# SCIENCE VERSUS SCIENTISM IN HISTORICAL GEOLOGY

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The study of historical geology holds great fascination for many people who are neither historians nor geologists. This discipline occupies a uniquely interesting and important position in human thought. Among the humanities, the study of history surely is of singular significance and, among the sciences, geology, dealing as it does with the very earth itself, is similarly of unique interest. When the two are combined in historical geology, which professes to be able to decipher the mystery of the origin and history of the earth and its processes, the resulting panorama is of marvelous interest and significance. Such a picture, in fact, is of far more than historical and geological pertinence. Anything which elucidates origins is necessarily of philosophical and theological interest, with strong implications regarding meanings and purposes and destinies as well.

It is little wonder, then, that historical geology has attracted the intense interest and concern of a great variety of people. As a matter of fact, the basic structure of modern historical geology was worked out over a hundred years ago by such men as James Hutton (an agriculturalist with medical training), John Playfair (a mathematician), William Smith (a surveyor), Charles Lyell (a lawyer), Georges Cuvier (a comparative anatomist), Charles Darwin (an apostate divinity student and naturalist), Robert Chambers (a journalist), William Buckland (a theologian), Roderick Murchison (a soldier and gentleman of leisure), Adam Sedgwick (who, when seeking election to the chair of geology at Cambridge, boasted that he knew nothing of geology), Hugh Miller ( a stonemason), John Fleming (a zoologist), and others of like assortment.

Although the basic framework of historical geology, as worked out by these men, has not changed to the present day, there has arisen a group of specialists in historical geology who have come to regard this field as their own particular field of science. and who now regard with some disdain any who venture to write or speak in this field without giving full allegiance to the accepted system. By its very nature, however, historical geology is not, and can never be, a genuine *science,* and therefore the dogmatic insistence that one follow the interpretations of its founders and present-day leaders, with all the implications of origins and meanings that are involved, is nothing less than *scientism.*

This is in no way meant to be a reflection upon the science of geology, which is a true science in every sense of the word, and which has made a tremendous contribution to our understanding and application of the laws of nature. When, however, a geologist (or lawyer or surveyor or naturalist or anything else ) seeks to become a *historical* geologist, he must leave the realm of science and enter that of philosophy or religion. The presently accepted system of historical geology is basically nothing else than a philosophy or a religion of evolutionary uniformitarianism. If this fact were only recognized and acknowledged by its adherents, no one would be greatly disturbed but, when this system is widely promulgated and insisted upon in the name of *science,* it has degenerated into mere scientism instead. This will become more evident as we consider the true meaning of science and the true nature of those physical processes studied by science.

*What Is Science?*

The word "science" itself of course is derived from the Latin *scientia* ("knowledge"), and this is essentially what it means. A more formal definition, as given in the Oxford dictionary, is as follows: "A branch of study which is concerned either with a connected body of demonstrated truths or with observed facts systematically classified and more or less colligated by being brought under general laws, and which includes trustworthy methods for the discovery of new truth within its own domain."

Science thus involves facts which are observed and laws which have been demonstrated. The scientific method involves experimental reproducibility, with like causes producing like effects. It is *knowledge,* not inference or speculation or extrapolation.

True science thus is necessarily limited to the measurement and study of *present* phenomena and processes. Data which have been actually observed in the present, or which have been recorded by human observers in the historic past, are properly called scientific data. Laws which have been deduced from these data, which satisfactorily correlate the pertinent data and which have predictive value for the correlation of similar data obtained from like experiments in the future, are properly regarded as scientific laws.

But there is obviously no way of knowing that these processes and the laws which describe them have always been the same in the past or that they will always be the same in the future. It is possible to make an assumption of this kind, of course, and this is the well-known principle of *uniformitarianism.* The assumption is reasonable, in the light of our experience with present processes, and it is no doubt safe to extrapolate on this basis for a certain time into the future and back into the past. But to insist that uniformitarianism is the only scientific approach to the understanding of *all* past and future time is clearly nothing but a dogmatic tenet of a particular form of religion.

That uniformitarianism has been the foundational

and guiding principle of historical geology is widely recognized. A standard textbook on the subject says, for example:

> "The uprooting of such fantastic beliefs (that is, those of the catastrophists — author) began with the Scottish geologist, James Hutton, whose *Theory of the Earth,* published in 1785, maintained that the *present is the key to the past* and that, given sufficient time, processes now at work could account for all the geologic features of the globe. This philosophy, which came to be known as the *doctrine of uniformitarianism* demands an immensity of time; it has now gained universal acceptance among intelligent and informed people.'"

Thus, science deals with the data and processes of the present, which can be experimentally measured and observationally verified. The principle of uniformity is a philosophy, or faith, by which it is hoped that these processes of the present can be extrapolated into the distant past and the distant future to explain all that has ever happened and to predict all that will ever happen.

But, when viewed in these terms, it is obvious that uniformity is not proved, and therefore is not properly included in the definition of science. There may be any number of other assumptions which might serve as the basis of such extrapolation, and all would similarly be mere acts of faith.

It is perfectly possible and reasonable, as we shall see, to assume that the processes studied by science were themselves created at some time in the past and will be terminated at some time in the future. The processes themselves then could tell us nothing about their creation or termination — this would be outside the domain of scientific investigation. Such information could come, if at all, only by revelation from their Creator.

