

**The Biblical Chronologist
Age of the Earth
Collection**

FIRST EDITION

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The Biblical BC Chronologist

WHAT HAS BEEN IS REMOTE AND EXCEEDINGLY MYSTERIOUS. WHO CAN DISCOVER IT?
(Ecclesiastes 7:24)

The following is a collection of excerpts on a common theme—the Age of the Earth. They are taken from past issues of The Biblical Chronologist newsletter. This collection is intended to convenience the researcher, student, or casual reader by bringing all of the material of interest on this topic from the BC together in a single, easily-accessible, affordable unit.

The Age of the Earth Doctrine in the Early Church

From Volume 1, Number 2, pages 1–6.

How old did Christians in the early centuries A.D. believe the earth was?

I only began to deliberately research this question about a year ago.¹ A passage from the recent book *The Fingerprint of God* by Hugh Ross prompted me to do so. It stated:²

Many of the early church fathers and other biblical scholars interpreted the creation days of Genesis 1 as long periods of time. The list includes the Jewish historian Josephus (1st century); Irenaeus, bishop of Lyons, apologist, and martyr (2nd century); Origen, who rebutted heathen attacks on Christian doctrine (3rd century); Basil (4th century); Augustine (5th century); and, later, Aquinas (13th century), to name a few.

I was quite surprised by this assertion; in the course of my studies I had come across many dates

¹Much of the research for this article was carried out while I was on the faculty of the Institute for Creation Research Graduate School. Their support of this research is gratefully acknowledged.

²Hugh Ross, *The Fingerprint of God*, 2nd ed. (Orange, California: Promise Publishing Co., 1991) 141.

for Creation which had been calculated by numerous Christian scholars of past centuries. Without exception these dates had been in terms of thousands of years only. How could early Christians have believed the days of creation were long periods of time (and, in the context of the above quote, “long periods of time” means millions of years) and still have set dates for Creation which were invariably less than ten thousand years ago? I determined to get to the bottom of the matter.

I began by investigating the five bibliographic references which Hugh Ross, the author, had given in support of his claim. It soon became obvious that these references failed to do their job – they did not support the claim that these early church fathers believed the six days of creation were long periods of time. In fact, they tended to do the opposite! Here, briefly, is what I found.

Ross’ first reference was to Joseph P. Free’s well-known Biblical archaeology and history textbook of a generation ago entitled *Archaeology and Bible History*. This appears to be the fountainhead of Ross’ claim. Free writes:³

It is said that this view was held by Josephus, the Jewish historian of the first century A.D., by many rabbis, and by some early Christian fathers, including Irenaeus (2nd century), Origen (3rd century), and Augustine (4th century).

I will return to this list by Free shortly.

Ross augments Free’s list of four names with two additional names of his own: Basil and Aquinas.

³Joseph P. Free, *Archaeology and Bible History*, 8th ed. (Wheaton, IL: Scripture Press Publications, Inc., 1962). Note that this quote is on page 20 of Free; Ross’ reference is to page 50, but this seems certain to be a typographical error as nothing on page 50 of the several editions of Free which I have surveyed pertains to the views of the early church fathers or the days of Genesis.

These are curious additions, however, for it is absolutely the case that Basil and Aquinas held to literal twenty-four hour days. Davis Young (who, like Ross, believes in a billions-of-years history for the earth) has written, “Many of the church fathers plainly regarded the six days as ordinary days. Basil explicitly spoke of the day as a twenty-four-hour period.”⁴

Ross does not give any reference to Basil, but he does reference Aquinas. Apparently Ross has completely misunderstood Aquinas, however, for the reference he gives asserts Aquinas’ adherence to twenty-four hour days quite plainly.

In context, Aquinas (in *Summa Theologica*) is answering the question “Whether Scripture uses suitable words to express the work of the six days?”. He advances the putative objection (objection 7) in reference to Genesis 1:5,

Further, *first*, not *one*, corresponds to *second* and *third*. It should therefore have been said that, *The evening and the morning were the first day*, rather than *one day*.⁵

and then answers this objection as follows in the section which Ross references:

The words *one day* are used when day is first established, to denote that one day is made up of twenty-four hours. Hence, by mentioning *one*, the measure of a natural day is fixed.⁶

In other words, Aquinas argues that Genesis 1:5 says “And there was evening and there was morning, one day” instead of “And there was evening and there was morning, a first day” as we might otherwise expect to read, specifically to inform us that these evening and morning combinations each constituted a single, normal, twenty-four hour day. Thus, Aquinas here advances the argument that

⁴Davis A. Young, *Christianity and the Age of the Earth* (Grand Rapids: Zondervan, 1982), 22.

⁵Thomas Aquinas. “The Summa Theologica,” *Great Books of the Western World*, vol. 19 (Chicago: Encyclopaedia Britannica, Inc., 1952) 375.

⁶Thomas Aquinas. “The Summa Theologica,” *Great Books of the Western World*, vol. 19 (Chicago: Encyclopaedia Britannica, Inc., 1952) 377.

the author of Genesis chose the word “one” specifically to exclude notions that the “days” of Genesis were anything but normal, literal, twenty-four hour days.

A few sentences later Aquinas gives credit to Basil for this explanation of the significance of the word “one” in Genesis 1:5. This, evidently, is where Ross got Basil’s name from. Yet I do not understand how Ross came to understand this section to support the notion that Aquinas and Basil “interpreted the creation days of Genesis 1 as long periods of time.” Their interpretation of Genesis 1:5 is, in fact, explicitly antithetical to that idea.

The remaining three of Ross’ references (2-4) all deal exclusively with Augustine. These references entirely fail to make Ross’ case, however, even for this single church father. It is true that Augustine did not hold the six days of Genesis 1 to be literal solar days, but this does not mean he supposed them to be long periods of time, by any means. Indeed, he appears to have regarded them as having no temporal duration at all! For example, from *The Literal Meaning of Genesis*:

But that day, which God has made, recurs in connection with his works *not by a material passage of time* but by spiritual knowledge, . . .⁷ [my emphasis]

and, again, from *The Confessions*

They have then their succession of morning and evening, part secretly, part apparently; for they were made of nothing, by Thee, not of Thee; not of any matter not Thine, or that was before, but of matter concreated (that is, at the same time created by Thee), because, to its state without form, Thou *without any interval of time* didst give form. For seeing the matter of heaven and earth is one thing, and the form another, Thou madest the matter of merely nothing, but the form of the world out of the matter without form; yet both together, so that the form should follow the matter *without any interval of delay*.⁸ [my emphasis]

⁷Augustine, “The Literal Meaning of Genesis,” *Ancient Christian Writers: The Works of the Father’s in Translation*, vol. 1, no. 41 (New York: Newman Press, 1982) 134.

⁸Augustine, “The Confessions,” *Great Books of the*

In other places Augustine clearly shows he believed the earth was created only about six thousand years before his time. For example, he wrote: “reckoning by the sacred writings, we find that not 6000 years have yet passed.”⁹ This statement appears in chapter 10 of Augustine’s *The City of God*, which chapter bears the heading: *Of the falseness of the history which allots many thousand years to the world’s past*. A careful reading of this chapter reveals that Augustine is here refuting contemporary pagan notions that the world was older than the few thousand years he understood the Scriptures to allow.

Augustine further defends the youthfulness of creation in the same book, chapter 12, which bears the heading: *How these persons are to be answered, who find fault with the creation of man on the score of its recent date*.¹⁰ Augustine repeatedly asserts the recent creation of man (less than six thousand years before his own time) in this chapter. Augustine clearly believed the Scriptures taught that Adam had been supernaturally created by God less than ten thousand years ago.

Augustine’s view of the antiquity of creation is not prominent in his writings – this was not an issue in his day, as we have already observed. But neither is it hidden.

I suggest an accurate summary of Augustine’s view of the physical history of the world would be that of an instantaneous, simultaneous, complete creation of all things by God less than six thousand years before his time. Though instantaneous, simultaneous creation of all things is not part of the usual patristic view of Genesis 1, this oddity cannot legitimately be called upon to support Ross’ claim that “Many of the early church fathers and other biblical scholars interpreted the creation days of Genesis 1 as long periods of time.” As with Aquinas and Basil, Augustine’s view seems opposite to what Ross wishes to show.

Thus Augustine, Basil, and Aquinas do not testify in Ross’ defense. What about the remaining

three names in Ross’ list – Josephus, Irenaeus, and Origen?

It appears that the total sum of evidence supporting Ross’ claim about these remaining three is the single sentence by Free which I quoted on page 1. Notice, however, that Free makes it clear he is reciting only hearsay by his choice of words (specifically, “It is said . . .”) and by the fact that he gives no references to support his statement.

Louis Lavalée gives us a glimpse into Origen’s thinking about the age of the earth by quoting directly from his writings:

Origen (b. 185), the great theologian of the Greek churches, defended “the Mosaic account of the creation, which teaches that the world is not yet ten thousand years old, but very much under that.”¹¹

It is, of course, impossible for Origen to have “interpreted the creation days of Genesis 1 as long periods of time” as Ross claims, and simultaneously to have believed that “the world is not yet ten thousand years old.”

It seems unnecessary to pursue the cases of Irenaeus and Josephus. Free’s hearsay was clearly not from a reliable source and should simply be disregarded.

I am not aware of any evidence supporting the notion that the early church fathers claimed millions or billions of years had passed since Creation. On the contrary, as we have seen with Augustine, these early Christians were sometimes at pains to refute such notions, which appear to have been prevalent among the pagans who surrounded them. Nowhere, that I know of, do we find them encouraging such ideas.

What does this mean to Biblical chronology research today? It shows, in a clear and objective fashion, that the text of Scripture evidently does not encourage an old-earth (billions-of-years) interpretation. If it did we should find many instances of such an interpretation, with suitable accompanying chronologies, in ancient Christian writings. In fact, if such instances do occur they

Western World, vol. 18, (Chicago: Encyclopaedia Britannica, Inc., 1952) 124.

⁹Augustine, “The City of God,” *Great Books of the Western World*, vol. 18 (Chicago: Encyclopaedia Britannica, Inc., 1952) 348.

¹⁰Augustine, “The City of God,” *Great Books of the Western World*, vol. 18 (Chicago: Encyclopaedia Britannica, Inc., 1952) 349.

¹¹Louis Lavalée, “The Early Church Defended Creation Science,” *Impact*, 160 (Institute for Creation Research, 10946 Woodside Ave. N., Santee, CA, 92071) October 1986, iii.

must be exceedingly rare, for, as I have said, I have never seen even one.

In my study of the chronological works of early Christians I have observed the following:

1. They believed that the chronological data given in the Bible was meant to be taken literally.
2. They used this data in a straightforward manner to compute the dates of Biblical events such as the Flood of Noah and the Creation.
3. They used extra-Biblical data to augment Biblical chronological data as necessary and without apology.
4. They generally disagreed about the exact dates of Biblical events (sometimes by a thousand years or more – due primarily to differences in ancient Old Testament manuscripts) but were uniform in their view that Creation had taken place less than ten thousand years ago.

It seems legitimate to conclude that the Biblical text itself must possess very little, if any, inherent tendency toward an old-earth interpretation, for most of the early church fathers were competent scholars who knew the Bible well, and were not timid about proclaiming what they felt it taught. As far as I have been able to determine, Christian orthodoxy embraces only the idea of a supernatural creation of the world less than ten thousand years ago. ◊

On the Scope of Biblical Chronology

From Volume 1, Number 5, pages 7–9.

Biblical chronologists attempt to answer questions of the form: “When did the Biblical/historical event X take place?” Typical questions of this form which fall within the scope of Biblical chronology are: “When was Jesus born?”, “When did Solomon begin to reign?”, and “When did Noah’s Flood take place?” By answering such questions Biblical chronologists seek to build an accurate chronology of Biblical history.

Questions about the date of extra-Biblical historical events—such as when Norway was first inhabited, or when the Pilgrims came to America, or

when my grandfather was born—are outside the scope of Biblical chronology. Questions regarding the timing of future world events which arise from Biblical prophecy are also outside the scope of Biblical chronology—they belong to the field of Biblical eschatology. (Questions in both of these categories are frequently impacted by the results of Biblical chronology, however.)

The proper scope of Biblical chronology is thus seen to be all Biblical/historical events back to the creation of the physical universe, the event with which Genesis 1 begins.

The Age of the Cosmos

Within this scope, the question, “When did Creation take place?” looms large today because of the enormous difference which exists between the date of Creation which has traditionally been calculated by Biblical chronologists and the age of the cosmos which modern science computes. Though a large number of claims have been made to the contrary, this problem is real and it remains unsolved. When I say this problem remains unsolved, I mean that there does not seem to have been any hypothesis advanced so far which is able to integrate all of the available Biblical and scientific data bearing on this question into a single, rational whole. Indeed, the hypotheses which have been advanced as “solutions” to this problem are generally horribly lopsided, doing violence either to pertinent Biblical or scientific data.

I hope you do not find it shocking or alarming that there are things which we do not yet know in the field of Biblical chronology. Let me remind you that the cosmos in which we live is the product of an *infinite* Creator. We should not be surprised when, as we probe about in this cosmos, we run into puzzles for which our finite minds can find no ready solution. Let me suggest that the only truly alarming situation would be if it were otherwise.

I do not mean to imply that the age of the cosmos problem is intrinsically unanswerable, however. It is a hard problem—perhaps even a *very* hard problem, if we judge from the length of time it has gone unsolved—but I have no doubt that it will eventually yield to rational investigation.

In the meantime, we answer those who ask us whether this problem shows that the Biblical his-

tory of the world is false or fanciful by pointing out the Bible's "track record" in this area. We point out that for many years some supposed the Bible's chronology of the kings of Israel and Judah was hopelessly confused and self-contradictory, but this portion of Biblical history eventually (about 50 years ago) yielded to rational investigation.

At times I am asked where my chronological scheme may find its greatest strength or weakness. Let me say without hesitation that the areas of greatest strength and certainty are precisely those areas where in the past the greatest difficulties and uncertainties were found. These are in the period of the divided monarchy for which there are four separate chronological yardsticks, all seemingly at constant odds with each other and with the years of contemporary history. It was long felt that these seemingly contradictory lines of measurement must be in error—one giving the years of the kings of Judah, another the years of the rulers of Israel, a third the synchronistic years of Israel with Judah, and the fourth the synchronisms of Judah with Israel. . . .

When the nature of the biblical chronological yardsticks is once understood, the four instruments of measurement for the period of the divided monarchy are of the highest value in providing a sound chronology for the rulers involved. Like a jigsaw puzzle, these numbers fit together only at certain precise points and only in line with certain basic principles of chronological procedure. It was four years after I had begun a serious study of the chronological involvements of the Hebrew kings before I was able to work my way through the data for the first two or three kings of Israel and Judah. But then, having once discovered the various principles involved, in only a few weeks I made my way through to the end.¹²

We then point out that for many years some

¹²Edwin R. Thiele, *The Mysterious Numbers of the Hebrew Kings* (Grand Rapids: Academie Books, Zondervan Publishing House, 1983), 20–21.

supposed the Bible's chronology and even history of the pre-monarchical period—including the Exodus and Conquest—was hopelessly in error and largely fanciful, but this portion of Biblical history also eventually (about 5 years ago) yielded to rational investigation. The problem was found to be due to a simple copy error in a single Biblical number resulting in an accidentally dropped millennium from traditional Biblical chronology. (The fact that such a simple thing could confound so many for so long surely has something to say about human finiteness, does it not?)

Finally, we point out that while no satisfactory answer has yet been found to the age of the cosmos problem, we believe that the track record of Biblical chronology in the past century is sufficiently good to warrant the conclusion that attempts to ground one's unbelief in supposed chronological/historical errors in the Bible must be regarded as highly precarious at the present time.

I will be returning to the age of the cosmos problem from time to time. I have introduced it here, under the topic of the *scope* of Biblical chronology, to emphasize the fact that this problem *belongs to Biblical chronology*. The question, "When did Creation take place?" is not a biological question—it is a *Biblical chronology* question. While this question is often entangled with discussions or debates about evolution and creation, this question does not belong to the field of creation/evolution—it belongs to the field of Biblical chronology. Similarly, it must be insisted that this question does not belong to theology, nor to geology, nor to Biblical hermeneutics, nor to astronomy. While each of these fields (and many others besides) may have valuable contributions to make toward the ultimate resolution of this question, the question itself lies properly only within the scope of Biblical chronology, and nowhere else.

I emphasize this because many individuals who are expert in fields other than Biblical chronology seem all too willing to pronounce their "expert" judgment or promote their "expert solution" to this problem which, they seem unaware, lies outside their field of expertise. In the process they invariably fail to give the problem the informed, intelligent treatment it deserves, and they generally succeed only in misinforming and hopelessly

confusing the general public regarding it. Please be aware—the problem of the age of the cosmos belongs to Biblical chronology, and by all sound principles of the discipline of Biblical chronology it must be regarded as an unsolved problem. Indeed, it remains an area of active research.

As you enter into the study of this and other Biblical chronology questions you need to be constantly on the alert. Many would like to claim chronology questions as their property, for, as I have discussed with you previously, historical facts can be used to tell all sorts of fictions if one is allowed to tamper with their chronology. You would (I hope) view your auto mechanic's recommended procedure for curing appendicitis with considerable skepticism; treat the pronouncements about Biblical chronology matters by experts in other fields in a similar way. ◊

Toward Unification of Pre-Flood Chronology

From Volume 4, Number 4, pages 1–10.

To unify sacred and secular chronologies of earth history it is necessary to work systematically from the present back into the past—an important lesson I learned the hard way.

By the time I had reached my mid-thirties I had spent over a decade actively trying to understand the disparity between Biblical and secular chronologies of earth history. I had focused on Noah's Flood in much of my chronological research. I had struggled and struggled with the problem of its proper historical date. And I had come to the point of all but despairing of ever finding the answer in my lifetime.

What bothered me most was the conviction that the Flood should be easily datable. The Bible clearly pictures the Flood as a very large disaster accompanied by a major destruction of civilization. Such an event should be easily datable because many natural chronometers are reset by geophysical disasters, and the sudden destruction of civilization at the time of the Flood should have left behind many datable remains. Yet the more I researched the Flood, the more intractable the problem of its proper date seemed to be. Nothing seemed to make sense—I was unable to achieve any

satisfactory unification of secular and sacred data.

Fortunately, however, I eventually came to realize that my research strategy had not been good—I had been trying to run before I had learned how to walk. Absolute chronologies are necessarily worked out from the present time, during which the chronologist is living, back into the past. I had been trying to solve the date of the Flood, a remote Biblical historical event, while entirely ignoring all of the chronology of the Bible and its related history which lay between the Flood and the present time. This was not sound procedure. I came to realize that I needed to adopt a new strategy. I needed to focus on the most recent disparity between secular chronology and the Bible and work on solving that problem before venturing any further back in time. Only in this way could a solid chronological foundation be assured for more remote investigations.

This strategy has worked very successfully for me to the present time. By following it I have discovered why the archaeologists and secular historians have been unable to find the Exodus and the Conquest—their dates for these Biblical events are out by a full millennium.¹³ And in addition, though I am now only entering my mid-forties, the problem of the proper date of the Flood and its unification with secular data lies behind me.¹⁴

The task which now lies at hand is the unification of Biblical and secular chronologies in the pre-Flood period (i.e., prior to 3500 B.C.). And the strategy, once again, is to determine at what point secular and sacred chronologies in the pre-Flood period first diverge. To implement this strategy it is only necessary to delineate the chronologies which are to be compared, and then to compare them.

To this task I now turn.

Pre-Flood Biblical Chronology

Figure 1 shows a time chart of pre-Flood Biblical chronology. The numbers used in its derivation are shown in Table 1. I have discussed most of these numbers previously in other contexts.¹⁵ The only

¹³Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993).

¹⁴Gerald E. Aardsma, "Biblical Chronology 101," *The Biblical Chronologist* 4.3 (May/June 1998): 6–10.

¹⁵Gerald E. Aardsma, "Chronology of the Bible: 5000–3000 B.C.," *The Biblical Chronologist* 2.4 (July/August

thing which I have added here is the date of the creation of Adam.

There is not much which needs to be said about this chronology. It is what the Masoretic Hebrew Text of the Old Testament yields when treated in a simple, straightforward manner. The *only* complexity is that one must recognize that “one thousand” has been lost from the text of 1 Kings 6:1 due to a copy error; one must recognize that the 480 years which appears in 1 Kings 6:1 today was originally 1,480 years.¹⁶

Reliability

As usual, one must ask about the reliability of this chronology. Chronology building is a process in which we attempt to measure elapsed time from the present back to an event or series of events. Measurements of elapsed time entail uncertainties, as is true of all physical measurements. This chronology, for example, relies heavily upon genealogical data found in Genesis 5. Many have asked whether this genealogical data is complete, or whether it might contain gaps, with the result that the chronology obtained from it is foreshortened. Such uncertainties demand that we inquire into the degree of confidence which the chronology of Figure 1 warrants. How accurate is it likely to be?

The most compelling argument for confidence in this chronology at the present time is that it has been constructed using the same principles and procedures as our highly successful post-Flood Bible chronology. That is, I have used a simple, straightforward approach to the chronological data of the Masoretic Text, supplemented only by the restored “one thousand” in 1 Kings 6:1, in this pre-Flood portion of the chronology just as was done in the post-Flood portion. Nearly every past issue of this publication bears substantial testimony to the fact that this approach successfully integrates much Biblical and historical data. We have found this to be true from the time of Samuel right back into the time of Noah—a stretch of some two and a half thousand years. And a substantial por-

1996): 1–5.

¹⁶Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993).

B.C.	Bible	
	period	details
3500	3520 ± 21 B.C.	- Noah's Flood -
3600		- birth of Shem -
3700		
3800		
3900		
4000		
4100		- birth of Noah -
4200		
4300	PRE-FLOOD	- birth of Lamech -
4400		
4500		- birth of Methuselah - - birth of Enoch -
4600		
4700		- birth of Jared -
4800		- birth of Mahalalel - - birth of Kenan -
4900		- birth of Enosh -
5000		- birth of Seth -
5100	5176 ± 26 B.C.	- creation of Adam -

Figure 1: Chronology of pre-Flood Biblical history.

Table 1: Primary chain of the Biblical computation, based on the Masoretic text, yielding dates for selected Biblical historical events back to the creation of Adam.

item	number	reference	date (B.C.)
accession of Rehoboam			931±10
Solomon's fourth year	4±0.5	1 Kings 6:1	967±11
accession of Solomon	40±5	1 Kings 11:42	971±11
Exodus from Egypt	1480±5	see footnote 16	2447±12
Israel enters Egypt	430±0	Exodus 12:40–41	2877±12
Jacob before Pharaoh		Genesis 47:1–11	2877±12
birth of Jacob	130±5	Genesis 47:9	3007±13
birth of Isaac	60±5	Genesis 25:26	3067±14
Abraham enters Canaan	75±5	Genesis 12:4	3092±16
death of Terah		Acts 7:4	3092±16
birth of Abraham	100±5	Genesis 21:5	3167±15
birth of Terah	205±5	Genesis 11:32	3297±17
birth of Nahor	29±5	Genesis 11:24	3326±17
birth of Serug	30±5	Genesis 11:22	3356±18
birth of Reu	32±5	Genesis 11:20	3388±19
birth of Peleg	30±5	Genesis 11:18	3418±19
birth of Eber	34±5	Genesis 11:16	3452±20
birth of Shelah	30±5	Genesis 11:14	3482±21
birth of Arpachshad	35±5	Genesis 11:12	3517±21
end of Flood	2±0.5	Genesis 11:10	3519±21
start of Flood	600±0.5	Genesis 7:11	3520±21
birth of Shem	100±5	Genesis 11:10	3617±22
birth of Noah	601±0.5	Genesis 8:13	4120±21
birth of Lamech	182±5	Genesis 5:28	4302±22
birth of Methuselah	187±5	Genesis 5:25	4489±22
birth of Enoch	65±5	Genesis 5:21	4554±23
birth of Jared	162±5	Genesis 5:18	4716±23
birth of Mahalalel	65±5	Genesis 5:15	4781±24
birth of Kenan	70±5	Genesis 5:12	4851±25
birth of Enosh	90±5	Genesis 5:9	4941±25
birth of Seth	105±5	Genesis 5:6	5046±26
creation of Adam	130±5	Genesis 5:3	5176±26

tion of this interval was reliant upon the genealogical data of Genesis 11, just as the present portion of the chronology is reliant upon the genealogical data of Genesis 5. The overwhelming success of this approach in the post-Flood portion of Biblical chronology strongly recommends confidence in the results of this same approach in the pre-Flood portion.

I have previously discussed the significant textual variants which appear in many of the key numbers used to construct this portion of the chronology.¹⁷ These and other considerations do caution against an inappropriate dogmatism—one will want to check this portion of our Biblical chronology in every conceivable way as usual, of course. But I have previously stated that “I will be very surprised if the true chronology which is finally obtained after all is said and done differs by more than a few centuries from that which the Masoretic text alone presents” and I will stand by this statement still.¹⁸ Indeed, it seems even more likely to be correct now than it did when first asserted two years ago.

In support of this assertion note that the date for the creation of Adam which I have found in Figure 1, i.e., 5176 ± 26 B.C., is very much in line with the work of other Biblical chronologists down through the centuries. It diverges significantly from the 4004 B.C. result of Bishop Ussher, of course, but this is almost entirely a consequence of his failure to notice the missing thousand years in 1 Kings 6:1. (It is hardly surprising that he failed to notice this since it is only the work of recent decades in the area of Biblical archaeology which has made this missing thousand years obvious, as I have previously pointed out.¹⁹) When this missing millennium is added in, Bishop Ussher’s result becomes 5004 B.C., less than two centuries from my result. The divergence between our respective measurements of the elapsed time from Adam to the present is, in this case, in fact, just 2.4%.

¹⁷Gerald E. Aardsma, “Chronology of the Bible: 5000–3000 B.C.,” *The Biblical Chronologist* 2.4 (July/August 1996): 3.

¹⁸Gerald E. Aardsma, “Chronology of the Bible: 5000–3000 B.C.,” *The Biblical Chronologist* 2.4 (July/August 1996): 5.

¹⁹Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993), 26.

Early chronologists tended to work from the Septuagint rather than the Masoretic Text. Sextus Julius Africanus (c. A.D. 170–240) arrived at a date of 5502 B.C. for the creation of Adam by doing so.²⁰ No adjustment of this date by restoration of “one thousand” should be attempted. I have previously pointed out that the numbers of significance to Biblical chronology appear to have been deliberately altered in the Septuagint in an effort to compensate for the unrecognized, accidentally dropped “one thousand” years in 1 Kings 6:1 of the primary Masoretic Text.²¹ Thus Africanus’ result of 5502 B.C. is directly comparable to my 5176 ± 26 B.C. The divergence in this case is three and a quarter centuries, or 6.3%.

