Others have worked on this question and they too have given quantitative determinations of temperature lowering during the ice age. Some examples are set forth by Nairn.¹⁶

The significant fact to note is that the *Encyclopaedia Britannica* suggests a temperature drop at the height of the ice age of 7-8° C which equals 12.4-14.4° F. Furthermore, the temperature drops estimated by other scientists range from 5 5° C to 11° C. This equals 9.9° F -19.8° F. Note that these temperature differentials agree precisely with a post-flood temperature that was 10° F -15° F colder than today, which we concluded must be the situation based on the carbon inventories. Thus, we are greatly encouraged that the calculations of this chapter have merit.

Secular scientists talk about an ice age that continued on and off for one million years. They speak, too, of inter-glacial periods when there were warm spells. When we realize, however, that one million years is recent compared with the four and a half billion years they believe the earth has existed, we see that they, too, are acknowledging that, relatively speaking, the ice age is very recent. Moreover, since the Bible establishes the earth's age as some 13,000 years, any other time periods suggested by secular scientists must be recognized to be erroneous. All evidence must be evaluated within the much narrower compass of 13,000 years rather than millions or billions of years.

To put it another way, once we realize that the ice age could have been induced only by the flood about 7000 years ago, then we know that the ebb and flow of the ice sheets would have been of tens or at most hundreds of years in duration. Thus, so-called inter-glacial periods become insignificant in the whole phenomenon. In fact, some of the phenomena commonly associated with warmer inter-glacial periods probably are to be associated instead with the warmer preflood world.

We might note, too, that our calculation of the world-wide average temperature before the flood agrees with the ice-age phenomena. At the ice age maximum, 28% of the continents were covered by ice. Since the ice age maximum, the world has warmed 10-20° F., and today over 10.4% of the continents are ice covered. Thus, we conclude, as an approximate generalization, that the world without an ice cap would possibly be warmer in proportion to the size of the ice cover. This proportion would point to a pre-flood, pre-ice age temperature that was 6-12° F. warmer than today. This obviously is a comparatively unreliable basis for making a temperature estimate,

but it does offer a guideline. We are encouraged that the conclusion of the study set forth in this chapter, that the pre-flood world was 10-15° warmer than today, is entirely in agreement with this guideline.

Carbon Cycle Changes

While there is evidence of temperature differentials in the past which agree with the conclusions of this study, other questions might fairly be raised. Does a figure of 3.7 gr/cm² over the earth's surface for the carbon in the carbon cycle immediately after the flood make sense? Where would the carbon have come from to build up to its present estimated volume of 8.8 gr/cm²? Are the 7000 years since the flood of sufficient duration to permit this build-up?

To answer these questions we should go back to creation. We discover from the Bible that the earth was formed out of the water and by means of water. We read in II Peter 3:5-6:

For this they willingly are ignorant of, that by the word of God the heavens were of old, and the earth standing out of the water and in the water: Whereby the world that then was, being overflowed with water, perished.

This suggests that in the day God created the dry land the foundation rocks of the earth were covered by sedimentary rock and soil.

Interestingly Dr. Cook argues for the conclusion that certain sedimentary rocks were present from the very beginning. He declares:¹⁷

These arguments seem, therefore, to show that the limestone and dolomite precipitates have always been present in the crust of the earth, being most likely precipitated in the relatively very brief period (Jeffreys, p. 959), of solidification of the crust during which thermal equilibrium was being established in and near the earth's surface under the present solar radiation-density environment.

The above (solubility and occurrence) requirement that the carbon in calcite and dolomite precipitates had to be present as such, and in practically the same amounts, throughout the entire history of the (solid) earth poses a difficult restriction apparently not even seriously considered previously.

This sedimentary rock and soil, of course, contained no C14, for that is a product of cosmic ray activity which could not have begun before creation. The sedimentary rock and soil of creation did however contain vast quantities of carbon. Estimates of the present volume of this carbon range from 1800 gr/cm² over the earth's surface to 5000 gr/cm². ¹⁸ In addition there is the carbon in the carbon cycle which we estimated to be about 10.5 gr/cm² before the flood and which is found in the vegetation, atmosphere, and ocean solution.

As already noted, in the post-flood world, a large part of the continent (an estimated 28.4%) was covered by glacier ice because of the flood. Thus, considerable carbon was covered which ordinarily would have been available to the carbon cycle. Additionally, large quantities of carbon were buried and became coal and oil fields. Moreover, the oceans were severely diluted of available carbon because of the new water from deep space. The carbon available to the carbon cycle therefore was reduced to the approximate 3.7 gr/cm² we have estimated.

Following the flood we would expect a substantial build-up of available carbon to the carbon cycle, especially from two areas. The first would be land erosion, and the second the uncovering of land shielded by glaciers. Any soils that had not been solidified into sedimentary rock by the action of the flood would have provided comparatively large sources of carbon. Since the ocean had been depleted of carbon by the dilution of the flood, much of this carbon provided by land erosion would have been available for ocean solution. In fact, many sediments were no doubt in suspension in the ocean water following the flood, and by the end of several hundred years would have entered the carbon cycle. As carbon from these extensive sediments became a part of the ocean solution, in time it would have added to the atmospheric carbon. Thus, warming of the earth would have occurred. This warming would have hastened glacial melting, which would have opened up substantial land areas, thus uncovering additional carbon to the carbon cycle.

It is possible from the secular evidence to show that an increase from an average of 3.7 gr/cm² of carbon in the carbon cycle in 4990 B.C. to 8.8 gr/cm² at the present time is quite realistic.

Dr. Plass estimates that during the last hundred years there has been an annual increase of 7.9 x 10⁹ tons of CO₂ in the CO₂ reservoir. ¹⁹ This is due chiefly to the burning of fossil fuels and the release of carbon from the soil. If we calculate the annual increase that would be

required to increase carbon from 3.7 gr/cm² to 8.8 gr/cm² during a period of 7000 years, we obtain an average annual increase of $\mathrm{CO_2}$ of 14.8 x 10° tons per year. This figure is a bit higher than the Plass estimate of 7.9 x 10° tons presently added annually, but it is of the same order. The higher figure surely reflects the heavy release of carbon from the soil during the period immediately following the flood.

As an additional check on our study let us calculate the carbon increase during the past 2250 years. We are able to estimate the annual increase of carbon to the carbon cycle during this period because of our knowledge of the carbon 14 to carbon 12 ratio that existed during this period.

