

DARWINISM—A CENTURY LATER

By ARTHUR L. MURPHY

IN 1959 Darwinism will be 100 years old. With its centennial nearby it should be possible to make a dispassionate assessment of its role in the development of world thought. The discussions that went on in the drawing rooms of the 1870's over "The Origin of the Species" contributed nothing to the understanding of Darwin's work, but they were largely responsible for the title "Silly Seventies" being attached to that era. There was no greater evidence of good thinking in the 1920's when the Scopes trial in Tennessee aroused again the old, puerile controversy of man's descent from the ape. Today we should be able to bring a broader scientific knowledge and a more mature judgment to the study. We have now, as well, the historian's great advantage of perspective.

To weigh the influence of Darwinism we must first consider the era in which it appeared—the middle of the 19th century. This was perhaps the greatest of centuries. Certainly it was in social advances and scientific development. It was also characterized by new thinking on the part of man toward individualism. It was a century of turmoil. Starting with the Napoleonic Wars almost every nation on the earth fought with somebody. More significant, socially, were the revolutions. Brazil won its freedom; Greece tried to and failed. There were revolutions in Poland and Belgium, and Paris seethed regularly with distraction. Italy became unified through internal stress. Prussia rose from a relatively minor state to rule Germany. The abolition of the slave trade in the United States and the British Dominions was another indication of the trend toward individual freedom.

Developments in the sciences of communication, with the invention of the linotype machine and practical photography, made the world smaller, and brought men into intimate contact with neighbors who had been mere names to them. Books which had been the privilege of the few became the right of the common man, and the daily press besides disseminating news soon discovered it had the means of molding public opinion. The development of railroads and transatlantic steamship travel served further to broaden man's concepts.

In medicine the century opened with Hippocrates still being taught in the schools; because nothing more basically sound had appeared since his time. Early in the century Schleiden and Schwann described for the first time the living cell, and the century ended with modern medicine in practice.

In physics and chemistry much of the work was not as obvious, but it was basic to the practical applications of today which we tend to attribute to our 20th century development. Actually, the 20th century did little more than put into use the principles already worked out in the nineteenth, till that fateful day in the autumn of 1945, over Hiroshima.

Into the middle of this period of bustling activity, of mental growth, of social emancipation, and moral uncertainty, burst Darwinism. Its mental effect was as great as the physical effect of the 20th century's atomic bomb. In it was a message for everybody, for scientist, statesman, and dilettante.

To the student who will read Darwin's work it becomes obvious that he did not present a complete conception of evolution. He spent a life time studying nature, observing and thinking. From what he saw, moulded by his philosophy, he built as full a theory as he could. In its essence there was nothing startlingly new about it. Aristotle had written of the possibilities of evolution. Erasmus Darwin, grandfather of Charles, had brought out a brief theory in a paragraph or two. Wallace, who was a contemporary of Darwin's, introduced a very similar theory shortly before Darwin did. He sent his paper to Darwin, who being a modest man, prepared to withdraw his own work and give the credit of the discovery to Wallace. However, it was pointed out to him that his studies were much more complete, the data he had gathered multitudinous. So after consultation with Wallace the two produced their work simultaneously. Because of the thoroughness of Darwin's presentation, Wallace's name was soon forgotten. Throughout history it has been shown a thousand times that the genius with the brilliant inspirations, unsupported by the will to culmination, lives for himself, or at the most, for his generation only. Like Aristotle, Julius Caesar, Joseph Lister, and Lincoln, it is the dogged unyielding plodders who mold their world. Thus, Darwin by his study and completeness established, with one sweep, a belief that had been bandied lightly in words for centuries.

In 1859 his theory burst on the European Continent. Its reception was mixed. On the whole, science accepted it warmly. On the whole, religion turned it down angrily. Society took it and left it as they chose. The reasons religion turned it down were understandable. This was an age in which materialism was developing rapidly. Religion could not be favorably disposed toward any movement that would tend to encourage it.

While there was absolutely nothing in the *Origin of the Species* incompatible with religious teaching, there was in the distortions, supposedly scientific, of the many who followed and developed Darwin's work. Nor were they one bit worse in their exaggerations, than the interpretations of it decried from the pulpits of the land, from Rome to the most northern Scottish kirk.

The effects of Darwinism on science were almost all to the good. It gave an order and a system to biology; literally, a constitution to govern it. This was also true for anatomy. The science of comparative anatomy was really founded on Darwinism. Geology, too, took on a new significance. If animals developed in such a way perhaps, the earth, too, at some time had evolved. The subject was approached with new eyes. Also there was a new welding of geology and biology, because of the search for fossils. Even astronomy, with this new conception of growth and development, was looked on afresh. As a result physics, and even mathematics, were stimulated. Organic and inorganic chemistry grew closer together when it was seen how interdependent in development the one was on the other. Thus, through the last half of the century grew a tremendous hustle of new thought and experiment, based on Darwin's work. So that erroneous, as much of the theory was, it served as a working hypothesis in every branch of science. Each new discovery gave added support to the conception, if not to the details of the theory. Today, if we pause to analyse some of our thinking on the most ordinary problems, we will find them to be coloured and even molded by the concept of a progressively changing world which Darwin's work first made clear.

