

The Biblical BCronologist

WHAT HAS BEEN IS REMOTE AND EXCEEDINGLY MYSTERIOUS. WHO CAN DISCOVER IT?

(Ecclesiastes 7:24)

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Chronology of the Bible: 5000–3000 B.C.

I have previously published a time chart of Biblical chronology in the period from 3000 to 1000 B.C.¹ That period covers the Biblical historical narrative from the birth of Jacob to the reign of David. The following article extends the Biblical time chart into the preceding two millennia. It covers the period from the birth of Seth, Adam's son, to Jacob.

While Biblical history immediately prior to Solomon is being hotly debated by Biblical archaeologists at present, Biblical history before Abraham is seldom even mentioned these days. As best I can determine, liberal Bible scholars regard the Biblical narrative of this remote era as high mythology, and conservative Bible scholars are at a loss to know what to say about it.

There are several reasons for this unhappy situation. First, and most importantly, in the millennium immediately prior to 1000 B.C. Biblical historicity appears to modern Bible scholars to be visibly crumbling with every turn of the archaeologists' spades these days. They do not understand that this crumbling is apparent only—that the mismatch between what one reads in the Bible and what the archaeologists have been finding is caused by a missing millennium in traditional Biblical chronology just prior to 1000 B.C.² And since Biblical historicity appears to most scholars to be taking such a beating in the millennium prior to 1000 B.C., it is understandably difficult for them to maintain confidence in Biblical historicity at

4000 B.C.

Second, this portion of Old Testament history is almost entirely dependent upon the very succinct first eleven chapters of Genesis. These move through history at a very rapid pace, providing few potential points of contact with secular data. This has fostered an isolation of this portion of Bible history from secular studies, and a feeling that it is somehow not really attached to the real world.

Third, the miraculous nature of the Creation account does not naturally lend itself to scientific investigation, and the scientific enterprise at present is so strongly steeped in naturalism that few are able to think in any other terms.

Fourth, the failure of Bible scholars to identify Noah's Flood and the Tower of Babel with any actual physical remains either from archaeology or geophysics has further contributed to the view that this portion of Biblical history is simply not right or not real.

Fifth, and finally, the extreme longevity credited to Biblical individuals in this period seems preposterous and innately mythological to some.³

The discovery of the missing millennium in 1 Kings 6:1⁴ changes the outlook for studies in this period rather dramatically. It restores Biblical chronology in this period to a firm footing, enabling

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

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

³This deduction, though widespread, is rather curious. Science is certainly unable to rule out the possibility of greater life spans in the past. Decades of research on the question of why humans age has still yielded no definitive result. (See, for example, Ricki L. Rusting, "Why Do We Age?" *Scientific American* (December 1992): 130–141.) And some researchers involved in the quest to understand the causes of aging are openly envisioning a time in the near future when life spans will be greatly increased as a result of advances in their field. These researchers obviously do not find the idea of greater life spans an intrinsically impossible or ridiculous one.

⁴Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research and Publishing, 1993).

meaningful comparisons with secular data for the first time in modern history. The present article is built upon this new footing.

The historical narrative of the Bible which spans the fourth and fifth millennia B.C. is naturally divided by the Biblical text itself into two major periods which I will call “Pre-Flood” and “Post-Flood” (Figure 1). Noah’s Flood is the event which defines the boundary between these two periods. It is thus the most significant Biblical chronometric reference point in these two millennia. A third period, “Proto-Israel”, commences near the close of the fourth millennium with the entrance of Abraham into Canaan.

The Date of Noah’s Flood

As recently as five years ago the date of the Flood seemed a nearly intractable problem. The difficulty was that state-of-the-art Biblical chronology computations at that time yielded a date for the Flood which was simply preposterous. They placed the Flood within a few hundred years of 2500 B.C., well within the range of the known history of a number of ancient civilizations in and around Mesopotamia—civilizations whose development carried on without interruption right through this entire period.

But the study of this problem was revolutionized by the discovery that exactly 1,000 years had accidentally been dropped out of Biblical chronological computations just prior to 1000 B.C.⁵ Restoration of this missing thousand years moves the Biblical date of the Flood back near 3500 B.C. where it is not only no longer preposterous, but, in fact, where it presently appears to be successfully integrating a great deal of secular historical, archaeological, and geophysical data.

It is not difficult to calculate the date of the Flood from the Bible. I have previously shown that the proper Biblical date for the beginning of the Proto-Israel period, which commences with the entrance of Abraham into Canaan, is 3092±16 B.C. Abraham’s entrance appears to have followed the death of his father, Terah, in Haran (Acts 7:4),

⁵Gerald 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
3000	PROTO-ISRAEL	- birth of Jacob -
3100		- birth of Isaac -
3200		- birth of Abraham -
3300	POST-FLOOD	- birth of Terah -
3400		- birth of Nahor -
		- birth of Serug -
		- birth of Reu -
		- birth of Peleg -
3500		- birth of Eber -
		- birth of Shelah -
		- 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 -
4600		- birth of Enoch -
4700		- birth of Jared -
4800		- birth of Mahalalel -
4900		- birth of Kenan -
5000		- birth of Enosh -
		- birth of Seth -

Figure 1: Chronology of Biblical time periods and selected events in the 4th and 5th millennia B.C.

and Genesis 11:32 informs us that Terah died at 205 years of age. Thus, Terah was born ($3092 \pm 16 + 205 \pm 5 =$) 3297 ± 17 B.C.⁶

To complete the calculation from the birth of Terah back to the Flood one uses the chronological data provided with the genealogy of Shem, Noah's son, in Genesis 11:10–25. It is easier to compute the span of time forward from the Flood to the birth of Terah and then add this entire span to the date of Terah's birth, than it is to work backward a generation at a time. I will follow the easier procedure below.

