

The Biblical Chronologist

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

(Ecclesiastes 7:24)

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Mount Sodom Confirms Missing Millennium

One of the most interesting pieces of work I have come across recently in my research is presented in “The Holocene climatic record of the salt caves of Mount Sedom”¹, an article authored by four Israeli scientists: A. Frumkin, M. Magaritz, I. Carmi, and I. Zak. It describes work they carried out on Mount Sodom (or Sedom), a salt mountain situated on the southwestern shore of the Dead Sea.² The work they describe is important to Biblical chronology research at the present time because it confirms, once again, that 1,000 years are missing from traditional Biblical chronology prior to the period of the kings of Israel.

Chronological background

Several years ago I proposed that 1,000 years are missing from traditional Biblical chronology.³ I argued that the sum total of Biblical, chronological, archaeological and historical evidence could only easily be explained by adopting the hypothesis that the “four hundred eighty” which presently appears in 1 Kings 6:1 was originally, in the autograph of 1 Kings, “one thousand four hundred

¹*The Holocene*, 1,3 (1991) pp. 191-200.

²You will find it helpful to have a physical map of Palestine, showing the Jordan River and the Dead Sea, open before you as you read this article. Many Bibles contain such maps. You will notice that the Dead Sea is divided into a northern basin and a southern basin by a peninsula which enters the sea from the east. This is called the Lisan Peninsula, *Lisan* meaning *tongue*. Mount Sodom is located on the west shore of the southern basin. Mount Sodom is close to 7 miles long and about a mile across. It runs north and south, with its northern tip about 3 miles further south than the southern limit of the Lisan Peninsula.

³See: “A New Approach to the Chronology of Biblical History from Abraham to Samuel”, 2nd ed., 1995, Aardsma Research & Publishing, 412 N. Mulberry, Loda, IL 60948.

eighty”. I suggested that the “one thousand” part of this number had been accidentally dropped from the text very early on as a result of a simple scribal copy error.

All that I have seen in my subsequent chronological research has only served to confirm this early suggestion. The work described in the article by Frumkin *et al.*, mentioned above, is another typical example. The present article explains how this comes about.⁴

Biblical background

It may seem unlikely that salt caves in a rock salt mountain on the shore of the Dead Sea could have anything to do with the idea that traditional Bibli-

⁴Confirmation of my proposal was not the intent of Frumkin *et al.*, of course; indeed, they had conducted and published their research several years before I had even made my discovery of the missing 1,000 years public. I met Israel Carmi, the third author of this article, at the 15th International Radiocarbon Conference this past summer. I presented my discovery of the missing 1,000 years in one of the sessions at that conference, so he and several hundred other radiocarbon scientists are now aware of my claim that 1,000 years have been accidentally dropped out of traditional Biblical chronology. Even so, academia is so steeped in philosophical naturalism, I suspect it will be a considerable time before my discovery is taken seriously in the secular literature.

The current mainstream view in academia is that the Bible contains only myth and unreliable tradition prior to the time of the kings of Israel (i.e., Genesis through Ruth). My discovery runs completely counter to this view, providing repeated demonstrations of the historicity of the Biblical text in these early books. Since the mainstream academicians already “know” that these early Biblical books are mythological or otherwise not historically reliable, they tend to treat my discovery as ridiculously, embarrassingly, impossible. It presently seems to me that this bias will only be overcome when the data heaped up against it has become so mountainous that every grade school child can immediately see what it means. Hence, I do not expect to see serious efforts to evaluate my claim in the standard secular literature for some time.

cal chronology leaves out 1,000 years, but they do indeed, and they provide some striking evidence for the historicity (i.e., historical actuality) of Genesis in the process. Mount Sodom's salt caves get involved because of an observation Abraham's nephew Lot made, which is recorded for us in Genesis 13:10.

And Lot lifted up his eyes and saw all the valley of the Jordan, that it was well watered everywhere – this was before the Lord destroyed Sodom and Gomorrah – like the garden of the Lord, like the land of Egypt as you go to Zoar.