These results, and many others similar to them by other Christian chronologists through the centuries, show that Biblical chronology does tend to converge somewhere within the second half of the sixth millennium B.C. for the creation of Adam. While claims which are extravagantly outside this range can be found today the *science* of Biblical chronology, both ancient and modern, does not encourage them.

For practical research purposes it seems reasonable to adopt the chronology shown in Figure 1 in the sense of a “working hypothesis”, while bearing in mind the possibility that refinements to this chronology of even several centuries may yet be found necessary. Adjustments beyond this range do not seem possible, however. That the true date of the creation of Adam—the most remote and thus most uncertain point in this chronology—could differ from the date shown here by even as much as 500 years appears essentially impossible.

Pre-Flood Secular Chronology

I showed last issue that pre-Flood Biblical history takes place in the Eden region and that this region is to be identified with the area at the head of the Persian Gulf—the region we call southeastern Iraq today.²² It is clearly the secular historical

²⁰Jack Finegan, *Handbook of Biblical Chronology* (Princeton: Princeton University Press, 1964), 146.

²¹Gerald E. Aardsma, “Chronology of the Bible: 5000–3000 B.C.,” *The Biblical Chronologist* 2.4 (July/August 1996): 5.

²²Gerald E. Aardsma, “The Location of Eden,” *The Biblical Chronologist* 4.3 (May/June 1998): 1–5.

and archaeological chronology of this region which is of interest to the present effort to unify sacred and secular chronologies in the pre-Flood period.

Figure 2 shows a modern secular chronology of this region which is widely known and applied within the technical literature at present.²³ The periods are named after the archaeological sites in South Mesopotamia (southeastern Iraq) where pottery and other archaeological artefacts characteristic of that time were first discovered. This is an archaeological chronology, not an historical one. That is, it has been built up from archaeological data without the aid of historical documents (since no secular written materials are found prior to Late Uruk times). Archaeological stratigraphy has been used to determine the relative chronology, and this has been supplemented by radiocarbon to obtain the absolute chronology.

The Ubaid period seems characterized by settled agricultural villages, with abundant, decorated pottery and well-built multi-room houses. This characterization transforms into a fully urban society during the Uruk.

Reliability

That the chronology of South Mesopotamia is not yet settled can be seen by comparing Figure 2 with a corresponding chronology published in the *Cambridge Ancient History* two decades earlier.²⁴ There we find the Ubaid to Uruk boundary 500 years later (at 3500 B.C.) and the dawn of the Ubaid well over a millennium later (at 4300 B.C.). Such large adjustments to this chronology over the past several decades make it unlikely that the chronology shown in Figure 2 is the final answer.

And indeed, the possibility of substantial departures from the Figure 2 chronology can be found in the modern technical literature. Joan Oates observes, for example:²⁵

²³Edith Porada, Donald P. Hansen, and Sally Dunham, "The Chronology of Mesopotamia, ca. 7000-1600 B.C.," in *Chronologies in Old World Archaeology*, volume 2 (Chicago: The University of Chicago Press, 1992), 94,96.

²⁴I.E.S. Edwards, C.J. Gadd, and N.G.L. Hammond, ed. *The Cambridge Ancient History*, vol. 1, part 2. (Cambridge: Cambridge University Press, 1971), 997.

²⁵Joan Oates, "Ubaid Chronology," *Chronologies in the Near East*, ed. O. Aurenche, J. Evin, and F. Hours (Oxford: BAR International Series 379 (ii), 1987), 474.

B.C.	South Mesopotamia	
	period	character
3000	JAMDAT NASR	
3100		
3200		
3300	LATE URUK	
3400		
3500		urban society
3600	MIDDLE URUK	
3700		
3800		
3900	EARLY URUK	
4000		
4100		
4200	UBAID 4	
4300		
4400		
4500		
4600		
4700	UBAID 3	
4800		
4900		agricultural villages
5000	UBAID 2	
5100		
5200	UBAID 1	
5300		
5400		
5500		
5600	UBAID 0	
5700	?	
5800		

Figure 2: The COWA 1992 secular chronology of South Mesopotamia. Ubaid 2 overlaps Ubaid 1 and 3. The bottom boundary of Ubaid 0 has not yet been determined.

Other [radiocarbon] determinations... place the end of Ubaid significantly earlier—perhaps as early as 4800 BC, with its earliest phases presumably to be dated before 6000. Whichever chronological approximation we accept, we must also accept an Uruk period approaching or even exceeding 1500 years.

These observations demonstrate two important facts. First, adjustments of even 800 years to the Figure 2 chronology are not unthinkable at the present time. Second, Figure 2 almost certainly represents a *minimum* chronology for South Mesopotamia—the true chronology is probably centuries older at all points.

A Better Approximation

Porada *et al.* were quite clear that their Figure 2 chronology was already out of date at the time of its publication, so some effort to update it seems called for.²⁶ Modification of the Figure 2 chronology is also called for by what we know of the Flood at present. We feel reasonably confident from several lines of evidence that the Flood happened near 3500 B.C.,²⁷ and archaeological considerations seem to place the Flood at the Uruk to Jamdat Nasr boundary as I have previously argued.²⁸ Thus, there seems sufficient reason to believe that the true chronology of South Mesopotamia will place the Uruk to Jamdat Nasr boundary near 3500 B.C., rather than the 3100 B.C. of Figure 2. Purely secular chronological considerations seem to support this as well, as I have previously explained.²⁹

²⁶Edith Porada, Donald P. Hansen, and Sally Dunham, "The Chronology of Mesopotamia, ca. 7000-1600 B.C.," in *Chronologies in Old World Archaeology*, volume 1 (Chicago: The University of Chicago Press, 1992), 121.

²⁷Gerald E. Aardsma, "Chronology of the Bible: 5000–3000 B.C.," *The Biblical Chronologist* 2.4 (July/August 1996): 1–5; Gerald E. Aardsma, "Noah's Flood at Elk Lake," *The Biblical Chronologist* 2.6 (November/December 1996): 1–13; Gerald E. Aardsma, "Noah's Flood at Devon Island," *The Biblical Chronologist* 3.4 (July/August 1997): 1–16; Gerald E. Aardsma, "Radiocarbon Dating Noah's Flood," *The Biblical Chronologist* 3.6 (November/December 1997): 1–11.

²⁸Gerald E. Aardsma, "Research in Progress," *The Biblical Chronologist* 1.4 (July/August 1995): 6–10.

²⁹Gerald E. Aardsma, "Research in Progress," *The Biblical Chronologist* 1.4 (July/August 1995): 8.

Given 1) the obviously unfinished character of the secular chronology at present, 2) the significant indications that the Figure 2 approximation needs to be considerably lengthened, and 3) the evidence from many fields that the Flood happened near 3500 B.C., it seems reasonable to suggest that Figure 2 be modified for the present purpose by the addition of 400 years to the B.C. dates at all points, as is shown in Figure 3. This single alteration does not fix everything which might be wrong with the Figure 2 chronology, of course. But it does bring the Uruk to Jamdat Nasr boundary into coincidence with the Flood. And it also moves the Ubaid to Uruk boundary one half the distance Oates has suggested may be called for. Thus, it should give us a better approximation of the true chronology of South Mesopotamia than Figure 2 alone presents.

Reliability One More Time

Still, Figure 3 is just an approximation, of course. The fact is that the secular chronology of South Mesopotamia *is* rather uncertain at the present time. This does not indicate any lack of ability on the part of the secular chronologists, but rather the inherent difficulty of building an accurate chronology at such an early time. I mention this only in passing, to point out the great privilege the Bible affords its readers in the relative ease with which remote chronology can be accurately determined from its pages.

Taking all factors into consideration it seems reasonable to assign an absolute uncertainty (3σ) of two centuries to the Uruk to Jamdat Nasr boundary, and five centuries to all points within the Ubaid in Figure 3.

Comparison

Figure 4 shows the two chronologies, sacred and secular, side by side. We must now ask if these two are compatible. In keeping with sound research strategy we prosecute this question from the more recent to the more remote times, looking for the most recent point of divergence.

B.C.	South Mesopotamia	
	period	character
3400	JĀMDĀT NĀSR	
3500		
3600		
3700	LATE URUK	
3800		
3900		urban society
4000	MIDDLE URUK	
4100		
4200		
4300	EARLY URUK	
4400		
4500		
4600	UBAID 4	
4700		
4800		
4900		
5000		
5100	UBAID 3	
5200		
5300		agricultural villages
5400	UBAID 2	
5500		
5600	UBAID 1	
5700		
5800		
5900		
6000	UBAID 0 ?	
6100		
6200		

Figure 3: A better approximation to the true secular chronology of South Mesopotamia. It is obtained from the COWA 1992 chronology of Figure 2 by pushing everything back 400 years.

Fourth Millennium

Our departure point is Noah’s Flood, in the middle of the fourth millennium B.C. Previous issues of this publication have thoroughly discussed this important historical event and its significance to the unification of sacred and secular history, so there is no need to dwell upon it here. It is the earlier times which are now of interest.

Unfortunately, the Biblical narrative provides us with very little history in the five centuries of the fourth millennium which precede the Flood. As a result there is not much we can compare to the secular record. However, it is normal to picture Noah and his sons busily constructing the ark in the century before the Flood, and this provides one checkpoint. Is ship-building a known industry in South Mesopotamia by Late Uruk times?

J. N. Postgate provides the following answer. “Boat-building certainly goes back to the Ubaid period in Mesopotamia. . .”³⁰

Clearly there is no anachronism immediately apparent in Noah and his sons building a ship—even a very large ship—in the technologically advanced, fully urban setting of Late Uruk times. Boat-building technology had been in place for probably a thousand years or more by then.

Fifth Millennium

If chronologically controlled Biblical history is sparse in the first half of the fourth millennium B.C., it is all but absent in the fifth millennium. Genesis 5 provides us with the names of eight individuals who were born in succession during this millennium, but no historical details are furnished with this Biblical list.

One might attempt an investigation of the long lives of these individuals. Does archaeology reveal that some people were living for a very long time during the Ubaid and Uruk periods in South Mesopotamia? But it is very difficult to see how to investigate this question. One could study skeletal remains, but what will the skeleton of an individual who lived to be 900 years old look like? Will it be distinguishable from that of an individual who

³⁰J.N. Postgate, *Early Mesopotamia: Society and Economy at the Dawn of History* (New York: Routledge, 1994), 230.

lives to be 90 years old today? We do not know the answers to these questions at present.

There probably *are* clever ways in which archaeology might get at the question of human longevity. Unfortunately, archaeologists are hardly taking the Bible seriously any longer back at these early times, so virtually no creative thinking is being invested in such questions at present. This potential check is thus not currently available to us.

Genesis 4:16–24 provides us with a few snatches of history through its recitation of the list of Cain’s descendents. But no chronological data is furnished in Genesis 4, and the detailed interpretation of the snatches of history which it provides is far from clear. All that seems safely inferred from these verses is that we should place the origin of tents, musical instruments, and metallurgy in the pre-Flood rather than the post-Flood period. I am aware of nothing against this assertion, and I have previously presented some compelling evidence in support of the metallurgy part of it.³¹

Thus, we have very little Biblical history to go on. It would be an overstatement to claim that sacred and secular chronologies positively harmonize in the fifth millennium and first half of the fourth millennium. But on the other hand it would be altogether false to claim that the two chronologies disagree; no point of divergence is apparent between the two chronologies during these millennia. Consequently it is appropriate to push the investigation back into the sixth millennium B.C.

Sixth Millennium

The sixth millennium takes us back, by any reasonable secular chronology, into the Ubaid. Biblically it takes us back into the first generation after Adam and ultimately to the creation of Adam himself.

Working our way methodically back in time, we first encounter the generation of Adam’s immediate children. Genesis 4:2 informs us that one of Adam’s sons was “a keeper of flocks” while another was “a tiller of the ground”. Here is a checkpoint.

³¹Gerald E. Aardsma, “Radiocarbon Dating Noah’s Flood,” *The Biblical Chronologist* 3.6 (November/December 1997): 1–11.

Are these two occupations present within the archaeological data of the Ubaid?

The answer to this question is an unqualified yes. The most extensive recent information on the Ubaid in South Mesopotamia has come from archaeological excavations at Tell el’Oueili. Jean-Louis Huot relates what has been found there:³²

At ’Oueili, the botanical remains were collected by flotation, and by the examination of imprints in clay. . .

The main plant grown was six-rowed hulled barley (*Hordeum vulgare*), of which seeds and internodal stems have been recovered. . . . As for wheat, the species in question is einkorn (*Triticum monococcum*), but this crop is of lesser importance.

We possess but little information about oil-crop plants. Only a single imprint and a grain of flax from the ’Ubaid 4 levels have been found, of the domesticated variety according to its size (*Linum usitatissimum*). The presence of the date-palm should also be noted. . .

Faunal analyses have been carried out by J. Dese. . . For this entire period, the most striking fact is the low proportion of sheep and goats: only 16.8%, compared with 37.6% of pigs and 45.5% of cattle. All these remains come from domesticated animals.

So there is clearly nothing anachronistic about Adam’s sons keeping flocks and tilling the ground. Nor have I been able to find anything else about the Biblical narrative of the first generation after Adam which seems out of place in the Ubaid.

This takes us back to the generation of Adam himself. It is here that we encounter the first real difficulty. There is nothing about the agricultural lifestyle of Adam and Eve, either while they are living in the Garden of Eden or after they have been banished from it, including the cultivation of fruit trees, which is anachronistic. Such a lifestyle

³²Jean-Louis Huot, “Ubaid Villages of Lower Mesopotamia,” *Upon This Foundation – The Ubaid Reconsidered* (Copenhagen: University of Copenhagen, 1989), 26–27.

B.C.	Bible		South Mesopotamia	
	period	details	period	character
3400			JAMDAT NASR	
3500	<u>3526 ± 21 B.C.</u>	- Noah's Flood -		
3600		- birth of Shem -		
3700			LATE URUK	
3800				
3900				urban society
4000			MIDDLE URUK	
4100		- birth of Noah -		
4200				
4300	PRE-FLOOD	- birth of Lamech -	EARLY URUK	
4400				
4500		- birth of Methuselah - - birth of Enoch -		
4600			UBAID 4	
4700		- birth of Jared -		
4800		- birth of Mahalalel - - birth of Kenan -		
4900		- birth of Enosh -		
5000		- birth of Seth -		
5100			UBAID 3	
5200	<u>5176 ± 26 B.C.</u>	- creation of Adam -		
5300				agricultural villages
5400			UBAID 2	
5500				
5600			UBAID 1	
5700				
5800				
5900				
6000			UBAID 0 ?	
6100				
6200				

Figure 4: Comparison of pre-Flood Biblical chronology with the Figure 3 secular chronology of South Mesopotamia.

is quite appropriate to the settled agricultural setting of South Mesopotamia during the Ubaid revealed by archaeology. The great difficulty is that we had expected Adam and Eve to be the first man and first woman ever created. Isn't this what the Bible teaches, and what Christians have historically believed? How then can the creation of Adam and Eve be chronologically situated in the middle of the Ubaid, an archaeological period overflowing with evidence of human existence and activity throughout?

Central Conundrum

Evidence of the existence of mankind prior to the creation of Adam and Eve is very surprising. We are immediately caused to wonder whether some chronological blunder has been committed. But try as we might, no intelligent solution in terms of chronological error appears.

If we push Biblical chronology to its breaking point and move the creation of Adam by 500 years to 5700 B.C., while leaving the secular chronology of Figure 4 alone, we still have the same problem—the creation of Adam still occurs part way through the Ubaid. If we push hard against the secular chronology and move the dawn of the Ubaid forward 500 years, while leaving Biblical chronology alone in Figure 4, we still have the problem.

If we push both Biblical chronology and secular chronology to their breaking points we may possibly be able to place the creation of Adam at the dawn of the Ubaid. This depends, of course, upon just how remote the dawn of the Ubaid is eventually found to be by the archaeologists (who have so far been prevented by ground water from digging to the bottom of the Ubaid at 'Oueili). But we are certainly out on a limb with such a procedure. If it is improbable that even one of these two chronologies should be out by 500 years—and it is—then it is, of course, highly improbable that they should both be out by that much.

But such forcing of the chronological data would be folly. It would be folly not only because of its improbability, but also because it does not solve the problem of the apparent existence of mankind prior to the creation of Adam anyway. While human culture prior to Ubaid 0 is presently unknown to archaeology in South Mesopotamia, there is am-

ple evidence of human existence prior to Ubaid 0 times in North Mesopotamia and elsewhere, such as Palestine. And this evidence stretches back over thousands of years prior to the Ubaid.

All of the Ubaid levels reveal that the Ubaid people were making and using decorated pottery. As one moves stratigraphically lower at other archaeological sites, such as Jericho in Palestine, one eventually encounters archaeological strata in which no pottery fragments are found at all. These imply that the technology of pottery manufacture had not yet even been discovered at their very early times. Such pre-pottery strata at Jericho date back to at least 8000 B.C.

Thus, secular chronology finds mankind in existence thousands of years before the Biblical date of the creation of Adam. This is the central conundrum of pre-Flood Biblical chronology for the conservative Christian. No appeal to chronological blunder can solve this conundrum. One can try to avoid the problem by embracing chronological anarchy—one can claim that secular chronology is meaningless. But we have not found the Exodus, the Conquest, and the Flood within the secular data by embracing chronological anarchy. The true solution, we believe, will be found in some other direction. ◊

Toward Unification of Pre-Flood Chronology: Part II

From Volume 4, Number 5, pages 1–10.

We are presently embarked upon a mission to unify pre-Flood sacred and secular chronologies. This is neither a frivolous nor an easy task. It warrants our full attention and our best effort. It demands that we adopt a sound method of attack on the problem. And it demands that we proceed logically on the basis of available evidence, deliberately putting pet theories and prejudices aside, if we hope to obtain the truth.

We have tackled some very difficult chronology problems in this newsletter in the past. None has been as intrinsically difficult and as urgently in need of solution as this present one.

Review

Last issue I compared pre-Flood Biblical chronology with the secular chronology of South Mesopotamia.³³ I found the most recent point of divergence between these two chronologies to be at the creation of Adam, 5176±26 B.C. The divergence results from the fact that secular chronology finds mankind in existence thousands of years before this date, while we had expected Adam to be the first man ever created. I have called this the central conundrum of pre-Flood Biblical chronology. It is toward the solution of this conundrum that we must now direct our effort.

Possible Solutions

There are only nine conceptually possible solutions to this conundrum that I am able to find. My method of enumeration is as follows.

The conundrum exists between Biblical and secular accounts of earth history. Specifically, the secular antiquity of mankind seems to extend beyond the Biblical date of the creation of Adam. This gives rise to two categories of solution: 1. an error of some sort is being made on the Biblical side of the problem, or 2. an error of some sort is being made on the secular side of the problem.

These two categories each bifurcate according to whether the problem is chronological or historical in nature. For example, the conundrum could arise because of some sort of problem with the Biblical chronology of the creation of Adam (i.e., the date), or it could arise because of some sort of problem with the Biblical history regarding the creation of Adam (i.e., the details).

Each of these branches bifurcates again according to whether the problem is intrinsic or extrinsic. For example, the conundrum could arise because Biblical chronology is intrinsically false (i.e., the data are fabricated), or it could arise because we have made an error in our handling of the Biblical chronological data.

These three bifurcations give rise to eight (i.e., 2³) conceptually possible solutions. The ninth possibility is that there is nothing wrong in either the Biblical or the secular side of the conundrum; the

evidences from both sides are valid and require only proper integration. In this ninth possibility the problem is seen to lie in our profound ignorance of the nature of creation events, rather than in the data from the Bible or in the data from secular studies.

These nine possibilities are enumerated as follows:

1. The Biblical chronological data leading to the creation of Adam are false (i.e., fabricated).
2. The secular chronological data leading to a great antiquity for mankind are false (i.e., fabricated).
3. The Biblical history which teaches that Adam was the first man to be created is mythological or otherwise fabricated.
4. The modern secular teaching that mankind existed in remote antiquity is a hoax or fabrication.
5. We have misunderstood the Biblical history of the creation of Adam; the Bible does not really teach that Adam was the first man ever to be created.
6. The archaeologists have misunderstood the history of mankind; archaeology does not really show the existence of humans before Adam.
7. We have made some mistake in the computation of the Biblical date of the creation of Adam (i.e., the basic Biblical chronological data are valid, but they have been misunderstood).
8. The secular chronologists have made some mistake in their computation of the antiquity of man (i.e., the basic secular chronological data are valid, but they have been misunderstood).
9. The Biblical and secular evidences must both be accepted as legitimate; the truth lies in a proper synthesis of the two.

Our procedure must now be to work our way through this list, considering each of these possibilities in turn. Our purpose is to attempt to dis-

³³Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1-10.

cover which of these nine solutions is most likely to be the correct one.

Are the Biblical Chronology Data Fabricated?

The first possibility is that the basic data from the Bible leading to the date of the creation of Adam are fabricated. That is, they have no basis in any real record of historical events. Rather, they have been fabricated more or less out of thin air.

This possibility encounters two principle difficulties. First, it is in violation of the doctrine of Biblical inerrancy. Second, the recent track record of this sort of claim is very poor.

The doctrine of Biblical inerrancy functions relative to the study of the Bible in much the same way as the law of mass/energy conservation functions relative to the study of the physical world. Both have proven to be guiding principles of no small merit, with the result that those who have experience with either are most reluctant to believe it will ever be shown false.

For example, in nuclear physics the discovery of beta decay led to an apparent violation of the scientific law of mass/energy conservation earlier in this century. Beta decay is one way that an atomic nucleus (the “parent”) can spontaneously transform into an atomic nucleus of a different element (the “daughter”). In beta minus decay, an electron is ejected from the parent nucleus in the course of the transformation.

The apparent violation of mass/energy conservation resulted when it was found experimentally that the electrons for any given type of beta-decaying nucleus could be ejected with a whole range of energies. Since the parent and daughter each had a fixed mass/energy, then, according to the law of mass/energy conservation, the ejected electron should have had a fixed mass/energy too, exactly equal to the difference in mass/energy between the parent and the daughter.

The experimentally observed failure of the ejected electrons to have a fixed mass/energy could have been taken as a clear falsification of mass/energy conservation. But, shunning this possibility, Enrico Fermi proposed, in 1933, that the missing mass/energy was being carried away by yet another particle, emitted from the decaying

nucleus together with the electron. To make this suggestion work, however, it was necessary to also propose that this additional particle was almost impossible to detect, since beta decay had been observed extensively in many laboratories, and no one had ever detected any additional particle.

To the novice, here was a contrived solution if there ever was one—a ghost particle that carried away the missing mass/energy but couldn’t be detected. How very convenient!

But to those in the know, the law of mass/energy conservation is worth staking one’s reputation on, no matter how improbable the proposal necessary to preserve it may seem. And, in point of fact, twenty-three years later Fermi’s proposal was conclusively proven correct when the ghost particles were finally observed by Frederick Reines and Clyde L. Cowan, Jr. Today the *neutrino*—partner of the electron in beta decay—is a common-place, well-known entity of particle physics.

The doctrine of Biblical inerrancy is the same way. It has worked so well in such diverse instances, those in the know refuse to set it lightly aside no matter how pressing the evidence against it may seem to be.

In addition to this there is the fact that the proposal that the Biblical chronology data are fabricated has not been faring very well lately. This proposal has been around for quite some time, and it has been applied in many more contexts than just the creation of Adam. For example, over forty years ago archaeologist Kathleen Kenyon wrote in regard to the destruction of Jericho by Joshua:

we may take it in the first place that chronology based on the Biblical record cannot be taken literally.³⁴

Kenyon believed the Biblical chronology data leading to a date for the conquest of Jericho were fabricated. As a result, she paid scant attention to them.

But I have shown that Kenyon was quite mistaken about this.³⁵ Indeed, we can only conclude that this fabrication hypothesis did Kenyon an

³⁴Kathleen M. Kenyon, *Digging Up Jericho*, (New York: Frederick A. Praeger, 1957), 258.

³⁵Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993), 86–90.

enormous disservice. It caused her to fail in her attempt to find the Biblical city of Jericho which had been destroyed by Joshua at the time of the Conquest. The evidence was all there. She excavated it and handled it herself. She commented on how the walls had been subjected to a fierce conflagration by the attackers who had destroyed the city—just as the Bible tells us Joshua did to Jericho. But because she regarded Biblical chronology as fabricated, and therefore unworthy of serious study, she failed to make the critical connection between the evidence she held in her hands and the history of Jericho recorded in the Bible.

Not only is properly executed Biblical chronology literally correct in dating the conquest of Jericho, I have shown that it is also literally correct in dating the Exodus and numerous other Biblical events right back to and including Noah's Flood.³⁶ In each instance the Biblical data have proven reliable despite widespread insistence that they are not.

For these reasons I judge that the true solution of our conundrum will not be found to lie with the proposal that the Biblical chronology data leading to the date of the creation of Adam are fabricated.

Are the Secular Chronology Data Fabricated?

Absolute dating of archaeological artefacts is highly dependent on radiocarbon dating. Is it possible that the radiocarbon dates have been fabricated—that rather than being the result of real measurements on real archaeological samples from the archaeological contexts of interest, these “dates” have been pulled merely from thin air?

No, this is not possible. It is not possible because the archaeological artefacts to be dated are supplied by many different archaeologists from many different countries working independently at many different sites, and because the samples are submitted to many different radiocarbon laboratories all over the world. One can certainly imagine how situations might arise in which a given archaeologist might be tempted to pull a “radiocarbon

date” out of thin air to support a pet theory, but it is impossible to imagine all archaeologists doing this, and even more impossible to imagine all radiocarbon labs going along with such a thing. In point of fact, I am well acquainted with a number of individuals who are intimately involved in dating samples using radiocarbon, and whatever their personal foibles, one cannot fault them along any such lines as these. They are devoted to making the most accurate physical measurement possible of the radiocarbon content of the samples submitted to them. They know full well, as do the archaeologists, that their claims can be checked by others, and very likely will be eventually, and it is a matter of professional pride for one's work to stand up to any amount of scrutiny. They also know that to be caught fabricating data means irreversible and quite possibly fatal damage to their professional careers.

The solution to our conundrum will not be found by waving the radiocarbon dates aside as so much fabrication. They are real—so real that you yourself would find the same result were you to make the measurement—and must be come to grips with as such.

Is the Biblical History False?

The next possibility—the idea that the Biblical account of the creation of Adam is simply mythological or otherwise false—is very prevalent at the present time. I reject this possibility for essentially the same reasons as the first possibility. That is, it violates Biblical inerrancy, and the recent track record of this sort of thinking is exceedingly poor, as nearly every issue of this newsletter has demonstrated since its inception.

I would only add here that this same sort of claim can be found historically in other than just Biblical contexts. For example, there was a time, not too long ago, when academic scholarship looked with distinguished disdain even upon the idea that the Troy of Homer's *Iliad* and *Odyssey* was a historical place. Skepticism, in this case, was snuffed out by the archaeological work of the self-educated Heinrich Schliemann in the closing decades of the last century, which work entirely revolutionized the accepted scholarly view of Greek history.

