

THE EARTH IN SPACE AND TIME

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This paper discusses the problem of the origin of the earth and heavenly bodies in the light of the Genesis record and modern scientific discoveries.

Since introduction of pagan philosophical interpretation into Christian theology in the fourth and fifth centuries A.D., Christian scholars have had to battle against evolutionary theories.

Modern astronomy has pushed back the bounds of the universe both in space and time, but so far as any explanation of the manner of its origin, nothing but hypotheses have been offered. No proofs of any kind have been forthcoming.

Atomic physicists have given strong support to the doctrine of creation by discovery of the relation between matter and energy. But no explanation has ever been offered that will show the source of the energy units from which material substance was derived. The Bible alone answers the question by saying that "by him all things consist." (Col. 1:17)

Attempts to push the time of the flood and creation back many thousands of years beyond the records of Genesis have met with very serious problems, and a careful analysis of the situation supports the "short-time" chronology.

It is important that Christian scholars avoid being "uniformitarian creationists" and thereby surrender the fundamental principles of true creationism.

From the beginning of human records, man has been concerned with the great mysteries of existence: how did the earth and life originate, what relation does the earth sustain to the rest of the universe, and how was this relationship established? Two philosophies have been developed—*cosmology*, which attempts to describe the universe in space and time, and *cosmogony*, which attempts to solve the problems of origin, nature, and purpose of the cosmos.

The purpose of this paper is to discuss the above questions in the light of modern scientific discoveries and of the Genesis record, and to see what conclusions can be reached that will be acceptable to the scientific Christian scholar. So much has been written about cosmology and cosmogony of ancient and medieval times that it is hardly necessary to go into that phase of the subject, except to point out very briefly the influence these ideas have had on modern scientific interpretation.

When Christianity became the dominant factor in the thought of the western world, its basic philosophy was founded on the Genesis record which set forth three fundamental principles: (1) that Jehovah God had created the heavens and the earth, (2) that this world and kinds of life were made in six days, and (3) that most of the life on earth was destroyed by a universal Deluge, known as the Noachian Flood.

In opposition to this world-philosophy, various pagan nations had their cosmogonies, none of which have proved to be of any real significance in solving the great problems of existence, either of the earth or of life upon it.

Had proponents of Christianity retained a firm commitment to the creation record of Genesis, modern science might have developed with quite a different emphasis than it has. But when Augustine and other theologians brought certain Greek ideas of the origin of the earth and the origin of life into Christian theology in the fourth and fifth centuries A.D., a dualism resulted which was very influential in the development of modern scientific philosophy. On one side of the question was the creation doctrine based on a literal interpretation of the Genesis record; and on the other side was the idea of long ages of evolutionary progress.

Beginning of Modern Science

In order to understand how these two conflicting views have influenced twentieth century philosophy, let us start with what might be considered the beginning of modern scientific thought, the work of Sir Isaac Newton. His studies on gravitation laid the foundation for celestial mechanics. Instead of men believing as they formerly had, that the movements of heavenly bodies were erratic, after Newton they came to realize that all existence is under the control of law, and that order and system prevail throughout the universe. The whole development of modern science is said to have begun with the publication of Newton's *Principia* in 1687. His mathematical principles, as set forth in this famous work, guided scientific men from that time on as they extended their search for natural knowledge.

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Sir William Herschel, an English astronomer, followed in the footsteps of Newton, and became the founder of sidereal astronomy. Some of his discoveries have had a profound influence in modern cosmology. His work was done between 1780 and 1822, approximately a century after Newton.

His work on the Milky Way led to the conclusion that the sun lies near the center of a flattened disc of stars with a radius of 2,000 parsecs (a parsec is 3.26 light-years, that is, 3.26 times the distance light will travel in a year) in its short radius, and about 30,000 parsecs in its longer distance.

Herschel saw nebulae, and compiled a list of 2,500. He suggested the idea of "island universes," but his ideas were so far in advance of the thinking of his time that it was over 100 years before this interpretation was accepted. It was not until 1924 that nebulae were recognized as galaxies. This was largely due to the work of E. P. Hubble of Mt. Wilson and Palomar observatories. He found evidence of stars far beyond our galaxy, and surveyed nebulae and found them distributed in all directions. From a study of several thousand photographs he derived a significant classification of other galaxies beyond the Milky Way.

The Palomar 200-inch telescope with which Hubble worked now reaches a billion galaxies, some of which are a billion light-years from the earth. The search for a fixed center of the universe had shifted away from the earth to the sun; then as the sun became only a minor member of the Milky Way galaxy, the search shifted to the greater universe beyond, for even the Milky Way galaxy appears to be only one of a number of large galaxies.