This Bible verse plainly states that the valley of the Jordan was everywhere well watered at the time of Abraham and Lot. This immediately catches the attention of those familiar with the valley of the Jordan in Palestine because this valley is certainly not well watered today. In fact, it is one of the most arid places on the face of the earth, especially along its southernmost extent where the Jordan River empties into the Dead Sea.

*The New Encyclopaedia Britannica*⁵ describes its present climate thus:

The Jordan Trench is a deep rift valley that varies in width from 1.5 to 14 miles. In its northern section the bed of the drained Lake Hula (Huleh) and the sea of Galilee (Lake Tiberias) are blocked by natural dams of basalt. Descending to about 1,310 feet below sea level, the valley is exceedingly dry and overheated, and cultivation is restricted to irrigated areas or rare oases, as at Jericho or at 'En Gedi by the shore of the Dead Sea.

Contrast the “exceedingly dry and overheated” of today with the “well watered everywhere ... like the garden of the Lord [i.e., Garden of Eden]” of Genesis 13:10.

Moses, the author of Genesis, seems to note this contrast in his day as well. He specifies that the valley of the Jordan was “well watered everywhere ... *before the Lord destroyed Sodom and Gomorrah*” [ed. emphasis]. Evidently, following the destruction of Sodom and Gomorrah, which includes

the time of Moses, of course, the climate of the Jordan Valley was altered so that it became arid, as it is found to be today.

In any event, Genesis 13:10 clearly implies that the amount of precipitation received by the Jordan Valley has not always been the same as it is today. Evidently there was at least one time in the past – before the destruction of Sodom and Gomorrah – when the Jordan Valley received much more rain than it does today.

A simple test

If we had some physical means of determining the relative amount of rainfall in the Jordan Valley over the past five and a half millennia, then we could use this to test when Lot's observation of a valley “well watered everywhere” might have been made. More specifically (and more quantitatively) notice that the old, traditional Biblical chronology dates Abraham and Lot to within a few hundred years of 2000 B.C. (depending upon which scholar you listen to). By way of contrast, my new Biblical chronology, with the accidentally dropped thousand years added back in, predicts this observation within about a decade of 3080 B.C. These disparate dates for the same event could be compared to a record of average annual rainfall for the third and fourth millennia B.C. to see which, if either, coincided with a time when the Jordan Valley was much wetter than it is today.

(Scientists would call this is a “doable experiment”. The predicted dates from the two competing chronologies are well separated from one another. Thus, one does not require highly precise dates in this test to decide which chronology is correct. We are not trying to choose between adjoining single years (which is practically impossible at present at these early dates), or adjoining decades (also nearly impossible in most instances), or even adjoining centuries. We are only choosing between adjoining millennia. Since the real physical dating uncertainties involved in this test are typically in the range of a few decades to a few centuries in these early millennia, the test can easily and accurately be carried out.)

The difficulty, of course, is in determining the relative amount of rainfall in the Jordan Valley over the past five or six thousand years. This is

⁵vol. 25, page 403, 1986.

where “The Holocene climatic record of the salt caves of Mount Sodom, Israel” comes in, for this is what its authors, Frumkin *et al.*, have done.

How they did it

The Jordan River Valley is part of the catchment basin for the Dead Sea – rainfall in the valley runs off into the Dead Sea. Since the Dead Sea has no outlet, the level of the Dead Sea depends only upon the rate at which water enters it through runoff and the rate at which water leaves it through evaporation. When the climate of the catchment basin (including the Jordan Valley) is arid, less water enters the Dead Sea (because there is less rainfall) and more water leaves the Dead Sea through evaporation. Under these conditions the level of the Dead Sea falls. When the climate of the catchment basin is moist, runoff into the Dead Sea increases and evaporation decreases so the level of the Dead Sea rises. Thus, the past level of the Dead Sea can be used to gauge the relative amount of rainfall in the Dead Sea catchment basin (including the Jordan Valley) in the past.