³⁶See Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993) and the previous issues of this newsletter.

But the maxim that “the only thing we learn from history is that we never learn from history” seems, unfortunately, all too true in regard to scholars’ general evaluation of the voice of the ancients from the past.

Is the Secular Teaching a Hoax?

The idea that the antiquity of man claimed by secular scholarship is a hoax can be dealt with relatively quickly. This falls into the category of conspiracy theory. The idea here is that the secular scholars have conspired to foist a view of the past which they know is false onto the unsuspecting public. They do this from evil motivations. Dissent within the ranks is essentially impossible because these evil-motivated scholars control the academic institutions, publishing houses, and granting agencies. They are easily able to snuff out all opposition before it ever really even gets going.

The problem with this theory is not that it characterizes scholars as motivated by evil. From what I have seen, many of them are! But the evil which motivates them is the ordinary, self-centered sort, and it is because of this fact that the theory fails. You only have to rub shoulders with these scholars for a short time to realize that any scheme, evil or otherwise, requiring that they *cooperate* is doomed to failure right from the start. Their pride would simply not allow it—they would each one claim the idea was originally theirs, and would each insist on being in charge of the whole operation. Nationalism, racism, sexism, and religious and anti-religious prejudices, always just beneath the surface of every gathering of scholars I have ever witnessed, would be sure to bring the whole scheme to ruin in short order.

Secular scholars from many different disciplines have been claiming a great antiquity for mankind for at least 100 years now. It is difficult to imagine a worldwide group of scientists successfully cooperating on anything voluntarily for even 100 days. That they should be able to do so for 100 years is simply preposterous.

The secular teaching that mankind existed long before the creation date of Adam cannot simply be dismissed as a gigantic, evil hoax.

Does the Bible Allow Mankind Before Adam?

This brings us to the fifth conceptually possible solution: that the Bible doesn’t teach that Adam was the first man ever to be created.

The discussion of this possibility takes us out of the realm of science and into the realm of Biblical hermeneutics. Since my formal training is only in science I cannot give an “expert” opinion on this question. But the most striking fact one encounters relative to this question is the near-universal agreement among those Christians who accept that Adam was a real, historical person—including many who *do* qualify as experts in Biblical hermeneutics—that the Bible does indeed teach that Adam was the first man to be created. That being the case, I am hopeful that the following, somewhat lengthy discussion, which explains only why *I* think we must accept that the Bible does teach that Adam was the first man ever to be created, will suffice for the present purpose. I am hopeful that it will be found, if short of “expert”, at least refreshingly original and stimulating.

To show conclusively from the Bible that Adam was the first man ever to be created is not the trivial exercise one might at first suppose. The prime difficulty is that the Genesis narrative of the creation of Adam never *explicitly* states that he was the *first* man to be created. One might imagine, for example, that other men had been created before Adam, but the Bible doesn’t record these earlier instances. Just because the creation of Adam is the first to be recorded in Scripture does not guarantee that it was the first to ever have happened.

Mother of all living

I suspect that Genesis 3:20 figures prominently into the popular acceptance of the idea that Adam was the first man ever to be created. This says (NASB):

Now the man called his wife’s name Eve, because she was the mother of all the living.

This is generally understood as establishing Eve as the first female ancestor of all mankind. And if Eve was the mother of all mankind, then Adam, her husband, must have been the father of all mankind.

And in that case it is clear enough that Adam must have existed prior to all other men.

But a critical approach to this line of argument shows it to be quite frail. In the first place it is possible to argue that since Adam named his wife Eve while they were still living in the Garden and isolated from the rest of the world, he was unaware that other people existed outside the Garden, and so he thought Eve was the mother of all the living even though she really wasn't. In this view, Genesis 3:20 faithfully records what Adam named his wife and why he gave her that name, while never intending to imply that Adam's reason was correct.

But more cogent to me are difficulties with the verse itself. The verse seems curious in two ways, and until these can be satisfactorily explained, I am loathe to apply it to any problem for fear of inadvertent misapplication. This would not be the case if what this verse says was repeated elsewhere in Scripture, but, in fact, it stands alone.

The first curiosity with this verse is that it seems chronologically out of place in the narrative. It sits near the end of the account of the Fall, in the middle of God's judgment of Adam and Eve's sin. It seems an interruption of the flow of the narrative to be told what Adam named his wife and why he named her that at this point in the account.

It also seems unlikely that Adam would actually have named his wife at this point in the narrative. This is such a solemn, tragic moment, following God's pronouncement of their sentence. Would Adam have been occupied in naming his wife while God was making skin clothes for them and preparing to banish them from the Garden?

Second, the internal chronology of the verse does not seem right. We are told that Adam called her Eve "because she was the mother of all the living". The difficulty is that at this point in the narrative she was, in fact, the mother of no one. As far as the narrative tells us we have just Adam and Eve, and Eve has not yet had any children. Proper internal chronology seems to require a different wording, something like "because she was to be the mother of all the living". The wording which actually appears in the text seems only appropriate in a retrospective perspective, in which the writer is looking back across generations to the Garden. But this perspective is not that of the rest of the narra-

tive, all of which seems to be taking place then and there. It is as if this explanation, "because she was the mother of all the living", is a scribal gloss which has become incorporated into the text, rather than being part of the original narrative.

In any event, both the external and internal chronology of the verse do seem to me to estrange it from the rest of the narrative. This is just another way of saying that I, at least, find this verse to be somewhat enigmatic. And since this is true, it seems necessary to exclude this verse from the present discussion, even though the sense in which it is normally understood is in agreement with my conclusion.

Aura of primacy

The idea that Adam was the first man created, though never explicitly stated in the narrative of the first few chapters of Genesis, is naturally inferred from it in several ways. Adam is the first human character to appear in the narrative, and there is an aura of primacy about his entrance into the narrative. He is created from the dust of the ground, rather than being generated by any human parents. One has the impression that he had to be thus created, precisely because there were no human parents around to produce him at that time. This impression is reinforced with the entrance of Eve into the narrative. One naturally infers that her creation from Adam's side was also not an arbitrary miracle, but rather a necessary one too, there being no other human females in existence at that time.

Test and see

The aura of primacy is further reinforced by the "test and see" character of the Genesis account of the creation of Adam. "Test and see" cases are natural to any invention which is the first of its kind; they have no natural setting with later duplicate copies of that same invention. We seem to be witnessing the initial "test flight" of the first human being as we watch God's interaction with Adam in the Garden.

The principle "test and see" case is the test of obedience posed by the tree of the knowledge of good and evil, of course. God has obviously given Adam free choice to eat or not to eat, and He is

watching to see what the outcome of this test will be.

But this is not the only “test and see” episode which the narrative presents. Another one occurs with Adam’s naming of the animals. Here the text is quite explicit that this is, indeed, a “test and see” case. Genesis 2:19 records, “And out of the ground the Lord God formed every beast of the field and every bird of the sky, and brought them to the man *to see what he would call them*; and whatever the man called a living creature, that was its name” [my emphasis].

Still another “test and see” case leads up to the creation of Eve.

Eve was not created simultaneously with the creation of Adam. Only after the passage of some time (presumably hours), during which Adam was alone in the Garden, was Eve finally created. One feels from the account (Genesis 2:18–24) that God has watched Adam to see his reaction to the world in his first several hours of existence, before concluding, “Yes, you see, he does indeed need a suitable companion.”³⁷

These “test and see” cases seem to place the reader in a setting of first-of-its-kind newness.

Note also that in this setting the narrative of Adam and Eve’s creation finds deep meaning, while the idea that other humans had been previously created turns many aspects of the narrative from profound to trite. Yet it is the case that the narrative of the creation of Adam and Eve is always treated as pregnant with meaning in the New Testament, and never as trite or in any way eclipsed by a still earlier precedent.

A Textual Confusion Explained

In addition to these arguments there is the fact that the idea that Adam was the first man ever to be created explains an otherwise curious confusion which appears in the Hebrew text. The *Wycliffe Bible Encyclopedia* explains the confusion:

In the OT the word *’ādām* is used more than 500 times in the sense of mankind

³⁷I trust my failure to overlay the simplicity of the text at this point in the discussion with theological concepts of God’s omniscience and sovereignty will not seem intolerable to the theologians. My reason for failing to do so is that the text itself seems deliberately void of these concepts at this point.

as well as in the sense of a proper name. Both uses appear in the Genesis record, but only from Gen 4:25 onward can it definitely be claimed that the specific person Adam is exclusively under consideration.

As a single example, consider Genesis 5:1–3. Leaving the Hebrew *’ādām* as it appears in the untranslated text yields:

This is the book of the generations of *’ādām*. In the day when God created *’ādām*, He made him in the likeness of God. He created them male and female, and He blessed them and named them *’ādām* in the day when they were created. When *’ādām* had lived one hundred and thirty years, he became the father of a son in his own likeness, according to his image, and named him Seth.

That the intended sense is not always immediately obvious is easily illustrated by comparing different English translations of these sample verses. For example, the NASB translates two of these four instances of *’ādām* as Adam, one as man, and another as Man. The KJV translates three of them as Adam, and the other as man.

This confusion exists throughout the creation narrative of Genesis, not just in these few verses of Genesis 5.

This confusion must strike the uninitiated as very strange. Why should the concepts of “Adam”, a specific creature, and “man”, all creatures of Adam’s class, be indistinguishable like this in Hebrew? And why would God allow a confusion of this sort to permeate something as foundational and important as these accounts of the Creation and the Fall in the early chapters of Genesis? Since so very much of faith, our understanding of the Bible and of God, and our understanding of man necessarily derives from these earliest chapters, one would hope for distinct clarity here if anywhere. There is, after all, the Hebrew word *’ish*, also translated “man” (e.g., Genesis 2:23) which might have been used to separate clearly between the concepts of “Adam” and “man” in each instance within the early chapters of Genesis. Why was such a duplicity of meaning allowed in *these* chapters, of all places?

The idea that Adam was the first man ever to be created provides an explanation of this curious apparent confusion. This lack of differentiation in vocabulary is expected in the case of there being only one specimen of a class of similar objects in existence.

Suppose for a moment that you were the owner of the only dog in the world. Then it would be perfectly understandable if you always referred to your dog simply as “Dog”. If you said, “Dog, come here”, there would be no confusion. The lack of differentiation in your vocabulary between your dog, “Dog”, and the class of all creatures of the same type, “dog”, would be entirely understandable in such a case. It would be a simple consequence of the fact that no such class of creatures of the same type existed.

Only in the case of there being two or more dogs in existence would it be necessary to provide some means of differentiating them. Only in that case would you need to increase your vocabulary from “Dog” to “Dog” and “Dog 2”, or, if you had more of a flare for esthetics, perhaps “Rover” and “Spot”.

I suggest that this lies at the root of the apparent confusion over this word *’ādām* in the early chapters of Genesis. These chapters, I suggest, provide a faithful witness to a time when no confusion resulted from a failure to separate between “Adam”, the specific individual, and “man”, the class of all such individuals, because Adam was then the only member of the class—the only man in existence.

1 Corinthians 15:45

These arguments fall short of proof positive because they are inferential. To settle the matter beyond all doubt, one really requires an explicit statement from Scripture saying directly that Adam was the first man ever to be created.

The closest Scripture comes to such a statement is in 1 Corinthians 15:45. There the apostle Paul writes [NASB. Small caps and italics are in the original. Small caps signify direct quote from the Old Testament. Italics signify word supplied by the translators.]:

So also it is written, “The first MAN, Adam, BECAME A LIVING SOUL.” The last Adam *became* a life-giving spirit.

This verse does explicitly say that Adam was the first man. But, it does not explicitly say that Adam was the first man *ever to be created*. This allows the possibility that “first man” might be interpreted in some other sense, such as “the first type of man”. I think it is very common, in fact, for the “last Adam” of this verse to be interpreted as a reference to Christ, and such a figurative meaning for “last Adam” hardly favors a literal interpretation of “first man, Adam”.

The figurative meaning for “last Adam” seems mandatory when this passage is read in the King James translation. This is because verse 47 is there rendered as, “The first man *is* of the earth, earthy: the second man *is* the Lord from heaven”. This seems to show that Paul has a contrast between Adam and Christ in mind in these verses.

But verse 47 is rendered quite differently in the NASB. There we find simply, “The first man is from the earth, earthy; the second man is from heaven”. This gives no hint of an analogy to Christ, which allows the possibility that the “last Adam” of verse 45 may not be intended figuratively at all. But a decision on this matter requires considerably greater expertise in New Testament textual issues than my training in science has afforded me.

There is another approach to this verse which does not seem to require great textual expertise, however, and which does seem to lead to the conclusion that this “first man, Adam” is intended to be understood in the sense of Adam being the first man ever to be created.

Notice that what Paul says “is written”, in verse 45, is not an exact quote. The phrase, “man became a living soul”, is all that is found in Genesis 2:7. To this has been added “the first” and “Adam” in verse 45, and yet Paul claims that all of this “is written”. In what sense can it be said that the entire phrase, “the first man, Adam, became a living soul”, “is written”?

The answer would seem to be that, while “the first” and “Adam” are not explicit in Genesis 2:7, the rest of what is written in the immediate vicinity of Genesis 2:7—the context of Genesis 2:7—clearly implies these additional words.

But if these additional words are implied by the context of Genesis 2:7—so that one may justifiably claim that they are “written” along with the rest of

the phrase from Genesis 2:7—then it clearly must be the context of Genesis 2:7 which determines their meaning, and not the context of 1 Corinthians 15:45. And in that case it is perfectly clear that their meaning must be “the first man ever to be created” for Genesis 2:7 clearly sits within a creation context.

If we go back to Genesis 2:7 and put these extra words in there, as the Spirit explicitly warrants through 1 Corinthians 15:45, then we read:

Then the LORD God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and the first man, Adam, became a living soul.

Here there can be no question. The context here is not analogy or typology. The context here is creation, plain and simple. And in that case we must conclude that the Bible does, in fact, teach both implicitly and explicitly that Adam was the first man ever to be created.

I judge that the Bible does require us to accept that Adam was the first man ever to be created. The resolution of our conundrum is not to be found in the idea that the Bible allows for the existence of mankind prior to Adam.

Are the Archaeologists Misreading the Data?

The sixth possibility is that the archaeologists are mistaken in their interpretation of the archaeological data. We are not thinking of chronology at all here (that comes in with the eighth possibility). For this possible solution the secular chronology is assumed to be valid. We are only thinking that the archaeologists are mistakenly identifying archaeological artefacts from pre-Adamic times as being related to *human* activity, when, in fact, they have nothing to do with humans.

One does not have to read very extensively in the archaeological literature to learn that this idea is impossible. The pre-Adamic archaeological artefacts are of the same sort as the post-Adamic ones. They include skeletal remains indistinguishable from modern man; painted pottery bowls, jugs, and plates; remains of houses which are nearly indistinguishable from even their modern counterparts in that same part of the world;

houses arranged in village structure, frequently with a surrounding wall; animal and plant remains testifying to agricultural occupations; graves testifying to burial of the dead and belief in life after death; carved or molded statuettes; and much more. There can be no mistake about the fact that one is viewing truly human assemblages in these archaeological data. The solution to our conundrum does not lie in this direction.

Is Our Biblical Chronology Mistaken?

The seventh possibility is that we have made some mistake in the computation of the Biblical date of the creation of Adam. A simple quantitative analysis quickly reveals that our conundrum cannot be resolved in this way.

Secular chronology places the origin of modern mankind (i.e., the first *Homo sapiens sapiens*) very far back relative to seven thousand years ago. Skeletal remains anatomically indistinguishable from modern man, together with art work, and clear evidence of burial of the dead date back to at least 25,000 years ago on the secular time scale. (In fact, 35,000 years more accurately reflects the current secular estimate.) Thus, to resolve the conundrum of mankind before Adam by an appeal to a mistake in our handling of the Biblical chronological data, one or more errors totaling at least 18,000 years must be found.

I noted last issue that Biblical chronologists have been arriving at a date for the creation of Adam very similar to my 5176±26 B.C. (i.e., well within 10% of it) right back to the time of the early church. Thus, if this date is out by 18,000 years, a great number of competent, godly scholars have somehow been terribly misled through the years. But let us suppose that this, indeed, has happened, and press on with our quantitative analysis.

We have verified Biblical chronology from the present back to 3500 B.C., the time of Noah's Flood.³⁸ Thus, these 18,000 missing years must fit somewhere in the interval between Adam and Noah, an interval we have calculated to be just

³⁸Gerald E. Aardsma, “Noah's Flood at Elk Lake,” *The Biblical Chronologist* 2.6 (November/December 1996): 1–13. Gerald E. Aardsma, “Noah's Flood at Devon Island,” *The Biblical Chronologist* 3.4 (July/August 1997): 1–16. Gerald E. Aardsma, “Radiocarbon Dating Noah's Flood,” *The Biblical Chronologist* 3.6 (November/December 1997): 1–11.

1,700 years long. Quantitatively, then, we are required to somehow stretch the interval from Adam to Noah by more than a factor of ten over what we (and others) have previously calculated from the Bible. I judge this to be an impossibility.

This 1,700 years was calculated on the basis of the explicit chronological data given in the genealogical list from Adam to Noah found in Genesis 5. Thus, this 18,000 years must fit somewhere in this genealogical list. Said another way, this list must somehow be stretched by over a factor of ten.

Some have argued for missing generations in these genealogies, to be sure. But our quantitative analysis shows that we require more than ten missing generations for every one which is given in Genesis 5. That is a lot of missing data for a list which gives every impression of having been compiled with accurate chronological computation in mind.

The Genesis 5 list is very similar in construction to the one in Genesis 11 which extends the genealogy from Noah to Abraham. The Genesis 11 list was a vital part of our Biblical chronology computation of the date of the Flood. In that computation we assumed no missing generations. Since our Biblical date for the Flood checks with many extra-Biblical chronological indicators, our treatment of the Genesis 11 chronological data must be regarded as sound. This means that we have yet to find any chronological evidence of even one missing generation in Genesis 11. Is it, then, credible to propose that ten generations are missing for every one which is given in Genesis 5?

I am willing to concede that there may, in the most pathological case, be even as much as 500 years error in my computed date for the creation of Adam, as I have previously stated.³⁹ But the suggestion that this computation may be in error by 18,000 years is way outside the bounds of any reasonable analysis of the Genesis 5 chronological data. The apparent existence of mankind prior to the creation of Adam cannot be resolved in this way.

³⁹Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 4.

Recess

Only the eighth and ninth possible solutions remain:

8. The secular chronologists have made some mistake in their computation of the antiquity of man (i.e., the basic secular chronological data are valid, but they have been misunderstood).
9. The Biblical and secular evidences must both be accepted as legitimate; the truth lies in a proper synthesis of the two.

But these are both far too lengthy to undertake here. Stay tuned! ◇

Toward Unification of Pre-Flood Chronology: Part III

From Volume 4, Number 6, pages 1–13.

Review

Two issues ago I introduced the "central conundrum" of pre-Flood Biblical chronology.⁴⁰

The conundrum is the apparent existence of mankind, according to secular scholarship, many thousands of years before the creation date of Adam determined from Biblical chronology.

Last issue I enumerated nine conceptually possible solutions to this conundrum.⁴¹

1. The Biblical chronological data leading to the creation of Adam are false (i.e., fabricated).
2. The secular chronological data leading to a great antiquity for mankind are false (i.e., fabricated).
3. The Biblical history which teaches that Adam was the first man to be created is mythological or otherwise fabricated.
4. The modern secular teaching that mankind existed in remote antiquity is a hoax or fabrication.

⁴⁰Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1–10.

⁴¹Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 1–10.

5. We have misunderstood the Biblical history of the creation of Adam; the Bible does not really teach that Adam was the first man ever to be created.
6. The archaeologists have misunderstood the history of mankind; archaeology does not really show the existence of humans before Adam.
7. We have made some mistake in the computation of the Biblical date of the creation of Adam (i.e., the basic Biblical chronological data are valid, but they have been misunderstood).
8. The secular chronologists have made some mistake in their computation of the antiquity of man (i.e., the basic secular chronological data are valid, but they have been misunderstood).
9. The Biblical and secular evidences must both be accepted as legitimate; the truth lies in a proper synthesis of the two.

These nine, I believe, cover the entire field of possibilities.

Last issue I discussed the first seven of these and showed that they each failed to present an adequate resolution of the central conundrum. This leaves two possibilities, the eighth and the ninth, to be explored.

Introduction

This issue it is the eighth possible solution which is the focus of our attention. We are inquiring into the reliability of the secular dating of the antiquity of mankind. We are not questioning the validity of the basic physical data used in this dating process. The idea that the basic physical data are somehow fabricated has been discussed previously as the second possible solution of my enumeration. This idea has already been set aside as false. Thus, I take as a starting point for the present study that the measurements of the radiocarbon content of ancient human artifacts upon which the secular dating is based are good, valid, physical measurements, so that we would find the same radiocarbon concentrations ourselves were we to make the

measurements on these ancient samples. The concern in the present study is not with the measured concentration of radiocarbon in the samples, but rather with the interpretation of those concentrations in terms of elapsed calendar years. Doesn't the process of converting a measured radiocarbon concentration to a calendar date involve certain assumptions? What guarantee is there that these assumptions are valid?

Radiocarbon Dating: Can You Trust It?

Notice that the discussion has already focused on radiocarbon dating, to the exclusion of all other dating methods. This is as it should be. The context of the present discussion is the putative existence of mankind prior to 5176 ± 26 B.C., the creation date of Adam found from Biblical chronology.⁴² We are trying to resolve whether absolute secular dates for human artifacts prior to 5176 ± 26 B.C. are legitimate. Since there are no secular written records extending that far back into the past, the only way to determine the absolute date of an artifact at such ancient times is radiocarbon dating. So it is radiocarbon dating—and not potassium-argon dating, or rubidium-strontium dating, or any other dating method—which is of exclusive interest to the present discussion. Only radiocarbon dating functions in actual practice to furnish reasonably precise absolute dates to the secular archaeologists in the time period of interest to this investigation.

It is important to notice, however, that it is not the whole of radiocarbon dating which is of immediate concern to us here. The putative range of radiocarbon dating is roughly 50,000 years. But in this study we do not need to concern ourselves, at least initially, with the question of the reliability of radiocarbon dates 50,000 years ago. Recall that sound research strategy dictates that we focus on the most *recent* point of tension between sacred and secular chronologies.⁴³ This point is now at the creation of Adam, 5176 ± 26 B.C., or roughly 7200 years ago, not 50,000 years ago. Thus, our

⁴²Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 2-3.

⁴³Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1.

strategy must be to find a set of radiocarbon determinations for human-related archaeological samples in the millennia immediately prior to the creation date of Adam, and investigate those radiocarbon dates critically to see if they are truly reliable. If they are *not* reliable—if we are able to show that some faulty assumptions have been made so that those human-related samples should really be dated *after*, rather than *before* the creation of Adam—then will be the time to critically examine yet older radiocarbon dates. If, on the other hand, they *are* found to be reliable, then the apparent existence of mankind prior to the creation of Adam is affirmed and there is no reason to pursue the reliability of radiocarbon any further back in time—at least as far as the present investigation is concerned.

Jericho

There are any number of suitable radiocarbon determinations which might be chosen for critical examination in the present context. I suggest, however, that we focus our attention on radiocarbon measurements from Jericho. My main reason for this suggestion is that Jericho is already somewhat familiar to most of us. Thus, it does not entail quite the difficult learning curve of other less familiar archaeological sites. Also, Jericho ties in very neatly with Biblical chronology at the time of the Conquest.⁴⁴ This provides us with a well established Biblical chronology reference point, which is convenient for checking the results of radiocarbon at Jericho at least that far back in time.

Archaeology at Jericho

Jericho is a conspicuous mound located about 6 miles (10 km) north of the Dead Sea. The mound rises on average about 50 feet (17 m) above the surrounding plain. The mound is made up of the debris of thousands of years of human occupation at the site. It is like a huge layer cake, with each layer representing one chapter in the history of Jericho. The oldest layer is at the bottom, with

⁴⁴Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993), 86–90; Gerald E. Aardsma, “Wood’s Jericho Tumbles,” *The Biblical Chronologist* 2.3 (May/June 1996): 1–6.

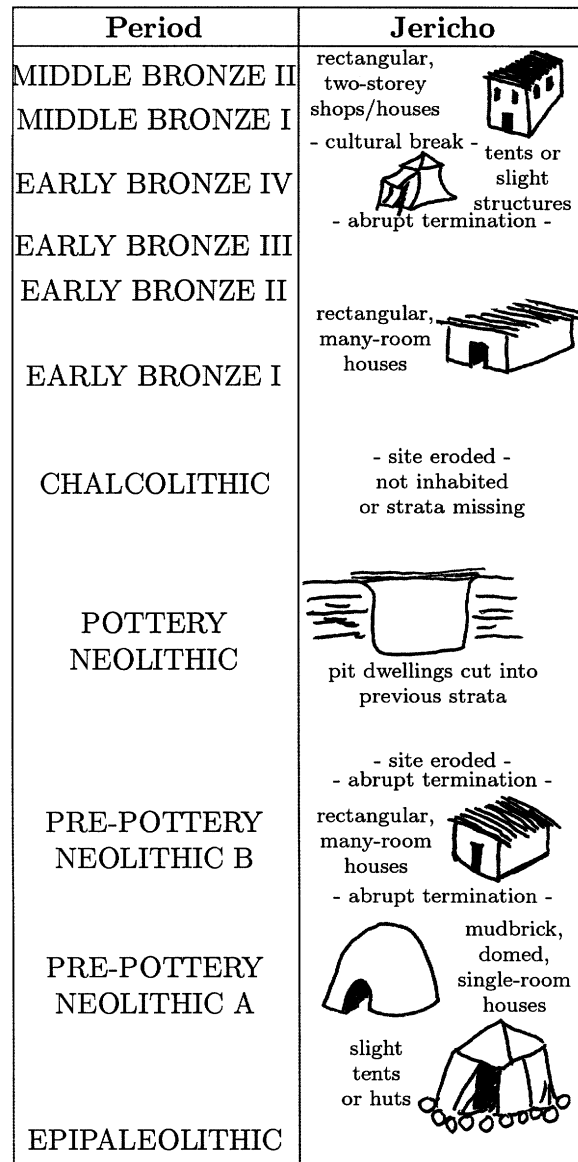


Figure 5: Archaeological strata at Jericho.

successively more recent layers above. This results from generation after generation of occupants leveling older remains and building anew on top of the compacted rubble of the past.