Arpachshad was born 2 years after the Flood (Genesis 11:10). Assuming this figure is rounded to the nearest whole year it should enter our computation as 2 ± 0.5 . Genesis 11:12 records that Arpachshad's son, Shelah, was born when Arpachshad was 35 years old. Genesis 11:14 tells us Shelah was 30 years old when Eber was born. Eber was 34 when Peleg was born (Genesis 11:16); Peleg was 30 when Reu was born (Genesis 11:18); Reu was 32 when Serug was born (Genesis 11:20); Serug was 30 when Nahor was born (Genesis 11:22); and Nahor was 29 when Terah was born (Genesis 11:24).

Adding all of these numbers together with their estimated uncertainties due to rounding yields 222 ± 13 years as the span of time from the end of the Flood to the birth of Terah. Adding this span to the date of Terah's birth, plus 1 year for the duration of the Flood itself (Genesis 7:11; 8:13), yields 3520 ± 21 B.C. as the date of the commencement of the Flood.

Textual Variants

Confidence in this result is somewhat shaken by textual variants. Specifically, the numbers used in this computation are all from the Masoretic

⁶Out of the seventeen age-related numbers found in Genesis 11:10–26, eight end in 0. This suggests the possibility that some of the numbers may have been rounded to the nearest decade. However, not all of the numbers end with 0 so it is clear that they have not all been rounded in this way. Nonetheless, rather than trying to reconstruct how much each number may have been rounded, I will follow the simple, uniform procedure of assuming a half-decade uncertainty in all of the father's ages used in this computation. This will not alter the computed absolute date of the Flood, of course. It will simply overestimate the total uncertainty due to round-off by a small amount.

text. Most of these numbers are different in both the Septuagint and the Samaritan Pentateuch (Table 1). Furthermore, the Septuagint contains an additional name, Cainan, between Arpachshad and Shelah. This additional name appears to be endorsed by Luke in his genealogy of Christ.⁷

Table 1: Variations in some of the numerical data found in Genesis 5 and 11 in the three known families of the text of the Pentateuch. (MT is Masoretic text, LXX is Septuagint, and SP is Samaritan Pentateuch.)

age at son's birth	MT	LXX	SP
Adam	130	230	130
Seth	105	205	105
Enosh	90	190	90
Kenan	70	170	70
Mahalalel	65	165	65
Jared	162	162	62
Enoch	65	165	65
Methuselah	187	167	67
Lamech	182	188	53
Noah	500	500	500
Shem	100	100	100
Arpachshad	35	135	135
Cainan		130	
Shelah	30	130	130
Eber	34	134	134
Peleg	30	130	130
Reu	32	132	132
Serug	30	130	130
Nahor	29	179	79
Terah	70	70	70

If one uses the Septuagint data the span of time from the Flood to the birth of Terah is extended by 750 years relative to the Masoretic data. That is, it becomes 972 years instead of 222 years. This introduces a potential alteration to the chronology of this portion of Bible history which is very large relative to the ± 21 year uncertainty assigned to the date of the Flood above.

There has been much speculation as to the cause of these variations in the ancient manuscript families of the Pentateuch, but no explanation of their

⁷Luke 3:23–38. Verse 36 contains the reference to Cainan.

Table 2: Primary chain of the Biblical computation, based on the Masoretic text, yielding dates for selected Biblical historical events in the fourth and fifth millennia B.C.

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 5	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
Dispersion from Babel		see footnote 9	3300±120
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

origin can be given with certainty. I would note, in passing, that the only numbers in Table 1 which are the same for all three textual families are the very numbers which bear the least chronological significance. The three instances in which all three textual families agree are for Noah, Shem, and Terah. In all three of these instances one does not use these numbers to carry Biblical chronology computations into earlier times. In all other cases in Table 1 the numbers given in the table *must* be used. This suggests that the variants have arisen through deliberate alteration to achieve some chronological purpose, rather than through a process of accidental copy errors.

If this deduction is correct, then it is possible to speculate a little further as to what that chronological purpose might have been. I suggest the purpose might have been to compensate to some degree for the loss of the “one thousand” in 1 Kings 6:1. It seems very probable that both the Septuagint and the Samaritan Pentateuch arose after the “one thousand” had been lost from the text of 1 Kings 6:1, as this loss appears to have occurred very early on in the transmission of 1 Kings. This accidental loss reduced the apparent antiquity of both the Flood and the Creation of man by 1,000 years. I suggest that while the loss of the “one thousand” from 1 Kings 6:1 was not recognized by ancient scholars—just as it has escaped the notice of scholars in modern times—it produced an obvious conflict with what was known of the history of civilization by scholars several centuries B.C. (when the Septuagint seems to have originated)—just as it does at the present time.

Putting all of this speculation together leads to the following self-consistent view. The Masoretic is the primary text. It accidentally suffered the loss of 1,000 years of real history from 1 Kings 6:1, perhaps even as early as the latter sixth century B.C. This produced an obvious conflict between what was known from secular sources of the antiquity of the Flood and of man. Both the Septuagint and Samaritan Pentateuch originators tried to alleviate this problem by considerably lengthening Biblical chronology prior to Abraham.

In any event, all speculation aside, the superiority of the Masoretic text seems generally to be acknowledged by scholars today. My work in Biblical chronology in the second and third millennia

B.C. supports this appraisal.⁸ Hence, it appears most reasonable to utilize the Masoretic data exclusively as the basis for calculations in these early millennia at this stage, while bearing in mind that the textual variants shown in Table 1 may possibly call for a lengthening of the chronology in the future.