As we saw earlier in this study, the ratio which we called the specific activity "I" has been relatively constant during the past 2250 years. Since we know the rate of increase of C14 during this time span (see Figure 1, Curve B), the rate of C12 increase would have been approximately identical. Calculating this increase of C12 gives us a figure of about 1 gr/cm² increase during the last 2250 years. This increase calls for an annual increase of about 11.9 x 109 tons CO₂ as compared with the Plass estimate of 7.9 x 109 tons annual increase at the present time. This calculation again serves to indicate the reasonableness of the calculations set forth in this volume.

Summary

In this chapter we have stepped forth boldly to attempt a reconstruction of the climates of the past going all the way back to the beginning. Because certain facts are available to us which are denied others who do not accept the Bible as absolutely trustworthy, we hopefully have been able to make this reconstruction in a much more accurate fashion than any heretofore attempted. With the certain knowledge of such Biblical facts as the date of creation, the existence of deep space waters, the date and certainty of the flood of Noah's day, the fact that much water was added to the earth during the flood, the scope and severity of the flood, and as a result of the flood the mountains were thrust up and the ocean basins were deepened, we were able to make computations that otherwise would have been impossible. The secular evidence of deep space water, deep space C14, ocean floor rifts, past temperature differentials as demonstrated by the ice age, and the lack of equilibrium in the C14 inventory all have served to further support the inerrant Biblical statement.

In any study of the past all facts are not known and some estimates must be made. By carefully making estimates which are in agreement with the known facts as far as quality is concerned and which are not sensitive in regards to precise quantities, we believe we have remained on solid ground in this study. Such estimates as the height of the preflood mountains, the selection of C14 date which points to sufficient worldwide catastrophe that we can relate it to the flood, and the relationship of CO₂ content to climate are some of the estimates which were integrated into known facts to obtain our conclusions.

Our conclusions that the pre-flood world was 15° to 20° F. warmer than the world today, and that the world temperature plunged downward 20° - 30° F. as a result of the flood, are supported by the secular evidence of great ice sheets that covered the earth in the past. The secular conclusion that at the height of the ice age the worldwide temperature was 10° - 20° F. colder than today gave further support to the conclusions resulting from this study.

We are quite aware that the conclusions of this chapter are somewhat speculative compared with information discussed in our earlier chapters. But we do believe this study will help to see the possibility of obtaining the most satisfactory reconstruction of the past only if the Bible data is considered.

In the next chapter, we want to look at the phenomena of ocean floor spreading and continental drift.

NOTES

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Chapter 14

The Earth was Divided

(Genesis 10:25)

In a previous chapter, we saw that the oceans present a great threat to the scientists' conclusion that the world is billions of years old. This is as it should be; the idea of this kind of age for the earth is completely without Biblical basis. Without regard for the Bible's clear teaching that this world is in the bondage of decay, scientists are determined to reconstruct, if at all possible, the geological and paleontological sequences of history. This is a difficult task even with Biblical help; and without help from the Bible, it is virtually impossible. The effects of the bondage of corruption (floods, fire, earthquakes, pestilence, etc.), have confused and thoroughly fragmented the natural record so that one wonders if any kind of satisfactory evidence can be forthcoming.

Man has successfully discovered many of the immutable laws by which God governs the universe. These discoveries have enabled him to achieve many scientific breakthroughs. New materials, medicines, surgical techniques, communication methods, and stratospheric explorations are all a result of man's discovery of God's laws of nature. Because man has been able to send a man to the moon, he has proven his ability to know the various concepts involved in such an undertaking. He must be given full credit for a job well done. He could be expected to succeed in his rocket trip because he is simply utilizing mechanisms that operate in accordance with the very precise laws that God has established.

These accomplishments have made men bold to believe that a like application of effort and intelligent research should enable man to turn the clock back to the beginning, and thus help him to understand the present and anticipate the future. So, scientists have courageously set forth in their search. Even though they must guess and speculate and assume as they view the available evidence, they are not afraid to draw conclusions, tentative though they may be. The rest of mankind

(too often Christians included), because they worship science, without question eagerly adopt each and every scientific conclusion.

Man continues to pour millions, even billions, of dollars into earth research and space exploration, and one can almost predict that he will develop more and more evidence to show that the Bible is correct. This will not cause natural man to believe the Bible. He probably will simply note that the ancients who wrote the Bible had some good ideas. The added testimony which attests to the accuracy and trustworthiness of the Bible will surely stand in judgment against man if he continues to deny the Lord of the Bible.

Back to the Oceans

Nevertheless, we must look briefly at other phenomena presently being considered by scientists, that is, the phenomena of ocean floor spreading and continental drift. These, too, are without satisfactory explanation apart from the Biblical testimony. Let us look briefly at the available evidence and the scientists' conclusions concerning this evidence, and then we will look at the evidence in the light of the Bible.

Increasingly in recent years scientists are discovering that the ocean floor is quite different from that which they had expected. Rather than an ocean floor covered by the accumulations of sediments deposited during eons of continental weathering, they have found it to be relatively bare of sediments. This paucity of ocean floor sediments has puzzled scientists, as we saw in a previous chapter.

Scientists now believe they have found a possible answer to the strange lack of ocean floor sediments. They believe that it is possible that the ocean floor is renewed every 100 million years or so. They believe that this is accomplished by the ocean floor moving under the continents at a rate of 2 to 10 centimeters per year; the ocean floor moves away from mid-ocean ridges and acting as a huge plate, slides under the continents at the edge of the ocean; and the sediments are swept clear as the ocean floor slides under the continent. Not only is the ocean floor apparently moving but the continents appear to be moving. As they move, they slide over the ocean floor, driving the sediment on the ocean floor deep in the earth. Scientists are presently earnestly studying evidence that gives rise to the conclusions of ocean floor spreading and continental drift. The scarcity of ocean floor sediments is part of the evidence that suggests these conclusions.