Figure 5 is a schematic diagram of the dwelling styles found within the layer-cake strata at Jericho. Only the order of the strata are represented in the figure, not their relative thicknesses. We owe our ability to construct such a diagram to the work of the British archaeologist Kathleen Kenyon. Between 1952 and 1958 she labored with a substantial crew, digging several very deep trenches into the mound of Jericho to expose its ancient buried

history.⁴⁵

The right column illustrates only a small portion of what Kenyon found by digging through the mound at Jericho. I have chosen to illustrate the style of domestic architecture which she discovered to be characteristic of the various layers, but the remains of houses are not all that Kenyon and other archaeologists found at Jericho, by any means. They also found stone tools, art-work, burials, animal bones, pottery fragments, seeds and other plant remains, metals, and much more. All of these artifacts show pronounced differences from level to level within the mound, revealing the markedly different ways of life of the occupants of Jericho from period to period.

Before we proceed I need to point out that my illustrations of the dwelling styles found at Jericho are very rough sketches of the basic forms only—they are not technically precise at all. Note also that Kenyon did not find instances of these dwellings all nicely preserved in the various strata in every case. Rather it was generally the case that only the foundation remained intact, and she had to deduce the form of the rest of the building from the rubble of the collapsed walls and roof which covered it.

But the major point to notice is that clearly-identifiable remains of domestic dwellings and many other types of artifacts are found—the mound is not just a hodgepodge of randomly scattered rocks and dirt by any means—and the characteristic styles of these dwellings and other artifacts vary markedly from one level to the next within the mound.

Distinct material differences in the artifacts recovered from various levels are not only found at Jericho but, indeed, at all ancient mounds throughout the land of Israel. Meanwhile, similarities in domestic dwelling styles, pottery styles, tool styles, and so forth, can be traced from mound to mound throughout Palestine in the same succession found at Jericho.

The patterns of artifact styles are, in fact, persis-

tent and widespread. Their obvious stratigraphical separation clearly assigns them to different, successive periods of time. A set of names for these successive periods, such as “Chalcolithic” and “Early Bronze”, has grown up over the decades of archaeological research in Palestine. These are shown in the left column of the figure, opposite the illustration of the dwelling style found at Jericho corresponding to that period.

Now I must briefly clarify the significance of these period names. They were originally coined on the basis of evolutionary notions of the development of man and his tool assemblages. While mankind’s technological abilities have increased throughout history, just as they continue to do today, the simplistic evolutionary scheme imagined by the inventors of these period names has not been supported by subsequent archaeological research. For example, “Neolithic” (‘neo’ = new, ‘lithic’ = ‘stone’) originally implied a period during which mankind had passed from the use of crude stone tools into the production of more technologically advanced stone tools. Today its meaning has come to imply a settled agricultural lifestyle, rather than any sweeping generalizations regarding the technology of stone tool manufacture. These period names are retained by archaeology today because of historical precedence, not because of any intrinsic descriptive value or literal significance, and they should not be interpreted literally by the reader.

The figure shows the archaeological strata found at Jericho from bedrock up until Middle Bronze II (MBII). There are yet more recent layers on top of the MBII stratum, but these are of no interest in the present context.

Adding Absolute Time

Figure 5 shows only a relative progression of domestic dwelling styles at Jericho. It does not tell us when, in calendar years, these various styles were in use there. If this *relative* progression was all the archaeologists had to say about Jericho there would be no problem—no central conundrum—at Jericho at least. We could imagine that the slight tents or huts at the bottom of the mound were constructed by some of Adam’s great-grandchildren, for example, who had migrated to Palestine from

⁴⁵Kathleen M. Kenyon, *Digging Up Jericho*, (New York: Frederick A. Praeger, 1957); Kathleen M. Kenyon, *Archaeology in the Holy Land*, (New York: Frederick A. Praeger, 1960); Kathleen M. Kenyon, “Jericho,” *The New Encyclopaedia of Archaeological Excavations in the Holy Land*, Vol. 2 (New York: Simon & Schuster, 1993), 674–681.

Mesopotamia.

But the archaeologists don't stop with Figure 5. Archaeologists quite routinely attempt to couple their *archaeological* data to *chronological* data (and please note that the two are not the same thing at all) in an effort to produce an accurate reconstruction of the past. It is this process of adding absolute time to Figure 5 which gives rise to our central conundrum.

The youngest (highest up) strata shown in Figure 5 are in historical times. They can be assigned absolute (calendar) dates on the basis of written sources. I will do this below.

It is the older strata—especially the Neolithic strata—which are really of interest to the present study. No written records are ever found in these early strata—one naturally infers that writing was unknown to these people—so that it is impossible to date them using contemporaneous historical texts. The only way reasonably precise absolute dates can be obtained for these strata, as I have mentioned above, is through application of the radiocarbon dating method.

Radiocarbon Dates at Jericho

James Weinstein has compiled a convenient and pretty much exhaustive list of radiocarbon dates from archaeological sites in southern Palestine.⁴⁶ My procedure in this section is simply to display every radiocarbon date listed by Weinstein for Jericho from the Pre-Pottery Neolithic A (Weinstein calls this the Early Neolithic I) through the Early Bronze IV period. It is the Neolithic radiocarbon dates which are of real interest to the present study, but I have included the more recent radiocarbon dates as well, up through the Early Bronze, so we can see how well radiocarbon does in these more recent, historically dated periods.

Now I must make you aware of a slight deviation from my just-stated procedure. Weinstein lists sixty radiocarbon dates from Jericho in the period of interest. The oldest three of these dates, from the Pre-Pottery Neolithic A period, encounter a technical problem which necessarily excludes them from our study.

⁴⁶James M. Weinstein, "Radiocarbon Dating in the Southern Levant," *Radiocarbon* 26.3 (1984): 297–366.

Radiocarbon dates are routinely *calibrated* today whenever one wishes to talk in terms of absolute calendar years, as is the case in the present investigation. (I plan to discuss more about the calibration procedure next issue.) The problem with these three oldest dates is that they extend beyond the range of the (computerized) calibration table.⁴⁷ This means that absolute calendar dates cannot be specified for them at present. It is necessary to exclude them from this study for this reason. This exclusion does not impact the outcome of the present investigation in any way. It merely reduces our sample of dates from sixty to fifty-seven.

I must also point out, in passing, that we are very privileged to have access to this sort of data today. The cost of a single radiocarbon determination on a sample today is roughly \$300. Thus, it is our privilege to work, free of charge, with a set of data which we must value, in modern terms, in excess of \$17,000. And this does not take into account the prodigious expense of obtaining the samples from deep within the mound of ancient Jericho, the result of several *years* of archaeological excavation.

Fifty-six of the fifty-seven radiocarbon dates of interest are from charcoal samples. Since radiocarbon measures when a tree grew, not when its wood was used by humans, it is possible to get older dates than we should for a given strata in some instances. But we would expect this inaccuracy to amount to no more than several decades in most instances, and we would expect it to exceed a century only very rarely. Because wood rots, dead trees are not likely to sit around for several hundred years before being used by humans in some construction project, or as fuel for their fires. So this source of dating error is not expected to be a problem for the present purpose. Uncertainties of a few decades or even a few centuries for radiocarbon dates in the Neolithic are of little concern to our present purpose, being much smaller than the problem of the thousands of years before Adam which we are endeavoring to resolve.

⁴⁷Calibration of all dates discussed in this article was carried out using the bidecadal dataset of CALIB 3.0.3. See M. Stuiver and P. J. Reimer, "Extended ¹⁴C Data Base and Revised CALIB 3.0 ¹⁴C Age Calibration Program," *Radiocarbon* 35.1 (1993): 215–230.

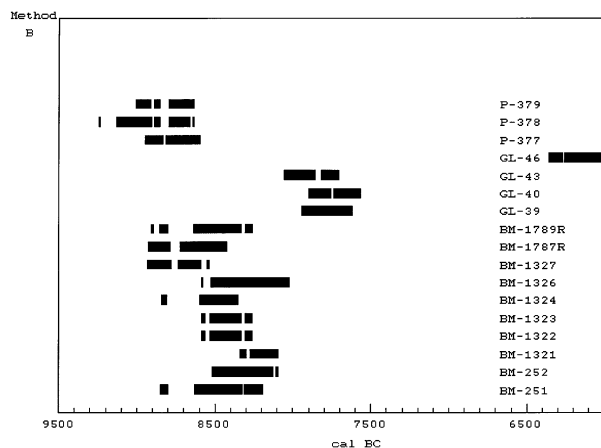


Figure 6: CALIB 3.0.3 output for seventeen Pre-Pottery Neolithic A samples from Jericho.

Figure 6 shows the graphical output from the calibration computer program for the Pre-Pottery Neolithic A radiocarbon dates. Seventeen of the fifty-seven samples fall in this group. Each horizontal bar in the figure represents one of these seventeen samples. Each sample is given a unique label, shown at the right side of the graph. The letters at the front of a label identify the radiocarbon laboratory which made the radiocarbon measurement on that sample. The numbers following the lab identifier are sample numbers, used by the laboratory to distinguish one sample from the next.

The broken horizontal black bars indicate the intervals in which the true calendar date of the sample is most likely to lie (i.e., when the original wood sample most likely grew). Radiocarbon does not furnish a single date for a sample, but rather it gives a probability distribution describing the relative probability the sample originates in a given time interval. The probability is roughly two-thirds that the true date of the sample falls somewhere in the black barred regions, and one-third that it falls outside those regions. As a general rule, the farther one goes away from the broken black bar on the time line, the more unlikely it is that the true date of the sample falls there.

GL-46 and Pretreatment

Most of these dates group together on the time line, as they should if all of the samples originate from the same approximate time. However, sam-

ple GL-46 is suspiciously different (more than 1000 years) from all the others. This is the one sample of the fifty-seven which is not charcoal. In fact it is listed as “humic extract”, which offers an immediate explanation of its relative youthfulness.

An ancient lump of charcoal is likely to become contaminated by modern living things before it is taken from the ground. For example, there may be rootlets from modern plants penetrating it. Or there may be bacteria or fungi growing on it.

If the whole lump of charcoal with all these modern contaminants is dated, one will get a date part way between the age of the charcoal and modern times. Said another way, the modern contaminants will make the radiocarbon age of the sample come out too young.

To get the true date of the charcoal, it is important to get rid of all contaminants before the sample is dated. One could physically remove rootlets using a microscope and a tweezers, for example. And one could remove fungi and bacteria, which reside on the surface of the sample, by dissolving away the surface of the charcoal with a suitable chemical.

Such procedures are called sample “pretreatment”. They are routine in all radiocarbon dating laboratories today.

The “humic extract”, sample GL-46, does not represent an archaeological sample at all. Rather, it is the part of the sample with all the contaminants which was dissolved during pretreatment. This sample would only have been “dated” by the radiocarbon laboratory to check their pretreatment procedure. One could imagine dissolving an ancient lump of charcoal in stages, and “dating” the dissolved portion of the sample at each stage. The first stage would contain the most contamination, and would give the youngest “age” as a result. Subsequent stages would contain less and less contamination, as more and more of the surface of the sample was dissolved away. The dates for these subsequent dissolved portions of the sample would become progressively older, until, eventually, all of the modern contamination was gone. After that each new stage of dissolved sample would yield the same, true date.

This is the sort of experiment a radiocarbon lab would run in the early days of its operation to determine how much pretreatment was necessary to

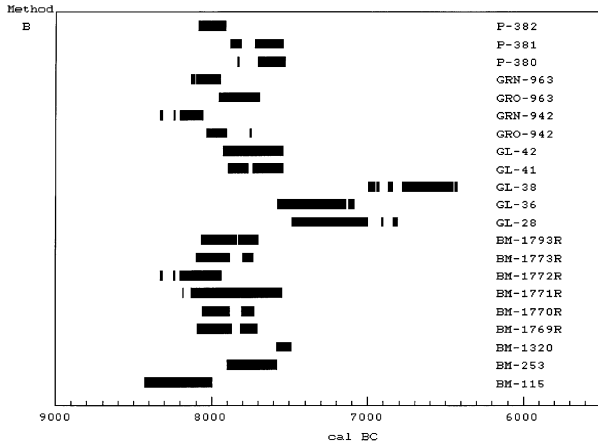


Figure 7: CALIB 3.0.3 output for twenty-one Pre-Pottery Neolithic B samples from Jericho.

remove all contamination from a sample. GL-46 appears to be only the forty-sixth sample to have been processed by the GL laboratory. Thus, this is very likely the explanation of GL-46. It is not a proper date of an archaeological sample at all, and, strictly speaking, should never have been included in Weinstein's archaeological list. I will eliminate it from subsequent discussion.

Other GL Samples

Once lab identifiers and sample pretreatment are understood, a red flag goes up with three other samples in Figure 6. We notice immediately that the other three GL samples all date significantly younger than the samples which were dated by the other two labs. At this stage we cannot tell whether this is because the Pre-Pottery Neolithic A period lasted this late in time, and the GL lab just happened to get the youngest samples from this period, or whether the GL lab, at this obviously early point in its history, had not yet perfected its pretreatment technique. To resolve this we need to go to the Pre-Pottery Neolithic B radiocarbon samples. These are shown in Figure 7.

A comparison of Figures 6 and 7 shows that the Pre-Pottery Neolithic B starts (and hence the Pre-Pottery Neolithic A is over) before the GL dates of Figure 6 on the Pre-Pottery Neolithic A samples. Figure 7 also shows three of five GL samples significantly younger than the samples from the other labs once again. These GL measurements seem to

show inaccuracies due to a lack of refinement in experimental technique. This is not too surprising since they were made very early on in the history of radiocarbon dating.

In quantitative terms the GL samples' inaccuracies are not all that large. They are, in fact, less than 10%. That is, the difference between the GL measurements and those of the other labs is less than 1000 years, out of a total measured time (from the present) of more than 10,000 years.

Inaccuracies on this order are common in science when one first sets out to make physical measurements of any sort. There are many things which can go wrong when one attempts to make physical measurements in the real world (because God's great creation is, in fact, not at all a simple affair) and one generally only learns about all the things that can go wrong by a painful process of them all going wrong. So these GL inaccuracies are understandable and even excusable. They cannot reasonably be taken as evidence of some general inaccuracy inherent in the radiocarbon dating method.

It is normal in science to eliminate from further consideration measurements which one knows are inaccurate. It is reasonable to do this with these inaccurate GL measurements at this stage. Since the reason for the inaccuracies in this case appears to be lack of experience on the part of the GL lab, it seems best, in order to avoid subjective bias, to simply exclude *all* GL dates from our final data set, whether they are in agreement with the results of other labs or not. There are a total of ten GL dates in the original set of fifty-seven, so this shrinks the total number of usable dates down to forty-seven. These forty-seven are still quite adequate for the present purpose, so I will follow this simple procedure in my final assignment of absolute dates to the Neolithic strata at Jericho.

BM "R" Samples

Now notice that many of the BM samples in both Figures 6 and 7 have the letter R appended to the sample number. The R in this case stands for "revised". The radiocarbon dates of these samples were initially measured and published in the 1980s. After publication the BM laboratory discovered that the dates on these and several hundred other samples processed during the same in-

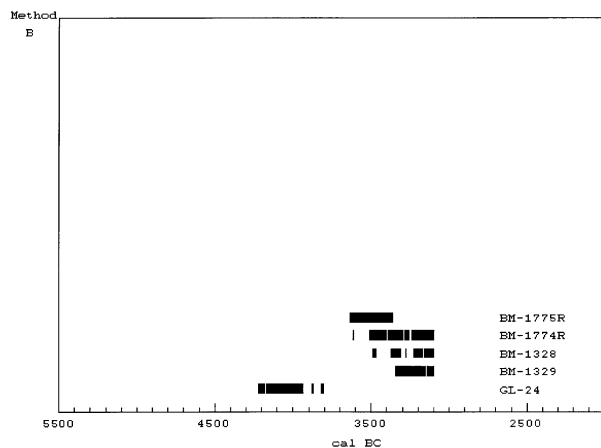


Figure 8: CALIB 3.0.3 output for five Early Bronze I samples from Jericho.

terval of time by their lab were incorrect. This resulted from some systematic errors in the calibration of the radiocarbon counters during the period when these measurements were being made. The BM lab found it necessary to revise the dates on these samples by several hundred years to correct for these systematic errors. Sample numbers with the R appended are the new, revised, published dates.

Weinstein's list, which was published in 1984, contains the original, uncorrected dates. I have used the revised dates, which were only published in 1990, rather than the original dates listed by Weinstein.⁴⁸

All of these inaccuracies and blunders certainly do not enhance radiocarbon's image. But they do belie the notion that radiocarbon labs are all in cahoots to scam the general public with a bunch of fabricated dates. They also falsify the idea that only selected dates, in agreement with some predetermined time scale, ever get published. And they certainly illustrate that radiocarbon is not a magic wand—a thing you wave over an archaeological sample and out pops the date of interest. Radiocarbon dating is a normal, intricate scientific procedure, carried out by normal, fallible human beings. And despite the best efforts of scientists and technicians, not all space shuttles return safely to the ground.

⁴⁸S. G. E. Bowman, J. C. Ambers, and M. N. Leese, "Re-evaluation of British Museum Radiocarbon Dates Issued Between 1980 and 1984," *Radiocarbon* 32.1 (1990): 59–79.

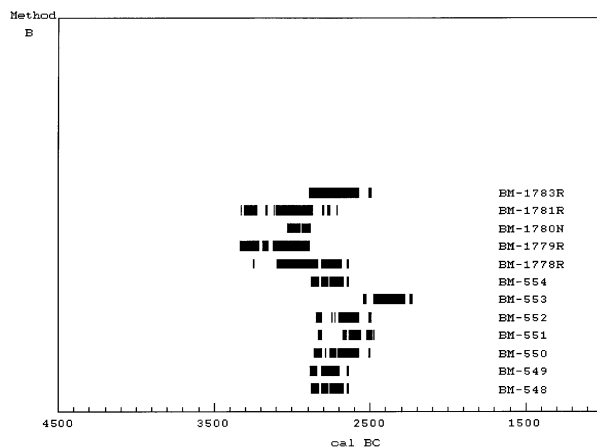


Figure 9: CALIB 3.0.3 output for twelve Early Bronze III samples from Jericho.

But we must not be distracted from our present purpose by these human errors. We are not interested, in the present investigation, in the question of whether radiocarbon scientists and technicians are infallible. They clearly aren't, but this fact is neither very surprising nor very helpful. It is not random human blunder, but rather systematic methodological error which interests us here. The fact that *some* of the dates in Figures 6 and 7 can be shown to entail random human errors of one sort or another, introducing inaccuracies as large even as 1000 years in some cases, only teaches us that we must not trust lone radiocarbon dates. Rather, we must demand evidence of reproducibility of results, preferably by several different labs. But this rule is quite generally applicable to scientific measurements of all sorts, and it does not add anything of interest to the present study. What we wish to learn at present is whether *all* of the radiocarbon dates in these two figures are somehow *systematically* too old by at least 3000 years.

Younger Strata

There are, unfortunately, no radiocarbon dates yet from Jericho for the Pottery Neolithic or the Chalcolithic. No samples have been submitted for radiocarbon dating from the Pottery Neolithic strata, and it is not clear whether Chalcolithic strata exist at Jericho—the site may have been unoccupied during that period.

The next set of dates at Jericho comes from the

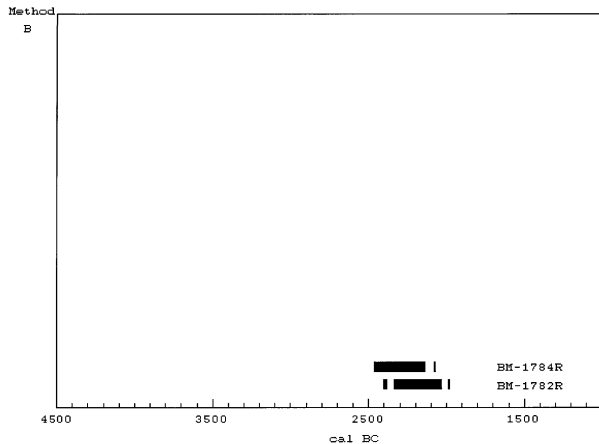


Figure 10: CALIB 3.0.3 output for two Early Bronze IV samples from Jericho.

Early Bronze I period. These are shown in Figure 8. There are only five dates for this period so far, and one of them is clearly an outlier. This is a GL determination once again, further confirming our suspicions regarding these early GL dates.

The next set is from Early Bronze III (Figure 9). There are twelve determinations in this set.

The final set is just two dates from Early Bronze IV (Figure 10).

Absolute Time at Jericho

These radiocarbon determinations purport to provide rough absolute dates for the stratigraphical units from which they were taken. They aspire to inform us when, in absolute time, these stratigraphical units were being formed. They suggest that Kenyon's stratigraphy of Jericho be assigned absolute dates as shown in Figure 11.

Before proceeding notice that this time chart covers eight millennia. Thus, the time scale is very compressed compared to other time charts which have previously appeared in this publication. From the perspective of Biblical chronology, this is a very panoramic view.

I have ventured period boundaries for the Pre-Pottery Neolithic on the basis of the radiocarbon results from Jericho shown in the "Radiocarbon" column.⁴⁹ (Note that all GL samples have been

⁴⁹There are some slight differences in the plotted radiocarbon date ranges of Figure 11 relative to Figures 6–10. Figures 6–10 are direct copies of the graphical screen out-

excluded from this column as discussed above.) The boundary between Pre-Pottery Neolithic A and Pre-Pottery Neolithic B is probably secure to within a century since it is bracketed by radiocarbon dates both above and below. The other two Pre-Pottery Neolithic boundaries are not nearly as secure, however, since they each have radiocarbon dates on one side only. Future radiocarbon determinations at Jericho may require that these boundaries be substantially adjusted.

I have not attempted to draw a boundary between the Chalcolithic and the Pottery Neolithic because we have no radiocarbon data from Jericho for these intervals. However, it is important to realize that radiocarbon dates do exist from other archaeological sites for the Pottery Neolithic and Chalcolithic periods in Palestine. Weinstein lists thirty-three radiocarbon dates for these two periods from other sites.

I have *not* used radiocarbon to establish any of the Bronze Age boundaries. Rather, I have used what we already know about these periods from my previous chronological work.⁵⁰ The Bronze Age places us within the historical period, and historical documents giving lengths of the reigns of kings and similar chronological information are preferred to radiocarbon because the dating uncertainty arising from them is generally much smaller than it is for radiocarbon. Note that there are NO historical documents for any of the Neolithic, so radiocarbon is the only way period boundaries within the Neolithic can be determined.

Observations on Radiocarbon Dating at Jericho

In regard to our primary question this issue—the reliability of radiocarbon—note, first of all, that

put of CALIB 3.0.3, while for Figure 11 I have used the Method B, one sigma ranges output in CALIB's .TXT file. The slight differences which appear are internal to CALIB 3.0.3. These differences are very slight and do not affect the present study in any way.

⁵⁰Early Bronze through Middle Bronze period boundaries are taken from Gerald E. Aardsma, "The Chronology of Palestine in Relation to the Bible: 3000–1000 B.C.," *The Biblical Chronologist* 1.4 (July/August 1995): 5. The date of the termination of the Chalcolithic period is fixed by Noah's Flood. It's date is taken from Gerald E. Aardsma, "Chronology of the Bible: 5000–3000 B.C.," *The Biblical Chronologist* 2.4 (July/August 1996): 2–3.

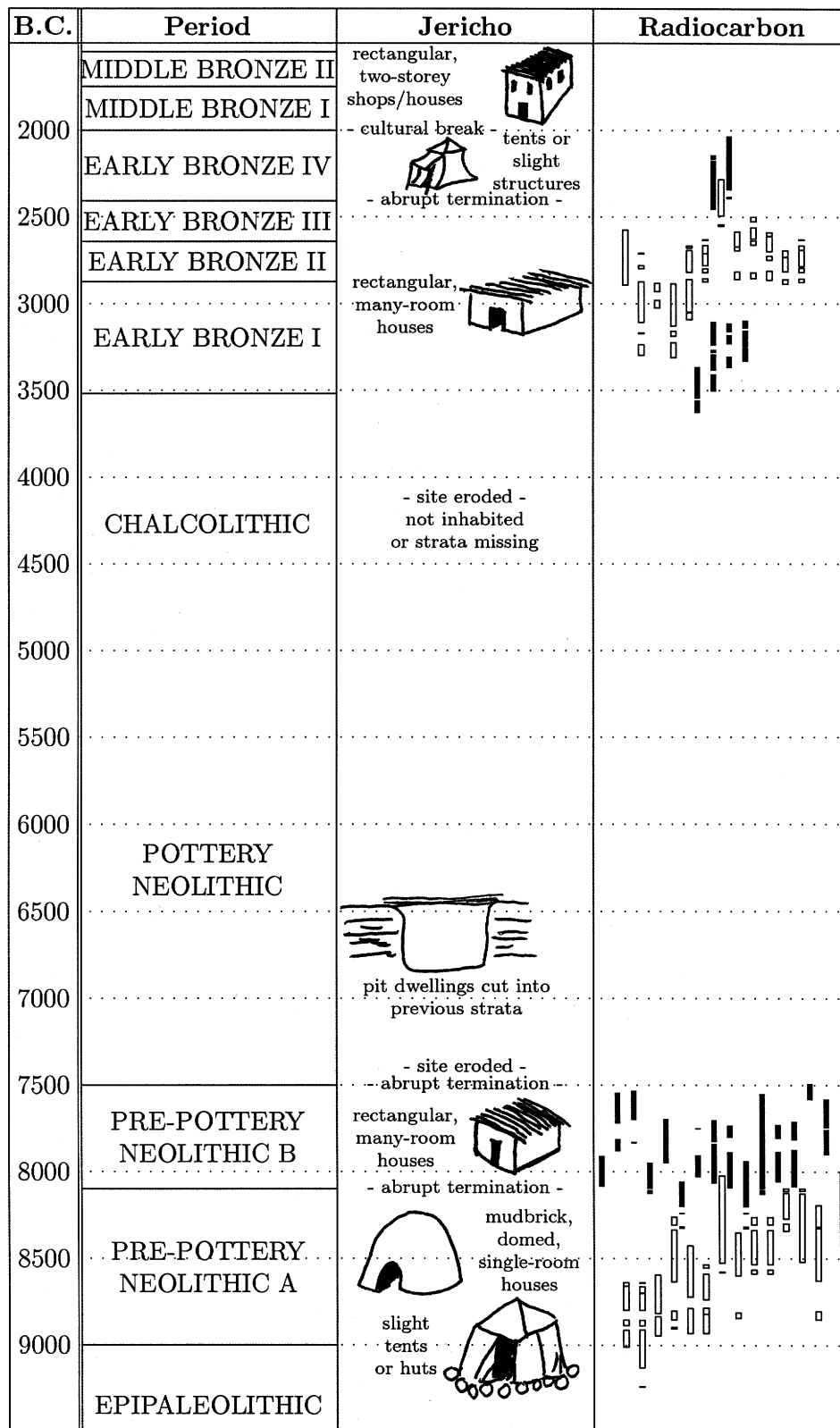


Figure 11: Absolute time assignments for the archaeological strata at Jericho.

the radiocarbon determinations from Jericho in Figure 11 leave the stratigraphy in its proper order. The lower strata are indeed the oldest, according to radiocarbon, and the upper strata the youngest. This immediately tells us that radiocarbon can be trusted to provide reliable *relative* dates, at least, regardless of what one may eventually conclude about the trustworthiness of its *absolute* dates.