By adopting the Masoretic data as the foundation of the chronology in these early millennia, I display my belief, based on my experience to the present time, that it will ultimately be found to be the best preserved and, hence, the closest to the truth. I will be looking to bring extra-Biblical chronological data to bear on this section of Biblical chronology (as is necessary in all sections of Biblical chronology) to check and correct my textual choices as necessary, of course. But 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.

Conclusion

Table 2 shows how the dates have been calculated for the events listed in the details column of the accompanying time chart (Figure 1). The Dispersion of mankind from Babel is not shown on the time chart but is included in Table 2. The calculation of this date has been discussed previously.⁹

When it is realized that study of even the most ancient civilizations enters a pre-historical period because of an absence of written materials from those civilizations much before 3000 B.C., the history recorded in the earliest chapters of Genesis, stretching back into the fourth, fifth and even sixth millennia B.C. is seen to be of an exceedingly rare antiquity—indeed, it stands unique and alone. Unfortunately, because of its uniqueness this history is often subjected to scoffing disbelief by modern scholars. But they need to begin to exercise greater care—the most recent work in Biblical chronology has clearly shown that it is a serious error to impute one’s own ignorance to the authors of the sacred text. ◊

⁸See, for example, Gerald E. Aardsma, “Chronology of the Bible: 3000–1000 B.C.,” *The Biblical Chronologist* 1.3 (May/June 1995): 2.

⁹Gerald E. Aardsma, “Research in Progress,” *The Biblical Chronologist* 1.4 (July/August 1995): 8–9.

Biblical Chronology 101

In the September 1993 issue of *The Quarterly Review of Biology* Professor Müller-Hill of the Institute für Genetik der Universität zu Köln in Germany observed:¹⁰

In science and elsewhere there are two types of truth: (1) The truth everybody already knows, and (2) the truth that is not yet discovered. Most persons deal in science, as elsewhere, with the first type of truth. Most scientists just analyze another homologous system, and thus simply produce more of the same. The second type of truth is different. At first it looks too bizarre to be true, and it may be as dangerous as fire. If you are not clever it may destroy you.

As you know, I have been grappling with a bit of the second type of truth for the past several years. You have been patiently hearing me out as I have attempted, first in my book, *A New Approach to the Chronology of Old Testament History from Abraham to Samuel*, and then in this publication, to explain and defend this new discovery of a missing digit in 1 Kings 6:1. I feel I owe you some account of its reception to the present time, and it is principally the fulfillment of this obligation which I am seeking to satisfy by the present unusual article.

While it is easy in one sense to fulfill this obligation, in another sense it is extremely difficult. Rather than trying to explain why this is, I will attempt to fulfill my obligation through a historical analogy. I hope, by this means, to convey to you as accurately and fully as possible where things presently stand and why.

Toward the latter part of the first decade of the seventeenth century after Christ, a professor of mathematics in his mid-forties, Galileo Galilei, learned about a newly invented instrument which was said to make distant objects look much closer. It was a spyglass, a first primitive telescope, the earliest forms of which were not too effective, with a magnification of only three or four. Galileo

quickly built his own spyglass and proceeded to make improvements on its design until he had produced a twenty-powered spyglass. He soon used this to view the moon—and he was immediately thrown into a great conflict with the wisdom of his day, and, indeed, with age-old wisdom, by what he saw.

A geocentric cosmology prevailed at the time, as it had for a very long time before. According to this view of the physical universe, the heavens were the realm of God and the earth was the realm of men. Since the heavens were the realm of God they were regarded as necessarily perfect and unchanging. And this conception included the idea that the heavenly bodies, such as the moon, were all geometrically perfect spheres.¹¹

According to the then prevailing geocentric cosmology of Aristotle, the heavens were perfect and unchanging, and heavenly bodies were perfectly smooth and spherical. The large spots visible on the Moon to the naked eye were usually explained away by ad hoc devices. One could, for instance, postulate that parts of the perfectly smooth Moon absorbed and then emitted light differently from other parts.

Now I hope you do not side with the “chronological snobs” (C. S. Lewis’ term, as I recall, for those who look down their noses at others who have lived before them, supposing the advancement in knowledge which they are privileged to partake of through no merit of their own is evidence of their intrinsic superiority) and regard everybody who lived back in Galileo’s day as foolish for believing such things. Galileo’s contemporaries were not lacking in intelligence—they were really no different than people today in that respect. Next time you are out of doors on a moonlit night take a long look at the moon with your unaided eyes, and see if you can discern any deviation from perfect smoothness in its orb. And then see how successfully you can answer the question of why God should have created the moon with

¹⁰Benno Müller-Hill, “Science, Truth, and Other Values,” *The Quarterly Review of Biology* 68.3 (September 1993): 399.

¹¹Galileo Galilei, *Sidereus Nuncius*, translated with introduction, conclusion, and notes by Albert Van Helden (Chicago: The University of Chicago Press, 1989), 10–11.

the pocked and pitted surface we have learned to believe it actually possesses.

The view held by Galileo's contemporaries was of very ancient and respectable lineage. It was theologically satisfying. And it was empirically attested by every person's own eyes—until Galileo sighted his spyglass on the moon and became the first man ever to behold its majestic mountains and sunken craters.

In a letter dated January 7, 1610, Galileo wrote:¹²

...it is seen that the Moon is most evidently not at all of an even, smooth, and regular surface, as a great many people believe of it and of the other heavenly bodies, but on the contrary it is rough and unequal. In short it is shown to be such that sane reasoning cannot conclude otherwise than that it is full of prominences and cavities similar, but much larger, to the mountains and valleys spread out over the Earth's surface.

