

# The Biblical BC Chronologist

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

(Ecclesiastes 7:24)

Volume 8, Number 2

March/April 2002

## Radiocarbon Dating the Exodus

*The entire Exodus story as recounted in the Bible probably never occurred.*

—*The New York Times*, March 9, 2002.<sup>1</sup>

In actual fact, the Exodus *did* occur. It occurred 2447±12 B.C. according to modern Biblical chronology. And, if objective archaeological evidence counts for anything, I might add that it occurred in just the way the Bible says it did.

Unfortunately, despite the best efforts of *The Biblical Chronologist*, these facts are still far from common knowledge.

The quote above, from *The New York Times*, speaks for most of the scholarly, academic world today. It also speaks for a rapidly growing segment of their (misinformed) lay disciples. These Exodus-is-fiction folk believe “the entire Exodus story as recounted in the Bible probably never occurred” because they think modern archaeology has proven this. They disdain conservative Christians, who cling tenaciously to their Exodus-is-fact view in the face of the overwhelming archaeological evidence (or, as is more often the case, in blissful ignorance of it).

In one sense their disdain is easily understood. People who hold religiously to the view that there is a live, full-grown elephant in the garage, when every zoo-keeper in the country has thoroughly investigated the garage and found it to be empty of elephants, hardly deserve to be applauded. And still less do certain members of this group deserve to be applauded when they declare the investigation inconclusive because an oil can on the windowsill has not been looked under yet.

But in another, more vital sense, the disdain of

<sup>1</sup>Michael Massing, “As Rabbis Face Facts, Bible Tales are Wilting,” *The New York Times on the Web* (March 9, 2002), [www.nytimes.com](http://www.nytimes.com).

the Exodus-is-fiction group is seriously misplaced. For there *is* an elephant in the garage, perfectly plain for everybody to see *if they will only look in the right garage!* The elephant is not housed at 1447 BC Street; it is housed at 2447 BC Street.

“I really think you should all stop quarreling—you have *all* got the address wrong. If you will please follow me down the street a ways, there is something down at 2447 I think you all need to take a look at...”

## Facts of the Exodus

The historically documented collapse of the Old Kingdom of Egypt was caused by the Exodus. Phiops II (also called Pepi II) was pharaoh when Moses was born. He is the pharaoh who oppressed the Israelites.<sup>2</sup> He came to the throne at age six, and died in his one hundredth year, having reigned for ninety-four years.

He was still a young man when Moses was born—only twenty or twenty-one years of age if history has accurately preserved his age at death. Thus the Hebrews suffered under his rule for the better part of a century. The book of Exodus remembers his long-awaited death with the words, “Now it came to pass in the course of those many days that the king of Egypt died”.<sup>3</sup>

The successor to Phiops II was Merenre An-tyemsaf II. This was the pharaoh whom Moses and Aaron confronted—the pharaoh who scoffed “Who is the LORD that I should obey His voice to let Israel go?”<sup>4</sup>—the pharaoh who lost his life in the Red Sea Crossing.

The Israelites left Egypt by means of the road

<sup>2</sup>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), 78–80.

<sup>3</sup>Exodus 2:23a, NASB.

<sup>4</sup>Exodus 5:2, NASB.

