, present, and future.

We are finding that not only geological history, and the history of all forms of life on the earth below man, but also that the history of man himself must be re-written in the light of evolution.

We are finding that all our educational theories and methods must be re-cast in the light of the same. The psychologists and educators of the world are now at work on this great task.

We are discovering that our theories and methods of government are right only to the degree that they take heed of the principle of evolution.

We are learning that all progress, if it is to be real and permanent, must be based on evolution, not on revolution. Revolution has been too much the method of the past; evolution must be the method of the future.

For this radical change that is coming into all departments of our thinking, we are indebted of course to many men. No one mind is capable of working out the whole evolutionary philosophy. But Darwin furnished the key. Here was his greatness. He pointed out the path along which others are pressing with such important results to civilization.

Into the work of social reform Darwin cast two fruitful seeds. First, all men who would be reformers, all who would dry up the streams of vice and evil in society and do good to their fellow men, he set to the work of observing, to the work of looking for facts, gathering statistics, studying conditions and environments as never before; thus they began to get a basis of accurate knowledge to found their reforms upon, such as no past age had known. And secondly, he was largely instrumental in casting the great and fruitful thought of prevention into the mind of reformers, teaching them that the way to get rid of ignorance and vice and to elevate the race is to begin with generations as soon as they are born and before they are born; it is to take care of heredity, and of the physical conditions, mental associations and environments of children from their very earliest

moments, and thus harness whole groups of intangible but mighty forces which the past has largely overlooked into our service to help us in our reformatory work.

What shall we say regarding the influence of Darwin upon morals? There has been grave and widespread fear that here the effects of his thought would prove disastrous. Has time justified the fear? I think I may answer that the tendency of Evolution has proved to be not at all the destruction of morals, or the weakening of the ethical foundation of society. Rather does Darwin's thought when carried to its legitimate conclusion seem to reveal the fact, more clearly than it was ever revealed before, that the order of the universe is a moral order, and that justice and right and truth are builded into the very nature of things.

Evolution says man's reason came into being responsive to the call of a rational universe. Because there was something to be known and understood ever pressing upon him, he learned to know and think. In the same way man's sense of beauty has been developed in him in response to his environment. Because he was in a world constructed on principles of beauty, his mind got the beauty-faculty, that is, grew to apprehend and enjoy beauty. Similarly Evolution teaches that men's ideas of right and justice have come into being because these things are realities. Right and justice are in the universe, and therefore they have come to be in him. Man is moral because the universe is moral. Thus we see that Evolution rightly understood cannot result in any permanent disturbance of morals, but must lead to a firmer foundation than much of the ethics of the past has known, a foundation in nature itself, in the very constitution of the universe.

What has been the influence on Christianity of Darwin's scientific investigations?

From the first it was seen that if the development theory came to be generally accepted it must produce a profound change in the theological thought of Christendom. The Bible story of creation could no longer be regarded as historic; the period of man's existence on the earth must be extended to many times six thousand years, and that of the existence of the earth to a period vastly longer still. There could have been no literal Adam and Eve. Instead of the first human beings having been created perfect and having "fallen", dragging down all their descendents with them, the human family began its career very low down, and has slowly, through the experience and struggle of ages, climbed to its present condition; and its face

is still forward and upward. In other words, ours is a rising, not a fallen world.

Since Mr. Darwin's scientific theory was thus seen to be subversive of much that was regarded as vital in the prevailing theology of Christendom, it was not strange that it stirred up a great theological controversy.

Of course, he had also to fight a hard battle with the scientists. He was a scientific innovator, a scientific heretic. He proposed a scientific theory which was new, and which ran counter to the view of practically every scientist living. In offering to the world his thought of the *Origin of Species* he was stepping forth into the arena as a solitary champion of a theory which must fall unless he could defend it successfully against the attacks and the criticisms of the whole scientific world.

However, this battle with the scientists, severe as it was, had the advantage of being concerned principally with facts and reasoning, and only to a limited extent with prejudices. This was why it was possible to bring it to an end within a reasonable time.