Later in 1610 Galileo published his discovery in a little book called *Sidereus Nuncius*, together with the further startling discovery that Jupiter was orbited by four moons of its own—an observation which conflicted severely with the geocentric cosmology of his day which held that the earth was the single center of rotation in the universe. Besides this publication he worked feverishly to produce other telescopes of high quality so other scientists could check his observations. And he wrote letters and gave lectures and carried out personal visits to eminent scientists of his day replete with late-night demonstrations of his observations.

It is well known how Galileo's discoveries were ultimately received by the religious establishment of his day—how he spent the latter years of his life under house arrest. Not so well publicized is how his discoveries were treated by other *scientists* of his day.

In April 1610 Galileo visited an astronomer of international reputation, Giovanni Antonio Magini, bringing his spyglass with him. He evidently

demonstrated the instrument for a gathering of local scholars, and allowed it to be thoroughly investigated by them. Their appraisal was chronicled a few days later by Martin Horky, a young associate of Magini, in a letter to the now famous astronomer Johannes Kepler (eight years younger than Galileo):¹³

Galileo Galilei, the mathematician of Padua, came to us in Bologna and he brought with him that spyglass through which he sees four fictitious planets [*i.e.*, *moons of Jupiter*]. On the twenty-fourth and twenty-fifth of April I never slept, day and night, but tested that instrument of Galileo's in innumerable ways, in these lower [earthly] as well as the higher [realms]. On Earth it works miracles; in the heavens it deceives, for other fixed stars appear double. Thus, the following evening I observed with Galileo's spyglass the little star that is seen above the middle one of the three in the tail of the Great Bear, and I saw four very small stars nearby, just as Galileo observed about Jupiter. I have as witnesses most excellent men and most noble doctors, Antonio Roffeni, the most learned mathematician of the University of Bologna, and many others, who with me in a house observed the heavens on the same night of 25 April, with Galileo himself present. But all acknowledged that the instrument deceived. And Galileo became silent, and on the twenty-sixth, a Monday, dejected, he took his leave from Mr. Magini very early in the morning. And he gave no thanks for the favors and the many thoughts, because, full of himself, he hawked a fable. Mr. Magini provided Galileo with distinguished company, both splendid and delightful. Thus the wretched Galileo left Bologna with his spyglass on the twenty-sixth.

¹²Galileo Galilei, *Sidereus Nuncius*, translated with introduction, conclusion, and notes by Albert Van Helden (Chicago: The University of Chicago Press, 1989), 11.

¹³Galileo Galilei, *Sidereus Nuncius*, translated with introduction, conclusion, and notes by Albert Van Helden (Chicago: The University of Chicago Press, 1989), 92–93. The italicized words in square brackets are mine, non-italicized words in square brackets are in the original.

(To his great credit, Kepler disregarded Horky's appraisal and, true to his own nature, accepted Galileo's observations enthusiastically.)

Another glimpse into the reception of Galileo's discoveries by his peers is afforded by the following quote:¹⁴

[Galileo] also received many letters in which objections to his discoveries were put forward, and answering them all was a frustrating business:

It is true that their reasons for mistrust are very frivolous and childish, since they persuade themselves that I am so rash that in testing my instrument a hundred thousand times on a hundred thousand stars and other objects, I have not known, or been able to recognize, those deceptions that they think they have recognized without ever having seen the instrument; or else, that I am so stupid that without any need I have wished to compromise my reputation and to ridicule my Prince.

It is clear that Galileo's discoveries were not well received by many of the leading men of his day. We must not judge these individuals harshly in this, however, for it is too true, as Professor Müller-Hill has pointed out above, that new truth often "looks too bizarre to be true".

I do not pretend to possess the genius of a Galileo, but I have, like Galileo, had the joy of discovering something which has previously been hidden from human understanding. I have, like him, exerted myself to communicate what I have discovered, and I have, like him, had a limited reception.

It is certainly the case that the assertion that one thousand years has accidentally been dropped out of Biblical chronology just prior to the first millennium B.C. appears, at first sight, as "too bizarre to

be true"; certainly it is every bit as bizarre as being told someone has seen mountains on the moon when the whole world knows the moon is perfectly smooth.

Nor do the implications of my discovery win it many friends among the learned men of our age. For many of them it entails the loss of a lifetime of work, and a deeply disturbing challenge to their long-held beliefs about the Bible, the world, and the nature of reality and the human experience.

My simple discovery necessarily obsolesces every Bible encyclopedia, every Bible dictionary, every Bible handbook, every Bible Atlas, every textbook on the Old Testament, every Bible history book, every Bible geography book, and every book on Biblical archaeology prior to the first millennium B.C. It revolutionizes our understanding of Biblical archaeology. It dramatically impacts our understanding of Biblical history. It sheds new light on secular history. It completely reverses modern scholarly assessments of the historicity of the Bible. It severely challenges naturalism, the reigning philosophical paradigm of academia. It overthrows long-standing theories of how the Old Testament came to be. It reveals that the early books of the Bible are of a rare and precious antiquity, undeserving of the brutish man-handling they have received at the hands of too many modern scholars. And because Christian theology unavoidably flows from our perception of history, it necessarily entails an abrupt discontinuity in the direction most modern theologians have been going. And because civilization, in the final analysis, is simply the tangible expression of its individuals' theology, it ultimately confronts the whole of our current culture—how we have each individually chosen to live. So I can understand the reluctance I have found, on the part of many, to accept, or even to seriously consider, what I am claiming.