Notice also that there is nothing capricious or erratic about the radiocarbon dates in this figure. There is some scatter, but it is well within what one should expect from the shown uncertainties in the individual measurements. The results are systematic, rather than chaotic, with radiocarbon dates from a given stratum grouped together, rather than spread helter-skelter here and there all over the time chart. The overall behavior of the data is really quite ordinary, as far as physical measurements go. This tells us that radiocarbon is measuring something which is really there, not something imaginary.

Notice, finally, that the radiocarbon dates from the Early Bronze IV stratum fall within the historically delineated Early Bronze IV period of time. The four radiocarbon dates from the Early Bronze I stratum are similarly all in harmony with the historically delineated boundaries of that period. This is evidence that radiocarbon does merit some degree of trust, not just for relative but also for absolute dates, at least as far back as 3500 B.C.

The twelve radiocarbon dates from the Early Bronze III (EBIII) stratum seem at first to undermine this conclusion somewhat. Only seven of them overlap the Early Bronze III period shown in the time chart. The remaining five seem to demand an Early Bronze II (EBII) or even late Early Bronze I (EBI) setting.

Recall, however, that there is really no archaeological distinction between EBII and EBIII.⁵¹ Indeed, it appears that EBII and EBIII are contemporaneous—rather than separated as shown in the time chart—with EBII pottery and culture being typical of southern Palestine, and EBIII pottery and culture typical of the rest of

Palestine, as Cohen has previously argued.^{52 53}

That being the case, we actually expect there to be no EBII period evident at Jericho—EBIII should follow directly after EBI there. This, in fact, is the principal thing these twelve radiocarbon dates from the EBIII stratum at Jericho actually show. Thus, rather than undermining confidence in radiocarbon's absolute dating ability, these twelve dates reinforce our confidence in it—at least back to 3500 B.C.

The Central Conundrum at Jericho

But now let us zero in on our central conundrum. To help with this I have added a "Bible" column to the time chart (Figure 12). I have placed three key Biblical events at their appropriate times in the chart according to Biblical chronology.⁵⁴ The conundrum is immediately apparent—the Neolithic and earlier strata at Jericho, with their plethora of evidence of human activity, predate the creation of Adam in this time chart.

This happens solely because of the radiocarbon dates on the charcoal samples from the Neolithic strata. Are these radiocarbon dates accurate? Can they be trusted?

Biblical Checks on Radiocarbon Dating at Jericho

In relation to these questions note, first of all, that no attack on radiocarbon which calls its assumptions into question in a general way can be accepted. In addition to the evidences in favor of the general validity of radiocarbon back to 3500

⁵²Rudolph Cohen, "The Mysterious MB I People – Does the Exodus Tradition in the Bible Preserve the Memory of Their Entry Into Canaan?" *Biblical Archaeology Review* 9.4 (July/August 1983): 16–29.

⁵³Biblically, the EBII culture appears to be the Amalekites, and the contemporaneous EBIII culture is the Canaanites. To draw this correctly on the time chart the horizontal line between EBII and EBIII should be changed to a vertical line spanning the entire EBII/EBIII period, with EBII on the left and EBIII on the right.

⁵⁴Gerald E. Aardsma, "Chronology of the Bible: 3000–1000 B.C.," *The Biblical Chronologist* 1.3 (May/June 1995): 1–3; Gerald E. Aardsma, "Chronology of the Bible: 5000–3000 B.C.," *The Biblical Chronologist* 2.4 (July/August 1996): 1–5; Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1–10.

⁵¹Gerald E. Aardsma, "The Chronology of Palestine in Relation to the Bible: 3000–1000 B.C.," *The Biblical Chronologist* 1.4 (July/August 1995): 3.

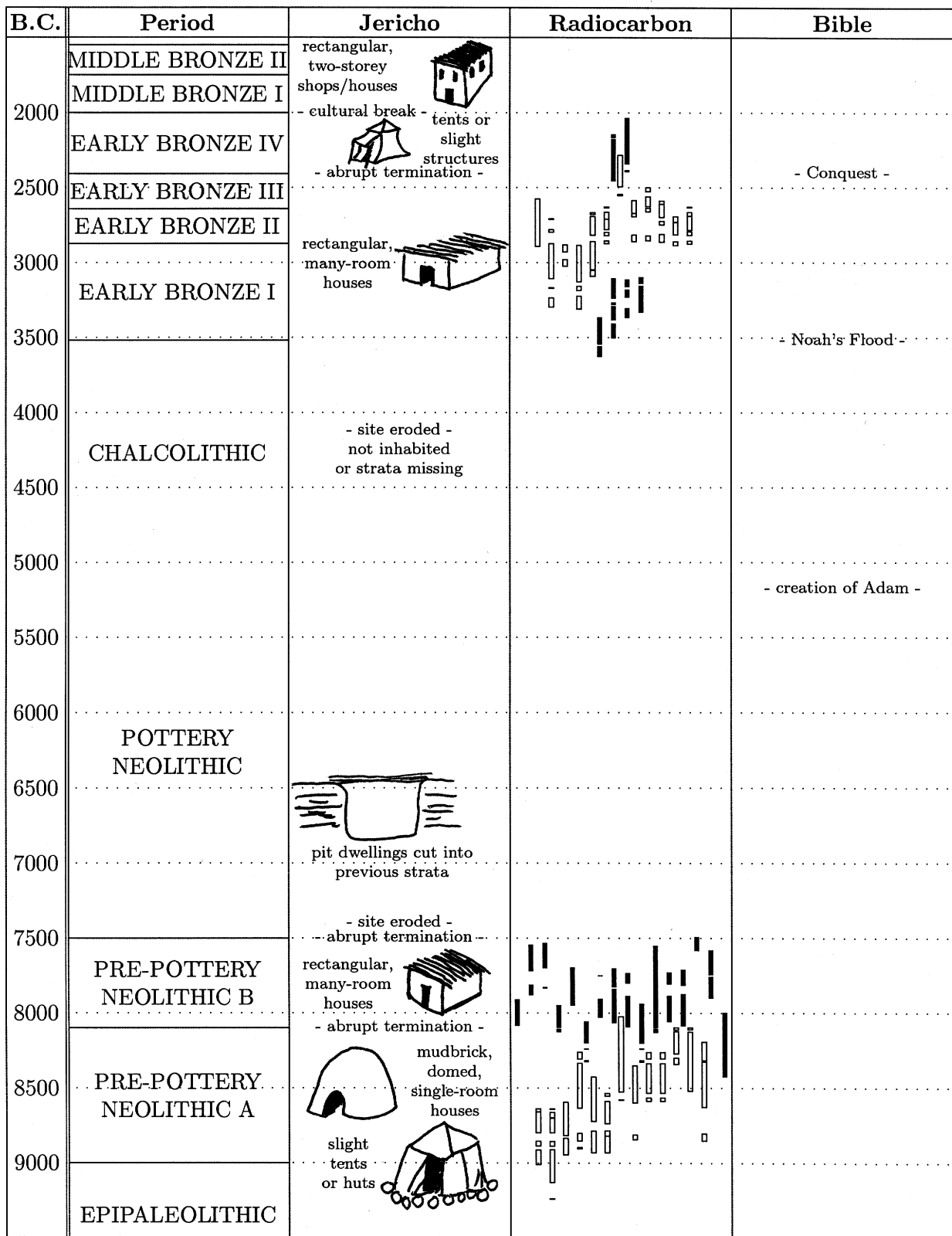


Figure 12: Chronology at Jericho relative to three key Biblical events.

B.C. mentioned above, Biblical chronology affords us two checks of the radiocarbon method back to that same time, and these yield the same conclusion in favor of radiocarbon.

The first check is the Conquest. We now know that EBI through EBIII is the civilization of the Canaanites.⁵⁵ We know that EBIV is the civilization of the early Israelites whose history is chronicled in the book of Judges.⁵⁶ We know, from the Bible, that Canaanite civilization was terminated, and Israelite civilization in Palestine initiated, by the Conquest. Finally, we know from Biblical chronology that the Conquest happened 2407±13 B.C.⁵⁷ Thus, if radiocarbon dating is reliable, then radiocarbon dates on artifacts from the EBI through EBIII (Canaanite) strata should fall before 2407±13 B.C., and radiocarbon dates on artifacts from the EBIV (Israelite) stratum should fall after 2407±13 B.C. Figure 12 shows that the requirements of this Biblical check on radiocarbon are satisfied. Thus we find that radiocarbon agrees with Biblical chronology back to the Conquest.

The second Biblical check is Noah's Flood. We now know that the Flood terminated Chalcolithic civilization in Palestine, and that the Early Bronze civilization sprang up there through the spread of Noah's descendants following the Flood.⁵⁸ Thus, if radiocarbon dating is reliable, then radiocarbon dates from Early Bronze Age artifacts should date after (more recent than) the Flood. Figure 12 shows that this requirement of this Biblical check on radiocarbon is satisfied for eighteen out of eighteen Early Bronze radiocarbon samples. Thus we find that radiocarbon checks with Biblical chronology right back to Noah's Flood.

Thus, the idea that radiocarbon is quite generally faulty because of some mistaken, basic assumptions simply cannot be accepted. *If* there is anything wrong with radiocarbon dating, we see

⁵⁵Gerald E. Aardsma, "The Chronology of Palestine in Relation to the Bible: 3000–1000 B.C.," *The Biblical Chronologist* 1.4 (July/August 1995): 1–6.

⁵⁶Gerald E. Aardsma, "The Chronology of Palestine in Relation to the Bible: 3000–1000 B.C.," *The Biblical Chronologist* 1.4 (July/August 1995): 1–6.

⁵⁷Gerald E. Aardsma, "Chronology of the Bible: 3000–1000 B.C.," *The Biblical Chronologist* 1.3 (May/June 1995): 1–3.

⁵⁸Gerald E. Aardsma, "Research in Progress," *The Biblical Chronologist* 1.2 (March/April 1995): 6–8.

immediately that the problem can only enter in for dates before the Flood, i.e., prior to about 3500 B.C. The evidence is very plain that radiocarbon is trustworthy after the Flood. The *only* question remaining is, "Is radiocarbon trustworthy before the Flood?"

But this question cannot be properly treated in any brief space, so I hope to deal with it at length next issue. ◊

Toward Unification of Pre-Flood Chronology: Part IV

From Volume 5, Number 1, pages 1–10.

Eight months ago I announced the conclusion of my effort to unify Biblical and secular chronologies back to the time of the Flood (roughly 3500 B.C.).⁵⁹ Since that time I have been embarked on a mission to unify sacred and secular chronologies in the period of time before the Flood. The present issue is the fourth in a series seeking this unification.

Review

Once the missing thousand years in 1 Kings 6:1 is recognized and allowed for, no divergence between sacred and secular chronologies appears until the creation of Adam, roughly 5200 B.C.⁶⁰ At that point one encounters the "central conundrum" of Pre-Flood Biblical chronology, which is the apparent existence of mankind, according to secular scholarship, many thousands of years before the creation date of Adam determined from Biblical chronology.⁶¹ One must somehow resolve this conundrum before sacred and secular chronologies can be unified.

I have enumerated nine conceptually possible solutions to this conundrum. I believe these nine

⁵⁹Gerald E. Aardsma, "Biblical Chronology 101," *The Biblical Chronologist* 4.3 (May/June 1998): 6–10.

⁶⁰Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993); Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1–10.

⁶¹Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 10.

exhaust the possibilities.⁶²

1. The Biblical chronological data leading to the creation of Adam are false (i.e., fabricated).
2. The secular chronological data leading to a great antiquity for mankind are false (i.e., fabricated).
3. The Biblical history which teaches that Adam was the first man to be created is mythological or otherwise fabricated.
4. The modern secular teaching that mankind existed in remote antiquity is a hoax or fabrication.
5. We have misunderstood the Biblical history of the creation of Adam; the Bible does not really teach that Adam was the first man ever to be created.
6. The archaeologists have misunderstood the history of mankind; archaeology does not really show the existence of humans before Adam.
7. We have made some mistake in the computation of the Biblical date of the creation of Adam (i.e., the basic Biblical chronological data are valid, but they have been misunderstood).
8. The secular chronologists have made some mistake in their computation of the antiquity of man (i.e., the basic secular chronological data are valid, but they have been misunderstood).
9. The Biblical and secular evidences must both be accepted as legitimate; the truth lies in a proper synthesis of the two.

I have argued that the first seven of these conceptually possible solutions fail to present an adequate resolution of the central conundrum.⁶³

⁶²Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 1–10.

⁶³Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 1–10.

The eighth possibility leads directly to the question, "Radiocarbon dating—can you trust it?"⁶⁴ Last issue I introduced a set of sixty radiocarbon dates from the archaeological site of ancient Jericho to be used as a case study in answering this question. Detailed evaluation of these radiocarbon dates revealed that they harmonize with Biblical and secular historical expectations back to the time of the Flood. This showed that radiocarbon can be trusted to provide reliable absolute dates back to 3500 B.C. The only question remaining—the focus of the present issue—is whether radiocarbon dating is reliable prior to the Flood.

Pre-Flood Radiocarbon: Can You Trust It?

While radiocarbon dating is seen to be reliable at Jericho back to the time of the Flood, is it possible that something was different before the Flood? Is it possible the Flood itself changed something—such as the radioactive decay rate—so that the accuracy of radiocarbon dating is thrown off in the pre-Flood period?

I think it is the case that nobody has ever investigated this question as critically and as thoroughly as I have. It was to get to the bottom of the reliability of radiometric dating methods that I chose the particular Ph.D. program I did some two decades ago, and my decision to join the faculty of the Institute for Creation Research Graduate School following graduation was entirely motivated by my concern to plumb the depths of this question. The reliability of radiocarbon dating is of extreme importance to Biblical chronology and to our whole understanding of the past. To the one who wishes to accurately harmonize Biblical and secular accounts of earth history it is worth every ounce of effort and every bit of personal pain it may cost to get to the bottom of this question. I prosecuted this question very critically through every means available to me for over a decade. I entered this investigation with an extreme prejudice against the reliability of radiocarbon dating, and I emerged from it over a decade later with an assured and unqualified conviction that, yes, ra-

⁶⁴Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part III," *The Biblical Chronologist* 4.6 (September/October 1998): 1–16.

diocarbon dating can be trusted in the pre-Flood period, back at least until 9000 B.C.

But, as usual, I do not want you to take my word for it simply because I claim considerable devotion to this question. I want, rather, to explain, as simply and clearly as I can, why it is I find “yes, radiocarbon dating is reliable in the pre-Flood period” to be the unavoidable truth. While I cannot take you through ten years worth of false starts and down a decade worth of blind alleys in the following few pages, I am hopeful that the following positive presentation of basic factual data will suffice to show this truth.

Tree-ring Calibration

The single most important fact to grasp about radiocarbon dating in the period of interest to the present study (i.e., back to about 9000 B.C.) is that radiocarbon dates are *calibrated* using tree-rings over this entire range. This makes changes in the past behavior of radiocarbon—hypothetical changes in its decay rate, or alterations in the initial amount of radiocarbon in living things—irrelevant. Calibrated dates are immune to any such changes.

There is nothing tricky about how this happens, and nothing very complex about the idea of calibrating radiocarbon dates using tree-rings. Here are the basic concepts.

Radiocarbon—a radioactive form of the carbon atom—is produced in the atmosphere through the action of cosmic radiation on air molecules. Once produced, radiocarbon mixes with stable carbon atoms already in the atmosphere in the form of carbon dioxide. Because the atmosphere mixes thoroughly and rapidly (which is what wind and storms are all about) the ratio of radiocarbon to stable carbon is uniform all over the globe at any given time.⁶⁵

Trees and other terrestrial plants get the carbon atoms they need to build their tissues from atmospheric carbon dioxide. As plants take in carbon dioxide from the atmosphere, they take in both

radiocarbon and stable carbon atoms, in the ratio these are found in the atmosphere. Because this ratio is everywhere the same at the same time in the atmosphere, all of the terrestrial plants growing at the same time at every location over the entire globe have the same ratio of radiocarbon to stable carbon.⁶⁶ Animals get the carbon they need for building their tissues by eating plants (or by eating other animals which have gotten their carbon by eating plants). Thus, both the terrestrial plant and animal kingdoms contain the same ratio of radiocarbon to stable carbon atoms in their tissues while living at any point in time. This ratio may fluctuate from decade to decade, because the ratio of radiocarbon to stable carbon in the atmosphere may change with time. But at any given time the ratio will be the same globally for all terrestrial plants and animals then living.

When a plant dies, it ceases to take in carbon dioxide from the atmosphere. Radiocarbon atoms slowly disappear from its tissues because, being radioactive, they slowly decay away. Thus, the ratio of radiocarbon to stable carbon atoms in dead tissue slowly decreases. Because this decay process is a nuclear phenomenon, it is impervious to normal environmental factors such as temperature and humidity. Thus, the ratio of radiocarbon to stable carbon atoms will decrease in lockstep in all tissues of all terrestrial plants and animals which ceased to metabolize at a given point in time. It is this fact which is exploited by the radiocarbon calibration method of dating.

In the radiocarbon calibration method, tree-rings whose ages are precisely known through direct counting of growth rings back from the present time, are used to construct a table (or graph). One column of the table contains the calendar date when each tree-ring grew. Opposite this date, in another column, is recorded the experimentally measured ratio of radiocarbon to stable carbon found for that specific tree-ring today.

Figure 13 shows a small portion of an actual calibration table. Each line in this table represents

⁶⁵Slight deviations from complete uniformity can be demonstrated, especially between the northern and southern hemispheres, whose atmospheres mix together relatively slowly. But these departures from complete uniformity are too small to be of any practical importance to the present discussion.

⁶⁶Biological fractionation can bring about small alterations in the ratio of radiocarbon to stable carbon in plant tissues from one species to another. This effect is too small to be of any practical significance in the present context, and it can be experimentally corrected for when the ratio of radiocarbon to stable carbon is measured in a sample in any event.

TABLE 2. Single-Year Data (*Continued*)

cal AD	$\Delta^{14}\text{C}$ (‰)	^{14}C BP	cal BP
1655	6.3 ± 1.6	236 ± 13	295
1654	7.1 ± 1.3	231 ± 10	296
1653	4.0 ± 1.9	256 ± 15	297
1651	4.9 ± 1.9	251 ± 15	299
1650	5.7 ± 1.3	246 ± 10	300
1649	4.0 ± 1.3	260 ± 10	301
1648	3.3 ± 1.8	267 ± 14	302
1647	4.0 ± 1.9	263 ± 16	303
1646	2.6 ± 1.8	275 ± 14	304
1645	2.2 ± 1.7	279 ± 14	305
1644	2.2 ± 1.0	280 ± 8	306
1643	3.8 ± 1.8	268 ± 15	307
1642	1.5 ± 1.8	288 ± 14	308
1641	2.1 ± 2.2	283 ± 17	309
1640	-2.5 ± 1.3	321 ± 11	310
1639	0.6 ± 1.1	298 ± 9	311
1638	-2.6 ± 1.7	324 ± 14	312
1637	0.6 ± 2.2	299 ± 17	313
1636	1.5 ± 1.3	293 ± 10	314
1635	1.3 ± 1.2	295 ± 10	315

Figure 13: A reproduction of a portion of an actual calibration table. (From: Minze Stuiver, Paula J. Reimer, and Thomas F. Braziunas, “High-precision Radiocarbon Age Calibration for Terrestrial and Marine Samples,” *Radiocarbon* 40.3 (1998): 1150.)

one tree-ring. The column at left (first column) is the calendar age of the ring, obtained by counting rings back from the present. The column at right (fourth column) is just another way of expressing the tree-ring count. It gives calendar years before present (B.P.), with 0 B.P. defined as 1950 A.D. The second column tells what the radiocarbon ratio in the atmosphere was when each ring grew, relative to wood which grew near 1850 A.D. (before the industrial revolution began to add a great deal of stable carbon into the atmosphere). This is determined by direct measurement on each ring. The third column gives the measured conventional radiocarbon ages of the tree-rings. This is just a traditional way of expressing the (fractionation corrected) ratio of radiocarbon to stable carbon atoms in the tree-rings. Calibration tables like this one (though generally giving results for every ten or every twenty rings, rather than for each and every year) now exist based upon a series of nearly 12,000 consecutive tree-rings stretching backward

in time from the present.⁶⁷

Suppose we would like to radiocarbon date a leather sandal found in ancient native American ruins in California. We do this today as follows. We first measure the ratio of radiocarbon to stable carbon atoms in the leather. (More accurately stated, we send the leather to a lab equipped to make such a measurement—along with three or four hundred dollars to pay to have this work done for us.)

Once we have this fundamental ratio, we go to the calibration table. We look in the table until we find a tree-ring sample having this same ratio. Since these two samples—the leather from the sandal and the wood from the tree-ring—have the same radiocarbon to stable carbon ratio today they are in lockstep at present.⁶⁸ This implies that they must both have ceased to metabolize (or died) at the same time, so they could begin their lockstep progression to the present time. We can, therefore, determine when the deer died, from which the leather for the sandal came, by looking at the adjacent column in the calibration table showing how many tree-rings ago that particular tree-ring was formed. This number will equal the number of years which have elapsed since the deer was killed by the native American, as long as each tree-ring in the calibration table corresponds to one calendar year.

Now we obviously must ask whether we can be confident each tree-ring in the calibration table does, in fact, correspond to one calendar year. And we will want to ask other probing questions about the tree-rings used to construct this calibration table, of course. But before we do let me emphasize that the whole burden of proof for the calendar re-

⁶⁷See, for example: Minze Stuiver, Paula J. Reimer, and Thomas F. Braziunas, “High-precision Radiocarbon Age Calibration for Terrestrial and Marine Samples,” *Radiocarbon* 40.3 (1998): 1127–1151.

⁶⁸I have skipped over the possibility of two or more tree-rings, which grew at different times, having the same ratio. This can happen (and frequently does) because the ratio of radiocarbon to stable carbon in the atmosphere fluctuates up and down with time. This effect can introduce more than one possible date range, usually within a few hundred years of each other, for a given sample. However, this effect is of no practical significance in the present context, which is seeking to show only that calibrated radiocarbon dates cannot possibly all be out by the thousands of years necessary to solve the central conundrum.

liability of radiocarbon dates has now shifted entirely away from the past behavior of the radiocarbon atom. Assumptions about the past decay rate of radiocarbon, or its initial concentration in the atmosphere, are irrelevant, as far as accuracy of the dates one obtains are concerned, when the calibration method is used. If the decay rate of radiocarbon was somehow altered by the Flood (and I know of no way to accomplish such a thing apart from explicit supernatural intervention, which the Biblical record of the Flood does not hint at) then this decay rate would have altered in all samples, including the tree-rings. In that case the ratio of radiocarbon to stable carbon would have remained in lockstep just the same, so the calibrated date would not be altered.

This is the important point. In the calibration method of radiocarbon dating—which all radiocarbon scientists now employ—the burden of proof for calendrical accuracy is shifted away from radiocarbon and onto the shoulders of *dendrochronology*, the science of counting tree-rings. Questions concerning the past behavior of radiocarbon itself—whether the Flood might have altered its radioactive decay rate, or whether the Flood might have caused a disequilibrium between present-day production and decay of radiocarbon, or any other such thing—do not impinge upon the accuracy of calibrated radiocarbon dates. In the quest to unify pre-Flood sacred and secular chronologies such questions are irrelevant.

Can Dendrochronology be Trusted?

Obviously, we must turn our attention away from the past behavior of the radiocarbon atom and focus it on the past behavior of tree-rings if we are to gain any real insight into the trustworthiness of pre-Flood calibrated radiocarbon dates. The critical question is not, “Can radiocarbon be trusted?” but rather, “Can dendrochronology be trusted?”

This was a difficult question to answer when the calibration method of dating first began to be developed. The only tree-rings extending far enough back in time to be of much use for calibration purposes at that time were from the remarkable bristlecone pine trees growing at high altitudes in the White Mountains of California.⁶⁹ These trees



Figure 14: Life-size bristlecone pine sample cores. Cores from two different bristlecones are shown mounted in wooden frames. The top core is from a relatively young tree. It has about 65 growth rings total, not all of which are shown here. The bottom core shows more closely spaced rings (slower growth) of a much older tree. This core has 598 rings in a total length of 261 millimeters (i.e., the average ring width is less than half a millimeter). The bark of this older tree is visible at right, indicating the youngest growth ring prior to coring.

grow very slowly (Figure 14) and live to very great ages—some more than 4,000 years. Because of their resinous nature, and the cold, arid environment in which they grow, dead bristlecones can be preserved for thousands of years. By overlapping ring patterns in dead and living bristlecones, dendrochronologists had been able to construct a continuous series of bristlecone tree-rings extending from the present back 7100 rings into the past. This tree-ring series provided the basis of the earliest calibration table.

But how was this bristlecone tree-ring series to be checked for calendrical accuracy? What if the dendrochronologists had matched the ring patterns incorrectly between two or more bristlecone specimens? One could certainly imagine an inadvertent duplication of a whole section of the series, artificially extending it thousands of years beyond its true range. And how could one be sure that these bristlecone pine trees only put on one growth ring each year?

To answer such concerns some sort of independent check on the bristlecone pine tree-ring chronology was needed. One desired to see a second, independent, calibration table, constructed

⁶⁹C. W. Ferguson, “Bristlecone Pine: Science and Esthet-

ics,” *Science* 159 (23 February 1968): 839–846.

using independently counted tree-rings. The calibration method could then be checked by seeing whether both calibration tables gave the same calibrated dates for all samples.

A small step in this direction was taken early on by comparing dendrochronologies from other types of trees, such as Douglas fir, to the bristlecone chronology. It was found that these agreed. But the ring series from these other trees were not nearly as long as the bristlecone pine series. This meant that only the most recent portion of the bristlecone chronology could be checked. Furthermore, all of the trees involved were from a single geographical region—the west coast of the United States. What was really needed was an independent, long dendrochronology from an entirely different part of the world. Fortunately, such a check was not long in coming.

Dendrochronologists were actively building long tree-ring chronologies not only in America, but also Europe. The European scientists found that they were able to construct a very long tree-ring chronology using oak trees. The younger portion of this chronology was pieced together from oak logs which had been used (and hence preserved) in the construction of various historic buildings. The chronology was then extended to more ancient times using older oak logs found preserved, for example, in ancient peat beds.

The European oak chronology was just what was needed to check the American bristlecone pine chronology. The two were obviously independent. Ring width patterns are determined by local environmental factors, such as temperature and rainfall. Since the specimens involved in these two chronologies grew on two separate continents, with an ocean between, there was no way the ring thickness pattern in one could act as any guide to the construction of the other. Furthermore, political boundaries assured that the scientists who worked on the oak chronology were different from, and independent of those involved in the bristlecone chronology.