Origin of the Universe

With all this amazing array of information regarding the universe, where do we now stand philosophically? The problem now shifts from the nature of the universe to the question of the manner and time of its origin. Study of radioactive elements has led many scientists to believe that the universe may be as much as five billion years old.

The suggestion has been made that matter originated under the influence of a number of significant factors, such as, for instance: (1) the presence of high temperatures, (2) the presence of free neutrons, protons, and electrons, (3) progressive aggregation of particles of matter as they were formed, and (4) extremely rapid formation of elements, probably within the first half-hour of existence.

Interesting as these suggestions may be, they fail to answer one vital question: the source of

these various factors. Where did the free neutrons, protons, and electrons originate? What forces were at work to cause them to unite to form matter? Until these questions can be answered, we are no nearer an explanation of the origin of matter than before.

Not only is this true, but to add to the quandary, many stars fail to fit into the sequence of later events supposed to lead to the present composition of the universe. Hoyle has suggested that the heavier elements were formed in supernovae and then dispersed. Yet there are far too few of these to account for the heavier elements of our galaxy.

Several hypotheses have been put forward to account for the origin of the universe. The earliest one of consequence was proposed by the French mathematician Laplace, in 1795, and is known as the nebular hypothesis. Laplace imagined that a lenticular nebula once existed as a diffuse mass of incandescent gas, filling space beyond the present limits of the solar system. As it cooled and lost heat, it shrank in diameter, and condensed into rings. These rings consolidated to form the planets.

The nebular hypothesis involved so many problems that at present it is wholly untenable to astronomers, and they have looked elsewhere for an explanation of the origin of the solar system. In passing, it may be noted that spiral nebulae are still pointed out as evidence of some kind of a process similar to that postulated by Laplace. But the only real evidence is the shape of the nebulae, and there might be many explanations, therefore this characteristic is of no real value.

In 1904 the geologist T. C. Chamberlain and the astronomer F. R. Moulton presented the planetesimal hypothesis. Incandescent gas torn from the sun, they suggested, was cooled and congealed in outer space to form small particles, or planetesimals. In time many of these aggregated supposedly to form the present planets. This hypothesis met with so many difficulties that it is now regarded as worthless. Just to mention one difficulty: it fails to account for the composition of the earth, with its iron-nickel core and its mantle and crust of entirely different types of rocks.

A more recent suggestion is that scattered dust particles in space might have been acted on by light pressure from the stars and thus caused to congregate, eventually forming the sun. But this does not account for the origin of the dust particles nor the stars.

It is quite obvious as we study these various hypotheses that they all start with the assumption of some kind of particles, either material or

energy units, but none of them can explain how or where these particles came into existence. This is an inscrutable problem.

Different Origins of the Universe

At present two theories (better called hypotheses, as they have really not reached the status of true theories) are attracting considerable attention. One hypothesis is called the "point-source" theory, or more commonly the "big-bang" theory. Proponents assume sudden formation of the universe from a small mass. Supposedly, this mass has been expanding and as new bodies are formed, they race away from the center of the universe at a terrific rate. The other hypothesis, the "steady-state" theory, assumes that the universe is stationary. The red shift upon which the idea of an expanding universe is built, does not mean expansion, say the advocates of the steady-state theory. On the contrary, new matter is being created in outer space, and it is this new matter that gives the appearance of expansion. In 1948 Hoyle and others proposed that the rate of the supposed expansion is equal to the rate of the creation of new galaxies.

It is not at all difficult, upon examination of these hypotheses, to recognize that they rest on grounds that are equally as unstable as any others that have previously been proposed. The whole matter of cosmogony is simply a case of speculation, but so far all of these speculations remain at the hypothesis stage.

Quantum mechanics has reduced the properties of the atoms to energy relations between various factors such as gravitation, magnetism, etc. Thus modern physics has linked the existence of matter with energy. The work on atomic disintegration has modified the old concept of matter formed *ex nihilo* to creation of matter from energy.

This still leaves unanswered the question of the source of energy organized into matter. Is matter only an accidental organization, or did it require direction by an intelligent Creator? Anyone familiar with the complexity and the systematic organization of chemical compounds finds it extremely difficult to believe that it all came about accidentally.

And what about "free energy?" Can it exist without any source? As far as we know energy proceeds from some source; it does not exist free in space. And if it does have a source, or even if it did exist free, could it ever build up this complicated universe without intelligent direction? These are questions that scientists have been unable to answer to this date.