I am not sure whether the reception of my new discovery has been better or worse than Galileo's was. I have had a few encouraging signals from scholars, even some of international reputation. But I have also had my share of "Horky/Bologna" experiences. At least I have not been put under house arrest yet.

But come what may, I am determined to fight on. As I see it, there is simply too much of truth at stake not to. ◇

¹⁴Galileo Galilei, *Sidereus Nuncius*, translated with introduction, conclusion, and notes by Albert Van Helden (Chicago: The University of Chicago Press, 1989), 100.

Research in Progress

Noah's Flood: A Global *Cataclysm*?

In 1961 theologian John C. Whitcomb, Jr. and engineer Henry M. Morris claimed Noah's Flood "was a gigantic catastrophe, beside which the explosion of the largest hydrogen bomb, or of hundreds of such bombs, becomes insignificant!"¹⁵ They argued that the Biblical text and the book of nature clearly portrayed this historic event as a cataclysm—a great overwhelming geologic upheaval. They pictured the Flood as accompanied by great tectonic events, earthquakes, volcanic eruptions, and tidal waves which together wreaked unimaginable havoc upon the face of the globe world-wide.¹⁶ They claimed it produced most of the layers of sedimentary rock strata which are found around the world, some of which are over a mile deep.¹⁷

Many Christians today have accepted this conception of the Flood. Indeed, the entire so-called creation/science movement is built around it. But is this understanding of the Flood correct? Was Noah's Flood a global *cataclysm*?

Biblical Indications

Whitcomb and Morris feel the Bible guarantees this view of Noah's Flood. They claim:¹⁸

There is no escaping the conclusion that, if the Bible is true and if the Lord Jesus Christ possessed divine omniscience, the Deluge [Noah's Flood] was the most significant event, geologically speaking, that has ever occurred on the earth since its creation.

¹⁵John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 242–243.

¹⁶John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 122–123, 261, 264–265, 268–269, 271.

¹⁷John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 123, 265–266, 268–272.

¹⁸John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 216.

That is a pretty strong claim. On what is it based?

While it is easy to see how one might argue that the Scriptures teach the Flood was *global*, it is much less obvious why one should accept they teach it was *cataclysmic*. It is unquestionably the case, in apparent contradiction to Whitcomb's and Morris' claim above, that Jesus is nowhere recorded in the Bible as having said the Flood "was the most significant event, geologically speaking, that has ever occurred on the earth since its creation", and He makes no mention of earthquakes, tidal waves, volcanoes, or mile-deep sediments at the time of the Flood that I have been able to find.

The Biblical historical record of Noah's Flood found in Genesis chapters 6 through 9, where one might naturally look for such teaching, also contains no explicit reference to earthquakes, volcanoes, tidal waves, or mile-deep sediments. This is a strange silence if this event was, in fact, not just accompanied by, but, indeed, *characterized* by such phenomena, as Whitcomb and Morris lead us to believe. The Biblical record is, after all, quite detailed, and even quantitative, regarding the *water* of the Flood. It tells us where the water came from, how long the rain lasted, how it lifted the ark, how deep the water became, how it covered everything in sight, how long it continued to rise, how it receded, and how long it took to dry up. Why so much detail about the water, and complete silence regarding the claimed tidal waves, earthquakes, and volcanoes?

Genesis does say that at the beginning of the Flood "all the fountains of the great deep burst open"¹⁹, and Whitcomb and Morris make a great deal of this phrase. They say:²⁰

This must mean that great quantities of liquids, perhaps liquid rocks or magmas, as well as water (probably steam), had been confined under great pressure below the surface rock structure of the earth since the time of its formation and that this mass now burst forth through great fountains, probably both on the lands and under the seas.

¹⁹Genesis 7:11

²⁰John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 122.

Why this simple phrase “must” mean this is not at all clear to me. Certainly the context of the phrase (i.e., Genesis 6–9) provides no hint of subterranean reservoirs of molten rock and steam erupting at this time—it just talks about plain, ordinary water flooding the earth.

So I find Whitcomb’s and Morris’ exegesis of the phrase, “all the fountains of the great deep burst open”, difficult to accept. In fact, their hermeneutical approach to the entire verse seems unsound to me. Notice that they interpret “fountains of the great deep” literally—they tell us that these mean “great fountains, probably both on the lands and under the seas”. But then they go on to interpret the parallel phrase, “and the floodgates of the sky were opened”, which immediately follows in the same verse, metaphorically. They say:²¹

Speaking metaphorically, the Scriptures say that the “floodgates of heaven were opened”.

Surely it is not sound hermeneutics to interpret the first of a set of parallel phrases literally, and the second metaphorically, is it? If the “fountains of the great deep” correspond to literal, physical fountains, shouldn’t “the floodgates of the sky” correspond to literal gates blocking water behind literal, physical dams in the sky? And if the notion of literal “floodgates of the sky” seems sufficiently absurd as to demand a metaphorical interpretation, shouldn’t that immediately tell us that the parallel “fountains of the great deep” should also be understood metaphorically? Wouldn’t it be far more reasonable to see in these two phrases simply the idea that the water which caused the Flood came as rain from the sky and as a transgression from the sea?

In any event, this little phrase certainly seems inadequate justification of Whitcomb’s and Morris’ claim that “if the Bible is true and if the Lord Jesus Christ possessed divine omniscience, the Deluge was the most significant event, geologically speaking, that has ever occurred on the earth since its creation.” Yet I can find precious little else in their book, *The Genesis Flood*, to justify this claim.

²¹John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 120.