Finally, the very different natures of the two types of trees involved—bristlecone and oak—was a significant advantage. Bristlecones are evergreens which grow very slowly, at high altitude, in a cold, arid environment, and live for thousands of years. None of these things is true of the oaks

used in the European chronology. They are deciduous, grow relatively rapidly, at low altitudes, in relatively warm, moist environments, and live for only hundreds of years.

Did these two dendrochronologies yield calibration tables in harmony with one another? The answer is an unequivocal yes. Figure 15 illustrates a portion of what was found when these two dendrochronologies were compared through their respective radiocarbon to stable carbon ratios. More recently, Stuiver *et al.* have reported:⁷⁰

[Radiocarbon] results determined in different laboratories for samples of the “same” dendroage usually yield offsets in the 0–20 [radiocarbon] year range. Values twice as large are occasionally encountered.

That is, the largest offsets between labs over the entire series of nearly 12,000 consecutive tree-rings available today are forty years or less. The possibility of miscounted or misplaced thousands of rings in these dendrochronologies is immediately removed by these observations. It is clear that the dendrochronologists know how to assemble their tree-ring samples correctly.

Furthermore, Figure 15 makes it clear that radiocarbon does, indeed, have a uniform distribution in the atmosphere, at least in the northern hemisphere. It shows that trees grown at the same time on separate continents have the same ratio of radiocarbon to stable carbon in their wood. This experimentally verifies the fundamental premise upon which the calibration method of radiocarbon dating is based.

Multiple Rings Per Year

The only question remaining at this point—and though one may appear a severe skeptic even to ask it, let us leave no stone unturned—is whether it might just be possible that both of these dendrochronologies have incorporated multiple ring growth per year. Suppose, for example, that the

⁷⁰Minze Stuiver, Paula J. Reimer, Edouard Bard, J. Warren Beck, G. S. Burr, Konrad A. Hughen, Bernd Kromer, Gerry McCormac, Johannes Van Der Plicht, and Marco Spurk, “INTCAL98 Radiocarbon Age Calibration, 24,000–0 cal BP,” *Radiocarbon* 40.3 (1998): 1041–1083.

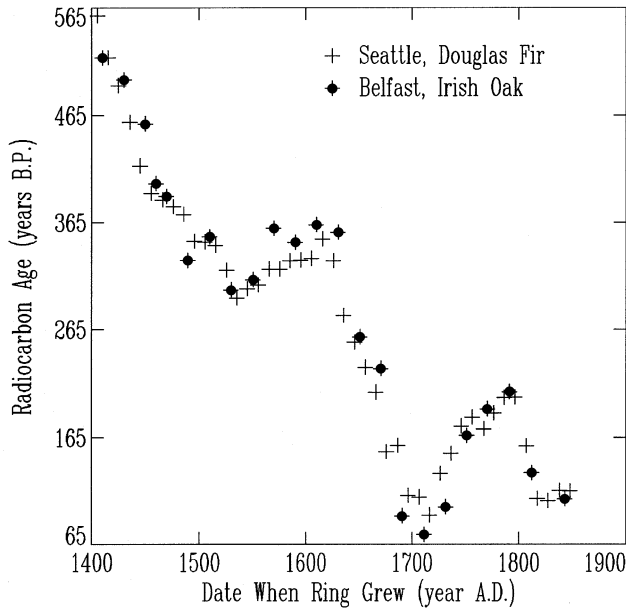


Figure 15: Radiocarbon to stable carbon ratio measurements on tree-rings from two separate continents measured independently by separate laboratories. (The ratio of radiocarbon to stable carbon is expressed on the vertical axis as an uncalibrated radiocarbon “age”. This is for traditional reasons only and does not imply calendar years on the vertical axis. After: Minze Stuiver, “A High-precision Calibration of the AD Radiocarbon Time Scale,” *Radiocarbon* 24.1 (1982): 1–26.)

trees used in these long dendrochronologies, both in America and in Europe, have a propensity for adding, not one growth ring each year, but two growth rings per year on average. If these rings were all treated as annual growth rings, then the dendrochronologies would appear to show a factor of two too many calendar years.

We know that calibrated radiocarbon dates are accurate back to the time of the Flood, and this means that the tree-ring count that these dates are based upon must also be accurate from the present back to that time. Thus, we know the trees used in constructing these long dendrochronologies, on two separate continents, were only growing one ring per year from the Flood down to the present time. But is it possible that something was different before the Flood, so that pre-Flood trees routinely grew two or more rings each year? Is it possible that multiple ring growth per year *prior to the Flood* is the explanation of the pre-Adamic

calibrated radiocarbon dates from human remains at Jericho?

It is possible to test the hypothesis of multiple ring growth per year before the Flood using the calibration table itself. The idea here is fairly simple. To illustrate it, imagine for a moment that there exists an aged magician who has the power to cause trees to grow brilliantly blue growth rings. In the years when he does not exercise this power all the trees in his world grow normal-colored growth rings for that year. But in the years when he does exercise his power, all the trees grow brilliant blue rings during that year. As a result, when you cut a tree down in the magician’s world and examine the growth rings you observe a pattern of brilliant blue rings interspersed among normal rings.

Now what motivates this magician to exercise his power is not known, but what is well known is that whenever he starts to cause the trees to grow blue rings he keeps it up for exactly ten years in a row before stopping again.

Given this odd behavior it is a simple thing to detect multiple ring growth in the trees of the magician’s world. If you cut a tree down and find a group of fifteen sequential blue rings, then you know that tree was not adding one growth ring per year. This immediately follows because we know the magician always exercises his power in ten year blocks. The extra five rings are evidence that the tree put on more than one ring per year during some of the years of that ten year span. If, on the other hand, you find that blue rings appear only in groups of ten, then you know that the trees have only been growing one ring per year.

In this analogy the magician represents the sun. The sun occasionally, for unknown reasons, goes into a relatively quiescent mode of operation.⁷¹ During such episodes few sunspots are seen on the surface of the sun, and the solar wind is reduced. This lets more cosmic radiation into the upper atmosphere of the earth, which allows more radiocarbon atoms to be produced in the atmosphere. Eventually the sun returns to normal operation and radiocarbon returns to normal levels in the atmosphere once again. But the result is that the ratio of radiocarbon to stable carbon atoms

⁷¹M. Stuiver and P. D. Quay, “Changes in Atmospheric Carbon-14 Attributed to a Variable Sun,” *Science* 207 (1980): 11–19.

in the atmosphere goes through occasional small “peaks”. Since the trees are simply “recording” whatever ratio of radiocarbon to stable carbon is in the atmosphere at the time they put on each growth ring, the rings themselves are permanently “dyed” with these higher than usual radiocarbon levels. These are the tell-tale “blue” rings.

Now, contrary to the magician of my analogy, our sun exhibits not one, but two quiescent modes. One mode lasts roughly 51 years on average, and the other about 96 years on average. We could expand our analogy and imagine that the magician paints growth rings blue for ten years at a time, while at other times he paints them red for twenty years at a time. This adds complexity to the analogy, however, which is why I have left it out above. The basic idea, I think, is nonetheless clear.

Examples of both quiescent modes are visible in Figure 15. These appear as valleys in the figure, rather than peaks, since radiocarbon “age” decreases whenever the ratio of radiocarbon to stable carbon increases. A valley resulting from the 51 year sort of solar quiescence dips to a minimum near A.D. 1700, and another, of the 96 year variety, reaches its minimum just after A.D. 1500. The valley near 1700 is known as the “Maunder minimum” and the one near 1500 is known as the “Spörer minimum”.

Quantitative Analysis

Now let us get down to quantitative business with this. Our immediate concern is to decide whether the calibrated radiocarbon dates from Jericho which appear to predate the creation of Adam are trustworthy. We are asking whether their apparently excessive age might be due to multiple ring growth per year prior to the Flood in the dendrochronologies upon which their ages are based.

How many rings per year would the trees need to have grown pre-Flood on average to bring the oldest radiocarbon dates at Jericho down in age so that they are equal to the creation date of Adam?

Figure 16, reproduced here from last issue, shows that the calibrated radiocarbon dates in question go back at least to a putative 8500 B.C. Meanwhile, we know that the Flood happened approximately 3500 B.C. Thus, 5000 growth rings

separate the Flood from the oldest human remains dated by the calibration method at Jericho.

We would like to try to compress these 5000 growth rings into just the span of time from the Flood back to Adam’s creation. That span of time, we know from Biblical chronology (see Figure 16), is 1700 years.

To compress 5000 growth rings into 1700 years, the trees must have been growing $(5000/1700=)$ 2.9 rings per year on average in the pre-Flood period.

If the trees were growing 2.9 rings per year in the pre-Flood period, then the sun-induced “peaks” in the ratio of radiocarbon to stable carbon measured in the rings (the “blue” and “red” rings) should occupy approximately $(2.9 \times 51=)$ 148 growth rings and $(2.9 \times 96=)$ 279 growth rings on average respectively, instead of their normal average of 51 and 96 growth rings. Do they?

Figure 17 shows that, in point of fact, they don’t.⁷² Each circle in the figure represents one “peak”. I found seven peaks before the Flood and nine peaks after the Flood.

Three of the nine post-Flood peaks are of the 96-year type. The average of their widths is 96 years (which is where the 96 year figure comes from). This average is plotted as the upper horizontal dashed line in the figure.

The average of the remaining six post-Flood peaks is 51 years. This is plotted as the lower dashed line.

The dotted horizontal lines show 2.9 times the post-Flood peak widths. The upper dotted line corresponds to the upper dashed line, and the lower dotted line corresponds to the lower dashed line.

If pre-Flood trees were growing 2.9 rings per year on average, then the pre-Flood peaks should all cluster around the upper and lower dotted lines, just as the post-Flood peaks cluster around the dashed lines. But they don’t. The pre-Flood peaks

⁷²I used the $\Delta^{14}\text{C}$ data from the INTCAL98 calibration curve for this figure. The data were downloaded over the Internet from the Quaternary Isotope Laboratory in Seattle, Washington (<http://depts.washington.edu/qil/>). I selected all peaks in the time span of interest which were large and well defined. Sixteen peaks total were found. To furnish an objective measure of the width of these peaks I performed a least squares fit of a Gaussian plus linear background to each peak.

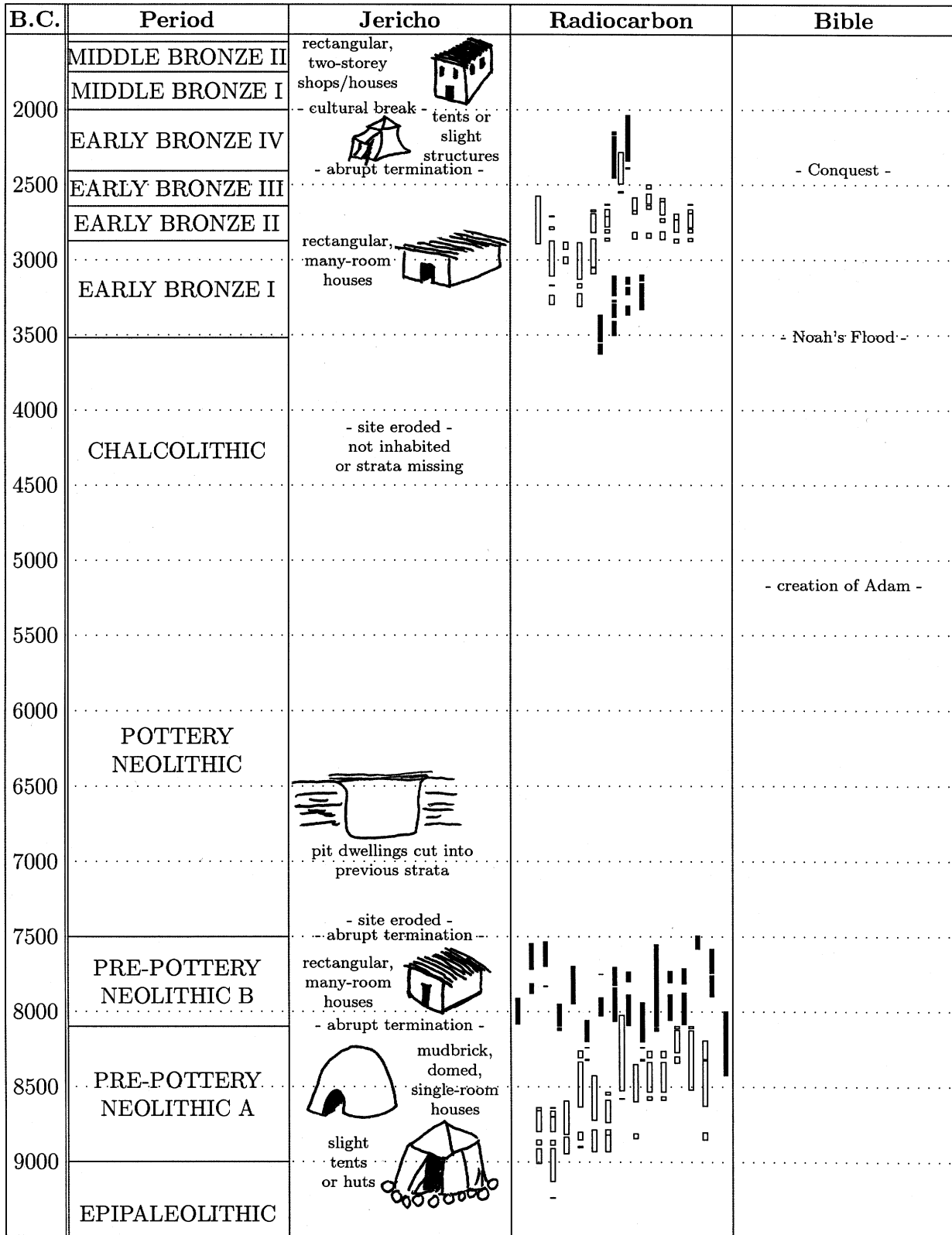


Figure 16: Chronology at Jericho relative to three key Biblical events.

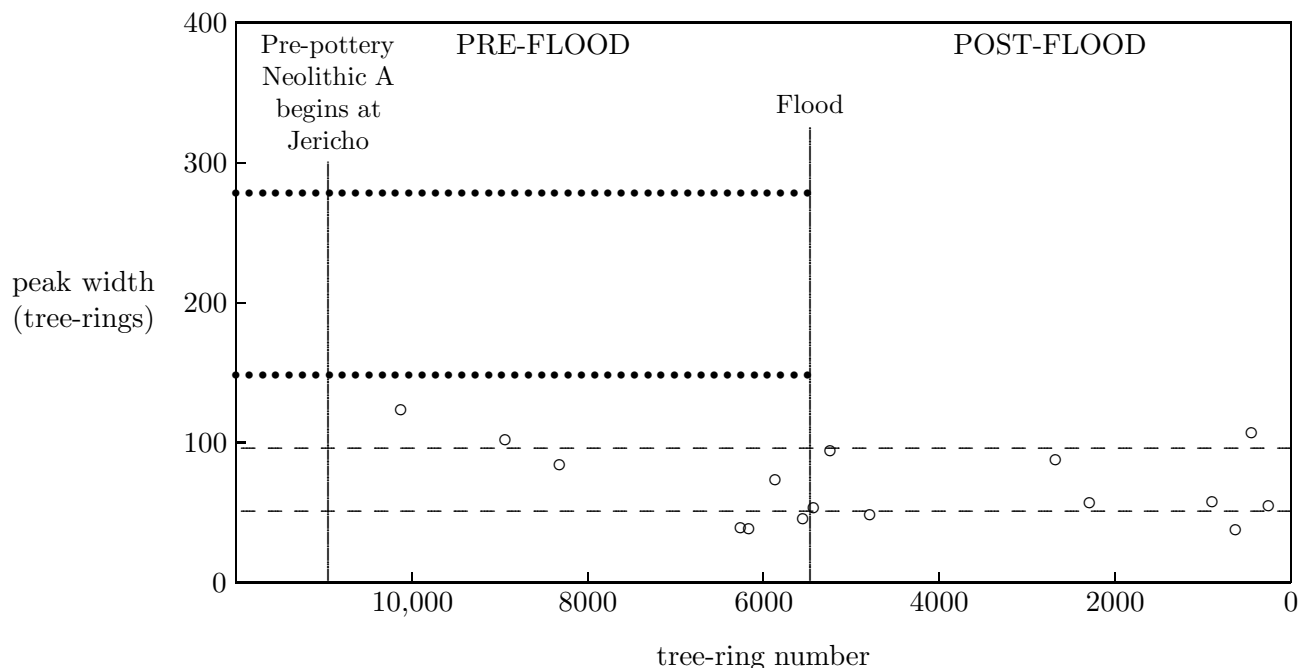


Figure 17: Widths of sixteen “peaks” from the INTCAL98 radiocarbon calibration table.

continue to cluster around the dashed lines. Apparently, there was no significant difference in the growth characteristics of the trees pre-Flood and post-Flood. The hypothesis that trees in the pre-Flood period were growing multiple rings per year is falsified.

Conclusion

This means that the apparently excessive ages of the earliest calibrated radiocarbon dates from Jericho can not be explained away as due to multiple tree-ring growth per year prior to the Flood. Five thousand truly annual growth rings do, indeed, separate early human remains at Jericho from the Flood. And this means that some 3300 truly annual growth rings separate these early human remains from the creation of Adam. The evidence for the apparent existence of mankind thousands of years before the creation date of Adam is unambiguously affirmed at Jericho.

Now I hope that you will agree with me that the “central conundrum” of pre-Flood Biblical chronology is properly named. Here is a conundrum indeed.

The Bible, we have seen, seems to teach that Adam was the first man ever to have existed.⁷³

⁷³Gerald E. Aardsma, “Toward Unification of Pre-

When coupled with the doctrine of Biblical inerrancy this leads immediately to what I will call Grand Fact 1.

Grand Fact 1 *Adam was the first human ever to have existed.*

Meanwhile, the data from the ground at Jericho lead immediately to Grand Fact 2.

Grand Fact 2 *Human remains and artifacts exist which greatly predate Adam.*

These two Grand Facts seem logically incompatible. One’s immediate reaction is to seek to reject one or the other of them. But try as we might, no rational way of rejecting either of them appears.

I have been reading and studying in the field of ultimate origins for at least a quarter of a century now. During this time I have seen a broad range of ideas about the origins of mankind and the meaning of Genesis. I have observed that these ideas, almost without exception, exercise themselves in an attempt to deny one or the other of these Grand Facts. Most, these days, seek to deny Grand Fact 1. But, as far as I have been able to

Flood Chronology: Part II,” *The Biblical Chronologist* 4.5 (September/October 1998): 1–10.

see, none of these ideas, whether secular or theological at root, has ever actually succeeded in demonstrating any rational way of denying either Grand Fact 1 or Grand Fact 2.

I have never yet found anybody who has ever been able to show any legitimate way of setting either of these Grand Facts aside, and I can conceive of no way of doing so myself. This leads me to conclude that apparently, difficult though this may seem, truth is to be had, not by a rejection of one or the other of these Grand Facts, but by embracing both of them together.

This brings us to our ninth and final possible solution.

9. The Biblical and secular evidences must both be accepted as legitimate; the truth lies in a proper synthesis of the two.

Can a workable synthesis of the Biblical and secular evidences for the antiquity of mankind be found? I'll be taking a look at this question next issue, Lord willing. ◊

A Unification of Pre-Flood Chronology

From Volume 5, Number 2, pages 1–18.

The present article is the culmination of five consecutive articles dealing with the problem of the unification of sacred and secular chronologies in the pre-Flood era.⁷⁴ It presents a new solution of this longstanding problem.

Review

Once the missing thousand years in 1 Kings 6:1 is recognized and allowed for, sacred and secular chronologies of earth history exhibit essential unity from the present back until the creation of Adam,

⁷⁴The previous four articles were: Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1–10; Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 1–10; Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part III," *The Biblical Chronologist* 4.6 (November/December 1998): 1–16; and Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part IV," *The Biblical Chronologist* 5.1 (January/February 1999): 1–10.

roughly 5200 B.C.⁷⁵ At that point in time one encounters the "central conundrum" of Pre-Flood Biblical chronology, which is the apparent existence of mankind, according to secular scholarship, many thousands of years before the creation date of Adam determined from Biblical chronology.⁷⁶ One must somehow resolve this conundrum before sacred and secular chronologies can be unified in the period of time prior to the creation of Adam.

I have enumerated nine conceptually possible solutions to this conundrum. I believe these nine exhaust the possibilities.⁷⁷

1. The Biblical chronological data leading to the creation of Adam are false (i.e., fabricated).
2. The secular chronological data leading to a great antiquity for mankind are false (i.e., fabricated).
3. The Biblical history which teaches that Adam was the first man to be created is mythological or otherwise fabricated.
4. The modern secular teaching that mankind existed in remote antiquity is a hoax or fabrication.
5. We have misunderstood the Biblical history of the creation of Adam; the Bible does not really teach that Adam was the first man ever to be created.
6. The archaeologists have misunderstood the history of mankind; archaeology does not really show the existence of humans before Adam.
7. We have made some mistake in the computation of the Biblical date of the creation of Adam (i.e., the basic Biblical chronological data are valid, but they have been misunderstood).

⁷⁵Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993); Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 1–10.

⁷⁶Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 10.

⁷⁷Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 1–10.

8. The secular chronologists have made some mistake in their computation of the antiquity of man (i.e., the basic secular chronological data are valid, but they have been misunderstood).
9. The Biblical and secular evidences must both be accepted as legitimate; the truth lies in a proper synthesis of the two.

I have argued that the first eight of these conceptually possible solutions fail to present an adequate resolution of the central conundrum.⁷⁸ Only the ninth possible solution remains.

The Problem

The ninth conceptually possible solution demands that both the Biblical and secular evidences regarding the antiquity of mankind be accepted as legitimate. To treat the ninth possible solution fairly in its own right one must deliberately put aside whatever lingering doubts they may have regarding the Biblical or the secular evidences bearing on the antiquity of mankind. One must no longer suppose that the sacred or secular chronological data are somehow fabricated or misunderstood. One must forsake the notion that the Biblical account of the creation of Adam is fictitious or abstruse. One must leave behind the idea that the archaeological data for pre-Adamic mankind are fabricated by the archaeologists, or that these data have somehow been misunderstood by the specialists who study them. All such intellectual baggage, no matter how comfortably threadbare, must be dropped at the threshold of the ninth conceptually possible solution, or one is self-condemned to remain outside its door.

For the ninth solution one must take as a starting assumption that the plain-sense, traditional view of Genesis is an accurate representation of the factual history the text means to communicate. That is, we are assuming at the outset that

⁷⁸Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 1–10; Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part III," *The Biblical Chronologist* 4.6 (September/October 1998): 1–16; Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part IV," *The Biblical Chronologist* 5.1 (January/February 1999): 1–10.

Adam was the first man ever to have been created, and that he was created only about seven thousand years ago (5176±26 B.C. according to modern Biblical chronology⁷⁹). At the same time we are assuming that the normal, secular, text-book reconstruction of pre-history is reasonably accurate. Specifically, we are assuming that the physical data which have been dug from the ground really do show an unbroken continuity of humanity from the present into the very remote past, many thousands of years before the creation of Adam. Succinctly stated, for solution number nine we take as our departure point two Grand Facts:⁸⁰

Grand Fact 3 *Adam was the first human ever to have existed.*

Grand Fact 4 *Human remains and artifacts exist which greatly predate Adam.*

The problem which is posed for the ninth possible solution is *not* how one might discard one or the other of these Grand Facts. Rather, it is, having accepted both, how to synthesize the two into a single, comprehensible whole.

The Difficulty

On the face of things this problem seems impossible to solve. The difficulty is that these two Grand Facts seem to say opposite things. Grand Fact 1, that Adam was the first human ever to have existed, establishes a point in time, 5176±26 B.C., before which there were no humans in existence. It states that the world was completely devoid of humans from the first instant of its creation up to and including the creation of Adam. Meanwhile Grand Fact 2, that human remains and artifacts exist which greatly predate Adam, implies a continuity of human existence on Earth from a very remote antiquity (at least 25,000 years ago, as we have previously discussed⁸¹) down

⁷⁹Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology," *The Biblical Chronologist* 4.4 (July/August 1998): 3.

⁸⁰Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part IV," *The Biblical Chronologist* 5.1 (January/February 1999): 1–10.

⁸¹Gerald E. Aardsma, "Toward Unification of Pre-Flood Chronology: Part II," *The Biblical Chronologist* 4.5 (September/October 1998): 9.

to the present time. This continuity of human existence—including evidence of villages, pottery manufacture, burial of the dead, and much more—continues with no apparent break right through 5176±26 B.C. Recall, for example, that the creation of Adam appears to fall in the middle of the Ubaid period in Mesopotamia⁸². This “Ubaid period” is just archaeological jargon summarizing the continuous succession of settlements and agricultural villages found by the archaeologists in Southern Mesopotamia, beginning probably prior to 6000 B.C., and certainly long before 5176±26 B.C., and continuing in an unbroken chain of human culture to somewhere in the vicinity of 4400 B.C. How, then, can these two Grand Facts possibly be reconciled?

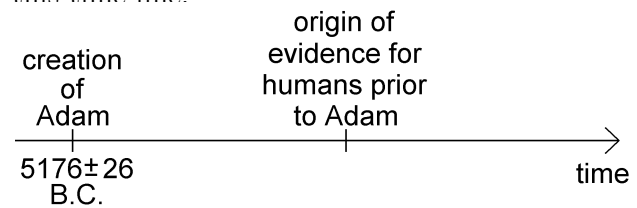
Certainly it is the case that if one assumes that history is comprised of an unbroken chain of naturalistic cause and effect phenomena, then no reconciliation of these two Grand Facts of any sort appears. But this is hardly surprising, for the assumption of an unbroken chain of naturalistic cause and effect is just a denial of Grand Fact 1. Grand Fact 1 demands the *supernatural creation* of Adam at the outset, and this demand cannot be reconciled with any assumed unbroken chain of naturalistic cause and effect phenomena into eternity past. To cross the threshold into solution number nine, one must leave the wearisome philosophical baggage of naturalism behind.

And strange though it may seem, once one has done so, a rational way of reconciling these two Grand Facts does appear.

The Solution

Logically, synthesis of these two Grand Facts can be accomplished if we accept that the evidence for humans prior to Adam only came into existence subsequent to the creation of Adam, as shown in

this time-line.



That is, these two Grand Facts can be reconciled if and only if Grand Fact 2 only became operable (i.e., began to be true) at some point in time after Grand Fact 1 had become operable. To see this we proceed deductively as follows.