With all these hypotheses, how much nearer are we to the ultimate solution of the origin of

the earth and of the heavenly bodies? We have two approaches to the question—the Bible and imaginative speculation of scientists.

The Bible clearly declares the ultimate source of all being in the following words:

By the word of the Lord were the heavens made. . . . For he spake, and it was. (Psa. 33:6, 9)

For by him were all things created. . . . And by him all things consist. (Col. 1: 16, 17)

Upholding all things by the word of his power. (Heb. 1:3)

Here, instead of vague speculations, we have positive statements, in fact, the only positive statements on the subject. Revelation gives what scientific methods cannot possibly reveal. The declaration in Genesis 1:1 states a profound principle that scientists have neither been able to overthrow nor substitute with anything better, in spite of all the new knowledge of the universe brought forth in recent centuries.

Ancient Records of Time Considered

Thus far we have been considering the world in space, but now let us turn to the question of time. What about the time element in creation? Can we learn anything from scientific investigation, or is time as well as space to be understood only by accepting the revelation of the word of God?

Ancient records regarding time are vague and difficult to coordinate with scientific time scales. A few examples will demonstrate this.

Chinese legendary history goes back to 2,700 B.C., but authentic chronology dates only to 1,300 B.C. Therefore this does not help us any in determining the age of the earth.

Hindu history began in the third century B.C. Their scholars worked out a system of cycles of the heavenly bodies that would mark the beginning of all things. The date at which they arrived was 4,320,000 years ago. Obviously this is purely theoretical, and is of no aid in solving our problem.

Egyptian tradition and mythology make it impossible to recover much of prehistory in that land. The first dynasty, that of Menes, a traditional monarch, is given by the 1966 edition of the Encyclopedia Britannica as 3,100 B.C. This is much more recent than older chronologies of Egyptian dates, and is not far from acceptable creationist estimates.

Before the first dynasty the Paleolithic "period" is estimated to have dated back to about 4,500 B.C. This is based solely on the uniformitarian hypothesis, which assumes that Paleolithic man arose by slow stages from savagery. The time may have been much shorter. From the first to the twelfth dynasty the records are very frag-

mentary, and may be subject to more change than is generally acknowledged by archaeologists.

The early Egyptian dynasties were listed by Manetho, an Egyptian priest of about 300 B.C., who wrote an Egyptian history for Ptolemy I. Only fragmentary portions of his writings are to be found in Josephus and other writers. Some of the dynasties of upper and lower Egypt may have overlapped, and if so, the time would have been shortened.

Babylonian records begin about 2,000 B.C., which is well within Biblical historical times. The earliest Greek records date from about 1,250 B.C., and the Roman from about 750 B.C., therefore these are of no value in settling the problem of the age of the earth.

Time Based on Genesis

The only records on which accurate dating can be established is that found in Genesis 5 and 11. Archbishop Ussher followed the Masoretic text, and his dates were placed in the margin of the King James version of the Bible for many years. According to his calculations, creation took place 4004 B.C. Many conservative scholars today doubt that his calculations were completely accurate, and yet, it must be admitted that they do give an approximation. One other translation, the Septuagint, made in the third century B.C., gives longer lives to many of the patriarchs. If this were accepted, the date of creation would be set at about 5,000 B.C. Josephus lists the patriarchs and agrees with the Septuagint. Which of the two possible dates is correct, is a debated question.

As to time before creation week of Genesis One, there are no valid records of life upon the earth—nothing but speculation. Therefore the only time that the Christian can reasonably accept, *on the basis of written records*, lies somewhere between 4,000 and 5,000 B.C., if we are to avoid doing an injustice to the Genesis record. Only a few hundred years would be necessary to adjust these dates to the Egyptian chronology.

Of course geologists would not agree with this conclusion, for they think they have evidence from the rocks that the Genesis record is not dependable. But it must be pointed out that the theory of long geological ages is open to serious question, however, that problem is outside the scope of this article.

One problem we must recognize is that of the rise of the great empires of antiquity before the dawn of recorded history about the time of Abraham. Many have asked, how could such large nations develop in so short a time? In answer to that query let us point out that the human race was very prolific at that time, and

the natural death rate low; we must not think in terms of the present rate of population growth.

Thus, when we consider the rapid multiplication of people in the early years of earth history and look at the population of the United States within 300 years, we begin to realize that not so many thousands of years are required as are often assumed to have elapsed between the flood and the time of Abraham. True, Bronze Age is placed at about 2,100 B.C. to 1,500 B.C., and the stone ages are, by some archaeologists, dated as far back as 10,000 B.C. But, as we have stated, Christian scholars are not obligated to accept these dates as valid.