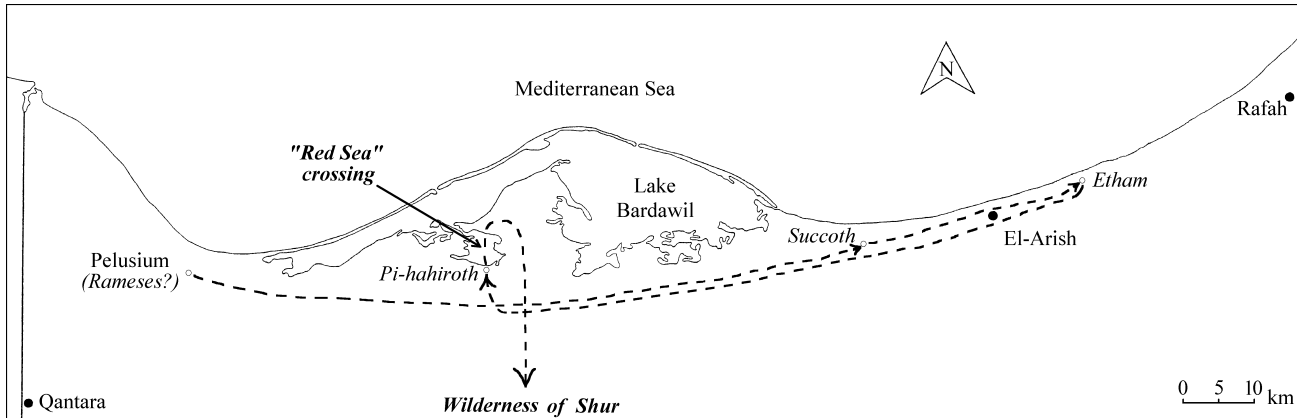


Figure 1: Map of the north Sinai peninsula. Open circles mark the location of the apparent hubs of archaeological site clusters; solid circles mark modern towns.

which, from remotely ancient times, has stretched across the northern Sinai desert (Figure 1). When they had put as much distance between themselves and Egypt as their legs would bear that first day, they set up temporary camp. The result was a shanty town of makeshift booths and lean-tos in the middle of the desert. They called it “Succoth”—“Booths”.

From there they moved on to Etham, at the edge of the desert, on the border of Canaan. They camped there for a time, but did not venture any further. They were not ready for war—and God was not yet done with the Egyptians. He commanded the Israelites to turn back, and camp in front of the sea at Pi-hahiroth.

It was, of course, just as unlikely back then as it is today that people could camp in a wilderness and leave no garbage in their wake. Modern campers tend to leave their empty drink cans and bottles strewn about the campsite. Back then it was broken earthenware. Several million Israelites make for a lot of broken, discarded pottery shards. Pottery shards are all but indestructible. They are still there today. Thus it is that the locations of Succoth, Etham, and Pi-hahiroth (and, therefore, the location of the Red Sea Crossing) are all clearly revealed by modern archaeology.<sup>5</sup>

The location of Mount Sinai, where the Israelites camped for a year after they had left Egypt, is revealed in the same way. Today it is called Mount

Yeroham.<sup>6</sup> The desert plain at the base of Mount Yeroham is littered with pottery shards of the same styles found at Succoth, Etham, and Pi-hahiroth. Many of these shards, discarded by the Israelites four and a half thousand years ago, I have held in my own hands (Figure 2).<sup>7</sup>

### Date of the Exodus

Modern Biblical chronology, restoring the millennium lost from the text of 1 Kings 6:1 in antiquity, dates the Exodus to 2447±12 B.C., as I have mentioned above.<sup>8</sup> The computation of this date is fairly simple. It was given in *The Biblical Chronologist* a number of years ago as follows:<sup>9</sup>

We begin with the accession date of Rehoboam, Solomon’s son, which is given by Thiele<sup>10</sup> as 931/930 B.C. I assign an uncertainty of ±10 years to this starting date based upon the range of scholarly opinions I have seen regarding it. To this date we must add the length of

<sup>5</sup>Gerald E. Aardsma, “The Route of the Exodus,” *The Biblical Chronologist* 2.1 (January/February 1996): 1–9.

<sup>6</sup>Gerald E. Aardsma, “Yeroham: the True Mount Sinai,” *The Biblical Chronologist* 6.4 (July/August 2000): 1–11.

<sup>7</sup>Gerald E. Aardsma, “Report on the Excursion to Mt. Yeroham – Part III,” *The Biblical Chronologist* 7.1 (January/February 2001): 1–16.

<sup>8</sup>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).

<sup>9</sup>Gerald E. Aardsma, “Chronology of the Bible: 3000–1000 B.C.,” *The Biblical Chronologist* 1.3 (May/June 1995): 1–3.

<sup>10</sup>Edwin R. Thiele, *The Mysterious Numbers of the Hebrew Kings* (Grand Rapids: Academie Books, Zondervan Publishing House, 1983), 217.