Grand Fact 1 establishes a point in time, 5176±26 B.C. according to our best modern reckoning, before which no humans were in existence. Grand Fact 2 implies continuity of human populations before, during, and after that time. If Grand Fact 2 were in operation at the time of Adam’s creation, then other humans besides Adam would have been in existence at the time of Adam’s creation. In that case Adam would not have been the first human ever to have existed, and Grand Fact 1 would be violated. Thus, Grand Fact 2 could not have been in operation at the time of the creation of Adam.

If, on the other hand, Grand Fact 2 only began to operate subsequent to the creation of Adam, then Adam would be, in point of historical fact, the first man ever to have been created, and Grand Fact 1 would not be violated.

Thus Grand Fact 1 and Grand Fact 2 can be reconciled if and only if we accept that Grand Fact 2 only became operable sometime strictly after the creation of Adam.

That is really all there is to the derivation of this solution. The derivation is, logically, very simple.

The result, however, is cognitively a bit of a bear.

The Result

What this solution says is that the world as it was initially created by God did not contain any evidences of pre-Adamic peoples. These evidences were added into the creation sometime following the creation of Adam.

The root concept which underlies this solution is that there can exist effects whose apparent causes were never really operative. For example, this so-

⁸²Gerald E. Aardsma, “Toward Unification of Pre-Flood Chronology,” *The Biblical Chronologist* 4.4 (July/August 1998): 8–10.

lution says that the remains of houses found in village settings in the lowest Ubaid levels in Southern Mesopotamia dating to the early sixth millennium B.C. are real enough remains. It also says that the impression they give of having been built and occupied by humans eight millennia ago is a valid impression. But it goes on to say that this impression is an impression only and that it does not correspond to factual historical reality. In reality the world was only created (i.e., supernaturally brought into existence out of nothing) in the late sixth millennium B.C., and there can be no real history before Creation.

We are not very familiar with such concepts, so they can appear strange and unthinkable at first. I find it helpful at such times to recall that the universe has been created by an infinite God. One consequence of this fact is that no matter how much we manage to comprehend of God and His great creation with our finite minds, there will always be yet an infinity of unthought truths outside our heads. The folly of attempting to limit reality to the truths we find comfortably familiar is apparent—should the thimble presume to limit the ocean to the few drops it may contain? Rather than shrinking back from the unfamiliar, let us revel in the vastness of God and, as we press forward, look to Him to enlarge our thimbles.

Name Tags

To help us deal with these concepts, and to render them less cumbersome in subsequent discussion, we need to give them some names.

Proleptic time

Joseph Scaliger, the eminent chronological scholar of some four centuries ago, coined the term “proleptic time”.⁸³ The word, proleptic, comes from a Greek root meaning “to take beforehand”. Proleptic time, in the sense of Scaliger’s usage, is time which is taken (or assumed), in an abstract mathematical sense, before real time begins at Creation.

Scaliger invented proleptic time while faced with a problem similar to our central conundrum. The chronology of dynastic Egypt as it was understood

⁸³Anthony T. Grafton, “Joseph Scaliger and Historical Chronology: The Rise and Fall of a Discipline,” *History and Theory* 14.2 (1975): 156–185.

back at that time seemed to extend before the creation of Adam as Biblical chronology was understood at that time. Thus Scaliger seems to have been the first chronologist to have dealt in a scholarly way with secular chronological data which appeared to extend back beyond Creation.

Scaliger’s problem was more diffuse than ours. Scaliger was aware—as indeed it has turned out—that the apparent conflict between these two chronologies might result from chronological errors either in his historical chronology of Egypt, which he had deduced from available historical sources, or in his Biblical chronology, which he had deduced from the Biblical chronological data. On the other hand, it was also possible (back at that time) that the conflict was real—that the secular chronology of Egypt really did extend back before Creation. Thus, Scaliger had two potential means by which his problem might ultimately be resolved.

Today the analogous problem, our central conundrum, has only one potential resolution. The first option available to Scaliger—that chronological errors lay at the root of the apparent conflict between his two chronologies—is not available to us today, as I have previously discussed.⁸⁴ Our problem is focused to just the latter option—the fact of secular chronologies unambiguously showing the existence of mankind before the creation date of Adam.

In Scaliger’s case it made sense to leave the latter option—that the secular chronology of Egypt really did extend back before Creation—in the background as much as possible. Why spend time dealing with abstruse philosophical questions which may vanish once sufficient data have finally been gathered? We are not surprised, therefore, to learn that Scaliger appears never to have engaged the difficult philosophical questions this latter option raises in overt discussion.

In what sense, if any, did he [Scaliger] consider these [pre-Creation] dynasties [of Egypt] to be real? What sort of history could be said to have happened

⁸⁴Gerald E. Aardsma, “Toward Unification of Pre-Flood Chronology: Part III,” *The Biblical Chronologist* 4.6 (November/December 1998): 1–16; Gerald E. Aardsma, “Toward Unification of Pre-Flood Chronology: Part IV,” *The Biblical Chronologist* 5.1 (January/February 1999): 1–10.

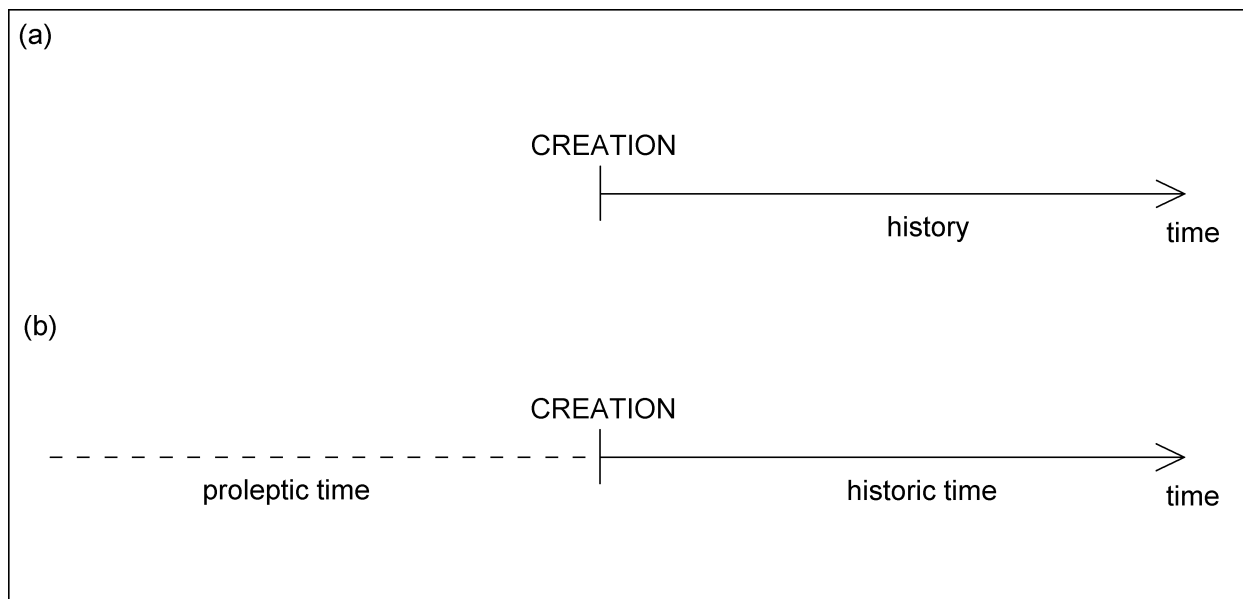


Figure 18: The relationship of Creation and time. (a) Real time begins at Creation. All of real history takes place subsequent to Creation. Prior to Creation neither time nor any physical reality of any sort exists. (b) Proleptic time is a mathematical extrapolation of the time parameter backward through Creation into the timeless void.

before the Creation?... [Scaliger] never gave a satisfactory answer to the question of whether the dynasties had really existed.⁸⁵

While Scaliger may never have explicitly addressed these questions, I think we may reasonably infer where Scaliger stood in regard to them. I find Scaliger’s answers to these questions to be logically implicit within his invention of proleptic time.

Proleptic time was invented for no other reason than that real time—what Scaliger called “historic time”—only originated at Creation. Real time looked to Scaliger as I have drawn in Figure 18a. Creation was an absolute beginning of time to him. Scaliger needed a mathematical device for carrying the time parameter artificially back beyond Creation so he could at least map the remotest dynasties of Egypt (as they were then understood) on a time line for comparison with his Biblical chronology. He invented proleptic time for this purpose. I suggest that proleptic time appeared to Scaliger as I have shown in Figure 18b.

It is clear enough that “historic time” had everything to do with real history in Scaliger’s mind.

⁸⁵Anthony T. Grafton, “Joseph Scaliger and Historical Chronology: The Rise and Fall of a Discipline,” *History and Theory* 14.2 (1975): 173.

Scaliger could easily enough have chosen to label post-Creation time “Mosaic time” or “Hebraic time” or even “Biblical time” if politics or pedantics had motivated his invention of proleptic time. But his choice of “historic time” shows he meant to deliberately distinguish the character of these two types of time on the basis of their historical reality. While the whole character of “historic time” is solid historical reality; the whole character of “proleptic time” is intangible mathematical abstraction.

If it could have been demonstrated to Scaliger that the secular and sacred chronologies he had derived were sufficiently accurate to confidently support the conclusion that the earliest dynasties of Egypt dated earlier than Creation (in actual fact, data which have only come available since Scaliger’s time have shown both Scaliger’s chronology of Egypt and his chronology of the Bible to be significantly inaccurate, as he was obviously aware was possible) it seems clear enough that he would have judged the earliest dynasties of Egypt—those which fell in proleptic time—not to be real history, no matter how jolting such a conclusion may have appeared to his contemporaries.

It seems proper and fitting to me, in honor of Scaliger, to retain his term “proleptic time” to

designate time taken before Creation, in a purely mathematical sense, as Scaliger intended (Figure 18). We stipulate, by the use of this term, that we are *not* merely referencing another era of real time; we mean fully to convey by this term imaginary time. Proleptic time is the mathematical projection of real historic time back behind Creation. Real historic time only begins at Creation, as the “In the beginning God created” of Genesis 1:1 teaches.

Virtual history

We need one other term in addition to proleptic time. We need a term to designate that sort of “history” which results from effects whose apparent causes were never really operative—the sort of “history” which “took place” in proleptic time, for example.

I suggest we avoid the term “proleptic history”. (It appears that Scaliger never used this term.) It would mean “history taken before Creation”. While it is clear enough how *time* might be extended, in a mathematical sense, back behind Creation, it is not at all clear how to extend *history* mathematically.

I suggest adoption of the term “virtual history”.

A “virtual focus” in optics, is a point from which light rays seem to emanate when in fact no light emanates from that point at all (Figure 19). A “virtual image” in optics is an image made up of virtual foci. Light rays appear to emanate from all points of a virtual image, but in actual fact no light emanates from the virtual image at all. When you look at yourself in a mirror you are looking at a virtual image of yourself. Light rays appear to emanate from the other “you” in the mirror, which is why you see “yourself” in there. But in actual fact the light rays which are entering your eyes have emanated from the real you and have merely bounced off the mirror. What you see in the mirror looks real enough—so real, in fact, that it is easy to imagine a whole other world in there, as children frequently do. But the world one sees behind the silvered surface of the mirror is not real at all. There is, in reality, no other “you” behind the mirror looking out at you. Behind the mirror is only solid wall.

Real history is that from which time emanates.

Virtual history is that from which time appears to emanate when in fact time does not emanate from it at all.

Principle 1

That is what I mean by the term “virtual history”. Now I want to show that virtual history is not just an imaginary concept, invented for the purpose of saving the Bible from some embarrassing physical data from remote antiquity.

Feeding of the five thousand

The Gospel of Mark records this snatch of history:⁸⁶

And He [Jesus] took the five loaves and the two fish, and looking up toward heaven, He blessed the food and broke the loaves, and He kept giving them to the disciples to set before them; and He divided up the two fish among them all. And they all ate and were satisfied. And they picked up twelve full baskets of the broken pieces, and also of the fish. And there were five thousand men who ate the loaves.

Let us travel back in history in an imaginary time machine to have a good look at those twelve baskets of leftovers. We are aware that a much greater mass of bread and fish has been collected up after the meal than was present in the crowd before the meal. We know that Jesus has done a miracle, somehow creating additional bread and fish from the original, small lunch. We are interested to see what newly created bread and fish look like.

Now I hope you will have no trouble agreeing with me, in this thought experiment, that the newly created bread and fish look very much like the original bread and fish. Indeed, it would be fascinating to study whether the two are distinguishable in any respect at all. But it is not necessary to delve into these physical data that deeply for the present purpose, and I do want to keep this simple.

⁸⁶Mark 6:41–44; NASB.

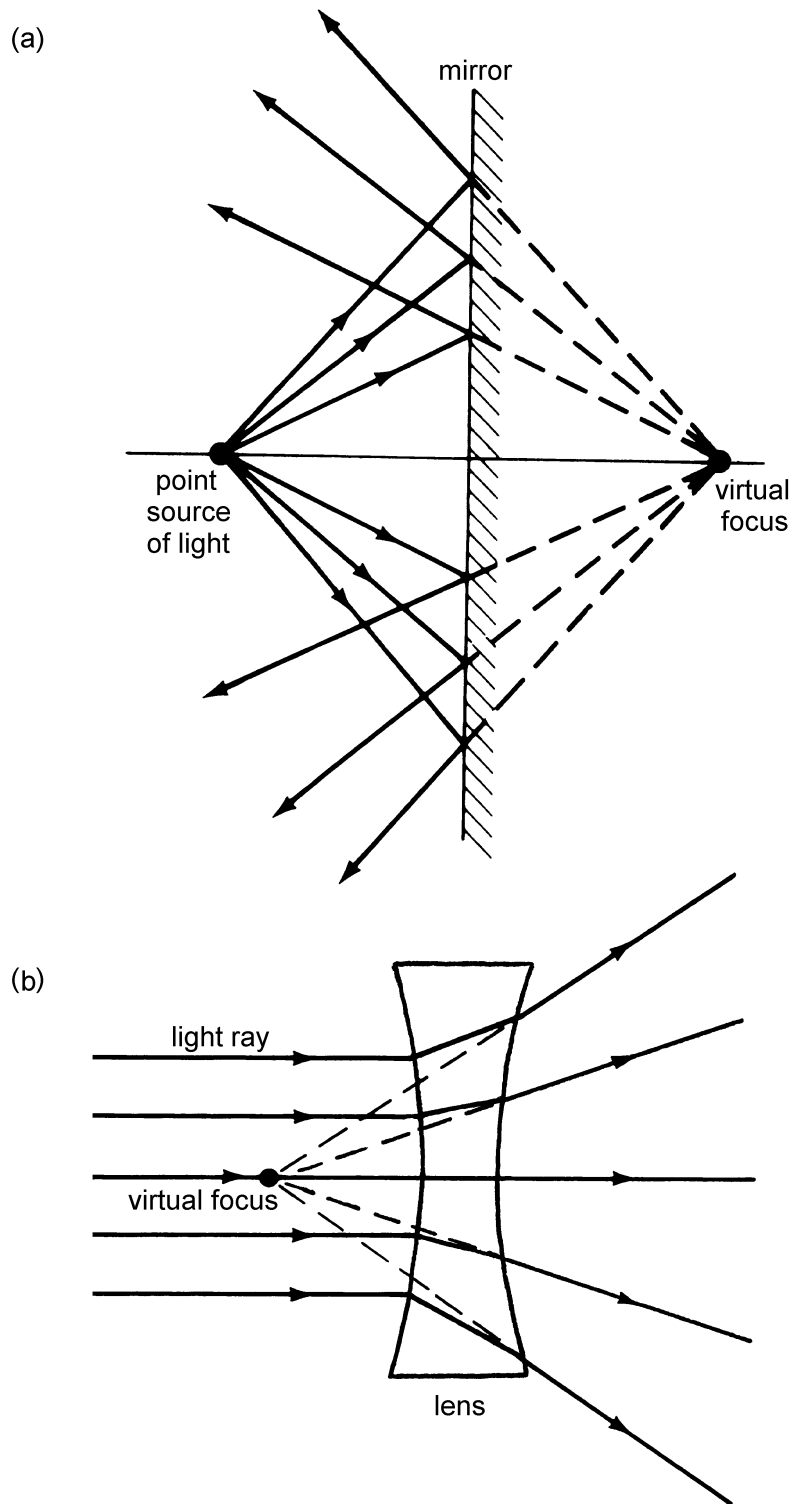


Figure 19: Illustrations of virtual foci. (a) Light rays from a point source of light in front of a mirror are reflected by the mirror with the result that they appear to emanate from a virtual focus behind the mirror. (b) Parallel light rays passing through a diverging lens from the left are refracted outward by it on the right with the result that they appear to emanate from a virtual focus to the left of the lens.

I am sure you will agree with me at least that all these fragments of bread and fish *look* like they have been cooked—there is no raw fish or raw bread dough here in these baskets. Let me work from this assumed point of agreement.

Was this newly created bread and fish, which looks cooked, ever, in fact, cooked? Well, no; we know that it wasn't. We know that, in actual historical fact, it was simply created in this cooked state.

You see immediately, then, that these fragments of bread and fish have a virtual history. To say they look like they have been cooked is to say they give evidence of having been subjected to an elevated temperature at some point in the past. But we know, in point of historical fact, that they were not ever subjected to an elevated temperature at all. They were simply *created* this way.

Thus we see that virtual history is not unique to proleptic time. Virtual history seems to be a general artifact resident within the physical substance produced by creation-type miracles. If we cast our vision backwards through the miracle of the feeding of the five thousand on the basis of the physical substance (i.e., bread and fish) produced by that miracle we do not see real history. We see a *virtual* history.

I have made this point on the surficial observation that both the bread and fish appear to have been cooked. But I suggest the virtual history of these fragments goes much deeper than that. I suggest that if one probes the newly created fish scientifically, for example, they will discover bones, and muscle, and veins, and biological cells, and even DNA with a whole genetic blueprint of the fish encoded within it. The Bible, after all, is quite clear that it was *fish* which Jesus created, not a soybean substitute, and *fish* entails all of these things. And all of this speaks of an elaborate "history". But the "history" it speaks of is one which this newly created fish flesh never actually had. The more versed one is in modern biology the more readily apparent the virtual history inherent within this newly created fish flesh becomes, and the more elaborate it is seen to have necessarily been. But it is unnecessary to press this point further here.

Water into wine

The miracle of the creation of wine from water which is recorded in John 2:1–11 provides another example of virtual history. If we study the wine which Jesus created from water on that occasion we find that it is of highest quality. Note the headwaiter's appraisal, "you have kept the good wine until now". One does not get "good wine" by just squeezing a few grapes. To get "good wine" there needs to be a protracted aging process. The fact that the wine Jesus created was "good wine" means that this wine gave the impression of having been through a lengthy aging process. If you study this wine, as the headwaiter has done with his eyes, nose, and tongue, or however more sophisticated scientific apparatus you may please, I venture to suggest that you will come away with precisely this same impression. It is "good *wine*" after all, and such is the nature of good wine.

But we know this wine never experienced a lengthy aging process; we know it was created only moments before. The newly created wine, we must conclude, has a virtual history quite apart from its real history.

Man born blind

Here is one more example. The Gospel of John, chapter 9, records another miracle. Here Jesus gave sight to a man who had been born blind. The thing about being born blind is that there is a great deal of learning connected with vision which normally takes place in the earliest months of life after birth, and which seems extremely difficult if not impossible to learn subsequent to that age. For example, when we first open our eyes after birth our brains are confronted with two images of the world, one from each eye. Because our two eyes are not in identically the same place, these two images are not identical. The problem of putting these two different images together into one composite, three-dimensional picture of reality must be worked out by the brain (i.e., learned) very early on, or it is unlikely ever to be learned at all.

Jesus worked a miracle, and this man who had been born blind could see. If we imagine studying this man moments after this miracle, seeking to know what newly imparted sight is like, we do not find him crossing and uncrossing his eyes as he

vainly tries to learn how to keep those two images lined up, and as he struggles to unite them into a single composite image. He seems to already know all the things necessary to see. But such knowledge implies a learning experience—a learning experience during infancy. You see then that the physical data—the condition of the man’s eyes, optic nerves, and most especially the arrangement of neural connections within the visual regions of his brain, give the impression of one who has been able to see since birth; they fail entirely to show a man born blind who had remained blind until moments before when Someone put clay on his eyes and told him to go wash in the pool of Siloam. This was a creation-type miracle in which sight was created. The physical substance affected by this creation-type miracle—the restored eyes, optic nerves, and brain cells—exhibit a virtual history distinct from their true history.

Obviously, virtual history is not unique to proleptic time. It seems, rather, to be a general feature of creation-type miracles. Virtual history is what one “sees” looking back through the “lens” (or into the “mirror”) called “creation-type supernatural event”.

I find, then, this fundamental principle:

Principle 1 *Virtual history is an intrinsic artifact of creation-type miracles.*

Essentials of Virtual Histories

Notice that the virtual histories in the foregoing examples look real enough. But they are not, in actual historical fact, real at all. We find from these examples that it is possible to trace the emanations of time back from the present towards a historical creation-type supernatural event, just as it is possible to trace rays of light back from our eyes toward a mirror. When we do so, we now realize, we are bound to see *something*. But just as surely as reality vanishes as soon as we extrapolate those rays back behind the mirror’s surface, so reality vanishes when we extrapolate those emanations of time back behind the miracle.

We have not discussed how to predict what a virtual history will look like in any given instance, or even whether it is possible to predict such a thing. But at this point such questions are unimportant. At the present stage the only really im-

portant things to observe are that: 1. virtual histories exist, 2. they look real, but 3. they do not correspond to real history at all, and 4. creation-type miracles inevitably give rise to some sort of virtual history.

Virtual Histories Applied

Our new solution to the central conundrum is now, I hope, beginning to look less strange. The Bible teaches us—if we are willing to accept its teaching—that supernatural events do happen in real life, and we find that at least one category of supernatural events, the creation-type category, gives rise to virtual histories. The Creation itself was most certainly a creation-type of supernatural event. We are no longer surprised, then, to find a virtual history for proleptic time within the physical data emanating from the creation period.

The apparent incongruity of Grand Fact 1 and Grand Fact 2 is now easily understood. Both of these Grand Facts are facts, but Grand Fact 1 is a statement about real history, while Grand Fact 2 is a statement about virtual history in proleptic time. Grand Fact 1 is the historical truth; Grand Fact 2 is an artifact of the supernatural character of the origin of the world.

Notice that the three creation-type miracles given as examples above each exhibit seemingly contradictory “Grand Facts” of their own. For the feeding of the five thousand Grand Fact 1 is that the multiplied fish and bread have come into existence only moments before. Grand Fact 2 is that considerable evidence exists within the fish and bread fragments themselves that they were cooked some hours previously. For the water to wine miracle Grand Fact 1 is that the wine has only moments before been created out of water. Grand Fact 2 is that considerable evidence exists within the wine itself that it has undergone a protracted aging process. For the man born blind Grand Fact 1 is that this man was born blind and has only moments before begun to see for the first time in his life. Grand Fact 2 is that considerable evidence exists within the man’s visual apparatus that he has been able to see all his life.

In all of these cases these Grand Facts are facts. It is utterly futile to try to deny either of them in any of these instances. Their reconciliation rests

in the recognition of the existence and nature of virtual histories. In each case Grand Fact 1 is a statement about real history while Grand Fact 2 is a statement about virtual history. Grand Fact 1 is the historical truth while Grand Fact 2 is an artifact of the creation-type miracle in each instance.

Finally, while it seemed strange to conclude that Grand Fact 2 only became operative after Grand Fact 1, as we deduced above, we now see that there is nothing strange about this at all. The same is true in all three examples of creation-type miracles given above. For the miracle of the feeding of the five thousand the evidence that the fish and bread have been cooked hours previously only arises *after* the fish and bread have been created. For the miracle of the changing of the water to wine the evidence that the wine has been through a protracted aging process only arises *after* the wine has been created. For the miracle of giving sight to the man born blind the evidence that he has been able to see all his life only arises *after* he has been given his sight. It is now obvious enough that this is how it must be. We can now see that this results from the simple fact that virtual histories cannot arise before the supernatural events have occurred which give rise to them.

Unification Achieved

Strictly speaking we are done. Recall that we set out, some months ago, to unify sacred and secular chronologies in the pre-Flood period (i.e., prior to about 3500 B.C.). We observed that there is no apparent point of tension between Biblical and secular chronologies of earth history in the pre-Flood period until one gets back to the creation of Adam. Thus, unification exists back to Creation Week. At that point, however, the central conundrum appears: secular chronology finds mankind in existence many thousands of years before the Biblical date of the creation of Adam. Unification of pre-Flood chronology required that a solution to the central conundrum be found.

A solution to the central conundrum has now been found. The Bible informs us that the creation of Adam is a part of a brief period of history during which the whole of physical reality was created and brought to its present form. This brief period of history is fully characterized by creation-type mir-

acles. Principle 1 informs us that virtual history is an intrinsic artifact of creation-type miracles. Thus, Principle 1 informs us that we will find some sort of virtual history of the world within the physical data of creation as we examine it today. This virtual history will appear to extend back before Adam and back before Creation into the timeless, historyless void of pre-Creation. Thus a historical and chronological conflict between sacred and secular in connection with Adam's creation is anticipated. The central conundrum is merely this anticipated conflict.

We now understand that this conflict is apparent only. We now see that it is entirely permissible, and no *real* conflict at all, for secular chronology to find mankind in existence many thousands of years before the Biblical date of the creation of Adam, because secular chronology prior to Creation is a chronology of a virtual history in proleptic time only. We now understand that the secular chronologists have been telling us what they see as they peer back through the creation-type miracles responsible for the existence and character of the cosmos we find ourselves in today. Principle 1 tells us that what they will see in this instance is virtual history only. Up until now they have not understood this. They have confused virtual history with true history; they have mistaken the virtual images in the mirror for reality. And, I have no doubt, many will continue to insist, when these things have been pointed out to them, that the virtual history they study is not virtual at all—that it is brute, palpable, reality itself. But the Christian ought not to do so. The one who truly believes the Bible should not suppose that, while the Bible doesn't mention it, Jesus and the disciples must in actual fact have busied themselves cooking all those loaves and fish they fed to the multitude that day—and not only that but cleaning all those fish too, and catching them all, and kneading all that bread dough, and mixing the ingredients for it, and grinding the sacks of grain to make the flour for it, and... The one who truly believes the Bible will rest in what the Bible reveals to be the intrinsic nature of creation-type miracles.

And once they have done so, they will find that the chimera of conflict between Biblical and secular chronologies of cosmic history has vanished.

Said simply, logically accurate thinking within a

Biblical framework *predicts* that an apparent conflict between secular and sacred chronologies of the world will be found prior to the creation period, at the very origin of Biblical chronology. This apparent conflict has now been identified. And what that means is that we are done; unification of sacred and secular chronologies of cosmic history has been achieved.

Curse, Not Creation

Though we are finished, I must not stop at this point, of course. While unification has been achieved, much remains which must yet be said.