Other Questions of Time, Uniform Change

Another question has been raised by glaciologists. If, as seems evident, the ocean levels were raised by the melting of the great ice sheets, how can we correlate this with Biblical history? If we put the glacial period after the flood, would not the melting of the ice have flooded the seashores within historical times?

Two points should be kept in mind. First, the theory of multiple glaciations is being challenged by competent authorities, and specialists have seriously suggested that the first three glacial "periods" are only evidences from various phases of the one true glacial epoch, the Wisconsin. Then if we put the flood from 2,500 to possibly 3,000 B.C., we have a thousand years between then and the first seaport of which we have any knowledge, that of ancient Tyre. This problem is one that needs study, but there are possible solutions well within the time limits allowed by present understanding of the Biblical narrative.

A careful review of all the genealogies and chronologies of ancient times shows that the oldest and most complete record is found in the Bible. No one has been able to offer positive proof against the Genesis record and its time elements. It is true that we cannot pin the time down exactly, nevertheless we can be confident that the time of creation can be located within fairly close limits.

We realize that some creationists, while they totally reject the evolutionary theory, still maintain that creation must have taken place as much as 30,000 to 100,000 years ago, and some even suggest millions. But these views are no more tenable to the conservative creationist than are those of the evolutionists, as far as time is concerned. The chief problem of these theorists is that they feel that they must have more time than the Genesis record allows to account for all the geological changes that appear to have taken place between the flood and the beginning of written history.

These creationists confuse the issue when they try to account for geological changes on the basis of more or less uniform action. They may recognize that the flood was responsible for some geological changes, but fail to grasp the enormous proportions or the violence that must have continued afterwards for many hundreds of years. These persons might be designated as "stretch-time" creationists or "uniformitarian creationists." Their main problem is that they are thinking too much in terms of present rate of change. They believe in creation, but confuse the whole question of time because they cannot conceive of processes much different from what they now observe.

The problem of radioactive dating is discussed by other authors in this *Annual*. Therefore I will simply submit that the claims put forth in that

field are not very impressive since there are so many untested and untestable hypotheses at the basis of the methods involved.

In conclusion, what can we really know about the earth in space and time? As far as space is concerned, we know a great deal, for our knowledge of the universe has expanded tremendously within the last four hundred years. But with respect to time, we know absolutely nothing about the origin of the rest of the universe, since the Genesis record deals only with the creation of this earth, and scientists have offered nothing but vague and impossible hypotheses. We can therefore conclude that the Biblical record of creation of the earth only a few thousand years ago is still valid, for nothing that scientific investigation has brought to light can disprove that record.

IS THERE LIFE ON OTHER WORLDS? A CRITICAL REASSESSMENT OF THE EVIDENCE

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The case for life on other worlds is examined according to three hypotheses that are presently put forward, viz.

1. *That there are numerous planetary abodes for life in the Milky Way and in the extra-galactic nebulae.*
2. *That simple life came into being by a fortuitous assemblage of inorganic matter in the primeval oceans of the earth.*
3. *That life has evolved from a simple beginning on earth and that it will have proceeded in a similar fashion on the other hypothetical planets.*

Evidence on each of these three counts is shown to be unsatisfactory and the intellectual edifice one that is open to considerable doubt. The question of life on other worlds is seen to be an open one.

"There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact." (Mark Twain, *Life on the Mississippi*)

Prejudice in scientific matters is deeply ingrained and never more so than in the answers which are given to the question, Is there life on other worlds? Evidence for and against is meager and the answer is always an opinion, or assertion, not a statement of scientific fact.

Landing of men on the Moon has engendered a surge of rash speculation, with dogmatic statements through the mass media to the effect that the achievement is the greatest thing to have happened since "the fish stood up and walked out of the sea," and that the answer to extra-terrestrial life is at hand. But no one is

able to show, outside fiction, that the fish once stood up and walked or that the problem of extra-terrestrial life is near resolution.

The dogmatic approach to the question of life on other worlds, of which I complain, is best illustrated by two representative statements. Ian McDonald reported in *The Times* of London (8 August, 1969 from Washington) on the subject, "Mariner 7 Finds Clue to Life on Mars," as follows:

By coincidence, the Mariner findings came only a day after other scientists had found evidence of organic material potentially suitable for the spontaneous evolution of life, in two separate samples of Moon dust. (Emphasis added) (p. 1)

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