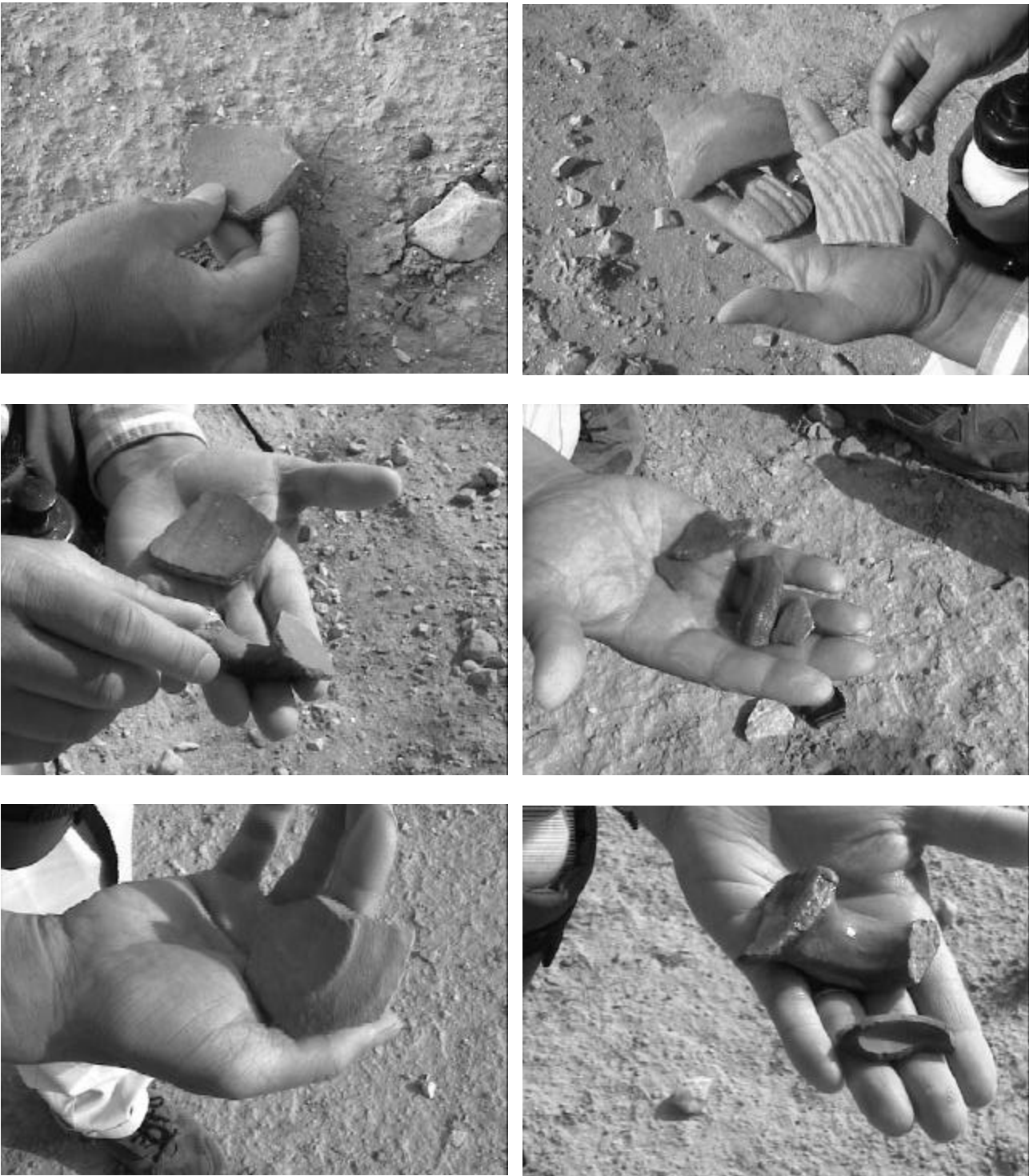


Figure 2: Ancient pottery shards from the desert plain at the foot of Mount Sinai (modern Mount Yeroham).

Solomon's reign, which is given as 40 years in 1 Kings 11:42 and 2 Chronicles 9:30. We must then subtract 4 and add 1,480<sup>11</sup> years to take us to the date of the Exodus (1 Kings 6:1). This computes to 2447 B.C. Allowing 5 years uncertainty in the length of Solomon's reign, a 0.5 year uncertainty in the timing of the commencement of the building of the temple, and 5 years uncertainty in the 1480 year figure gives a total uncertainty in the date of the Exodus of about 12 years.