The floor of the ocean contains other evidence. Careful study of the ocean floor has revealed that in each ocean there are great ridges constructed by extreme volcanic activity. Karl K. Turekian writes:

The major oceanic ridge systems form a series of connected topographically high areas present in all oceans. Ridges are between 1000 to 4000 kilometers above the ocean floor at points protruding from the sea surface as islands. The term 'mid-oceanic ridge' has sometimes been used for the system, after the most prominent example, the mid-Atlantic ridges. The topography is representative of a composite of volcanic and rupture features, called faults. At the center of the mid-Atlantic ridge, for example, there is a discontinuous 'rift valley' characterized by heavy earthquake activity and higher than average heat flow. A series of transverse trenches that offset the axis of the ridge is also prominent . . . the ridges appear to be continuous around the earth, except for offsetting by breaks. They are a major feature of the ocean basins; coupled in some way to the location of the continents.¹

The discovery of parallel magnetic bands on either side of these ridges has helped to foster the thought that the ocean floor is spreading away from these ridges toward the continents. Because, as igneous rocks solidify and cool, they are magnetized to match the earth's magnetic direction existing at the time of such solidification, it is possible to determine the earth's magnetic situation in the past. As ocean floor lavas on either side of the oceanic ridges were measured for their magnetic sign, it was discovered that the sign of the remnant magnetic field alternated in bands parallel to the ridge. This has led scientists to believe that there must be some kind of a spreading action that is taking place on the ocean floor. As new lavas pour forth from the ridges they solidify with the magnetic sign of the earth at that time. As they pour out on the ocean floor, the existing ocean floor is pushed away from the ridges and toward the continents. O. W. Scholl writes:

The general spreading model stipulates that pebogic sediments are swept against the continental block, along with down-welling oceanic crust, and are either added to or stuffed beneath the continental crust ²

The assumption of ocean floor spreading as related to remnant magnetic fields is discussed in an article in "Science Magazine":

Additional information about reversals is provided by the magnetic anomalies over the mid-ocean ridges. These anomalies are produced by igneous rocks which become magnetized as they solidify and cool in a narrow zone along the ridge axis. As new material forms, the previously magnetized material spreads to either side. If the rate of spreading is the same on both sides on the ridge, the result is a bilaterally symmetrical pattern of normally and reversely magnetized strips with widths proportional to the lengths of the corresponding polarity intervals. The magnetic anomalies do not in themselves determine an independent reversal time scale for reversals, the profiles provide a nearly continuous record of polarity intervals.³

The timetable of this spreading action is quite recent by geological standards which speaks of millions and billions of years. John and Maurice Ewing write:

Dividing the half-width of the thin sediment strip by the magnetic anomaly pattern gives a date of approximately 10 million years ago for the discontinuity in all areas, whether the spreading rate has been fast or slow. Thus it appears that the initiation of the spreading cycle occurred in many parts of the world at the same time.⁴

A timetable of less than ten million years is further suggested by Enrico Bonatti, who writes:

A basalt pavement outcrops almost continuously in a band along the crestal region of the East Pacific Rise. . . . The lavas are fresh "oceanic tholeuities" which were emplaced less than one million years ago by fissure eruptions.⁵

Thus, the assumption of ocean floor spreading is one theory that has been set forth to account for the relatively thin sediments found on the ocean floor. Karl V. Turekian writes:

The ocean floor sediments are transported under the continents as the result of ocean floor spreading. This explanation is particularly attractive in light of the recent interpretation of magnetic anomalies in the deep ocean.⁶

John and Maurice Ewing address the question by suggesting that this spreading has produced the thin sediments.

The suggestion was made that the spreading that has produced the thin sediments on the crest is relatively recent and that it has been

preceded by a long period of quiescence during which the flank sediments had accumulated.⁷

The spreading of the sea floor is suggested as the reason for the relatively deep sediments which are found along the continents. J. Tujo Wilson makes reference to this:

Most geologists who have studied the broad problems of the earth have been puzzled by the behavior of continental margins. In all parts of the world near coasts, sedimentary deposits are found which appear to have been derived from places where there is now deep ocean, and these deposits, with others from the continental side, seem to have been pushed on to the continents forming marginal mountains and adding to the area of the continents.⁸

The theory of ocean floor spreading is not without many problems. Scientists are surprised that there is so little evidence of ocean floor buckling, a condition that would be expected if the crust of the ocean floor were being pushed away from the ridges and toward the continents. L. Knopoff writes:

Over large parts of the sea floor, generally remote from the median ridges, deep sedimentary basins show little evidence of buckling or warping.⁹

The lack of evidence to suggest the ocean floor is spreading against the continents is seen elsewhere also. The Peru-Chile Trench, for example, located in the Pacific Ocean along South America shows no evidence of this kind of spreading action. O. W. Scholl, *et al.*, write:

None of the expected stratigraphic and structural effects of a spreading sea floor have been imposed on the sedimentary fill of the Peru-Chile Trench. During the last several million years, and perhaps during much of the Cenozord, the trench has not been affected by an oceanic crust thrusting under the continent.¹⁰

The age correlation of ocean bottom crust being progressively older as related to the mid-ocean ridges is not satisfactory either. Although potassium-argon dating leaves much to be desired, as was shown in a preceding chapter, it is the one dating method presently employed to attempt to determine ocean floor ages.

David Fisher, et al., write:

K-Ar determinations of age from whole rock samples of tholeutic basalts dredged from the crest of the East Pacific Rise and from the flanks of three seamounts of varying distances from the crest, show that the crest is younger than one million years and that age does not correlate with distance from the crest.¹¹

One other phenomenon is receiving great attention by scientists and may be related in some manner to the evidence which suggests to scientists that the ocean floor is spreading. The phenomenon is the possibility of continental drift. For some time, it has been noticed that the configuration of the North and South American continental shoreline rather closely matched that of Europe and Africa. It almost appears as if at some time in the past they were one continent and that it split apart, and the separate parts or continents drifted to their present positions with the Atlantic Ocean between them. Similarly, at one time the continental areas of Australia and Antarctica appear to have been a part of the other continents. Moreover, a very interesting discovery was made by Maurice Ewing in 1949 during a National Geographic Society study of the Atlantic Ocean floor. He writes:

Some of the things we found on this second cruise create new scientific puzzles. One was the discovery of prehistoric beach sand in two core samples of the bottom, brought up in one case from a depth of two and in the other nearly three and one-half miles far from any place where beaches exist today. One of these sand deposits is 1200 miles from land.¹²

This discovery further substantiates the idea of continental drift. Further detailed studies of the fit of continents to each other revealed the following:

The eastern hemisphere and the western hemisphere do fit remarkably well around the edge of the Atlantic. The quality of the fit is sufficiently good that the result can hardly be coincidental. The result obtained by Bullard, et al. (1965), requires that Europe and Africa be rotated relative to each other and that North and South America be rotated relative to each other before the fit be made. The eastward protrusion of South America neatly fits the Gulf of Guinea; the overall match of the margins of Africa and South America have a root mean square misfit at the 500 fathom contour of 0.93°. This is less than 2% of the total rotation of the two continents which is about 570°. 13

It has also been noted that the medium ridge of the Atlantic Ocean approximately bisects the margins on either side. The enormous symmetry of the mid-Atlantic ridge relative to the two continental margins and the remarkable fit of the two continental margins to each other is singular indeed.