How does one go about determining what the level of the Dead Sea was in the past? This is where Mount Sodom comes in.

Mount Sodom is located on the western shore of the southern basin of the Dead Sea. It is made of salt, with a rock cap about 130 feet thick. Because salt is soluble in rainwater, it is not surprising that the mountain is found to contain a number of caves. These salt caves, in fact, are long conduits which have transported water for millennia down through the mountain and into the Dead Sea. These are naturally formed conduits, the result of rainwater dissolving its way through the mountain.

These conduits tend to start out as vertical shafts, or sink holes, on the relatively flat top of the mountain. They then assume a nearly horizontal aspect through the mountain, discharging their water into the Dead Sea at the prevailing surface level of the Dead Sea.

The physical forces which shape the conduits are such as to keep the conduit exit at or near the surface level of the Dead Sea. When the Dead Sea level changes, the horizontal portions of the conduits are rapidly cut upward or downward into the rock salt by the runoff water, as necessary for

the conduit to once again discharge its water at the surface of the Dead Sea. When this happens, the older horizontal channel of the conduit goes out of use.

The date at which a given conduit channel was last active can be determined by radiocarbon analyses of pieces of wood (e.g., twigs) washed into the conduit and left stranded in that channel when the last runoff water to use it had subsided. (If the same channel had been used again after the twig was stranded, the twig would have been flushed out by the new surge of water from above.)

By studying the geometry (including width) of these natural salt caves (conduits) through Mount Sodom, Frumkin *et al.* were able to deduce the Dead Sea level for more than the past 7,000 years.⁶

Results

The result of their study is shown in Figure 1. The level of the Dead Sea is plotted for the past 7,000 radiocarbon years⁷ in this figure. The predicted dates of Lot’s observation according to the two (old and new) Biblical chronologies are also indicated.

As can be seen, the old chronology fails rather badly. It places Lot’s observation of the Jordan Valley being “well watered everywhere” at a time when the region was so arid the south basin of the Dead Sea had actually completely dried up!⁸

⁶The brief summary I have given here necessarily skips over many of the details of the careful study which Frumkin *et al.* carried out. For a fuller description, see their article, referenced in footnote 1 above.

⁷Note that “radiocarbon years” provide only a rough approximation to true calendar years. It is necessary to use a calibration table to change from radiocarbon years to calendar years. (See *Radiocarbon*, Vol. 35, No. 1, 1993.) In *The Biblical Chronologist* uncalibrated radiocarbon years are designated “BP” (for “Before Physics”) while “B.C.” and “A.D.” are used for true calendar years.

⁸Frumkin *et al.* (p. 198) have suggested this desiccated period may correlate with Genesis 14:3: “All these came as allies to the valley of Siddim (that is, the Salt Sea)”. They state: “Possibly the Vale of Siddim refers to the dry south basin of the Dead Sea which at a later time (when the book of Genesis was written) had become submerged again.”

However, this suggestion cannot be harmonized with Lot’s observation that the valley of the Jordan was “well watered everywhere” at this time.

I suggest that the clause “(that is, the Salt Sea)” should be regarded as explaining (or updating) the proper noun “Siddim”, not as equating “the valley of Siddim” with “the Salt Sea”. Note that only the southern basin had dried up