## Reasons to Check the Date of the Exodus

I have previously pointed out that Biblical chronology, like all other fields of study, is a human endeavor, not a divinely inspired enterprise. Since humans are fallible creatures, the Biblical chronologies we construct need to be checked in whatever ways we can find to check them.<sup>12</sup>

There are three good reasons why we would like to check this 2447±12 B.C. Exodus date.

### Reason 1

First, notice that this date rests upon the Biblical chronology foundation laid several decades ago by Thiele. That is, it starts with 931/930 B.C. as the accession date of Rehoboam.

This date was worked out by Thiele based upon his understanding of a virtual maze of Biblical chronological data for the reigns of the various kings of Israel and Judah, starting with a secular (extra-Biblical) anchor point. Because Thiele was fallible, like the rest of us, the accuracy of this date cannot be guaranteed.

In the quote above I assigned a ( $3\sigma$ ) uncertainty of ±10 years to this date based on the range of scholarly opinions I had seen at the time regarding it. I feel it is important here to point out that history has proven scholarly opinion—even unanimous scholarly opinion—to be often very wide of

<sup>11</sup>See Gerald E. Aardsma, *A New Approach to the Chronology of Biblical History from Abraham to Samuel*, 2nd ed. (Loda IL: Aardsma Research & Publishing, 1993) for details of this number.

<sup>12</sup>Gerald E. Aardsma, "Biblical Chronology 101: On Checking Biblical Chronology," *The Biblical Chronologist* 6.2 (March/April 2000): 12–14.

the mark in areas of chronology. Despite the scholarly consensus in favor of 931/930±10 B.C. for the accession of Rehoboam, we still must not take this starting date as guaranteed. It requires an independent check of some sort before it can be held with confidence.

In the past it has not been possible to check this date by any independent means. But a controversy is presently raging in Biblical archaeology which promises to change this over the next several years.

The controversy is over the proper date of the Iron Age I and II in Israel. A great deal of time and effort is currently being expended to independently establish the proper absolute dates for Iron Age I and II using radiocarbon.

Some fear this may remove archaeological support for the reigns of David and Solomon if it comes out the wrong way. This, I suggest, is a needless worry. Based on my several decades of experience with Biblical chronology and archaeology I can confidently predict that the investigation presently underway will not falsify the Bible's history of David and Solomon. Though I have yet to investigate the issue in depth (there are much bigger issues demanding of my time at present), it strikes me as another, smaller-scale mixup of the missing millennium type.

That is, in the case of the missing millennium, traditional Biblical chronology specified a date for the Exodus of approximately 1450 B.C. The archaeologists went looking for the Exodus around 1450 B.C. and, when they failed to find anything remotely resembling the Exodus within a few centuries of that date, they concluded the Bible's history of the Exodus was false. For whatever curious reasons they failed to critically question traditional Biblical *chronology*, even though their archaeological data—at Ai, for example—harmonized *in detail* with the Biblical account, the *only* difficulty being that it dated a millennium earlier than expected. In any event, in actual fact, there is *nothing* wrong with the Biblical historical narrative of the Exodus; it is the traditional *date* of the Exodus which is wrong—it is out by 1000 years! The problem is with traditional Biblical *chronology*, not Biblical *history*.

Now notice the parallels in the present Iron Age controversy. Traditional Biblical chronology specifies dates for David and Solomon. The archaeolo-

gists of a generation ago went looking for David and Solomon at these dates, and felt they had found them in the archaeological remains of Iron Age I and II. But now a few modern archaeologists propose that Iron Age I and II date later than the traditional Biblical dates for Solomon and David, and then go on to conclude that the Biblical history of David and Solomon must be false *because there is no archaeological evidence for David and Solomon at the traditional dates!* Once again, for whatever curious reasons, they fail entirely to ask the obvious, “But how do we know the traditional dates for David and Solomon are true?”