L. Knopoff discusses the idea that, in his judgment, the rifting or spreading of the primordial continent began some 150 to 170 million years ago and has proceeded at a rate of about 3 cm. per year. He indicates that paleomagnetic evidence further substantiates continental drift. According to this evidence either the pole of rotation of the earth has wandered over the earth or there has been continental drift which would have changed the direction of the magnetic poles.

Many problems arise, of course, relative to the theory of continental drift. We will comment on two of the problems. The first is that the paleomagnetic evidence appears to indicate polar migration before the continental break-up. 14 The other is that no evidence is forthcoming at the present time that shows movement of the continents relative to each other. This is partly due to the difficulty of making the precise measurements required to show a drift of a few centimeters per year if such is indeed taking place. Scientists estimate that with present methods it will take thirty to fifty years to detect and measure such drift. 15

We have set forth very briefly some of the questions facing scientists relative to the ocean floor. From the foregoing we could make a few observations.

- 1. Except along the continental edges where there is a thickening of sediments, the ocean floor has very thin deposits of sediments. This comes as a great surprise and puzzle to scientists who, in view of their opinion that the earth is very old, logically expect very thick deposits.
- 2. In the middle of the ocean floor huge rifts are in evidence which indicate great volcanic action in the past or some kind of an up-welling of the ocean floor in these areas.
- 3. On either side of these mid-oceans rifts are parallel magnetic bands that indicate past reversals of the earth's magnetic field.
- 4. An examination of the continental edges of North and South America, compared with those of Europe and Africa, indicates that at one time these continents were joined together as one large continent.
- 5. The theory presently in vogue to account for the phenomena described above is two-fold. First, the ocean floor is slipping under the continents, thus burying the ocean sediments under the

continental masses. Second, the continents are moving away from each other and accentuating this ocean floor stripping and burying activity. These theories are held although there is little evidence of buckling or warping at the continental edge, which would seem to be required if the theories were correct. Moreover, there is no measurable movement of either the ocean floors or the continents. Thus, it would appear that these theories are at best, exceedingly speculative.

The Bible Answers

When we go to the Bible we can begin to make sense of all of the questions and observations presented in this chapter. We saw in a previous chapter that an analysis of the ocean water and ocean floor accords exceedingly well with the Biblical date of 11,013 B.C. What about the question of continental division? Does the Bible have anything to say about this?

Indeed the Bible does have something to say. In Genesis 10:25 we find an extremely intriguing statement:

And unto Eber were born two sons: the name of one was Peleg; for in his days was the earth divided; and his brother's name was Joktan.

As if to make certain that this important though strange piece of information, which seems so out of place in the Biblical record, would not be lost or overlooked, it is repeated in I Chronicles 1:19.

What can the Bible mean by the declaration that in Peleg's day the earth was divided? We saw in an earlier chapter that Peleg lived from 3153 B.C. to 2914 B.C. We decided at that time that the division in Peleg's day was a reference to the Tower of Babel when God confused the language to force men to fill the earth. Do you recall that one of the clay tablets spoke of the collapse of an ancient ziggurat (ancient temple tower), which occurred simultaneously with a confusion of language? We quoted a paragraph from Stephen Gaiger who wrote *Bible and Spade*:

George Smith also quotes a remarkable fragment relating to the collapse of such a ziggurat. "The building of this temple offended the gods. In a night they threw down what had been built. They scattered them abroad, and made strange their speech. The progress they impeded.¹⁶

The truth suggested by the fragment, that an earth-shattering event occurred which scattered peoples, is reinforced by the phenomenon that about 3000 B.C. there was a marked change in the way bricks were formed. The new method of forming brick continued for several hundred years. As we saw in Chapter 6, this remarkable archaeological evidence strongly indicates that some drastic event occurred about 3000 B.C. to occasion such a change in a major building material, particularly when the bricks made before 3000 B.C. were more convenient and sensible to use than those made after this date.

All of these pieces of evidence can be coordinated with the evidence of continental division if we realize simply that during Peleg's day the continent was divided and probably at the same time the languages were confused. By understanding the fact that this division did take place about 5000 years ago, we are able to see the precise agreement that exists between the secular and sacred records. Additionally, we shall see that it gives us an insight into the difficult question of how animals and man are found on continental masses, separated by thousands of miles of ocean. We will look at this question in the next chapter as we outline the past, beginning at the very beginning.

NOTES

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Chapter 15

Ancient History

Thus far in this volume we have examined a number of pieces of scientific information in the light of the Bible. We have seen that there is marvelous correlation between the sacred and secular records (there must be, once the secular record is properly understood).

Let us now try briefly to reconstruct earth's history from the beginning, looking especially at the aspects of truth we have already discussed. We are greatly helped in doing this by the absolutely trustworthy chronology the Bible offers as well as by many other statements which are part of the sacred record.

In The Beginning

The belief in the fact of the creation of the universe 13,000 years ago in six days, each day of 24 hours' duration, appears quite naive to say the least. And yet God has given us the calendars in Genesis 5 and 11 to assure us that the year 11,013 B.C. is the beginning. The secular evidence of C14 information and ocean sediments does not violate the Biblical time-table but actually reinforces it, as we saw in previous chapters. The Bible reinforces the Genesis six-day creation account by stating in Exodus 20:11:

For in six days Jehovah made Heaven and earth, the sea, and all that in them is, and rested the seventh day: wherefore Jehovah blessed the sabbath day, and hallowed it.

And we read in Exodus 31:17:

It is a sign between me and the children of Israel for ever: for in six days the LORD made heaven and earth, and on the seventh day he rested, and was refreshed.