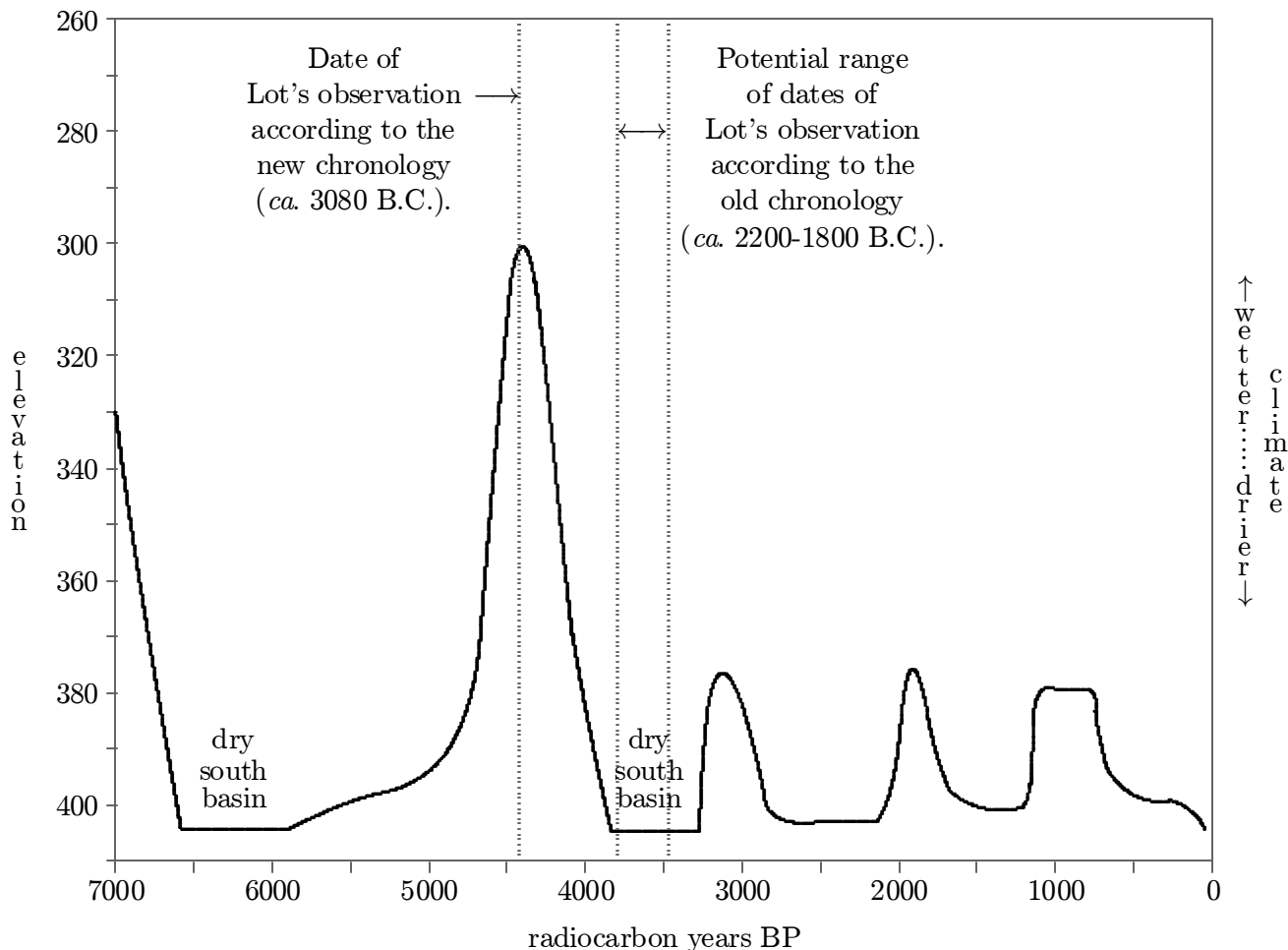


Figure 1: Elevation of the surface of the Dead Sea in meters below mean sea level for the past 7,000 radiocarbon years, and predicted dates of Lot's observation. (Elevation data from Frumkin *et al.*, *The Holocene*, 1,3(1991)191-200).