While it is somewhat discouraging to see Biblical *chronology* issues misconstrued by Biblical archaeologists as Biblical *historicity* issues, Biblical chronology much appreciates the influx of new, independent chronological data resulting from such controversies. It is not at all impossible that the new radiocarbon data now being obtained on Iron Age I and II may expose errors in the Biblical chronology computations of Thiele and other scholars, altering the accepted date of the accession of Rehoboam by a few decades. This would then alter Biblical chronology dates for the reigns of Solomon, David, Saul and all earlier Biblical events—including the Exodus—by the same few decades. Obviously then—coming back to the main point—it is prudent to do whatever can be done to check this 2447±12 B.C. Exodus date.

## Reason 2

The second reason we would like to check this 2447±12 B.C. Biblical chronology date for the Exodus is that it disagrees significantly with the modern historical/archaeological chronology of Egypt. Let me now explain how this comes about.

Biblical *chronological* (numerical) data lead to the conclusion that the Exodus happened 2447±12 B.C., as outlined above. Biblical *historical* data lead to the conclusion that the Exodus must be synchronous with the collapse of the Old Kingdom of Egypt. That is, the sorts of things (e.g., the plagues) the Bible informs us happened to Egypt at the time of the Exodus lead irresistibly to the conclusion that the nation of Egypt must have been all but destroyed by the time the Exodus was complete. Said simply, the Biblical history

of the Exodus, when dealt with logically, intelligently, and honestly, calls for the collapse of the nation of Egypt in consequence of the Exodus.<sup>13</sup>

In addition the reigns of pharaohs Pharaohs II and Merenre Antyemsaf II provide an unambiguous synchronization with the Biblical account.<sup>14</sup> Basically, the Biblical narrative requires that the pharaoh of the Oppression rule in excess of 80 years, and that he be followed by the pharaoh of the Exodus whose reign should be very short and terminate with the nation of Egypt in a state of disaster. The 80 year reign requirement is in itself a complete give-away for the proper location of the Exodus in Egyptian history because Pharaohs II is the only pharaoh ever to have achieved this. And the fact that his reign is followed by the very short (1 year) reign of Merenre Antyemsaf II, which is followed by the collapse of the Old Kingdom of Egypt, provides as certain proof of the location of the Exodus in Egyptian history as anyone is likely ever to obtain for anything at all in history.

But this leads immediately to a clash with the modern historical/archaeological chronology of Egypt, which places the date of the collapse of the Old Kingdom around 2180 B.C.—several hundred years later than my 2447±12 B.C. date of the Exodus. Figure 3 shows this conflict. It shows my chronology of the Bible relative to Peter A. Clayton’s historical/archaeological chronology of Egypt.<sup>15,16</sup> Note that the collapse of the Old Kingdom comes at the end of the Old Kingdom. Thus, we expect the end of the Old Kingdom to be synchronous with the Exodus. But, in Figure 3, they are not. Clearly, either my Biblical date for the Exodus is wrong, or the modern historical/archaeological date for the collapse of the Old Kingdom of Egypt is wrong. This obviously encourages us to check the Biblical chronology date in whatever way we can.

<sup>13</sup>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), 57–58.

<sup>14</sup>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), 78–80.

<sup>15</sup>Gerald E. Aardsma, “The Chronology of Egypt in Relation to the Bible: 3000–1000 B.C.,” *The Biblical Chronologist* 2.2 (March/April 1996): 1–9.

<sup>16</sup>Peter A. Clayton, *Chronicle of the Pharaohs* (New York: Thames and Hudson, 1994).

### Reason 3

The third reason we would like to check our Biblical date for the Exodus is simply because of its central importance to the dates of all of the Biblical historical events which precede it. The computation of the dates for Abraham, Isaac, Jacob, Noah, the Flood, . . . on back to the creation of Adam all depend on the date of the Exodus. Any inaccuracy in this date automatically spills over to these earlier dates.

### How to Check the Date of the Exodus

Radiocarbon provides the only truly independent means of checking the date of the Exodus today. It is independent because it is based on physical measurements made on ancient objects, not on historical records or scholarly opinions of any sort.

If I could pick whatever sample I pleased for radiocarbon dating the Exodus, I would pick the cereal grains the Israelites carried with them for food when they left Egypt. I would pick this particular sample because one can be reasonably certain the Israelites were eating grains that had grown that year. Thus the date the grains grew—which is all radiocarbon can hope to tell us—would correspond to the date of the Exodus, which is the date we wish to check.