Thus, we can be reassured that all of the events recorded in the opening chapter of Genesis are included in this six-day period.

Looking briefly at the six days of creation, we can see the unfolding of God's program. Genesis 1:1 states:

In the beginning God created the heavens and the earth.

This statement is a declaration that God is the creator and that He constructed the universe at the beginning of time. This truth is reemphasized throughout the Bible. For example, we read in Isaiah 42:5:

Thus saith God the LORD, he that created the heavens, and stretched them out; he that spread forth the earth, and that which cometh out of it; he that giveth breath unto the people upon it, and spirit to them that walk therein.

Verse two of the Bible gives us the first step in the formation of the universe. On the first day God brought into being the raw materials that were to become the stars and the planets. Genesis 1:2 declares:

And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

"The earth was without form, and void" means it was in a state of emptiness and chaos. This suggests that when the elements, the "stuff" of the universe, were first created, they were in a gaseous unresolved form. The universe was unable to support life and was unavailable for any known useful purpose. This initial step was transitional in God's creative activity, as suggested by Isaiah 45:18:

For thus saith the LORD that created the heavens; God himself that formed the earth and made it; he hath established it, he created it not in vain, he formed it to be inhabited: I am the LORD; and there is none else.

The Hebrew word for "in vain" is *toho*, which is the same word used in Genesis 1:2 where it is translated "without form." Thus, the Bible appears to indicate that while the earth did exist for a time in chaos, the final purpose of God was to create earth for habitation.

Verse two of Genesis then states that "darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters." This is a surprising statement because "God is light." Even though God is a Spirit and under no circumstance is to be considered material substance, it is significant that God's appearance is often characterized by brilliant light. We think of God's glory in the

presence of Moses on Mount Sinai and of Jesus on the Mount of Transfiguration. In the new heavens and the new earth, we read in Revelation 21:23:

And the city had no need of the sun, neither of the moon, to shine in it: for the glory of God did lighten it, and the Lamb is the light thereof.

Thus, it would appear that God was required to create darkness, even as He says in Isaiah 45:7, "I form light and create darkness." The presence of darkness together with the Spirit of God seems quite incompatible. This in turn might offer a clue as to why scientists have been unable to discover the true nature of light. They can use light, they know how it manifests itself, but they do not know what it is. The fact that the Bible speaks of darkness being created suggests that darkness is more than just the absence of light. Does darkness of itself have some substance? Is this suggested by the plague of darkness over Egypt, a darkness that could be "felt"? In Exodus 10:21, Jehovah said to Moses:

And the LORD said unto Moses, Stretch out thine hand toward heaven, that there may be darkness over the land of Egypt, even darkness which may be felt.

Verse two of Genesis 1 goes on to declare that the Spirit of God moved or brooded on the face of the waters. This beautifully emphasizes the activity of the Godhead in creation. While other Scriptures underscore the activity of Christ and the Father in creation, this verse shows that the Holy Spirit was intimately involved from the very beginning with the drama that was to take place in time in this universe.

We were surprised to find the reference to darkness in the second verse, but it is also rather surprising to see the emphasis on water in relationship to creation. I do not know the full implication of this, but we read in II Peter 3:5:

For this they willingly are ignorant of, that by the word of God the heavens were of old, and the earth standing out of the water and in the water.

As we saw in an earlier chapter, this suggests that although creation was accomplished in six 24-hour steps, sedimentary rock, that is, rock formed from water-borne sediment, was present from the beginning as part of the earth's crust. That this is so is amply borne out by the vast amount of sedimentary rock which shows no relationship

whatsoever to the flood, that is, it has no C14 content, which indicates it was laid down prior to the beginning of cosmic activity, and it contains no fossils, which could only have resulted from the flood.¹

In any case, before day one drew to a close, God performed one more mighty creative act. God said, "let there be light." As we have already noted, the precise nature of light is a mystery. Obviously it is not dependent upon light bearers such as the sun or stars because they were not made until the fourth day. God is the Creator, and already on the first day God established a 24-hour rhythm of night and day.

The second day was the division of the waters that had been brought into being the first day. These gigantic, unformed, gaseous, semi-liquid clouds were divided so that deep space called firmament or heaven was produced. Discoveries by contemporary scientists show that these huge water clouds still exist in deep space.

The third day was focused on the waters that would become the scene of the formation of earth. They were gathered together and the dry land came into being under God's creation program. It was then that the universe first experienced living organisms because the Bible declares in Genesis 1:11:

And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so.

The earth had become ready to supply food for animals and man who would be created the sixth day.

On the fourth day, God focused His attention on the universe. Until this time there was light but no light bearers. The earth was a complete planet but the balance of the universe still consisted only of the huge water clouds that had been separated from the water from which the dry land of the earth emerged. On this day God made the sun, the moon, and the stars.

These light bearers took their responsible positions in continuing the 24-hour rhythm of day and night which was established by God on the previous three days. Moreover, they became the sources of the light which had been created by God the first day.

One important truth suggests itself at the moment. As small as planet earth is in comparison with the universe, this planet has the preeminence in the universe. The sun, moon, and stars have only a supporting role. The fact that the universe is billions upon billions of times greater in size than the earth does not diminish its preeminence. We have an infinite Creator, and it is no more difficult for Him to create a universe than it is for Him to create life or any other part of creation. The apparent endless expanse of the universe, which is held together by immutable God-given laws, gives us a deeper insight into the magnificence, majesty, omnipotence, and omniscience of the Creator. The earth is the scene of the manifestation of God's love, grace, wrath, and justice.

Once we understand the pre-eminence of the earth, we can begin to understand why the Bible declares, in connection with Christ's second coming, that the stars will begin to fall from heaven (Matt. 24:29), and why "the heaven departed as a scroll when it is rolled together; and every mountain and island were moved out of their places" (Revelation 6:14). Infinite God's treatment of the universe at Christ's return is no more a problem to God than it would be for man to empty a bucket of water. In other words, the size, complexity, and nature of the universe is relative. To us the universe appears infinite, and surely it must have a life duration commensurate with its size and complexity, but for God it is merely another item created as part of God's program of redemption. The timetable for the universe is the same as that of the earth.

Since the earth was created about 13,000 years ago, in the year 11,013 B.C., the universe must have been created in the year 11,013 B.C. also. Moreover, the end of the universe is simultaneous with that of the earth. Revelation 21:1 declares:

And I saw a new heaven and a new earth: for the first heaven and the first earth were passed away; and there was no more sea.