As a matter of fact, a full and complete understanding of any process, even in its present character, could in that case be obtained only in the context and framework of the fact of its prior creation. This is because *meaning* is inextricably inter-related with *origin* and *destiny.*

Apart from this stricture, however, it is possible and proper to study science, in the sense of present processes, without reference to the past or future. Thus, the science of physics deals with the present processes of the physical world; the science of chemistry deals with the present chemical properties and behavior of matters; the science of geology deals with present geological processes and earth features; the science of biology deals with the processes of life in plants, animals and man. So long as the question of *origins* or *ends* is not considered, there will be no conflict between the Bible and science. The Bible has numerous references to present phenomena of science, and all will be found in strict accord with the actual observed data. It is only when questions of origins or destinies (or fundamental meanings) are considered that conflicts appear.

To a considerable degree, therefore, a *Christian* study of physics or chemistry or other science can proceed along the same lines as a treatment by non-Christians. The same textbooks can be used, the same experimental apparatus, the same methods, provided only that the study is limited to an elucidation of the actual present properties and processes of the data of that science. But as soon as intrinsic meanings or origins or destinies are brought into the treatment, there will inevitably be conflict between the uniformitarian and Christian world-views.

*The Processes of Science*

Assuming that our study of science will be, as is proper, limited to the study of present processes, we soon encounter a most remarkable and significant fact. Regardless of the particular discipline of science we study — physics, chemistry, biology, geology, etc. — these processes all are built upon two basic concepts and follow two basic laws. The two basic concepts are *energy* and *entropy,* and the two laws are the *first and second laws of thermodynamics.*

Since the implications of these laws are highly important to the Christian cosmology, it will be well to allow a non-theist, thoroughly evolutionary and uniformitarian in his philosophy, to define them. Dr. Harold F. Blum, the Princeton biologist, states them as follows:

> "Energy appears in various forms: heat, light, kinetic energy, mechanical work, chemical energy, and so forth. Energy can change its form but not its quantity — this is a statement of the *first law of thermodynamics,* which until quite recently could be accepted without qualification. We know, now, that matter is another form of energy, but that does not alter this fundamental principle which is also called the law of conservation of energy."[2]

Energy is the concept which measures the capacity of doing work. Thus, everything in the physical universe, including matter and all the phenomena associated with matter, is essentially one or another form of energy. This first law of thermodynamics, which was proved empirically about a century ago, is really the most basic of all scientific laws. It has been verified in countless thousands of experiments, ranging from those on the scale of the sub-nuclear particles to measurements of the stars and galaxies, and there is no known exception. Thus, according to this most basic and best-proved of all scientific laws, there is *nothing which is now being created or destroyed.* Present processes, with which alone true science is able to deal, are *not* processes of creation.

With respect to the second law, Blum continues: "The *second law of thermodynamics* cannot be put in such concise form as the first; it is stated in numerous ways, according to the kind of problem understudy. . . It is one of this law's consequences that all real processes go irreversibly. Let us consider a universe in which the total amount of energy remains, supposedly, constant. Any given process in this universe is accompanied by a change in magnitude of a quantity called the *entropy* . . . All real processes go with an increase of entropy. The entropy also measures the randomness or lack of orderliness of the system, the greater the randomness the greater the entropy . . ."[3]

Thus, the second law of thermodynamics states that there is a universal tendency toward disorder and decay. In any finite open system, of course, there may be temporarily and locally an increase of order, due to the influx of ordering energy from outside the system, but the tendency is always ultimately downward toward disintegration and death. This law also is proved beyond question, with no known exceptions. As Blum says, in the preface to the third edition of his book:

"Wishful thinking to the contrary, the second law of thermodynamics remains with us; . . . no wise scientist will, I think, deny its existence or import."[4]

Since we are here specially concerned with geological processes, the testimony of a prominent geologist will also be cited. Dr. Brian Mason, who is Curator of Physical Geology and Mineralogy at the American Museum of Natural History, says:

"In redistribution and recombination of the chemical elements in minerals and rocks the atoms or ions lose part of their energy and yield more stable systems. Every rock exemplifies the laws conditioning the stability of crystal lattices, laws which follow the general principles of the structure of matter and of thermodynamics . . . the study of equilibria in laboratory experiments and by thermodynamic methods has thrown a flood of light on geochemical reactions, such as the origin of rocks and minerals, the processes of weathering and decomposition, and other kinds of transformations going on within the earth . . . The major value of thermodynamics in geochemistry is that it provides a general approach to problems of stability, equilibrium, and chemical change."[5]

Thus, the two laws of thermodynamics are not simply laws of physics and engineering, as they are too often considered to be, but are universal laws governing the behaviour of all matter and processes on the earth, including those of biology, as Blum has shown, and of geology, as Mason has shown. The first law teaches that energy (which includes everything in the physical universe) is quantitatively constant. The second law teaches that energy is qualitatively deteriorating. Thus *the present processes of nature are not processes of creation and integration, but rather of conservation and disintegration.*

All real processes in the universe of course therefore involve change, which means essentially exchanges of energy, or transformations of energy from one kind into another. But these changes are basically processes of decay. Locally and temporarily there may be processes which seem to be processes of growth and integration (such as the growth of a child or the growth of a crystal or the manufacture of an automobile). But these are due to a temporary excess influx of ordering energy into the system. Eventually, though, the child will grow old and die, the crystal will disintegrate, and the automobile will end up in the auto graveyard. Most processes fail even to exhibit this tentative growth character. In geology, for example, typical processes are erosion, heat flow, and radioactive decay. In fact, it is such processes as these whose measured rates have served as the basis for geochronological calculations. But here a very important caution is in order. Although the second law of thermodynamics indicates that any system must decay, it says nothing about the rate of decay. As Mason says:

"It is important to realize, however, that thermodynamics cannot predict the *rate* at which a reaction will proceed and does not tell us anything of the mechanism of the reaction."[6]

And, similarly, Blum says:

"The second law of thermodynamics points the direction of events in time, but does not tell when or how fast they will go."[7]

These rates of decay will depend upon many variables, and in nearly all cases must be determined empirically, by actual measurements. There is never any assurance that the decay rates will be constant, as they may well change if the factors which influence them change. All geochronometers are suspect from this cause alone.

*The True Uniformitarianism*

We can now see that the concept of uniformitarianism, while perfectly valid and proper in its legitimate framework, has been applied quite illegitimately in historical geology. True uniformity has to do with the inviolability of natural law (e.g., the laws of thermodynamics), and not with the uniformity of process *rates.* The laws of thermodynamics indicate what the character of all natural processes must be, but they do not indicate how fast or how slow such processes will proceed. And there is certainly never any assurance that the rate of any given process will always be constant.

But it is this assumed uniformity of process rates which is at the very hub of the principle of uniformity as it has been applied in historical geology.

This is evident from the following rather typical description of the principle:

> "Opposed to this line of thinking was Sir Charles Lyell (1797-1875), a contemporary of Cuvier, who held that earth changes were gradual, taking place at the same uniform slowness that they are today. Lyell is thus credited with the propagation of the premise that more or less has guided geological thought ever since, namely, that *the present is the key to the past*. In essence, Lyell's *doctrine of uniformitarianism* stated that past geological processes operated in the same manner and at the same rate they do today."[8]

Now it is quite obvious that if geological processes have always been going on at the same slow rates they exhibit today, the earth must be immensely old. Age calculations by certain of these processes — such as radioactive decay, continental erosion, canyon-cutting, deltaic deposition, oceanic sodium increments, etc. — when based on present rates, are of course bound to give extremely high values, far greater than can possibly be accommodated within the framework of Biblical chronology.

But there is clearly no scientific basis for assuming such uniformity of process rates. It is quite valid to assume that running water will erode soil and rock, that radioactive minerals will decay, and that all other such processes will proceed irreversibly, in accord with the second law of thermodynamics, but neither this nor any other scientific law provides any guarantee that such rates will always be slow and uniform. In fact, it is certain that all such real decay processes are so intricately complex and are affected by such a great number of factors (a change in any one of which may drastically affect the process rate) that it will forever be quite impossible to say exactly what the rate will be except under very precisely known and experimentally confirmed conditions.

It is encouraging that many geologists in recent years are beginning to recognize and acknowledge this distinction. For example, Zumberge, in a widely used introductory text, after defining uniformitarianism as above, cautions:

> "From a purely scientific point of view, it is unwise to accept uniformitarianism as unalterable dogma. As pointed out in chapter one, man's experience with geological processes is restricted to only a minute fraction of the total span of earth history. He should never close his mind to the possibility that conditions in past geological time were different than today, and that the doctrine of uniformitarianism may not apply in every case where the reconstruction of some segment of earth history is involved."[9]

A very strong statement of the pitfalls of uniformitarianism in attempting to explain the sedimentary rocks is given by a member of the geology faculty at Pennsylvania State University:

> "Conventional uniformitarianism, or 'gradualism, i.e., the doctrine of unchanging change, is verily contradicted by all post-Cambrian sedimentary data and the geotectonic histories of which these sediments are the record. Thus, quantitative interpretations of the Ordovician from the Recent are meaningless."[10]

More recently, a Columbia University geologist has clearly tried to distinguish between the true and the fallacious uniformitarianism (calling them methodological and substantive uniformitarianism, respectively) :

> "Uniformitarianism is a dual concept. Substantive uniformitarianism (a testable theory of geologic change postulating uniformity of rates or material conditions) is false and stifling to hypothesis formation. Methodological uniformitarianism ( a procedural principle asserting spatial and temporal invariance of natural laws) belongs to the definition of science and is not unique to geology."[11]

With this we would heartily agree. Uniformity of natural laws is basic in science, and is quite in accord with scripture (always allowing, of course, for the possible miraculous interruption of those laws by the Creator when He so wills). But the type of geological uniformitarianism which has held sway for a hundred years, and which has indeed served as the very foundation of the theory of evolution, is not only contrary to the Biblical record, but is completely inadequate to explain the actual data of geology.