In sharp contrast, the new chronology succeeds very well. It places Lot's observation at the one time in the past 7,000 years when the Dead Sea level was highest. Notice (Figure 1) that the Dead Sea level was over 100 meters (or 330 feet) above its present-day level in 3080 B.C. This was surely a period when the Dead Sea catchment basin (including especially the Jordan Valley) received much

at this time, not the whole sea (the northern basin is over 1,000 feet deeper than the southern basin), so a one to one correspondence between "the valley of Siddim" and "the Salt Sea" is impossible in any event. Furthermore, there is plenty of valley south of the Dead Sea, even with the southern basin full to 300 meters below mean sea level, for the armies of Genesis 14:3 to have met and fought in, and this valley could reasonably have borne the title "valley of Siddim" in Abraham's time. Thus, it is not at all necessary to suppose that the valley in which this battle took place was the dried up southern basin of the Dead Sea.

more rainfall than it does today – at no other time in the past seven thousand years has the Jordan Valley been as "well watered everywhere" as during this relatively brief period.⁹

In this way the salt caves of Mount Sodom confirm that 1,000 years are missing from traditional Biblical chronology, and testify that the early chapters of Genesis report historical fact, not fiction, in the process. ◊

⁹Note also in Figure 1 that according to the new chronology Lot's observation falls very close to the peak of this "well watered" period. This suggests that the level of the Dead Sea began to recede relatively soon after Lot's observation, which implies that the region began to dry out relatively soon after Lot's observation. This seems possibly significant because Sodom and Gomorrah were destroyed relatively soon after Lot's observation, and Genesis 13:10 seems to mark this destruction as the turning point in the climate of the region, as we have seen above.

Biblical Chronology 101

[Biblical Chronology 101 will be a regular feature of The Biblical Chronologist. It is especially designed for beginners. In this space each issue I hope to teach the precepts and principles of modern Biblical chronology. We open “class” this issue with a few introductory remarks.]

About the teacher

I am a scientist, not a theologian. I hold an earned Ph.D. in nuclear physics, with special emphasis on radioisotope dating methods such as radiocarbon. I have been involved in the study of Biblical chronology, especially as it relates to the age of the earth and the date of Old Testament events such as Noah’s Flood and the Exodus, for over a decade now. From 1987 through 1994 I conducted Biblical chronology research at the Institute for Creation Research where I served as assistant professor of physics on the graduate faculty.

In this class I hope to teach you the science of Biblical chronology: what we presently know and don’t know about Biblical chronology, what tools are available to tackle Biblical chronology problems today, which research strategies lead to success, why Biblical chronology is important to Christian faith and practice, the history of Biblical chronology, and much more.

I am also a conservative Christian. I assume I am addressing students who, for the most part, are also conservative Christians. Conservative Christian values will be assumed in this class.

While I am an unabashed follower of Christ, to the best of my knowledge I have no overriding theological agenda or denominational bias in this work. Furthermore, I am not out to prove that the Bible is true, or that God exists. I do mean to show clearly and overwhelmingly that those who are currently claiming that history and archaeology prove the Bible is false are wrong. I am especially concerned that Christian young people be equipped to intelligently defend their faith against such claims – claims which they are bound to face in almost any higher educational institution today. And I am anxious for pastors and Bible teachers to be equipped with reliable, up-to-date, factual information in this area; my experience has been that

such information naturally strengthens faith and refutes skepticism.

But I am a scientist, not a theologian, so you will not be subjected to much preaching or exposition of Greek or Hebrew in this class. Rather, it is the gathering and evaluation of physical data from any and all sources bearing on the chronology of earth history which will be our principal occupation.

Biblical chronology and you

Biblical chronology seems to give rise to a curious “occupational disease” in some of its practitioners. (I am serious here.) Some people who study Biblical chronology seem to me to lose touch with reality. They begin to see mathematical patterns which nobody else can see in tables of numbers and date lists. They become highly attached to these patterns and use them to decide what they will believe to be true, and sometimes to predict the future. Or they may become very defensive about their own chronological views, and lose their ability to discuss Biblical chronology and related issues in a charitable or rational manner. They may regard those who don’t hold to their particular chronological scheme as heretics.