Perhaps the reference to seas being no more underscores the renewal of the universe in every aspect because the creation began with water. The new heaven and new earth are created new, as compared with the old universe, as our resurrected spiritual bodies are new as compared with our present bodies. Note the additional references to this grand truth in II Peter 3:7:

But the heavens and the earth, which are now, by the same word are kept in store, reserved unto fire against the day of judgment and perdition of ungodly men.

We read in II Peter 3:10-13:

But the day of the Lord will come as a thief in the night; in the which the heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up. Seeing then that all these things shall be dissolved, what manner of persons ought ye to be in all holy conversation and godliness, Looking for and hasting unto the coming of the day of God, wherein the heavens being on fire shall be dissolved, and the elements shall melt with fervent heat? Nevertheless we, according to his promise, look for new heavens and a new earth, wherein dwelleth righteousness.

Isaiah 65:17 tells us:

For, behold, I create new heavens and a new earth: and the former shall not be remembered, nor come into mind.

Returning to the creation of the light bodies on the fourth day, we should not be frustrated by questions such as the earth receiving light from light bearers located billions of light years in space. At the moment God created the light bearers, He unquestionably also brought the light to earth. Therefore, we should not look for clues regarding the age of the universe from phenomena such as the speed of light.

Moreover, we should not expect the chemical composition of the moon or the other planets necessarily to be the same as that of our earth. They were a creative activity distinctly separate from that of the earth. This has been shown by moon exploration. Scientists have discovered that a wide difference exists between the chemical composition of the earth and the chemical composition of the moon.

A portion of the deep space water that was separated on the second creative day from that from which the earth emerged could have been utilized by God in creating the universe. Or it is possible that this water continued in deep space as scientific evidence presently shows. We might recall that this is the source of most of the water that deluged the earth in the awful flood of Noah's day. (See Chapter 13.)

On the fifth day, God created the fish and the birds. The earth was now about prepared for the crown of God's creation, man.

On the sixth day, God continued his creative acts by bringing into being the animals. Then as the final creative act in the six days of creation, He created man in the image and to the glory of God. God saw everything He had made, and behold, it was very good.

One is struck by the introduction of Christ to man. In His first act of power, at Cana of Galilee at a marriage feast, He displayed Himself

as Almighty Creator. There He turned the water into wine, huge quantities of wine, in an act of instantaneous creation. There is none of the element carbon in water, but carbon is required in wine. Where did it come from? Christ, of course, created it and showed and proved conclusively that He is Creator. Do the six jars point to the six days of creation? He again powerfully displayed Himself as Creator when He multiplied the loaves and the fish in the presence of the thousands who ate. This is Christ who formed and created instantaneously during the six days of Genesis 1 (John 1:3, Hebrews 1:2).

From Adam to the Flood

We will continue our reconstruction by examining the 6023-year period from Adam to the flood.

We may suppose that when God created the earth, He created one large continent with the balance of the surface of this planet covered by oceans. In Genesis 1:9-10 we read:

And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so. And God called the dry land Earth; and the gathering together of the waters called he Seas: and God saw that it was good.

This language would surely permit a one-continent concept and there appears to be no language elsewhere in Scripture which would prohibit this interpretation. The continental area could have been larger than the presently existing continental areas. As seen in a previous chapter, the volume of the seas possibly could have been on the order of one half as large as they are today. The submarine canyons found on the ocean floor, the continental shelves which occupy a global area of about 7% of that of the oceans, and the finding of continental beach sand in mid-Atlantic, all point to the possibility of a large continent that occupied a greater area of the earth's surface than the sum of all the continents today. However, the size of this great continent is not germaine in a critical way to our discussion. Whatever the size, the land masses of today could have existed as one continent at the beginning. This is suggested by secular evidence and is permitted by the Bible.

As seen in an earlier chapter, the climate was 15-20° F. warmer than the world-wide average today. Vegetation was exceedingly lush, and many plants reached a huge size in such benevolent climate conditions. Many large land animals, such as the dinosaurs, roamed

the plains and forests. No high mountains on a par with those of today existed. Perhaps the highest was less than 5,000 feet. Disease was not nearly as prevalent as today. Therefore, man reached astounding ages (Genesis 5). Perhaps the animals, too, were exceedingly long-lived.

Mankind was not overly plentiful on earth at that time. While he lived as long as 900 years or more, his first-born child probably was not born until he was anywhere from perhaps 60 to 500 years of age. Noah, for example, was 500 years old before he fathered a child. Moreover, there is no evidence that families were larger in those ancient days than at any other time in history. Noah had only three sons, as did Terah who lived some 2700 years later. No statement is found anywhere in the Bible that suggests that there were large families in this period or any other period of history. Life must have been very slow moving with each marriage and each birth a great and signal event. The total population of the world before the flood possibly could have never exceeded one million.

Ancient man from this period was very skillful. His intelligence was easily as great as any later generation because he had been created a perfect man in the image of God. Only the results of sin were corroding him and causing his death. Early, very early, he thought that in this creation he could find security and hope. So Cain built a city (Genesis 7:14). His descendant Jubal invented musical instruments (Genesis 4:21), and his descendant Tubalcain forged articles of bronze and iron (Genesis 4:22). Man had learned to live very successfully in his environment.

But sin multiplied. Believers intermarried with unbelievers. The vast majority no longer thought about God. Rather, they placed their trust and confidence in the strong (Genesis 6:4), and their wickedness began to be boundless.

The Flood

So God intervened. The year was 4990 B.C. After preparing for the continuation of man and animals by means of the ark which Noah had obediently built, God destroyed the earth with water. God brought a great deep-space rain cloud into the path of the earth, and the water began to pour upon the earth. Simultaneously, the floor of the ocean erupted in massive volcanoes and water and lava flowed from the bowels of the earth.

The Bible says in Genesis 7:11:

In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened.

Here is the first clue that speaks to the question of mid-ocean ridges and paleo-magnetic anomalies. The gigantic proportions of the Noachian deluge would have left tremendous scars on the ocean floor of such openings of the fountains of the deep. As water poured forth, basaltic lava also must have poured forth as happens with volcanoes today.