> "Substantive uniformitarianism as a descriptive theory has not withstood the test of new data and can no longer be maintained in any strict manner."[12]

Since geological uniformitarianism in the traditional sense can no longer be maintained, and since uniformitarianism in the true sense is in no way a peculiar possession of the science of geology, it is thus completely wrong to refer to uniformitarianism as being in some way particularly the possession of geological theory. An illuminating admission giving the reason why this identification continues to be made is revealed in the following:

> "As a special term, methodological uniformitarianism was useful only when science was debating the status of the supernatural in its realm for if God intervenes, then laws are not invariant and induction becomes invalid . . . The term today is an anachronism for we need no longer take special pains to affirm the scientific nature of our discipline."[13]

If one looks beneath the surface of these reasonings, he begins to see that the real problem is not one of science at all, but of scientism! That is, historical geologists have attempted to defend substantive uniformitarianism (i.e., uniformity of process rates) by citing the undisputed evidence of methodological!

uniformitarianism (i.e., uniformity of natural law) . Whether this fallacy in reasoning has been conscious or sub-conscious is really immaterial; the basic reason for it in either case, has been the innate desire to relegate the position of the Creator and His possible intervention in history as far back in time as possible, and perhaps even to eliminate Him altogether. A full-orbed philosophy — nay, a religion — of origins and development has thus been erected upon a fallacious uniformitarianism. And this is scientism, not science.

*The Evolutionary Framework*

The vast ages of earth history which supposedly are implied by the principle of uniformity have been subdivided into a more or less standard series of geological eras and periods, each with a generally accepted name and approximate duration. The whole sequence is known as the Geological Column, and the corresponding chronology is known as the Geological Time Scale. This of course is the very backbone of the so-called historical geology. Any given rock formation must occupy a certain position in the Column, and presumably it can be dated as to time of formation in terms of the Time Scale.

A highly pertinent question needs asking at this point. On what basis are the various rock types and formations identified and classified? How is one system assigned to, say, the Devonian Period and another to the Ordovician? How do we know which is older and which is younger? How are the divisions between successive periods recognized ?

As a matter of fact, this problem of stratigraphic classification is involved in no little uncertainty and controversy at the present time, even though the Geologic Time Scale has been generally accepted in its present form for about a hundred years.

The layman is inclined to assume that the principle of superposition is the main factor in determining relative age, and that equivalent strata in different areas can be recognized by their chemical or physical composition. However, this is not so. The factor which is by all odds the most important in assigning an age to a given stratum is its biological content — that is, the *fossils* it contains.

> "That it appears that the only presently available rational geochronological indices are biostratigraphically based — i.e., *biochronologic.*" [14]

This means plainly that *only* the fossils can be relied upon as a criterion for determining the time in earth history when a particular formation was deposited. Other data — vertical position, physico-chemical characteristics, and other factors — are essentially insignificant.

> "Physico-geometrical data (apart from radiometric) can do no more than provide a crude local relative chronology or circumstantial evidence in support of a biochronologic framework."[15]

Now the only way in which the fossil contents of a rock could possibly indicate how old the rock might be is if the animals found as fossils were living only at that specific time in earth history. This means that there have been different kinds of life at different periods in history, and that therefore the living forms provide an unambiguous index to the chronology.

But how do we know which forms were living when? There must be some systematic way of viewing and classifying the changes of life forms with the passage of geologic time. The key, of course, is evolution! If we are to explain everything in terms of uniform laws and uniform processes, this must include the development of the biological world as well as the physical world. All kinds of animals must therefore have gradually developed from earlier and simpler forms. There must have been a slow increase of organization and complexity of living forms during geologic history. And this is the clue we need! Simple fossils mean a formation is ancient; complex fossils are recent.

The fossil record thus is of absolutely paramount importance in geologic dating. The fossil forms are classified according to the underlying evolutionary assumptions, and then they in turn become "index fossils" for future dating purposes.

> "In each sedimentary stratum certain fossils seem to be characteristically abundant: these fossils are known as *index fossils.* If in a strange formation an index fossil is found, it is easy to date that particular layer of rock and to correlate it with other exposures in distant regions containing the same species."[16]

The evolutionary significance of this methodology is clearly indicated by the following:

> "Once it was understood that each fossil represents a biologic entity, instead of a special divinely created life form, it became quite obvious that the plants and animals of each stratigraphic division had simply evolved from those of the preceding epoch through gradual adaptation. They were, in turn, ancestral to those that followed."[17]

This technique might have merit if it were actually known, from historical records or from divine revelation or from some other source, that in fact all living forms had actually evolved from prior forms. But the actual evidence for evolution on such a scale as this is, as implied by the above quotation, limited to the fossil record itself. In a presidential address before the Geological Society of America, Dr. Hollis Hedberg also stressed the evolutionary significance of the fossil record, as follows:

> "That our present-day knowledge of the sequence of strata in the earth's crust is in major part due to the evidence supplied by fossils is a truism. Merely in their role as distinctive rock constituents, fossils have furnished one of the best and most widely used means of tracing beds and correlating them. However, going far beyond this fossils have furnished, through their record of

> the evolution of life on this planet, an amazingly effective key to the relative positioning of strata in widely separated regions and from continent to continent."[18]

Thus, the primary means of dating rock formations relative to each other, in the Geologic Column, is the evolutionary sequence of life on the earth through geologic time, and the preservation of distinctive life forms as fossils deposited in the rocks laid down during each successive period. But, then, in turn, the history of evolution on the earth has been built up on the basis of the record revealed in the rocks representing the successive geologic ages. In fact, the only genuine historical evidence for the truth of evolution is found in this fossil record. As Dunbar says:

> "Although the comparative study of living plants and animals may give very convincing circumstantial evidence, fossils provide the only historical, documentary evidence that life has evolved from simpler to more and more complex forms."[19]

The evidence for evolution afforded by living plants and animals is, indeed, hardly convincing at all. The almost universally accepted biologic mechanism for producing evolutionary change is supposed to be genetic mutation (a sudden, random change in the biochemical structure of the germ cell) preserved, if favorable, by natural selection.