Indeed, when Whitcomb and Morris set about to finally develop their cataclysmic Flood model for their reader, they do so, not on the infallible basis of unambiguous, explicit Biblical statements, but on the very fallible basis of human *inference*. Under the heading “GEOLOGICAL IMPLICATIONS OF THE BIBLICAL RECORD” they write:²²

The only proper place to begin this study is with the Bible record of the Flood itself. The following appear to be legitimate *inferences* from the account: [my emphasis]

Now I am a scientist by training, not a theologian, so I have no intention of centering this discussion on the fine points of what might or might not be *inferred* from the Biblical text. I only wish to establish the point that the Bible nowhere explicitly teaches that the Flood was a cataclysm. Quite plainly, the *only* way Whitcomb and Morris have been able to arrive at their cataclysmic Flood model is through *inference*.

Now the fact that the cataclysmic Flood model *can* be inferred from Scripture does not mean that it *must* or *should* be inferred from Scripture. It is possible, through mistaken reasoning, to infer all sorts of things from Scripture which it simply does not teach. Please note that other Christian investigators have arrived at quite different models for the Flood from their reading of Scripture. Evidently it is possible to honestly *infer* a variety of Flood models from Scripture—from cataclysmic to tranquil.

My point is simply this: the cataclysmic Flood model is *not* a Bible doctrine by any legitimate exposition of Scripture. It is a *scientific* model only, on the same plane as every other model of Noah’s Flood which has ever been inferred from Scripture—it can legitimately claim no special supra-scientific status. And since this is the case, it is altogether proper and appropriate to submit this model to the usual rigors of scientific examination, and to declare it false—with no consequent aspersions on the divinity of Christ or the truth of the Bible—should it fail the test.

²²John C. Whitcomb, Jr. and Henry M. Morris, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Company, 1961), 120

Scientific Indications

During the past five months I have been studying geophysical data collected from Elk Lake in Minnesota and recently published by The Geological Society of America.²³ I have previously pointed out that an accurate scientific model of Noah's Flood is one of the most urgent needs at the present time for harmonizing Biblical and secular chronologies of earth history prior to about 3000 B.C..²⁴ I entered this study hoping the Elk Lake data might help in the development of such a model—in weeding out wrong ideas and instigating new insights. I have not been disappointed.

The Elk Lake data has both weeded and instigated. In the present article I focus on the weeding. I hope to return to the instigative side of the Elk Lake data in a future issue.

The major weeding is in regard to the cataclysmic Flood model. Specifically, there is no sign of a cataclysmic flood of any sort at Elk Lake for at least the past 10,000 years. Since Biblical chronology places the Flood only a little more than 5,500 years ago,²⁵ the Elk Lake data falsifies the cataclysmic Flood model. This is in agreement with the conclusion arrived at previously through the study of archaeological data in the Near East²⁶ that Noah's Flood was not a cataclysm.

General Background

To show how this conclusion is derived some general discussion of Elk Lake is necessary. Most importantly, as usual, we must ask about the chronology of the geophysical record at Elk Lake. How is it determined? How accurate is it claimed to be? Can the claims be trusted?

Elk Lake is located in Itasca State Park in Minnesota. While its surface area (1 square kilometer, or 250 acres) is average for lakes in Minnesota, its

²³J. Platt Bradbury and Walter E. Dean, ed., *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States* (Boulder: The Geological Society of America, Inc., 1993).

²⁴Gerald E. Aardsma, "Biblical Chronology 101," *The Biblical Chronologist* 1.6 (November/December 1995): 10.

²⁵Gerald E. Aardsma, "Chronology of the Bible: 5000–3000 B.C.," *The Biblical Chronologist* 2.4 (July/August 1996): 1–5.

²⁶Gerald E. Aardsma, "Research in Progress," *The Biblical Chronologist* 1.4 (July/August 1995): 10.

depth is unusual. It is a very deep lake, with a 30 meter (97 foot) depression in its southeastern end today. In the past the lake was considerably deeper—laminated lake sediments have raised the bottom of the lake in the depression from an original 50 meters (160 feet) to the present 30 meters.

Edward B. Nuhfer *et al.* studied the processes which produce laminated sediments in the lake today.²⁷ They collected sediment as it settled from the overlying water column in Elk Lake. They used specially designed sediment traps equipped with a time marking device so they could record when different types of sediment settled out. The traps were placed in Elk Lake in the late seventies and early eighties.

Nuhfer *et al.* found that "modern laminations in Elk Lake are created by distinct seasonal processes".²⁸ In other words, the sediments which are accumulating at the bottom of Elk Lake today are laminated because of the yearly cycle of seasons. This comes about as follows.

In the winter the lake freezes over. The ice cover typically lasts for about five months. During this time the water in the lake does not circulate, and organic detritus mixed with precipitates of iron and manganese settles to the bottom of the lake producing a relatively thick brown layer of sediment.

In the spring, following the melting of the ice, wind-driven circulation of the lake takes place until it becomes thermally stratified. The period of circulation is variable, depending on how warm and windy the spring is. During this brief period sediment is resuspended from shallower portions of the lake, producing a layer of redeposited sediment in the deep portions of the lake. The thickness of this layer varies considerably from year to year.

²⁷Edward B. Nuhfer, Roger Y. Anderson, J. Platt Bradbury, and Walter E. Dean, "Modern Sedimentation in Elk Lake, Clearwater County, Minnesota," *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States*, ed. J. Platt Bradbury and Walter E. Dean (Boulder: The Geological Society of America, Inc., 1993) 75–96.

²⁸Edward B. Nuhfer, Roger Y. Anderson, J. Platt Bradbury, and Walter E. Dean, "Modern Sedimentation in Elk Lake, Clearwater County, Minnesota," *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States*, ed. J. Platt Bradbury and Walter E. Dean (Boulder: The Geological Society of America, Inc., 1993), 93.