Thus, the great rifts in the ocean floor originated. For forty days enormous quantities of lava and water flowed from these fissures. Simultaneously, the earth was deluged with new water from deep space. The rate of deposition of the new water approximated that which would cover the entire earth to a depth of 100 feet per 24-hour period. Obviously, this changed the equilibrium of the earth's internal forces. Variations and reversals of the earth's magnetic pole were occurring at a time rate of hours or days. As each day's volume of the deep earth magmas poured from the earth's deep ocean rifts, the mid-ocean ridge was built up. Thus, the lava poured down the ridge slopes and solidified at increasingly great distances from the rift source. As the lavas cooled, they cooled with the earth's magnetic vector frozen within them. Additionally, great mountains were built as the earth came back to equilibrium. These processes caused further magnetic anomalies.

When the waters first struck the earth as it began to move through the great deep-space rain cloud, temperatures on the other side of the earth must have plummeted. In some areas animals by the thousands were instantly frozen by the first great temperature oscillation. As the waters rose they were buried in huge cakes of ice that covered hundreds of miles. Animals and insects by the millions were instantly buried, sometimes singly and sometimes in great twisted masses as the flood waters continued. Never before or since did conditions even remotely approach the possibility of fossilization that existed in these destructive days.

And then, as abruptly as it had begun, the deluge ended. The awesome rain of forty days stopped. The earth was stressed to its very

foundations by the fantastic magnitude of pressures and imbalances placed upon it by the new water. Already changes were taking place. The ocean basins were deepening. The mountains began to thrust higher, and, as the water settled into the ocean basins, the land was torn by the receding torrents. The floor of the ocean at the continental edges became deep with sediment. The ocean water was heavy with sediment so that most of the ocean floor had some sediment build up. Sedimentary rock, pockmarked by fossils, became abundant everywhere. The pressures of the flood waters upon water-deposited sediment produced ideal conditions for such rock development. Huge pockets of plants buried under thousands of feet of water and silt, and further compressed by gigantic mountain-building stresses, became fossilized into oil and other hydrocarbons.

As the water left the continental mass, it became evident that the whole face of the earth had changed. Huge areas were covered with ice because the world-wide temperature had dropped 20-30° F. Severe oscillations of temperatures continued for possibly hundreds of years. Therefore, some of the ice fields would recede and grow again repeatedly.

There was still one great continent, or possibly two, hooked together and separated on one side by the so-called Tethys Sea. Possibly, the continent was smaller after the flood due to the waters rising over the low-lying continental slopes, and the first evidence of what is now the Atlantic Ocean was seen. Great deposits of sediment were placed at the edges of the continents as the waters receded from the continents. The oceans themselves contained much sediment in suspension so that for a number of years sediment accumulation occurred at an abnormally high rate all over the ocean floor.

Why should we conclude that there was no continental division as a result of the flood? Several reasons suggest themselves. First, secular evidence suggests polar wandering or paleo-magnetic reversals much earlier than that produced by continental drift. The effects of the flood, without continental movement, could account for this. Secondly, the Bible gives no intimation of continental division occurring as a result of the flood. Thirdly, a single continent at the conclusion of the flood provides a very satisfactory solution to the problem of animals and man occupying every continent.

Let us think further about this. The Bible indicates that all flesh with the breath of life was destroyed in the flood of Noah's day, with the exception of Noah and his family and the animals with them in the

ark. Thus, in the year 4989 B.C., man and animals again began to populate the earth, beginning from the slopes of Mount Ararat where the ark had come to rest. The animals began to migrate to every area of the huge continent with nearly the same configuration as before the flood. For example, since there were only two elephants saved in the ark, all of the elephant population sprang from these two. For the next couple of thousand years, the habitation of the elephants was generally in that part of the continent toward which the original elephants began to migrate. Similarly, after leaving the ark, various species of animals began to migrate toward other parts of the continent, and their progeny continued to develop in that part of the continent.

Likewise, man began to move to the fertile crescent of the Mesopotamia Valley. Because he is by nature quite gregarious, he normally wanted to remain close to the main body of humans. (We see the same phenomenon today; our metropolitan areas encompass a large percentage of the earth's population.) At the same time, there were some independent individuals who began to migrate to other parts of the continent. Their number, however, was probably quite incidental as compared with the main body of civilization which developed on the plains of Shinar or Sumer in the Mesopotamia Valley.

Twelve to fifteen centuries passed. The flood was almost forgotten. Man began to develop into a cohesive social, political, economic unit. Under the leadership of possibly one of the greatest city builders of all time, the great cities of Babylon, Erech, Nineveh, and others were constructed. The Bible tells us that his name was Nimrod (Genesis 10:9-11). Even before the flood, mankind had developed technologies as diverse as forging bronze and iron and making musical instruments. Therefore, it is not at all surprising that the people of Nimrod's day showed such competence as city builders. Unquestionably, much of the technology developed before the flood was taught to post-flood generations by the greatest boat-builder of all time, Noah. Expertise of the highest order would be required for one man to single-handedly construct an ocean-going vessel 450 feet. The Bible tells us that Noah lived for another 350 years after the flood, so he had ample opportunity to share his technical and scientific knowledge.

By the year 3200 B.C., man had become quite self-sufficient. He had forgotten about God and had placed his reliance on the skills and

ingenuity of man. He had found that all kinds of wonderful comforts and security could be developed from the earth. He began to honor those who were strong. His dependence upon God had become extinct almost. Instead he worshiped the creation itself.

Moreover, God had decreed to Noah that man was to be fruitful and was to multiply and fill the earth. But man was not obedient to this command. Except for a few unsociable nomads, most of the population congregated in the great cities whose foundations had been laid by Nimrod. Some had begun to live in Egypt and some lived in Palestine, in the area of Jericho, but these, too, were incidental developments compared with the super civilization which developed around Babylon.

Continental Division

Almost 2,000 years earlier God had visited the earth with the awe-inspiring flood that destroyed the world of that day because of its sins. Then about the year 3153 B.C., terror struck this planet. The world has again rejected God, but God had promised that He never again would destroy the world with a flood. But God did act. He did not act with a flood, but He acted by bringing confusion into the affairs of man. He confused their ability to communicate by changing their languages and dividing the continent into a number of continental areas.