This is confirmed by the very prominent Edinburgh geneticist, C. H. Waddington:

> "It remains true to say that we know of no way other than random mutation by which new hereditary variation comes into being, nor any process other than natural selection by which the hereditary constitution of a population changes from one generation to the next."[20]

Since our focus of attention in this paper is geology, we do not wish to digress into a discussion of genetic theory at this point, except to call attention to the fact that *present* processes of biologic change are associated almost exclusively with mutations, as far as permanent, hereditary, truly novel changes are concerned. Presumably if evolution is actually a fact of nature, it is to be explained in terms of mutation and natural selection. This, in fact, is undoubtedly the consensus of the thinking of most leading evolutionists today, not only those working in the field of genetics, but also those in the field of paleontology.

Furthermore, it is admitted by all geneticists that the great majority — in fact, almost all — mutations are basically harmful. This is only to be expected, since they represent random changes in very highly-ordered systems:

> "Mutations occur at random, not because it would be convenient to have one. Any chance alteration in the composition and properties of a highly complex operating system is not likely to improve its manner of operation and most mutations are disadvantageous for this reason. There is a delicate balance between an organism and its environment which a mutation can easily upset. One could as well expect that altering the position of the foot brake or the gas pedal at random would improve the operation of an automobile."[21]

As a matter of fact, mutations provide a very fine illustration of the second law of thermodynamics — the universal tendency toward disorder and decay. In any case, truly beneficial mutations are obviously such very rare events, if they occur at all, that it is quite impossible to see real evolution occurring among present plants and animals. There is, of course, a great deal of variation, within basic kinds of creatures — in fact, no two individuals are exactly alike — but there are also quite clear-cut gaps between such basic kinds of creatures.

Since evolution cannot be demonstrated as occurring in the present, and since, indeed, such evidence as does exist of biologic change in the present seems to be evidence of decay and death, rather than growth and increasing organization, it is obvious that, in the last analysis, the only real evidence for evolution in the broad sense is that contained in the fossil record.

But the fossil record is based on the geologic ages, and the geologic ages have been built up as an interpretive framework for earth history on the very basis of the assumption of evolution! This is obviously circular reasoning, but that in itself does not condemn it since, in the final analysis, all philosophies are based on circular reasoning. One always brings certain innate presuppositions with him when he tries to Philosophize on origins and meanings, and these necessarily determine his conclusions. It is only when such circular reasoning is called science that it really becomes scientism. As a religious faith, it may be a live option, but not as science!

### *Basic Inconsistencies in Evolutionary Uniformitarianism*

The fallacious application of uniformitarian reasoning to geological process rates thus has led to the system of the evolutionary geologic ages. This in turn forms the evidential basis of the theory of evolution, which presumably accounts for the origin and development of all things, including life and including man. All of this, as we have just seen. involves a powerful system of circular reasoning, somewhat disguised but nonetheless real.

But there is another, perhaps even more significant, fallacy in this system, which will now be discussed. True uniformitarianism involves the constancy and reliability of natural laws. These laws are formulated to describe the processes of nature, and by their very nature, as concepts developed by scientific measurements and methods, these processes are known only in their *present* form. As noted earlier, these laws deal basically with the concepts

of energy and entropy, and are ultimately structured around the two laws of thermodynamics.

The most basic and universal of all scientific laws is that of conservation. There are, of course, a number of different conservation laws (energy, mass, momentum, electric charge, etc.) but the most important is that of energy (including mass, as a form of energy).

> "The physicist's confidence in the conservation principles rests on long and thoroughgoing experience. The conservation of energy, of momentum and of electric charge have been found to hold, within the limits of accuracy of measurement, in every case that has been studied. An elaborate structure of physical theory has been built on these fundamental concepts, and its predictions have been confirmed without fail."[22]

Thus, the basic structure of the universe, in so far as *science* knows it, is conservative. That is, nothing is now being created or destroyed. The present processes of nature, *including all geologic processes and all biologic processes,* are not creative in nature.

Consequently, it is fundamentally impossible for science to learn anything about origins. Science deals with present processes, and present processes are conservative, not creative. Thus, historical geology, professing to discover the history of the origin and evolution of the earth and its inhabitants through a scientific study and extrapolation of present processes, is a self-contradiction.

And the situation becomes even more contradictory when the second law of thermodynamics is considered. Not only is the universe basically conservative in quantity, but it is also basically degradational in quality.

> "Man has long been aware that his world has a tendency to fall apart. Tools wear out, fishing nets need repair, roofs leak, iron rusts, wood decays, loved ones sicken and die, relatives quarrel, and nations make war . . . We instinctively resent the decay of orderly systems such as the living organism and work to restore such systems to their former or even higher level of organization."[23]

Thus, all systems, no matter how large or how small, living or non-living, tend to become disordered and disorganized, to decay and die. Application of an excess of ordering energy from outside the system is continually needed to offset this decadent tendency, and even more is needed if, for a while, the system is to manifest a period of growth and integration.

There could hardly be imagined a philosophy more in fundamental contradiction with this actual and unquestioned law of nature than the philosophy of evolution. According to evolution, there is an innate principle of development and progress in the universe, leading always to higher and higher levels of complexity and integration.