The sociological effects of Darwinism were mixed. Through the middle ages the common man accepted willingly enough a way of life laid down for him by his rulers in church and state. He knew that if dull, it was all the more certain to lead to a glorious resurrection. The Renaissance showed him that he might think for himself. The French Revolution gave a great boost to his ego. But, it was not until the nineteenth century that he did really begin to think more and more as an individual. Subject to an increasingly broad-minded, but still dominating aristocracy, Darwinism was to him the great leavener. Looking back into the past he could see himself originating in the same way as his master on the hill. They shared a common ancestry, and if, in the distorted discussions of the time, this progenitor were a monkey, our common man felt his equality all the better established.

Sociologically this much of Darwinism was good. But in the many new and often wild doctrines of sociology being bandied across the land, materialism was finding an ever greater place. Science, in the breathless strides it was making, encouraged this. A few years after Darwin, Koch, the brilliant bacteriologist, laid down his postulate for establishing a particular bacterium as the cause of a specific disease, reducing one of the natural sciences, in this particular phase, to the cold accuracy of mathematics.* It was an outstanding example of good scientific thinking, that nothing be accepted without tangible proof. If a man be trained in this process of thinking through the period of a life time he develops a creed which is made up of facts. If there is then put before him a conception of creation interwoven with a religious belief in the supernatural, calling for a broad faith, and for the acceptance of any number of things which he is unable to grasp in his hands, which he cannot see through a microscope, his reasoning falters. It is understandable that if his scientific training is not bulwarked with a proper moral and spiritual development, he becomes a materialist. It does not mean that the Godless scientist is, in his thinking, a man of poorer moral sense than his church-going, hymn-singing neighbor. It does mean that his intellectual and spiritual senses are not in proper balance.

With the knowledge of science in the 1880's more primitive than it is today, this individual was met with more commonly. Atheism, which today is acknowledged as an attribute only of the ignorant, was then associated too commonly with the educated man, and in Darwinism he was able to find justification for his belief. Genesis was not seen as a simple true story, or as a divine allegory. There was no need to go back to beginnings. Science talked in terms of 40 and 50 millions of years. That in itself was inconceivable; why go further. So that a new philosophy developed and the originator of that new philosophy was Nietzsche. Will Durant calls him the son of Darwin, and the brother of Bismarck. Cruel to Darwin though this may be, Nietzsche did build his philosophy on Darwinism. He was poor, frustrated, uncertain in his mind. Like Judas, he was almost a saint and probably died a sinner. In natural selection he saw a new development which he made almost into a religion. He distorted it. He did not or would not see Darwin's examples

*"Find the living germ in the infected body. Isolate it. Grow it in pure culture. Inject it into another body. Produce there the symptoms of the disease. In that body find again the same germ."

of the many animals like the opossum and chameleon that had survived through the eons of evolution, in passive ways. Nietzsche learned only the lesson of the lion. Strength was the doctrine he took. Hence, everything that was powerful, was good. It followed that everything that was weak, was bad. The evil conclusions that could be built on these two premises were endless. Accepting Nietzsche's philosophy, the believer could only thrust aside the greatest way of life ever taught, the Sermon on the Mount. Prussia embraced Nietzsche, rose to the fore among the German states, and rapidly crushed France in the Franco-Prussian Wars. It was only a few years later as history goes, that Germany guided, more openly than ever before, by this philosophy, threatened to conquer the world in two terrible wars.

Before laying these holocausts at Darwin's feet, it must be remembered that the philosophy of communism which took over when Nietzsche and his last Nazi horde succumbed, was based, just as firmly, on the purest idealism.

During the twentieth century our lives have been molded, and are still being, in part, by Darwinism. Yet, like the first faggots of a lasting fire, of the original concepts, little remains. Darwin taught the principle of evolution. In its support he presented a partial theory. Admittedly, it was based on a very limited knowledge. There was a good bit of faulty reasoning in his presentation, too. What he gave us was really no more than a beginning. It was taken by too many as the completed structure; and it was difficult then, as it is today, to convince his antagonists of this. Men who quote him regularly in distorted phrases, very frequently have never read his work. To assess his accomplishment it is essential, too, that we also disregard the sniping of semiscientists, who themselves have contributed nothing original or constructive to a conception of evolution in any form. With good enough aim they blast away at some small appendage of Darwin's work, and settle back in the belief that they have brought the whole structure tumbling down.