Continental division must have been exceedingly traumatic. The earth began to shake and buildings began to fall. The earth began to move; the great continent which survived the flood began to break up. Relentlessly, great masses of earth continental size began to slide over the ocean floor. At the forward edge of these masses, mountain building began to occur with dramatic suddenness. Land masses of sedimentary rock were twisted and folded and overturned. Like a toy the earth shuddered for the second time in 2,000 years under stresses too huge for our minds to comprehend.

And man was spread apart and isolated. He was isolated by vast bodies of water and by changes in language. He was not able to frustrate God's plan that he should be fruitful and multiply and fill the earth. Only when he learned to prevent conception, as he has in our day, would he again become guilty of the monstrous sin of disobedience to this command.

Perhaps physically the earth was ripe for this kind of rupture.² Many residual tensions could have been present due to the catastrophic nature of the flood. In any case, God acted, and the continent began to split apart. The animals moved with the part of the fragmented continent on which they happened to be living. Most of mankind lived in or near the Mesopotamia Valley, and they remained in the same area which became known as Africa and Asia. The nomads who had migrated away from the population centers moved with the continental pieces on which they lived. Thus, for example, the nomads who had begun to live in that part of the continent which became North America, became the ancestors of the American Indian.

The movement of the continents must have been fantastic in its impact upon the physical earth. We can see the results, for example, on the western side of North and South America. Scientific evidence shows that this was the leading edge of the part of the continent that broke away from Europe and Africa. As this continent moved over the ocean floor, great mountain building resulted, and so we find the great mountains and high plateaus of the Americas all along the western side. The eastern side shows no such characteristics. This also explains the fact of earthquake zones being principally located along the western area of the Americas.

Possibly as a result of the tremendous changes which occurred in the earth by the continental division, the ocean floor could have ruptured again in a fashion similar to that which occurred during the flood. Because of these changes as well as the imbalances that resulted from the movements of the continents, many magnetic reversals of the earth's polarity could have taken place, freezing additional magnetic anomalies in the lava which flowed from the great sores in the ocean floor.

When the dust had settled, we would have discovered that the earth had become pretty much what we see it to be today. It was still colder worldwide than today, but a warming process, beginning after the extreme cold which gripped the earth immediately following the flood, was taking place. While many of the large pre-flood animals whose existence depended upon a warm climate and heavy vegetation had become extinct, others flourished and continue to exist today. Because man had been forcibly separated by language, many and varied races and nations began to come into being at widely separated places in the world. The science of writing, which probably had been invented by the Sumerians as a result of the God-sent confusion of

languages, was further developed by each emerging race. And so the earth left its prehistorical period and entered into the period covered in ancient history books.

This attempt at a reconstruction of a few aspects of the prehistorical world seems almost like fantasy, like the wildest kind of speculation. But the Bible tells us that the world began some 13,000 years ago. It details the fact of a world-wide deluge that destroyed the face of the earth. It describes the mountain building that followed this fantastic flood. It gives us the truth of continental division about 5,000 years ago, and the scientific evidence agrees with these startling Biblical assertions. It must, of course, because the Bible is infallible truth.

If our scientists would simply examine the evidence that continues to pour forth under present-day research in the light of the Biblical statement and timetable, they would make far more progress in reconstructing the history of man and the earth.

NOTES

¹ See Appendix XI for a discussion of the problem of lack of C14 in many fossils and fossil fuels, such as coal and oil.

² See Dr. Cook's interesting idea, that the stresses caused by the load and flow of a large ice cap might be sufficient to cause the breakup of a continent, in *Prehistory and Earth Models* by Melvin A. Cook (London: Max Parrish, 1966), Chapters 7-10.

Chapter 16

Conclusion

In our study, we began by insisting upon the absolute trustworthiness of the Biblical record. Applying this presupposition to Genesis 5 and Genesis 11, we unravelled them to produce an exact chronology that began with Adam in 11,013 B.C. We addressed ourselves to the troublesome period of the judges. Again, we were able to develop a very exact chronology.

We then compared the dates found by Biblical reckoning with some of the available archaeological evidence. We saw that the secular evidence of the place and the time of the earliest great city civilization in the Mesopotamia Valley agreed very well with the Biblical account. We also discovered that events related to the Tower of Babel in all probability made their impact on the development of writing as well as expediting the Egyptian civilization to a high level of accomplishment beginning with the First Dynasty.

When we continued our study of Egypt, we discovered three precise chronological reference points that span almost 700 years and relate to three of the greatest pharaohs of antiquity. The exact correlations between the archaeological record and the sacred pages establish the following absolute dates:

Pharaoh	Dynasty	Reign B.C.
Sesostris III	12th	1888-1850
Thutmosis III	18th	1501-1447
Rameses II	21st	1279-1212

The fact that we have found correlation between dates established by astronomical evidence and the dates established by Biblical reckoning for these three great pharaohs indicates the reliability of our conclusions concerning the trustworthiness of the Biblical record. According to the laws of probability, we might expect one Biblical date to coincide with one secular date, but it could never be coincidental that three dates or even two would agree as they have in our study. We believe that the archaeological and astronomical evidence provides serious confirmation to the chronology we have set forth in this book.

A by-product of our archaeological study has been the development, on a very minimal basis, of an understanding of the Egyptian governmental situation from the 12th Dynasty. Hopefully others can build upon this to develop a further understanding of this period in history. Because the archaeological record is replete with information from these dynasties, much has been written about them. Relatively little, however, has been tied to the Biblical account. We trust this study will help others to mesh the sacred with the secular records.

Generally, the physical sciences have been considered to be the final authority on the proper understanding of the earth's age. Among many others, two prominent sources of scientific evidence, which have been studied extensively in an attempt to date the world, are the oceans and the radioactive decay of certain elements. Therefore, we faced these issues squarely.

We showed that the seemingly unreproachable conclusions concerning the age of the earth, which were developed from recent scientific investigations, are not as solid as they seem. The scientists' conclusions have been received with confidence by most people mainly because their results have been based on basic truths which under other investigations have consistently proven reliable. Scientists have shown good insight into the physics and chemistry of present day phenomena. Despite their analysis of the present environment, their conclusions concerning the age of the earth must be considered untrustworthy for two important reasons. The most important reason is that their conclusions do not take into account all of the available data, namely, the Biblical truth which alone gives the accurate time table.

Also, we have shown that even when scientists start with sound first principles, so many unverifiable assumptions must be made in the application of those principles that the conclusions are equally unverifiable and, therefore, must be considered incomplete. Their