> "Most enlightened persons now accept as a fact that everything in the cosmos — from heavenly bodies to human beings — has developed and continues to develop through evolutionary processes. The great religions of the West have come to accept a historical view of creation. Evolutionary concepts are applied also to social institutions and to the arts. Indeed, most political parties, as well as schools of theology, sociology, history, or arts, teach these concepts and make them the basis of their doctrines. Thus, theoretical biology now pervades all of Western culture indirectly through the concept of progressive historical change."[24]

We would agree completely that modern science reveals a concept of universal change — but this change is one of decay and dissipation. The supposed universal process of evolution, on the other hand, postulates a universal law of progress and increased organization. Thus, the theory of evolution and the second law of thermodynamics squarely confront and contradict each other. Each is precisely the converse of the other. One is a universal law of change upward, the other a universal law of change downward! It should be plain and obvious that only one of these principles can possibly be valid.

Herein is another, and climactic, contradiction in evolutionary historical geology. Historical geology purports to tell us of the evolutionary development of life on the earth, and to do so in terms of *present* processes. But present processes are processes of decay, and therefore contradict the very concept of evolution.

If historical geology would be truly scientific, as it claims to be, then it must recognize that it must be organized within the framework of *true* uniformitarianism, which is uniformity of natural law. It must realize that the story of earth history which it seeks to decipher has been one enacted within the framework of laws of conservation and decay, not of creation and development.

Therefore, to assume that the origin and history of the earth can be interpreted within the framework of an assumed uniformity of process rates and an assumed innate principle of evolutionary development is to reject the very basic laws of science which it professes to follow. But this would still be a permissible point of view to take, since not even uniformity of natural law can be *proved* in the prehistoric period. It is legitimate to assume, if one wishes to do so, that the two laws of thermodynamics were not in operation during the geological ages, and therefore that evolution and progress were possible on a worldwide scale. The paleontologic data can then be interpreted to fit into that framework if one wishes so to do. All the contradiction and anomalies which abound in such a system can all be explained away by piling hypothesis upon

hypothesis (e.g., explaining great areas where "young" fossils are buried beneath "old" fossils by means of the theory of the overthrust fault). Since all of this can never be subjected to laboratory verification, and is thus out of reach of the "scientific method," this framework of evolutionary uniformitarianism cannot be disproved scientifically.

But to say that a system erected upon such assumptions, which contradict the basic laws of science, is itself "scientific" is entirely unwarranted. And when the theory of evolution, based as it is upon this system, and the paleontologic data interpreted in accordance with it, is then made the foundation for all modern studies in theology, sociology, history, politics, and the arts — indeed into an all-embracing evolutionary world-view — and when all of this monstrous system is taught and indoctrinated as *scientific fact* almost everywhere, as it is today — the charge of *scientism* is a gross understatement of the true situation!

*Implications of Evolution*

The system of evolutionary uniformitarianism is, therefore, not a science but a system. It is a form of religion, a faith in innate progress, in materialistic development, in pantheistic humanism. It is the essence of modern man-centered culture. The evolutionary philosophy, as noted by Rene Dubos,[25] has profoundly affected every field of human thought and activity. Man has been led to see himself as organically linked to all other forms of life:

> "Comparative biology has revealed, furthermore. that man is linked to all living organisms through a common line of descent, and shares with them many characteristics of physiochemical constitution and of biological organization; the philosophical concept of the 'great chain of being' can thus be restated now in the form of a scientific generalization."[26]

Not only so, but since all things can be explained in terms of this supposed universal process of evolution, effectuated by the cybernetic processes of mutation and natural selection, there is no need any longer to postulate a divine Creator originating or guiding the development of the universe. God becomes an unnecessary hypothesis. Man, as the highest stage of the evolutionary process, now having come to understand and even to guide it, is himself the creator.

> "What is almost certain, however, is that the various components of human culture are now required not only for the survival of man, but also for his existential realization. Man created himself even as be created his culture and thereby he became dependent upon it."[27]

In the last analysis, then, evolution is a religion that permits man to divest himself of concern for or responsibility to a divine Creator. It is not a science in any proper sense of the word at all. And the same must therefore be true for the system of evolutionary geology which both supports it and is supported by it.

We hasten to say again that this is no criticism of the sciences of geology or biology, or of the scientists who practice them. The genuine sciences of geology and biology, dealing as they do with the *present* processes of the earth and of life are of highest merit and importance. It is believed that the great majority of geologists and biologists, who may nominally subscribe to the concept of evolution and the geological ages, have never fully considered its implications and that many of them would refute it if they did, professionally costly though such a stand might become.

It is not surprising, in view of the foregoing, that the system of evolution has been appropriated as the pseudo-scientific basis of every political or philosophical system of the past hundred years which has been opposed to Christianity, or even to theism in general. In particular has this been true of the various forms of modern "liberalism," including socialism, fascism and communism.