The theological battle was different. It had to do largely with prejudices and fears. Religious men held beliefs which in many cases they were unwilling even to have investigated, beliefs which they regarded as having something sacred about them, and therefore which were not to be tried by the tests of "mere human reason" and "profane science".

Only persons who are now far past middle life can remember how intense and often bitter this battle with theology was. An incident or two will illustrate it.

A story is preserved regarding the then somewhat eminent Dean Burgon, a splendidly honest and outspoken old dogmatist of the English Church, who having to preach a sermon on an important occasion when many scientific men were present, concluded his discourse by vigorously denouncing the new scientific theory of Darwin, and saying with biting sarcasm to the scientists before him,

"Gentlemen, leave me my ancestors in the Garden of Eden, and look for your own (not mine) in the Zoological Gardens."

A story quite as interesting comes to us regarding Professor Huxley and an English Bishop.

We are told that at an annual meeting of the British Association for the Advancement of Science, in those days when Darwin and Darwinism were so cordially hated, a Bishop of the English Church closed a sarcastic speech against the new doctrine by turning to Huxley, its leading advocate in the body at that time,

and saying in the presence of a large audience with the most cutting accents,

"Is the learned gentleman really willing to have it go forth to the world that he believes himself to be descended from a monkey?"

Professor Huxley rose, and in his quiet way, but with terrible effect, replied,

"It seems to be that the learned bishop hardly appreciates our position and duty as men of science. We are not here to inquire what we would prefer, but what is true. The progress of science has been from the beginning a conflict with old prejudices. The origin of man is not a question of likes and dislikes to be settled by consulting the feelings, but it is a question of evidence to be settled by strict scientific investigation. But, as the learned bishop is curious to know my state of feeling on the subject, I have no hesitation in saying that, were it a matter of choice with me, which clearly it is not, whether I should be descended from a respectable monkey or from a bishop of the English Church who can put his brains to no better use than to ridicule science and misrepresent its cultivators, I would certainly choose the monkey."

Such a retort as this could not have come from Darwin, who never under any circumstances allowed himself to be drawn into personalities or sarcasm. But it well illustrates how intense was the conflict between the theologians and the scientists, and how strongly the former intrenched themselves behind mere vulgar prejudices; as it also illustrates the magnificent fighting qualities of Huxley, who, though not so influential in quiet ways as Darwin, was, more than any other, the leader in open fight through all the hard campaign.

And now how strange it seems to call to mind the fact that when the author of the theory over which all this conflict raged, died, in the year 1882, within less than half a generation from the time when the noise of the battle was loudest, the Church of England, the church of the very bishop who had uttered the taunt which I have mentioned, actually threw open the doors of Westminster Abbey, her most sacred burial place, and craved the honour of interring the author of the Darwinian theory among her most illustrious dead. How strikingly the story illustrates the widening of men's thought, and the triumph of charity over prejudice and of knowledge over bigotry at least in that little corner of the world which we call England.

It is important clearly to understand that the controversy which arose between the Church and the theory of Evolution put forth by Darwin, was theological, not religious. Evolution did not disturb religion. What it disturbed was the Genesis stories of the Creation and the Fall, and whatever system or systems of Chris-

tian theological dogma men had built upon those legends. But those legends and those systems of theology had no necessary connection with religion. All religion outside of Christendom is independent of them; and it is coming to be more and more clearly seen that even Christianity as taught by Jesus bears no necessary relation to them.

When Darwin's thought first came before the world many declared it to be atheistic.

But it is now recognized by thinking men generally that this charge is without foundation. Of course, men may be atheists and disciples of Darwin, as men may be atheists and opponents of Darwin. But, certainly there is nothing necessarily atheistic in Darwin's teachings. This is seen to be so, first, from the fact that he himself was not an atheist, as near the end of his life he explicitly declared; second, from the fact that many of the most eminent supporters of the Darwinian theory are believers in God; and third, from the fact that the theory deals with method and not at all with cause; and, so far as we can see, God may as easily work by law as by cataclysm, may as fittingly create the world and man by gradual and orderly development as by sudden fiat and arbitrary special acts. Indeed to many devout minds the theory of evolution, so far from tending to banish God from the universe, seems to fill the universe full of a Divine Presence as the older theory never did.