This close correspondence of sample date to the date we wish to check is not as clear with many other samples. For example, a sample of cloth from one of the garments worn by the Israelites might have been several decades old already by the time of the Exodus. This is also true with the date of the Israelites' sandals, or their walking sticks.

But none of this really matters because nobody presently possesses either grains, or cloth, or walking sticks known to be from the Exodus.

Having said this I need to add that this is the state of affairs *at present*. I do not expect this state of affairs to go on indefinitely. What we now know about the route of the Exodus provides us with the potential of obtaining many objects which were contemporary with the Exodus and which might ultimately be used to check the date of the Exodus using radiocarbon. For example, there is all that broken pottery the Israelites discarded in the desert. Radiocarbon can be used to date certain types of pottery today (because of the organic substances present in the ceramic matrix). As another

example, we now know the location of the Red Sea Crossing (Figure 1). From the Biblical historical narrative we know a lot of chariots were lost at sea at this crossing point. This raises the potential of archaeological work finding wooden parts from these chariots which might then be dated using radiocarbon.

But this is all future. For now we must work with what we have.

What we are in possession of at present are the tombs of many of the pharaohs, and it is through this link that we are able to check my Biblical chronology date of the Exodus at the present time.

### Radiocarbon and The Tomb of Phiops II

We are able to check my 2447±12 B.C. Biblical chronology date of the Exodus by radiocarbon dating the pyramid of Phiops II, the pharaoh of the Oppression discussed above. This is an easy check for us to make because all the work of gathering and dating the sample has already been done for us. It was carried out by Bonani *et al.* as part of a large-scale radiocarbon dating program of Old Kingdom monuments. Their results are reported in the present issue of *Radiocarbon*.<sup>17</sup>

Bonani *et al.* describe their sample collection technique as follows:

In the field we looked for organic materials that were clearly linked to the construction of the monuments. Temples and pyramids built from mud bricks yielded grass, straw, and reed fragments, which were mixed into the clay and soil before shaping the bricks. Finding suitable materials in stone monuments was a greater challenge. In most of these monuments the stone building blocks were leveled and secured in place with mortar that was manufactured locally. This required massive fires to heat gypsum or limestone. The roasted minerals and the ashes from the fires were added to the

<sup>17</sup>Georges Bonani, Herbert Haas, Zahi Hawass, Mark Lehner, Shawki Nakla, John Nolan, Robert Wenke, Willy Wölfli, "Radiocarbon Dates of Old and Middle Kingdom Monuments in Egypt," *Near East Chronology: Archaeology and Environment. Proceedings of the 17th International <sup>14</sup>C Conference*, ed. Hendrik J. Bruins, I. Carmi, and E. Boaretto *Radiocarbon* 43.3 (2001): 1297–1320.

B.C.	Bible (Aardsma, 1997)		Egypt (Clayton, 1994)		
	period	details	period	details	
1000	MONARCHY 1051 ± 16 B.C.	- Solomon begins to reign - - David begins to reign - - Saul begins to reign -	THIRD INTERMEDIATE	- Dynasty 21 begins -	
1100		- birth of Samuel -			
1200		- birth of Eli -			
1300			NEW KINGDOM	- Dynasty 19 begins -	
1400					
1500					
1600				- Dynasty 18 begins -	
1700	THEOCRACY		SECOND INTERMEDIATE	- Hyksos rule begins -	
1800					- Dynasty 13 begins -
1900					
2000		- death of Samson -	MIDDLE KINGDOM	- Dynasty 12 begins -	
2100		- Jephthah begins to judge -			
2200		- Tola begins to judge - - Gideon begins to judge - - Deborah begins to judge -	FIRST INTERMEDIATE	- Dynasty 11 begins - - Dynasty 9 begins - - Dynasty 7 begins -	
2300		- Ehud begins to judge -			↑ reign of Phiops II ↓
2400		- Othniel begins to judge - - Conquest begins - - THE EXODUS -	OLD KINGDOM	- Dynasty 6 begins -	
2500		- birth of Moses -			- Dynasty 5 begins -
2600					- Dynasty 4 begins -
2700				- Dynasty 3 begins -	
2800	PROTO-ISRAEL	- death of Joseph -	EARLY DYNASTIC		
2900		- Joseph's famine - - birth of Joseph -			- Dynasty 2 begins -
3000		- birth of Jacob - - birth of Isaac -			- Dynasty 1 begins -
	3092 ± 16 B.C.				