The influence of Darwinism upon Marxism has been especially significant:

> "Orthodox Marxian socialists in the early years of the twentieth century felt quite at home in Darwinian surroundings. Karl Marx himself, with his belief in universal 'dialectical' principles, had been as much a monist as Comte or Spencer. Reading *The Origin of Species* in 1860, he reported to Friedrich Engels, and later declared to Ferdinand LaSalle, that 'Darwin's book is very important, and served me as a basis in natural science for the class struggle in history.' On the shelves of the socialist bookstores in Germany the works of Darwin and Marx stood side by side."[28]

The views of a prominent contemporary historian, Dean of the Graduate Faculties at Columbia University, are significant:

> "It is a commonplace fact that Marx felt his own work to be the exact parallel of Darwin's. He even wished to dedicate a portion of *Das Kapital* to the author of "*The Origin of Species.*"[29]

Some of the reasons for this feeling of debt on the part of Marx are discussed as follows:

> "It is that, like Darwin, Marx thought he had discovered the law of development. He saw history in stages, as the Darwinists saw geological strata and successive forms of life . . . But there are even finer points of comparison. In keeping with the feelings of the age, both Marx and Darwin made struggle the means of development. Again, the measure of value in Darwin **is** survival with reproduction — an absolute fact occurring in time and which wholly disregards the moral or esthetic quality of the product. In Marx the measure of value is expended labor — an absolute fact occurring in time, which also disregards the utility of the product."[30]

To similar effect is the definitive historical evaluation by Dr. Gertrude Himmelfarb:

> "There was truth in Engels' eulogy on Marx: 'Just as Darwin discovered the law of evolution

in organic nature, so Marx discovered the law of evolution in human history.' What they both celebrated was the internal rhythm and course of life, the one the life of nature, the other of society, that proceeded by fixed laws, undistracted by the will of God or men. There were no catastrophes in history as there were none in nature. There were no inexplicable acts, no violations of the natural order. God was as powerless as individual men to interfere with the internal, self-adjusting dialectic of change and development."[31]

It is possible to trace similar direct connections between evolutionism and fascism, as well as other philosophical and political symptoms of the basic antipathy to God which seems to afflict a substantial segment of mankind. Perhaps of more immediate concern is the fact that evolutionism is of predominant influence in the system of John Dewey, the chief architect of modern education theory in this country.

But that is another story, and would carry us too far afield from the context of this study. Our point is simply that the presently accepted system of evolutionary uniformitarianism in the so-called historical geology has projected its influence deeply into almost every sphere of human thought and that, in general, this influence has been highly inimical to the cause of Biblical Christianity. It is thus of immense concern to people in every walk of life and cannot be left simply to the self-assumed authority of those who claim jurisdiction over this field.

*The Biblical Framework*

The study of origins, destinies and meanings is thus properly to be considered as outside the domain of science. Science deals with present processes, and present processes are conservative and degradational, not creative and organizational. Understanding of the creation and organization of the universe into its present form is therefore to be obtained from other sources than science. Religion necessarily enters the picture.

As noted, evolution is one such possible religious explanation for the universe. But as such, it explicitly contradicts what we know about the present world, which operates in accordance with the first and second laws of thermodynamics.

It is far more reasonable to recognize that neither the data nor the processes nor the methods of modern science can lead to an understanding of origins. And certainly, then, the unaided speculations of human reasonings cannot do it. Therefore, divine revelation is required if we are ever really to know anything about the Creation — its date, its duration, its methods, its order, or anything else about it.

It is eminently reasonable, therefore, to reorganize the data which we have obtained in our studies of the universe and its inhabitants in terms of the Biblical framework given us by divine revelation. The Biblical framework does give a perfectly satisfying system for harmonizing all the data of biology, geology, and paleontology, as well as other sciences.

The Bible record describes a special Creation of all things, fully functioning from the very beginning, complete and finished by creative and formative processes no longer in operation, now being sustained by God in accordance with the conservation principle enunciated in the first law of thermodynamics. It also describes a Fall of man, and God's Curse pronounced on the earth, introducing a universal law of decay and disorder, in accordance with the second law of thermodynamics, which for the first time brought disharmony and death into the world. It then describes a great world-destroying Flood in the days of Noah, which completely changed the first cosmos and its structure and processes. It indicates, then, that since the Flood there has been an essential uniformity of both laws and processes, which can thus now be studied and elucidated by the scientific method.

It will be found, if enough study is devoted to it, that all the real data of the fossil record, of biological mechanisms, of geologic processes, and of all natural phenomena, can be oriented and understood within this framework. Such a system will be fully consistent with both the basic laws of science and history and the data of divine revelation.

[1]Carl O. Dunbar: *"Historical Geology"* (2nd Ed., John Wiley and Sons, New York, 1960), p. 18. Emphasis is his.

[2]Harold F. Blum: *Time's Arrow and Evolution* (Torchbook Edition, New York, Harper and Brothers, 1962), p. 14.

[3]*Ibid*, pp. 14, 15.

[4]*Ibid*, p. v.

[5]Brian Mason: *Principles of Geochemistry* (2nd Ed., New York, John Wiley & Sons, Inc. 1960), pp. 64, 68.

[6]*Ibid*, p. 68.

[7]Blum, *op cit.*, p. 16.

[8]James H. Zumberge: *Elements of Geology* (2nd Ed., New York, John Wiley and Sons, Inc., 1963), p. 200. Emphasis is his.

[9]*Ibid*, p. 201.

[10]P. D. Krynine: "Uniformitarianism Is a Dangerous Doctrine," *Journal of Paleontology*, Volume 30, 1956, p. 1004.

[11]Stephen Jay Gould: "Is Uniformitarianism Necessary?" *American Journal of Science*, Volume 263, March 1965, p. 223.

[12]*Ibid*, p. 226.

[13]*Ibid*, p. 227.