All of this is far from a Christian standard of conduct, and I would not want to find that *The Biblical Chronologist* had contributed in any way to such behavior in its readers. Paul warns, in 1 Timothy 1:4, not “to pay attention to myths and endless genealogies, which give rise to mere speculation”, and again in Titus 3:9 “but shun foolish controversies and genealogies and strife”. It is certainly possible to get into “foolish controversies” and haggle over “endless genealogies” in Biblical chronology, but we are not to do so. Remember that “the Lord’s bond-servant must not be quarrelsome, but be kind to all, able to teach, patient when wronged, with gentleness correcting those who are in opposition” (2 Timothy 2:24,25a).

The goal of true Biblical chronology research is to discover and communicate the truth about earth history – what really took place in the past and when it took place. We esteem honesty and rationality in this pursuit. We invite and encourage free and open discussion. We strive always to operate within a framework of true Christian love. ◊

Research in Progress

[Someone I read a long time ago in the Physics library at the University of Toronto (I can no longer recall the author's name or the title of the book) compared scientific research to mining. He noted, for example, that the miner does not create the gems or ore he is after, he can only find what is already there. Similarly, the researcher does not create anything new, he simply discovers what is already there. This (forgotten) essayist went on to extend the analogy in various ways, all of which I have found to be generally valid in my own experience as a researcher; I think it is a good analogy.

There is one aspect of this analogy which I want to convey here, in this premiere installation of this regular column, in hopes of putting the contents of this column into proper perspective. This is the observation that veins of ore are naturally somewhat unpredictable. Whether a particular vein will lead to a yet richer vein, or to a dead end, cannot be judged with much confidence beforehand. You follow the vein, using all your ingenuity and previous experience to try to stick with the richest ore. But, in the final analysis, you cannot guarantee whether you will go home at the end of the day with a bag full of gems, or an empty sack.

Research is also unpredictable. Sometimes a particular avenue of investigation looks exciting, only to prove, after much work, to be a dud – a dead end. Sometimes truly exciting and valuable discoveries open up where least expected.

This column is intended to communicate up-to-date information about my personal research in Biblical chronology – the questions I am trying to answer, my most recent discoveries, and what these discoveries may mean. In this column we are on the frontier of Biblical chronology research. Here, ideas are necessarily speculative, and results are unpredictable.

Consequently, you should treat this column the way you would treat a roller-coaster. Get in and enjoy the ride. Don't get too excited about where you think it may be taking you – we'll see where we have gotten to when we finally get there.]

I was attending the International Conference on Creationism this past summer when, while studying in my room one evening, I uncovered something

which I had not expected. I have thought about it a great deal since, but have had almost no time to investigate it further. I hope to have a good shot at it before the next issue of *The Biblical Chronologist* goes to press, however.

With the discovery of the dropped 1,000 years in 1 Kings 6:1 I feel we can successfully harmonize Biblical history with secular data from all fields back to the time of Abraham. Once one has come to accept this, the correct chronology of the historical events recorded in Genesis 1 - 11 becomes the new frontier. In particular, the date of Noah's Flood stands as *the* central question.

To date an event in earth history using physical chronometers, one needs to have some idea of what that event was like and what it did so he can determine what present-day remains to apply his physical dating methods to. I have previously attempted to date Noah's Flood, being fully persuaded (by *The Genesis Flood*¹⁰) that the Flood was a super-cataclysmic affair which totally destroyed everything on the earth. I was looking for, and trying to date, a globe-shattering cataclysm.

I concluded, several years ago, that the secular data provided by tree-rings, ice-cores, and radiocarbon forbade a date for such a flood any more recent than about 10,000 years ago.¹¹ This conclusion was very disturbing, however. Traditional Biblical chronology places the date of Noah's Flood at about 5,000 years ago, largely based upon the chronological data found in the Genesis 11 genealogy (Noah to Abraham). It is not at all obvious why there should be five to ten thousand years missing in the genealogical/chronological data of Genesis 11. Furthermore, it is not obvious where any significant gaps might exist in this data. I continued to work on these difficulties, however, convinced that there had to be some reasonable answer to them. This was my mind-set and prin-

¹⁰Whitcomb, J.C., and Morris, H.M., 1961, Presbyterian and Reformed Publishing, Philadelphia.