Under the touch of the evolutionary philosophy, as many of the profoundest thinkers of our day are coming to interpret that philosophy, the old-time absentee Deity, dwelling in a far off heaven, and making himself known to men only in occasional miraculous manifestations, becomes transformed into an Infinite and Eternal Power that impels all things, an Infinite and Eternal Intelligence that guides all things, an Infinite and Eternal Life that kindles all finite life, an Infinite and Eternal Goodness, Justice and Love that holds the world in its arms, and comes to manifestation in all our human justice, goodness, and love.

Saint Paul never dreamed of Mr. Darwin or his theory. But was it not exactly the God of modern Evolution that he unconsciously portrayed, when he wrote: "In him (God) we live and move and have our being"?

Some have imagined that Darwin's thought of Evolution is inimical to man's spiritual life, specially to prayer and worship. But others answer: Rather, when deeply understood, does it not bring God nearer than he ever was before, and with a clearer voice does it not say to every human soul,

“Speak to him, thou, for He hears:
And spirit with spirit may meet:
Nearer is He than breathing,
And closer than hands and feet.”

Some have supposed that Evolution is hostile to man's great hope of immortality. But here, too, I think it is coming widely to be felt that the fear is without warrant. If in some respects the evolution theory seems to bear against the probability of a future life for man, in other respects it is believed to support it. To many minds a future life seems to be implied by Evolution,—seems to be logically necessary to complete the theory of Evolution itself. Why should human progress stop with the grave? Man does not seem to attain the full possibility of his nature in this world. The most complete earthly life is conscious of powers unused, of faculties only partly developed, or hopes and plans unrealized. Have we not in this fact a promise, or at least an intimation, written in man's own soul, that this life is only a beginning, an infant school, where man is prepared for something greater beyond?

To sum up the whole matter of the religious influence of Darwin, I may say: “I think the prevailing verdict among the most influential religious thinkers of the West is, that instead of the doctrine of Evolution proving an injury to religion, as many at first feared, its effect has rather been to make religion reasonable and intelligible, to bring it into the natural order, and therefore to make it seem more real, more valuable and more attractive. Evolution seems to show that religion is an essential part of man's higher life; that the religious instinct or the religious faculty in man is something as normal and as necessary as his reasoning faculty: that man is as much made to aspire toward what is above him, to cherish ideals, to care for the spiritual side of life, and to worship, as he is to think or to breathe: and that what men ought to do, therefore, is not to neglect or

ignore their religious nature, but train and develop it in ways that are sane, intelligent and uplifting.”

I close with a word or two regarding Darwin the man.

Few nobler or more attractive characters are to be found in modern history, than the great scientist whose life and work we have been studying. He was as modest as a girl, but in his search for truth he was as courageous as a knight. He was singularly unselfish. He had in his nature no egotism and no jealousy. Young scientists, and scientists who were as yet unknown, had no truer friend.

As a worker he was persevering and patient as few men have ever been. This accounts for the fact that his work was so enormous in quantity as well as so superior in quality.

If he had any one trait of character that outshone all others, it was perhaps his candour and his absolute truthfulness. He never exaggerated. He never overestimated the value of his own writings or investigations. Nobody has ever pointed out the objections to his scientific theories more fully, more conscientiously or more ably than did he himself.

Well may the whole world, well may the whole world of religion as well as the world of science, sit down at the feet of Charles Darwin to learn unselfishness, candour, sincerity, honesty, and honour.

They laid him, when he died, in Westminster Abbey, beside that greatest of all English Scientists up to his own age, Sir Isaac Newton. Were they not right in the spot they chose for him? Must we not believe that a thousand years from now, it will be said, Newton and Darwin, those two, whose ashes sleep side by side in England's most splendid mausoleum, were the two British men who in the time preceding the close of the Nineteenth Century did most for the world's science, and perhaps also for the World's religion?