Summer stratification brings stagnation once again, which persists for another four or five months. During this period the warmer temperatures in the upper water layers of the lake cause calcium carbonate to precipitate out, producing another relatively thick, distinct, characteristically light-colored sediment layer.

In the fall the warm surface layers of the lake begin to cool. This causes iron compounds to precipitate, producing a thin, reddish-colored sediment layer. Fall winds mix the lake once again, producing another redeposited layer similar in its characteristics to the spring layer.

Thus, at the present time, five sediment layers are typically produced each year in a repeating cycle (Figure 2).

The individual seasonal sediment layers also contain a biological component which exhibits a well-defined annual cyclicality. Specifically, diatoms (i.e., minute unicellular algae with silicified skeletons) live in the lake. While these are present year round, the spring and fall circulations provide them most abundantly with the essential elements they require for growth and reproduction. Thus, the sediment layers produced at these times of the year are especially rich in diatom skeletons. In fact, in some years diatom blooms can be sufficiently extensive to produce spring or fall sediment layers which are made up almost exclusively of diatom skeletons.

Each individual type of diatom has its own unique preference for temperature and other environmental factors. Thus, spring and fall diatom blooms tend to be dominated by different diatom species.

While a significant amount of variation in layer thickness and composition is observed at Elk Lake, there is clearly adequate information preserved within the sediments to reveal that they are indeed due to a cyclic succession of seasons throughout.

At the present time about 2 millimeters (slightly less than one tenth inch) of sediment accumulates each year. The individual seasonal layers are, therefore, about one quarter of this amount, or about one half millimeter. Nonetheless, these are easily resolved under low-power magnification, and their entrained diatoms can be easily identified using higher-power magnification.

The counting of bundles of seasonal sediment

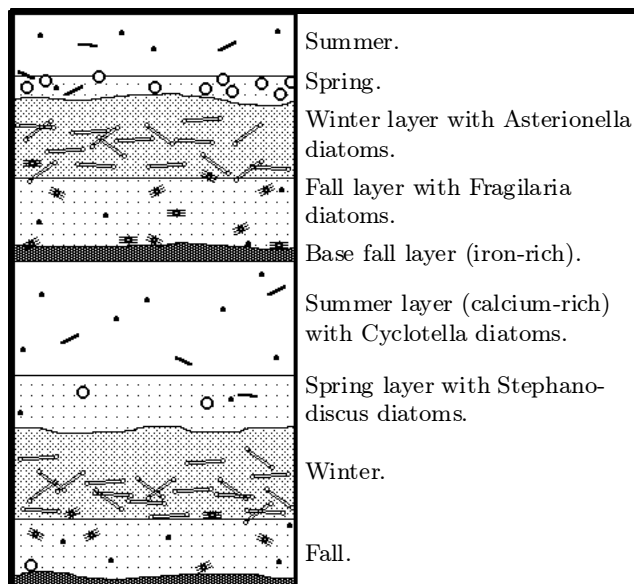


Figure 2: Idealized portion of sediment column from Elk Lake showing two years of accumulation. [Adapted from Figure 11 of E. B. Nuhfer *et al.* See footnote 27 for full reference.]

layers, corresponding to a single year, is the basis for the chronology at Elk Lake. Such “direct counting” methods²⁹ of chronology building are very labor intensive. Imagine the work involved in collecting cores from the bottom of the lake (done with piston corers through holes in the ice during the winter) and then processing these cores (freezing, halving, surfacing, photographing) to enable counting the 2 millimeter thick layers through 20 meters of bottom sediment!

But the work involved is well worth the final result, yielding a chronology for the core samples, and hence the sedimentary history of the lake, which exhibits both relatively high precision and long duration.

In fact, about 10,000 bundles of seasonal layers have been counted at Elk Lake from the bottom to the top of the 20 meters of sediments which have accumulated at the bottom of the lake. Said simply, Elk Lake appears to have recorded approximately 10,000 years of history in its sediments.

Can we trust this count? Several lines of independent evidence strongly combine to say yes—despite the obvious headaches this entails for the

²⁹ Other examples of direct counting methods include tree-ring and ice layer counting.

Biblical chronology issue of the date of Creation.

First, a simple computation shows that no major counting error exists. The lake is found to have about 20 meters of laminated sediment today. Annual bundles of layers, though variable in thickness from year to year, are observed to average about 2 millimeters throughout the sediment column.³⁰ Twenty meters divided by 2 millimeters per year does yield 10,000 years.

Second, the Elk Lake sediment count has been checked by independent researchers using independent cores. Donald R. Sprowl has compared his counts from cores obtained in 1982 and 1983 with those which Anderson *et al.* found, principally from cores obtained in 1978.³¹ He counted a total of 10,120 annual layers top to bottom in his cores compared to 10,400 from the 1978 Anderson chronology. The difference arises principally from difficulties in preservation and recovery of the laminated sediments for measurement (e.g., loss of material between two consecutive cores), not from identification of what constitutes an annual bundle of individual laminations.

Third, tree-ring counts yield the same overall extent. The longest tree-ring chronologies available today also extend back about 10,000 years.

Fourth, and finally, radiocarbon measurements corroborate the laminated sediment counts. Anderson *et al.* obtained fourteen radiocarbon measurements from organic remains from within the Elk Lake sediments. They concluded that there was “essential agreement between the two methods”.³² And Sprowl and Banerjee used mag-

netic properties of the sediments to compare the Elk Lake direct counting chronology with radiocarbon measurements from sediments in other lakes. They concluded that their data “clearly indicate the validity of the varve [i.e., annual sedimentary bundle] counting process and suggest an overall error in the varve counts of less than 500 years.”³³

Since lake sediments, tree-rings, and radiocarbon are quite different ways of dating the past, the fact of their basic agreement reasonably precludes any significant error in the Elk Lake chronology.