Anyone who studies the subject of evolution fairly and dispassionately, is almost certain to accept the principle. The right or wrong of any specific theory is good for indefinite argument. George Gaylord Simpson uses a graph to illustrate the different interpretations that may be put on a known set of facts. He spreads little crosses of knowledge almost indiscriminately within the arms of the vertical line representing time, and the

horizontal, representing development of structure. The non-evolutionist is free to deny any connection or relationship among the crosses. One evolutionist may see them all connected by a single curving line, and another, with equally good logic, may link them by a series of incomplete lines, all beginning at the common point of infinity. This latter view might represent the interpretation of DeVries, who believes that variations in development appear suddenly and in great jumps. Whereas the purer evolutionist, who prefers the curved line, claims these jumps are simply time periods of which we lack sufficient knowledge to fill in.

Darwin's beliefs on heredity and variation had little observation to support them. Mendel's later work on mutation confirmed much of his theory, but we are still uncertain as to whether they are as great modifying influences as Darwin believed. The inheritance of acquired characteristics, developed by Darwin from Lamarck's theory, is, in its original form, almost completely discarded. But in its place today is the belief that within the chromosome of the embryonic cell are determining factors producing much the same effect. Lamarck believed that the giraffe developed its long neck by reaching and reaching; that the son reached a little more than the father; that as trees grew higher, the higher later offspring had to reach. With this particular form of inheritance Darwin did not agree. He said that originally there were both short-necked giraffes and long-necked giraffes; that the short necked giraffes starved to death. This is an example of his variation by chance. The second most important point in his theory, it has been completely discounted. Henri Bergson, in the early years of this century, demonstrated its extreme unlikelihood by an example. He compared the vertebrate eye, most highly specialized structures in the body, with the eye of a very primitive type of mollusk, and showed the striking similarity between the two. If, he said, the eye of man, for example, developed purely by chance, is it not asking too much that the same chance acting through millions of years, could occur in a completely different organism, to produce an almost identical eye in this very primitive creature. Such a development, he said, must then be of the psychological order. This vague term explained nothing, but it made allowance for the introduction of factors other than the physical.

The Mendelian discoveries very simply disproved Darwin's theory of sexual selection. Greatest of the arguments against Darwin's natural selection lies in a relatively superficial

observation of nature. There is an essential morality apparent among even the lower animals of our earth. Among mammals the breast is for the betterment of the race and is of no advantage to its possessor. To study a community of ants, or to read Maurice Maeterlinck's "Life of the Bee" is to realize the interdependence in ant hill or hive of the individual and its society. The conception that such an individual is living for itself alone, trying to be the swiftest to get food, the most powerful to strike down its neighbor, is untenable. Natural selection may be retained in the evolution theory, only in its broadest sense. If it be interpreted as a natural and altruistic selection then the likelihood of survival may be granted not only to the lion with the most powerful jaws, and the lobster with the toughest shell, but also to the human with the greatest love or greatest sense of morality.

Whatever theory we choose to accept we must suppose the presence of some inner force. Bergson spoke of it as an *elan vital*. Buis called it cellular consciousness. DuNouy spoke of it as telefinalism. Even the amoeba, one of the simplest of unicellular structures, show evidence of having a mind capable of learning, capable of accepting, and involuntarily rejecting, and of adapting itself to changing conditions. None of this Darwin allowed for in the individual. No doubt Wordsworth had no scientific intent, but there is truth with poetry in his "every plant enjoys the air it breathes". The scientist, then, who cannot, by the tenets of his creed, go beyond observable facts, finds himself unable to present a complete evolution theory. He may simply shrug his shoulders as did one, and conclude that good and bad angels must play a large part. Gaylord Simpson, more specifically, leaves the problem to theology or philosophy. "The ultimate mystery," he says, "is beyond the reach of scientific investigation and probably of the human mind."

The most popular scientific theory today is the so-called synthetic theory. This is largely non-Darwin, and in parts anti-Darwin. It is a mixture of vitalist and finalist theory; vitalist being one who believes that there are forces outside those of the physical, acting to produce development; and the finalist believing that these forces are still in progression. In detail there is little of Darwinism left.

In 1492 Columbus discovered America, sailing on the theory that the world was round. Reaching America, which he thought to be Asia, he believed his theory proven. It was not, and the

world could still have been flat. Columbus died in ignorance of his mistake. Today we do him honour for his discovery, without blame for his failure, or for all the crimes and transgressions that have been committed on the American continent since 1492. If we liken the work of Columbus to a bright star in the sky, we can only liken the broader, deeper concepts of Darwin to a galaxy.

The closing lines of the last Chapter in his "Origin of the Species" are these: "There is a grandeur in this view of life with its several powers having originally been breathed by the Creator into a few forms, or into one, and that while this planet has grown, according to the fixed laws of gravity, from so simply a beginning, endless forms, most beautiful and most wonderful have been, and are being, evolved."