[14]T. G. Miller: "Time in Stratigraphy," *Paleontology*, Volume 8, February 1965, p. 119. Emphasis his. Miller is at Keele University in Staffordshire.

[15]*Ibid*, p. 128.

[16]J. E. Ransom: *Fossils in America* (New York, Harper & Row, 1964), p. 43.

[17]*Ibid*.

[18]H. D. Hedberg: "The Stratigraphic Panorama," *Geological Society of America Bulletin*, Volume 72, April 1961, pp. 499-518.

[19]C. 0. Dunbar, *op cit*, p. 47.

[20]C. H. Waddington: *The Nature of Life* (New York, Atheneum, 1961), p. 98.

[21]Frederick S. Hulse: *The Human Species* (New York, Random House, 1963), p. 53.

[22]Gerald Feinberg and Maurice Goldhaber: "The Conservation Laws of Physics," *Scientific American*, Volume 209, October 1963, p. 36.

[23]Van Rensselaer Potter: "Society and Science," *Science,* Volume 146, November 20, 1964, p. 1018.

[24]Rene Dubos: "Humanistic Biology," *American Scientist,* Volume 53, March 1965, p. 6.

[25]Rene Dubos, *supra.*

[26]*Ibid,* p. x.

[27]*Ibid,* p. 8.

[28]Richard Hofstadter: *Social Darwinism in American Thought* (New York, George Braziller, Inc., 1959), p. 115.

[29]Jacques Barzun: *Darwin, Marx, Wagner* (2nd Ed., New York, Doubleday, 1958), p. 8.

[30]*Zbid,* p. 170.

[31]G. Himmelfarb: *Darwin and the Darwinian Revolution* (London, Chatto & Windus, 1959), p. 348.

## BOOK REVIEWS

By SAMUEL WOLFE

THEOLOGY — By Timothy Dwight. Review of Timothy Dwight by C. E. Cunningham. McMillan Co. 1942 (a biography).

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When he entered Yale University in 1795, there were hardly any Christians there. After he had been President a short time there were hardly any infidels.

After his death in 1817 it was said that none since Washington was more universally lamented. In 1965, who, even among Christians, has even heard of Timothy Dwight?

Almost single-handedly he reversed the trend from skepticism to evangelism. It was one of the great feats of our history. But since then the growth of pseudo-liberalism he combatted has all but obliterated his memory. Surely those professional people today who believe in the Genesis account should be challenged to wipe the dust from this honored tomb.

Though he was pre-eminent as a preacher, Dwight's reputation was gained chiefly for his defense of the faith. In his day the contributions of Lyell and Darwin were still future. But he well discerned the approaching storm. Dwight's "Theology"[1] is still obtainable in many libraries, and his keen pithy utterances on these matters are still pertinent. His well-reasoned contentions for the Genesis account of the Creation and the Flood are inspiring for the Creationist today.

[1]Theology; explained and defended, in a series of sermons, by Timothy Dwight. 5 volumes. Printed by Clark and Lyman for Timothy Dwight. New Haven, Connecticut, 1818-19.

By WALTER E. LAMMERTS

Freedom, California

*Wonders of Creation.* Harold W. Clark, Pacific Press Publishing Association, Mountain View, Calif. 1964. 129 pages. Nine colored illustrations and 65 black and white.

Professor Emeritus Clark has done a superb job in writing and the Pacific Press Publishing Association in publishing this beautifully illustrated book. In his introduction he very aptly quoted from Remans 1 :19-21: "For what can be known about God is plain to them, because God has shown it to them. Ever since the creation of the world His invisible nature, namely, His eternal power and deity, has been clearly perceived in the things that have been made." Clark goes on to say that as he has studied nature for many years, he has been looking for these proofs. The facts he gives and beautifully illustrates constitute clear proofs, not only that God exists, but that He is continually at work "upholding all things by the Word of His power." Hebrews 1:3.

Aside from the chapter "The plants will teach you," which we have reprinted with both his and the publisher's kind permission, all the other chapters are equally interesting and challenging to anyone who is fair minded and wishing to see evidence for the glory of God's creative genius. In this mechanistic age we are in danger of being completely out of touch with the nature that God created. Even our school laboratories are being taken over by materialists who would vainly try and reduce everything in nature to mathematical equations expressing impersonal physico-chemical laws. It is refreshing then to turn to this book and see nature in larger perspective and have one's attention again called to the many clear evidences not only of design but beautiful design.

Some of the intriguing chapter headings are "Who made birds fly?" "the fish declare," "Treasures of the sea," "the desert shall bloom," and "fearfully and wonderfully made." The picture of the peacock alone is worth the price of the book! The chapter on "Divine geometry" is one that has personally intrigued me for a long time. It is interesting that the mathematical concepts man arrives at without relation to a study of nature are the very same ones we see displayed in nature! Surely interesting evidence that though we are finite, our thinking or conceptual ability insofar as it may be expressed conforms to that which God displays in nature: that is we think in the same image as He does, even though finite and therefore incapable of ever fully understanding what we see.

I particularly like Professor Clark's discussion of the origin of desert plants. So many people think cactus originated in the desert in response to desert conditions. The sight of the immense barrel shaped cactus growing among the pine trees which one sees on the way to Acapulco, Mexico, should quickly remove this illusion. As Clark says, as desert conditions developed, many plants died out and only those having genetic variability potential *already existing* were able to survive.

This marvelously illustrated book is a must for every teacher of boys and girls of high school age.