Figure 3: Aardsma's Bible chronology relative to Clayton's historical/archaeological chronology of Egypt, from 3000 to 1000 B.C. Radiocarbon date range for Phiops II tomb (see text) is shown by vertical bars on dividing line between the two chronologies.

mortar mix, along with remaining charcoal fragments. The usually very small fragments (1–2 mm) constituted the datable material. While searching the monuments, we examined seams between stone blocks for mortar filling and for black specks of charcoal inside the mortar.<sup>18</sup>

I have only seen the pyramid of Phiops II at some distance in a photograph, and I have been unable to find a description of its construction, but it was evidently made of stone with mortared joints because the sample used for radiocarbon analysis in this particular case is described by Bonani *et al.* as “charcoal”, with the added note “S face, 1st course, amalgamated sample”.<sup>19</sup>

The radiocarbon date range found for this sample of charcoal is shown in Figure 3. As usual the black bars mark the  $1\sigma$  date range and the white bars mark the  $2\sigma$  range. There is less than a 5% chance the true date of the charcoal sample lies outside the  $2\sigma$  date range.

It is immediately clear that this radiocarbon date checks roughly with my  $2447\pm 12$  B.C. date for the Exodus. It is also clear that this radiocarbon date range does not check with the modern historical/archaeological chronology of Egypt. The radiocarbon date range for this charcoal from Phiops II tomb is at least a century older than the date of the death of Phiops II according to the modern historical/archaeological chronology of Egypt—an unlikely temporal relationship.

This latter observation implies that the Old Kingdom of Egypt is at least one century, and probably several centuries older than the modern historical/archaeological chronology of Egypt allows. This conclusion is strongly reinforced by numerous other radiocarbon dates of Old Kingdom

<sup>18</sup>Georges Bonani, Herbert Haas, Zahi Hawass, Mark Lehner, Shawki Nakla, John Nolan, Robert Wenke, Willy Wölfl, “Radiocarbon Dates of Old and Middle Kingdom Monuments in Egypt,” *Near East Chronology: Archaeology and Environment. Proceedings of the 17th International <sup>14</sup>C Conference*, ed. Hendrik J. Bruins, I. Carmi, and E. Boaretto *Radiocarbon* 43.3 (2001): 1297–8.

<sup>19</sup>Georges Bonani, Herbert Haas, Zahi Hawass, Mark Lehner, Shawki Nakla, John Nolan, Robert Wenke, Willy Wölfl, “Radiocarbon Dates of Old and Middle Kingdom Monuments in Egypt,” *Near East Chronology: Archaeology and Environment. Proceedings of the 17th International <sup>14</sup>C Conference*, ed. Hendrik J. Bruins, I. Carmi, and E. Boaretto *Radiocarbon* 43.3 (2001): 1310.

samples reported on in this same paper by Bonani *et al.* It is also strongly supported by a series of radiocarbon dates from Jericho, reported by Bruins and van der Plicht in this same volume of *Radiocarbon*. Bruins and van der Plicht conclude:

the collective <sup>14</sup>C evidence of the Early Bronze Age from Jericho and other sites in the southern Levant as well as from Egypt for the Predynastic period and Dynasties 1–6 strongly challenges the current archaeo-historical time framework for these cultural and political periods. Most <sup>14</sup>C dates overwhelmingly show that these periods are significantly older than currently accepted.<sup>20</sup>

Thus radiocarbon sides with modern Biblical chronology against the modern historical/archaeological chronology of Egypt in regard to the collapse of the Old Kingdom and date of the Exodus. Evidently the modern historical/archaeological chronology of the Old Kingdom of Egypt needs to be pushed back several centuries—as I indicated in my initial presentation of the missing millennium thesis nearly a decade ago.<sup>21</sup>

### Limitations

This radiocarbon check agrees roughly with my  $2447\pm 12$  B.C. date for the Exodus, as mentioned above. It shows clearly that this Biblical chronology date for the Exodus is certainly not out by 1000 years, for example. But notice that it still allows the possibility that this date for the Exodus is out by as much as a century.