¹¹Aardsma, Gerald E., 1990, Radiocarbon, dendrochronology, and the date of the Flood. *Proceedings of the Second International Conference on Creationism - Volume II*. Creation Science Fellowship, Pittsburgh, pp. 1-10; Aardsma, Gerald E., 1991, *Radiocarbon and the Genesis Flood*, ICR Technical Monograph #16. Institute for Creation Research, Santee, CA; Aardsma, Gerald E., 1993, Tree-ring dating and multiple ring growth per year. *Creation Research Society Quarterly*. volume 29, number 4, March 1993, pp. 184-189.

cipal occupation until that evening at the ICC.

I had decided I had a responsibility to acquaint myself with the archaeology of the Bible lands prior to the time of Abraham – not because I expected to find anything very helpful or interesting there, but simply out of academic duty – and I felt the ICC would be a good place to do so. Hence, I took *The Archaeology of Ancient Israel*¹² along to the conference.

According to my new Bible chronology Abraham was born *ca.* 3167 B.C. This corresponds roughly to the beginning of the so-called Early Bronze I period in Palestine. The period which precedes EB I in Palestine is called the Chalcolithic (pronounce the Ch as a K), as I learned from chapter 3 of the book mentioned above.

As it turns out (I was not expecting this) the Chalcolithic and its people look similar to what we might expect the pre-Flood world and its people to have looked like. Briefly: they are advanced in the arts and in metallurgy, well beyond the EB people who follow them; they do not appear to show any sign of human government; there immediately appears evidence of cruelty and violence within the human remains of this period; the entire civilization disappears suddenly and without a trace: “The impression is created of a sudden end to the period as a result of a catastrophe of some sort . . .” (p. 79); and those who come after them seem to start over from scratch. Finally, the termination of this culture is dated *ca.* 3600 B.C. which is synchronous (within dating errors) with the new Biblical date for the Flood of *ca.* 3520 B.C. (calculated assuming no gaps in Genesis 11 and using the Masoretic Text).

Could the Chalcolithic correspond, in fact, to the latter stages of the pre-Flood civilization in Palestine? It is immediately obvious that if it does, then the Flood was not the super-cataclysm I have been supposing it to be, because the remains of this civilization are still preserved (though relatively poorly) in Palestine in their place of origin. If it doesn't, we have surely uncovered a curious coincidence.

These ideas diverge significantly from my previously accustomed thinking and, no doubt, from many of yours. They arise from the physical data,

¹²1992, ed. Amnon Ben-Tor, (translated by R. Greenberg), The Open University of Israel.

however, not my wishes or imagination. Furthermore, they seem to offer potential solutions to some exceedingly difficult chronological problems which continue to plague the super-cataclysmic Flood paradigm despite years of intensive research.

Obviously I need to get to the bottom of this. To do so I have formulated the working hypothesis: the Chalcolithic in Palestine was catastrophically terminated by the Biblical/historical event known as Noah's Flood. It seems to me that there are two questions which need to be answered as I attempt to determine whether this hypothesis is true or not:

1. What physical/archaeological evidence can be found bearing on the question of whether the Chalcolithic was terminated by a *flood*?
2. How widespread was the cultural hiatus which is seen in Palestine at the end of the Chalcolithic?

I will be prosecuting these questions over the next several weeks and months as I am able to do so.

Have we identified remains of the pre-Flood civilization? Are we finally about to settle the date of the Flood? Stay tuned! ◊

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:

1. to encourage, enrich, and strengthen the faith of conservative Christians through instruction in Biblical chronology,
2. to foster informed, up-to-date, scholarly research in this vital field within the conservative Christian community, and
3. to communicate current developments and discoveries in Biblical Chronology in an easily understood manner.

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Editor and Writer: Gerald E. Aardsma, Ph.D.

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