I must, for example, immediately clarify that I am *not* saying that the virtual history in proleptic time which appears today is an artifact of Creation itself. Principle 1 leads us to expect that Creation did have a virtual history. But that virtual history is veiled to our eyes at present. It is veiled because between Creation and the present there sits another creation-type miracle called the Curse, resulting from the Fall. When we look backwards in time we necessarily peer through the lens of the Curse, not the lens of Creation.

The Bible is clear that the whole world was changed as a result of the sin of Adam. The whole character of reality was somehow changed by the Curse, from pleasure and meaning and fulfillment to pain and emptiness and futility. Romans 8:20, in speaking of these things, says “for the creation was subjected to futility, not of its own will, but because of Him who subjected it” (NASB). The act of subjecting the universe to futility necessarily involved creation-type miracles. We are given glimpses of this immediately in the account of the Fall and the Curse (Genesis 3). There, for example, we see the restructuring of man’s work experience. Now the ground, which had yielded “every tree that is pleasing to the sight and good for food”, brings forth “thorns and thistles” instead. There also, for example, we see the restructuring of woman’s child-birth experience, with pain and ambivalence the consequence. As in the case of the man born blind this obviously involved some very basic physiological restructuring.

The universal consequences of the Fall and the Curse are elaborated in the New Testament, especially in contrast to the future state when God

will intervene once more to judge and to restore all things. For example, in Romans 8:21–22 we read “that the creation itself also will be set free from its slavery to corruption into the freedom of the glory of the children of God. For we know that the whole creation groans and suffers the pains of childbirth together until now.” This figure of speech, “suffers the pains of childbirth”, appears as a direct allusion to God’s pronouncement of judgment upon Eve at the Curse mentioned above, “I will greatly multiply your pain in childbirth, in pain you shall bring forth children” (Genesis 3:16; NASB). Thus, by this metaphor, Paul shows that the Curse brought about a restructuring not just of the basic physiology of Eve, but indeed of the basic physics of the whole creation.

We must regard the Curse, then, as a creation-type miracle operative upon the entire cosmos. And in consequence of this, the virtual history of proleptic time which we now see must be regarded as an artifact of the Curse, not of Creation.

Historical Reconstruction

I find, then, the following reconstruction of the history of the creation period (Figure 20).

The world was supernaturally brought into existence out of nothing by God 5176 ± 26 B.C. and fashioned and furnished by Him through a sequence of miracles over the course of six ordinary days, culminating with the creation of Adam on Day 6. The initially created world was not of the same character as the world we live in today. Sometime subsequent to Creation Week Adam and Eve ate of the forbidden fruit of the tree of the knowledge of good and evil. The Bible does not specify how long after, but one gets the impression of days, weeks, or possibly months. This was the Fall. The result was the Curse, with the subjecting of the whole creation to futility, as we find it to be in actual experience today. The virtual history of proleptic time we see today—including evidences of pre-Adamic man, dinosaurs, exploding stars, concentrations of radioisotopes in rocks, and all the rest—had its origin at that time.

Now I hope you will agree with me that the sequence of events and the timing of them in this reconstruction are certainly not radical departures from traditional thinking. If you research the mat-

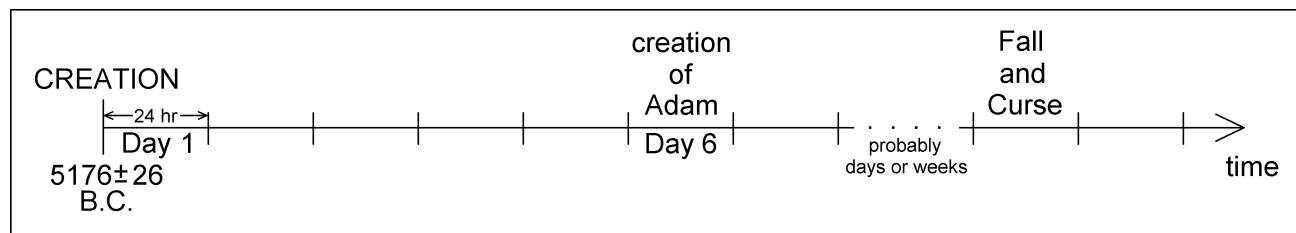


Figure 20: Time-line showing a reconstruction of the history of the creation period.

ter you will find that they are, in fact, pretty much in line with what the early church fathers, for example, believed Genesis meant to communicate.

This is quite remarkable. Having applied all that modern science has to offer by way of technical and factual advancement in the field of chronology we find ourselves, on this whole question of the chronology of earth history, back where Christians were two thousand years ago. All that has been done, really, in delving into this ninth conceptually possible solution of the central conundrum, is to show that the plain, simple, thousands-of-years-only chronology of the past, which the Bible has been communicating to its readers from very ancient times, is every bit as functional in our scientifically advanced and technologically sophisticated world today as it was when it was first written thousands of years ago.

Monogenetic Headship?

I can find only one point where this present solution seems to differ from traditional expectations. The difference is interpretive, not chronological, but it is a difference just the same, and therefore deserving of special scrutiny.

This solution finds other humans besides Adam and Eve in existence at least from the time of the Curse on. This follows logically from the fact that archaeology reveals human remains and artifacts before, during, and after the time of the creation of Adam, and on continuously from there. What one sees in the archaeological record before the Curse we know to be virtual history only, but from the Curse on one is dealing with real history. Thus archaeology reveals other human populations in existence from the time of the Curse on. I have not had opportunity to go back and check traditional thinking on this yet, but certainly it is widespread belief today that the Bible teaches that all of hu-

manity has descended genetically from Adam and Eve.

More important than traditional beliefs on this matter, of course, is what the Bible has to say about it. Having researched this question I must report that I can find, in fact, no solid Biblical footing for the doctrine that Adam and Eve are the genetic heads of humanity. Meanwhile there seem to be several indications embedded within Genesis itself that Adam and Eve were *not* the only humans to emerge from the creation period. (By “creation period” I mean the Creation, Fall, and Curse inclusive).

Romans 5:12

The Bible definitely does teach a certain unity of mankind under Adam. For example, “Therefore, just as through one man sin entered into the world, and death through sin, and so death spread to all men, because all sinned” (Romans 5:12). But Adam appears only as a historic representative of mankind in such cases. Genetic headship is never specified.

1 Corinthians 15:39

1 Corinthians 15:39 says, “All flesh is not the same flesh, but there is one flesh of men, and another flesh of beasts, and another flesh of birds, and another of fish”. A certain unity of mankind is found here as well, but it is not a monogenetic unity either. To read this as a statement of the monogenetic origin of mankind would also demand we accept a monogenetic origin of all birds, and another monogenetic origin of all fish. But such an interpretation seems forbidden not only by the enormous number of species of birds and fishes alive today, but also by what we are explicitly told about their creation in Genesis 1:20. Specifically (NASB), “Then God said, ‘Let the waters teem with swarms of living creatures, and let birds fly

above the earth in the open expanse of the heavens’.” To instantaneously “teem with swarms” seems to explicitly require a polygenetic origin of the fishes at least.

Acts 17:26

A unity of mankind is again seen in Acts 17:26, “and He made from one [or possibly, ‘one blood’], every nation of mankind to live on all the face of the earth”. This appears to be the closest one ever gets to explicit support for the monogenetic origin of mankind in the New Testament. But it too falls short of this mark. If Paul had said, ‘He made from one individual’ or ‘He made from one man, Adam...’ the case would be clearly closed. But Paul did not say this, and it is difficult to suppose he ever meant even to imply this.

This passage is taken from Paul’s address to the men of Athens. In context, Paul is arguing against their polytheism and pointing them to the one true God through repentance and faith in Christ Jesus. To have introduced the premise of the genetic unity of mankind in Adam into the argument to these Athenians would have served no useful purpose and would only have clouded his message. These listeners were pagans unfamiliar with Adam. The origins of the different stocks of mankind would have been an interesting open question to them. But to get their thinking off into that issue would be to detract from the central issue and the whole purpose of Paul’s presentation, which was to show them their individual need of Christ.

In context Paul is arguing, not the genetic unity of mankind as progeny of Adam, but the universal need of mankind for a Savior. I suggest that the unity of mankind which is alluded to here is the same sort as is found in the 1 Corinthians 15:39 passage just discussed above. This is the idea that, though fish come in many different varieties, there is a basic unity among fishes which, for example, sets them completely apart from birds. Though greatly varied, they exhibit a deep unity. They seem, while sporting many unique options and accessories, to nonetheless have all been fashioned from a single basic blueprint. Paul is saying that while there is much variation in physical appearance and cultural behavior among mankind, the fact is that all men are fashioned by God from a single basic blueprint, with the logical infer-

ence that men of all nationalities, whether Jews or Greeks, have the same need of a Savior.

Genesis 3:20

One other passage which might be felt to bear explicitly on this matter is Genesis 3:20. It says (NASB), “Now the man called his wife’s name Eve, because she was the mother of all the living”. This could be interpreted as an explicit statement of the genetic motherhood of Eve (and hence also the genetic fatherhood of Adam) over all mankind.

I find such an interpretation improbable, as I have previously pointed out in another context.⁸⁷ The difficulty with this interpretation is that it renders this verse anachronistic. At this point in the narrative, just subsequent to the Curse, Eve was, in point of historical fact, the mother of no one. To interpret this verse as a statement of Eve’s universal motherhood over all mankind gives the phrase “because she was the mother of all the living” the character of a scribal gloss, written into the margin of the text as an explanatory note to other scribes while looking back millennia after the events described by the narrative itself had transpired, rather than the character of part of the original narrative. To avoid this apparent anachronism requires the text to say, “because she was *to become* the mother of all *who would live*”. But the text does not say this. It says she was then, at that point in the narrative, the mother of all who were then, at that point, living.

My training is in physical science, not textual criticism. I am, therefore, not qualified to pass any final judgment on this textual question. So I will simply observe that interpretation of this verse as guaranteeing the monogenetic headship of Adam and Eve seems precarious because: 1. of the apparent anachronism generated in doing so, 2. of the lack of support for such an interpretation elsewhere in Scripture, and 3. of other Scripture passages which seem to show the opposite. It is to this last point that I now turn.

Genesis 4:12–17

There are at least two indications in the Genesis narrative that other stocks of humanity existed be-

⁸⁷Gerald E. Aardsma, “Toward Unification of Pre-Flood Chronology: Part II,” *The Biblical Chronologist* 4.5 (September/October 1998): 5.

sides just Adam and Eve following the Curse. The first is seen with God's punishment of Cain for the murder of Abel, recorded in Genesis 4:12–17.

Cain had been a sedentary farmer, apparently somewhere within the Eden region, though external to the Garden of Eden, as I have previously discussed.⁸⁸ This lifestyle was now forbidden to him: "When you cultivate the ground it shall no longer yield its strength to you". From this point on he was condemned to live as "a vagrant and a wanderer on the earth". This, evidently, meant living outside the Eden region because Cain complained, "from Thy face I shall be hidden" and verse 16 says "Then Cain went out from the presence of the Lord and settled in the land of Nod, east of Eden." Thus God's judgment entailed disruption of Cain's mode and location of living.

What is interesting in the present context is Cain's response to God. He argues that God's punishment is too severe, that it amounts to being condemned to death. He says, "whoever finds me will kill me". Taken at face value this seems to imply that there were other people at that time living outside the Eden region, hostile to any who might venture into their territory.

This interpretation can be avoided by the assumption that Cain was not referring to other people already outside the Eden region, but to future descendants of Adam who would spread from the Eden region and take vengeance on Cain once they had found him. But this does not fit the context very well. Note that God does not respond to Cain's complaint by pointing out that there were a whole seven continents out there, and countless islands, all uninhabited and waiting to be explored, so Cain would have no trouble keeping ahead of any makeshift posse. God treats the threat to Cain's life from other human beings altogether seriously, going so far as to give him a supernatural sign for his protection. Why should God respond to Cain's complaint in this extraordinary way if all the world outside the Eden region was at that time completely unpopulated?

Furthermore, if Cain was worried merely about vengeance from his relatives, then his complaint that God's judgment was too severe is very curious. If vengeance on Cain by his relatives was

Cain's concern, then it was obviously a much bigger concern if he stayed in the Eden region, where they all lived at that time, than if he left. In that case he would be better off to get out of the Eden region and head for the hills. He should not complain "I shall be a vagrant and a wanderer on the earth, and it will come about that whoever finds me will kill me"; he should rather say, "I quite agree; I really need to get out of here, and the sooner I leave and the further I go the better."

Genesis 6:1–4

Even more forceful to me is the second indication from Genesis that other stocks of humanity existed besides just Adam and Eve following the initial creation period. This indication arises in connection with the "sons of God" found in Genesis 6:1–4. Here we find (NASB):

Now it came about, when men began to multiply on the face of the land, and daughters were born to them, that the sons of God saw that the daughters of men were beautiful; and they took wives for themselves, whomever they chose. . . . The Nephilim were on the earth in those days, and also afterward, when the sons of God came in to the daughters of men, and they bore children to them. Those were the mighty men who were of old, men of renown.

This passage raises the question of who the "sons of God" were. Two principal theories can be found for this. One is that they were descendents of the supposedly godly line of Seth, chronicled in Genesis 5, who married women from the supposedly ungodly line of Cain detailed in Genesis 4. The other is that they were angels who left the angelic realm and came down to earth to cohabit with the daughters of men. While arguments can be marshaled from Scripture in defense of both theories, the fact that two principal theories continue to exist despite many years of discussion on the matter shows that neither is really satisfactory.

Study of the use of the term "son of God" in the Bible reveals that the term means one who has come directly (first generation) from God by any means. Thus the angels, including the fallen angels and their leader, Satan, are all sons of God

⁸⁸Gerald E. Aardsma, "The Location of Eden," *The Biblical Chronologist* 4.3 (May/June 1998): 1–5.

by direct creation.⁸⁹ Those who have been born again are spiritual sons of God by virtue of the new creation.⁹⁰ Jesus is “the only begotten son of God”.⁹¹ That is, He is the only one to have come directly from God by means of birth through a woman. And, most importantly for the present question, the Bible calls Adam a son of God—this again by virtue of direct creation.⁹²

This Biblical meaning of the term shows clearly that if any other humans had been created subsequent to the creation of Adam, they would also have been sons of God just as Adam was. This, I suggest, is the simple meaning of the reference to sons of God in Genesis 6. The text presumes the reader is aware that Adam and Eve were not the only created humans, and it includes these others in the narrative without apology or ado.

What the text seems to be communicating in this passage is that the crossing of Adam’s line with the genetic lines represented by these other created men resulted in hybrid vigor in the children. This, I suggest, is the simple explanation of the “mighty men” and “men of renown” which resulted from these marriages. By way of contrast, it is very difficult to see why the crossing of Cain’s and Seth’s lines should yield “mighty men” and “men of renown” as a unique, noteworthy result; and very nearly impossible to see how the imagined physical interbreeding of angels and humans could give rise to any offspring at all, let alone offspring one might call “men”. Notice that it is an experimental fact that when one manages to overcome the significant barriers to the interbreeding of two species even as closely similar as the lion and the tiger, the resulting offspring are neither lions nor tigers.

The monogenetic headship of Adam and Eve over all mankind is deeply embedded doctrine today. It therefore seems surprising to find this doctrine challenged by this new chronological unification. But when one actually appraises the Biblical data bearing on this question one finds that perhaps the plain sense of the archaeological data is

not so surprising after all. I am reminded that it was once also deeply embedded doctrine that the orbits of the planets should be perfect circles, that the surface of the moon should be a perfectly smooth sphere, and that all heavenly bodies should orbit the earth.

Philip Henry Gosse

This new unification raises many other questions—as is normal for new paradigms. I do not yet have answers for them all, of course. But I know of no question which this unification raises which poses any serious challenge to its validity.

The closest theory I have seen to this present unification is one originally propounded by Philip Henry Gosse in his book, *Omphalos*, published in 1857.⁹³ Gosse is very clear that he regarded Creation as real and as an absolute starting point, before which there was neither history nor time. Gosse was a zoologist of considerable stature in his day, and the arguments of his book draw heavily from his careful observations in that field. He was keenly aware, from his studies, that a newly created organism would necessarily bear many evidences of having existed prior to its creation. This led Gosse to differentiate between *prochronic* developments, (“because time was not an element in them”), and *diachronic* developments (“as occurring during time”) in newly created organisms.⁹⁴ Prochronic and diachronic developments are simply expressions of virtual and real history specific to the biological realm.

Gosse also separated between *ideal* time and *actual* time. These are parallel to Scaliger’s *proleptic* time and *historical* time, with the distinction that Gosse, not being a chronologist, left the question of the actual date of Creation open. I think it would be quite inaccurate to suggest Gosse left this question open out of any personal ambivalence regarding it. Every indication is that he personally held to the plain sense of Biblical chronology and that he believed that Creation had happened roughly six thousand years ago, as was common for devout individuals of that day tutored in Ussher’s

⁸⁹Job 1:6; Job 38:7.

⁹⁰2 Corinthians 5:17; Galatians 6:15; Ephesians 2:10; John 1:12; Romans 8:14; 1 John 3:1.

⁹¹John 3:16,18.

⁹²Luke 3:38.

⁹³Philip Henry Gosse, *Omphalos: An Attempt to Untie the Geological Knot* (London: John Van Voorst, 1857).

⁹⁴Philip Henry Gosse, *Omphalos: An Attempt to Untie the Geological Knot* (London: John Van Voorst, 1857), 125.

chronology. But he was not trying to prove that one must accept a six thousand year real history of the world—an effort which would have taken him very wide of his field. He was trying to show that if one accepts the fact of Creation, one automatically gets “prochronisms”—which he demonstrated with an exhaustive thoroughness from his field. Gosse hoped to make the point, by analogy with his observations from zoology, that it is a logical error to conclude the Biblical date of Creation falsified by physical data appearing to show a great antiquity for the world.

I wish to be distinctly understood that I am not proving the exact or approximate antiquity of the globe we inhabit. I am not attempting to show that it has existed for no more than six thousand years. I wish this to be distinctly stated, because I am sure I shall meet with many opponents unfair enough, or illogical enough, to misrepresent or misunderstand my argument, and sound the trumpet of victory, because I cannot demonstrate *that*. All I set myself to do, is to invalidate the testimony of the witness relied on for the indefinitely remote antiquity [of the world]; to show that in a very large and important field of nature [i.e., zoology], evidence exactly analogous to that relied on [for demonstrating a remote antiquity of the world] would inevitably lead to a false conclusion...⁹⁵

I hope I have been perfectly clear in my presentation that I do not leave the date of Creation open. While Gosse was not a chronologist, I am. While Gosse only aspired to defend Biblical chronology from an overhasty and undeserved condemnation which had arisen as a side effect of secular chronology, I aspire to unify Biblical and secular chronologies into a single, harmonious whole. While a lack of chronological precision and definition was not detrimental to Gosse’s purpose, it is inimical to mine. The date of Creation can be determined using the normal tools and methods of the chronologist’s discipline just as surely as the

date of any other historical event can be determined. The dividing line between proleptic time and real time is the Creation event recorded in the Bible. The Bible provides a chronology of history back to and including that event. According to modern Biblical chronology Creation happened 5176±26 B.C. Prior to 5176±26 B.C. is proleptic time only. From 5176±26 B.C. to the present is real time. Proleptic time exhibits virtual history only. Real history begins with Creation at 5176±26 B.C.

Creation versus Curse

Gosse and I differ on one other point as well. *Omphalos* leaves its reader with the impression that the virtual history of proleptic time we see today is a direct consequence of Creation itself. I have tried to be careful to show that this is not the case. To be logically consistent one must attach this virtual history not to the Creation but to the Fall and the Curse. This is an important distinction with a number of significant consequences. It seems important to highlight a single theological consequence here.

To assign the virtual history in proleptic time which we now see to the Creation implies, for example, that God created most of the fossils of the earth which we see today sometime during Creation Week. Since all the work of Creation Week was seen to be “very good” by God⁹⁶ this would mean that the fossils were also “very good”. But this immediately presents a theological difficulty. The main thing fossils speak of is death. Fossils result from death, and frequently they show unpleasant deaths. For example, fossils have been found of fish with other fish in their stomachs. Could all of this have been created by God during Creation Week, and all deemed “very good”?

But it is not just fish we must contend with here. There are also human remains, recovered from deliberate burials, also found within the virtual history of proleptic time. Indeed, that is part of the very evidence which led us to identify virtual history and proleptic time in the first place. We saw above that this sort of evidence could not have existed prior to the creation of Adam, because the Bible teaches us that Adam was the first man ever

⁹⁵Philip Henry Gosse, *Omphalos: An Attempt to Untie the Geological Knot* (London: John Van Voorst, 1857), 339–340.

⁹⁶Genesis 1:31.

to have existed. But even if we suppose that this evidence was created by God late on Day Six, after Adam had been created, then it still would fall under God's "very good" assessment. Could evidence of human death, even of young people and infants, be a feature of Creation's virtual history and all of Creation still be deemed "very good" by God?

The whole character of the virtual history of proleptic time which we see today is one of death, and horror, and pain, and futility. We learn from the Bible that these are not native to Creation; rather they are the consequences of sin.⁹⁷ It does not seem theologically possible that even virtual history could have displayed the character it does today prior to the entrance of sin into the world at the Fall. Death, and horror, and pain, and futility are the fruits of Satan's work, not God's work. Yet if one assigns the virtual history of proleptic time which we now see to Creation, one necessarily implies that these are fruits of God's work.

Obviously, this is an important distinction. Clearly, it is important that Principle 1 be applied in a logically consistent fashion. Since virtual histories result from all creation-type miracles, the virtual history of proleptic time which we see today is necessarily an artifact of the Fall and the Curse, not of Creation. In this matter Gosse's thesis differs substantially from mine.

Gosse's theory has been frequently criticized for its objectionable theological implications. I suppose it is overly sanguine to hope I shall be entirely spared condemnation for Gosse's oversight by critics of my thesis. But thoughtful readers will see that there is a substantial difference between our two theories, so that the old theological arguments against Gosse's thesis cannot logically be trotted out against mine. This unification of sacred and secular chronologies is not just another presentation of the "Creation with appearance of age" idea. It is, rather, a new idea which I should label, if anything, "Curse with investiture of futility". Let it not be libeled that I am promoting the concept that God put fossils in the rocks to fool fools. Please notice that the Fall was the Serpent's victory and the Curse his spoil, not God's. The only one in the business of fooling fools is the

Serpent.

Implications

There are three implications of this chronological unification which seem to me to warrant explicit mention before I bring this article to a close.

The first is that efforts to prove a seven thousand year old earth and cosmos from the physical data are now seen to be seriously inappropriate. They amount to trying to prove that the fish Jesus fed to the five thousand were born, grown, caught, cleaned, and cooked all in the few moments before the meal began. Will the Master be honored by disciples so engaged?

The second is that efforts to stretch Creation Week out over long geologic ages (e.g., day-age theories) are also seen to be seriously inappropriate. They are, in final logical analysis, simply a denial of supernatural Creation. They amount to trying to prove that the fish Jesus fed to the five thousand were born, grown, caught, cleaned, and cooked over the natural time span common to all fish that have ever been born, grown, caught, cleaned, and cooked, in full agreement with the physical data from the fish fragments. Real creation-type miracles, we have seen, have a virtual history. If the geologic ages are not the virtual history resulting from the creation period, then what is the virtual history from that period? Failure to find a virtual history resulting from the creation period is just another way of saying that no creation-type miracle occurred in connection with Creation. And that is just a way of saying that Creation was a natural phenomenon rather than a supernatural one. Will the Creator—He who "spoke, and it was done"⁹⁸—be honored by such a recasting of His work of Creation?

Third and final, Christians need to stop squandering time and energy deriding evolution. The Bible says evolution *didn't* happen, not that it *couldn't* happen. The Bible says "In the beginning God *created* the heavens and the earth"⁹⁹, not "In the beginning God *evolved* the heavens and the earth". So the fact that we got here by supernatural Creation is plain and settled. But evolution is still a perfectly legitimate scientific hypothesis

⁹⁷Romans 5:12.

⁹⁸Psalm 33:6, 9 (NASB).

⁹⁹Genesis 1:1.

of virtual history in proleptic time. Now please note that I did not say amoeba to man evolution is what virtual history shows. In point of fact I seriously doubt that amoeba to man evolution is what virtual history actually shows. I am trying to convey that the truly fascinating question now is what it is that virtual history really does show, in sharp contrast to the purely negative exercise of trying to prove that the data of virtual history do not show evolution.

The linchpin of evolution has been the belief that Biblical chronology and Biblical history have been falsified. That is, the linchpin of evolution has been the belief that supernatural Creation has been shown to be false. This has seemed to leave naturalism in possession of the entire playing field. As long as naturalism has had possession of the entire field, evolution has necessarily been the only game allowed. But we now understand that Biblical chronology and Biblical history have not been falsified. The linchpin of evolution has, in fact (whether any evolutionists ever admit it or not), been pulled. That being the case, Christians need to get involved in the exploration of virtual history in a positive way, formulating and testing other hypotheses of organic relationships in virtual history. They are the right ones to do this work; they are the ones whose eyes are now wide open.

Real history, the Bible informs us, is a mixture of natural and supernatural events. It would, therefore, not be surprising to find that virtual history was also such a mixture. Perhaps this is the true lesson to be learned from the systematic absence of transitional forms between fossil kinds. Perhaps this is the true lesson to be learned from the complete failure of modern science to demonstrate a naturalistic origin of the living cell. The field is wide open. It is time to stop the negative exercise of beating up on evolution. It is time for the positive exercise of finding out the truth about virtual history to begin.

Conclusion

Creation lies at the root of all of physical reality. It is, therefore, not possible, in any brief space, to introduce a theory for the unification of sacred and secular chronologies back into the dawn of Creation which covers all contingencies. Still, I hope

that sufficient breadth has been achieved in these few pages to give an accurate impression of what this new unification looks like, the foundation upon which it stands, and some of the potential it seems at present to hold.

In closing it seems appropriate to simply recap the thread of the argument leading to this long-sought unification of sacred and secular chronologies in the pre-Flood period.

1. If one believes in creation-type miracles, one automatically believes in the existence of virtual histories, whether one knows it or not. Virtual histories are logical imperatives of creation-type miracles.
2. Thus, if one believes the world came into existence through supernatural Creation, as the Bible teaches, then they believe the whole cosmos has a virtual history.
3. To say the whole cosmos has a virtual history is to say the whole cosmos gives the appearance of having existed prior to Creation in proleptic time.
4. Therefore, belief in Biblical Creation logically carries with it a prediction that secular chronology and secular "history" will appear to extend back beyond the Biblical date of Creation (5176 ± 26 B.C. according to modern analysis) into proleptic time.
5. Unification of sacred and secular chronologies is achieved by simply identifying modern secular chronology prior to the Biblical date of Creation with this predicted chronology of virtual history in proleptic time.

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