Noah’s Flood Not A Global Cataclysm

The global cataclysmic Flood model pictures the surface of the earth as being scoured by water and torn apart by tectonic events during the Flood. Clearly, any modest-sized lakes which existed pre-Flood would necessarily be completely obliterated by such a cataclysm. Their surrounding earth would be eroded away until they were no more, or they would rapidly be filled and covered with eroded debris until deeply buried. It is impossible, in the global cataclysmic Flood model, for Elk Lake to have existed pre-Flood without having experienced an extreme disruption at the time of the Flood.

While Elk Lake shows clear signs of changing climatic and environmental conditions through its 10,000 year history, it nowhere shows any sign of the sort of extreme disruption which a cataclysmic flood would necessarily cause. Its seasonal sedimentary layers give every indication of having accumulated one after another in a relatively undisturbed, annually repeating cycle. The Elk Lake data renders the notion of a global cataclysm anywhere during the past 10,000 years completely untenable.

We are thus faced with the fact that either Noah’s Flood was not a global cataclysm, or Noah’s Flood took place more than 10,000 years ago. The obvious next question is, “Is it possible for Noah’s Flood to have occurred more than 10,000 years ago?”

³⁰Roger Y. Anderson, J. Platt Bradbury, Walter E. Dean, and Minze Stuiver, “Chronology of Elk Lake Sediments: Coring, Sampling, and Time-series Construction,” *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States*, ed. J. Platt Bradbury and Walter E. Dean (Boulder: The Geological Society of America, Inc., 1993), 38 (Figure 1).

³¹Donald R. Sprowl, “On the Precision of the Elk Lake Varve Chronology,” *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States*, ed. J. Platt Bradbury and Walter E. Dean (Boulder: The Geological Society of America, Inc., 1993) 69–74.

³²Roger Y. Anderson, J. Platt Bradbury, Walter E. Dean, and Minze Stuiver, “Chronology of Elk Lake Sediments: Coring, Sampling, and Time-series Construction,” *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States*, ed. J. Platt Bradbury and Walter E. Dean (Boulder: The Geological Society of America, Inc., 1993) 40.

³³Donald R. Sprowl and Subir K. Banerjee, “Geologic Implications of the Elk Lake Paleomagnetic Record,” *Elk Lake, Minnesota: Evidence for Rapid Climate Change in the North-Central United States*, ed. J. Platt Bradbury and Walter E. Dean (Boulder: The Geological Society of America, Inc., 1993) 161.

The Date of Noah's Flood

There is only one way to date Noah's Flood at present. One must use Biblical chronology. When one does so using sound Biblical chronology procedures, one finds that the Biblical date for the Flood is about 3500 B.C.³⁴ This date is only 5,500 years ago—a full 4,500 years short of 10,000 years ago.

Now the process of deducing calendrical dates using Biblical data is a human enterprise, and, as such, it is not infallible. Even though the doctrine of Biblical inerrancy assures us that the autographs of the Biblical text itself were error-free we must still deal with questions of textual preservation, and even if we had the autographs we would still need to consider questions of interpretation of the text which often arise in the process of computing a date from Scripture. For example, should "begot" (King James Version) in Genesis 5 and 11 be understood to imply direct descent, father to son, or might it allow one or more generations to be skipped occasionally? Human fallibility renders it impossible to guarantee that 3500 B.C. is an accurate date for the Flood.

Having said this, however, one must also face the fact that the Bible most certainly does not leave the question of the date of the Flood open to wanton speculation. It *does* give chronological data which give every indication of having been given so we might be able to date the Flood. Thus, while it is inappropriate to try to assign infallibility to specific dates which have been calculated using Biblical chronological data, it is entirely appropriate to ask what range of dates the text of Scripture reasonably allows for any given event.

When we ask this question in regard to the Flood—taking everything we know about the science of Biblical chronology at present into consideration—we find that it would be very surprising if the true date of the Flood differed from 3500 B.C. by more than a few hundred years, and really quite shocking if it differed by as much as a thousand years. Note that Biblical chronology checks with secular chronologies back to 3000 B.C. at least—as practically every issue of *The Biblical Chronologist* has shown in one way or another.³⁵

³⁴Gerald E. Aardsma, "Chronology of the Bible: 5000–3000 B.C.," *The Biblical Chronologist* 2.4 (July/August 1996): 1–5.

³⁵See, for example, Gerald E. Aardsma, "Mount Sodom

Thus, to accommodate an additional 4,500 years back to the Flood, one would need to find room somewhere for all this additional time in just the interval of history between Noah and Abraham. This would require the insertion of an additional eight centuries which the text does not mention for every one hundred years which it does mention.

One may safely conclude that Biblical chronology will not admit a displacement of the date of the Flood to 10,000 years ago. The idea that 3500 B.C., the Biblically derived date of the Flood, might be inaccurate by 4,500 years or more is simply unreasonable.

Was Noah's Flood a global *cataclysm*? Sedimentary data from Elk Lake combine with chronological data from the Bible to say no. ◊

The Biblical Chronologist is a bimonthly subscription newsletter about Biblical chronology. It is written and edited by Gerald E. Aardsma, a Ph.D. scientist (nuclear physics) with special background in radioisotopic dating methods such as radiocarbon. *The Biblical Chronologist* has a threefold purpose:

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