Also notice that this radiocarbon check is just a single date on a single sample. As I have pointed out before, things can certainly go wrong with radiocarbon dates—radiocarbon, too, is a fallible human endeavor—so one must not put too much confidence in single dates. We would really like to

<sup>20</sup>Hendrik J. Bruins and Johannes van der Plicht, “Radiocarbon Challenges Archaeo-historical Time Frameworks in the Near East: The Early Bronze Age of Jericho in Relation to Egypt,” *Near East Chronology: Archaeology and Environment. Proceedings of the 17th International <sup>14</sup>C Conference*, ed. Hendrik J. Bruins, I. Carmi, and E. Boaretto *Radiocarbon* 43.3 (2001): 1331.

<sup>21</sup>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), 60–61.



check the reproducibility of this single radiocarbon result with a set of a dozen more dates from different charcoal samples from Phiops II tomb. But obtaining such dates is an expensive exercise, of course, and the monument itself is of priceless antiquity, discouraging repeated attacks upon it for charcoal samples, so there are limits to what can be achieved in practice. Fortunately, the single radiocarbon result in this case is backed by a large set of radiocarbon dates from many other Old Kingdom monuments, with which it displays general chronological consistency. This goes a long way toward certifying its reliability in this instance.

But there are yet other uncertainties. We don't know, for example, when this tomb was built for Phiops II relative to his death. Notice that the  $2\sigma$  radiocarbon date range only overlaps our  $2447\pm 12$  B.C. date for the Exodus by roughly two decades. Thus, all is fine as long as this tomb was built for Phiops II sometime during or after his final two decades of life. If the tomb was built earlier in Phiops II reign, say when he was fifty years old, then it was built forty-nine years before the Exodus. In that case this radiocarbon date range would imply that the  $2447\pm 12$  B.C. date for the Exodus is several decades too old.

Finally, notice that radiocarbon does not directly date when the tomb was constructed. The radiocarbon date is only on the *charcoal* from the tomb. When one radiocarbon dates charcoal they get the date the wood grew from which the charcoal came. We do not know when this wood grew relative to the construction of the tomb. The chronological consistency of this radiocarbon date with many other radiocarbon dates from Old Kingdom monuments reported by Bonani *et al.* makes it unlikely the wood from which this charcoal came was centuries old by the time it was used in the construction of Phiops II tomb. But it is not at all impossible that it may have been a decade or more old by that time.

These limitations do not allow us to check the  $2447\pm 12$  B.C. date for the Exodus down to the year, or even down to the decade, using this single radiocarbon result. We can legitimately conclude only the following:

1. The  $2447\pm 12$  B.C. date for the Exodus from modern Biblical chronology checks with a single radiocarbon date from Phiops II tomb

within measurement uncertainties, and

2. The  $2447\pm 12$  B.C. date for the Exodus seems unlikely to be more than about a century too old, or more than about a decade too young according to this radiocarbon check.

## Conclusion

The fact that the modern Biblical chronology date for the Exodus checks with this radiocarbon date from Phiops II tomb is very good news, of course. When one considers that the Biblical chronology date of the Exodus was out by a full thousand years just a little over a decade ago, there is obviously significant cause for rejoicing—very substantial progress has been made.

But we must not rest on our laurels, of course. We can, and must, do better yet. Many of the limitations with this single radiocarbon check could be overcome by radiocarbon dating other samples from other Exodus contexts, as discussed above. *The Biblical Chronologist* exists for just such a purpose. Our aim is to bring about suitable additional radiocarbon dates as rapidly as possible.

The Exodus did indeed happen—it happened  $2447\pm 12$  B.C. according to modern Biblical chronology—and this fact of history cannot be undone by any amount of modern Biblical archaeological muddlement.  $\diamond$

## Readers Write

Dear Dr. Aardsma,

Thank you for the copy of the issue on aging [*BC* Volume 8, Number 1]. You present the problem of aging in a logical way. Can it be solved? . . .

Regarding the age “600” of Noah you state was the oldest he reached (or went beyond) for having children, I am not going to correct you even though it refers to age 500 in Genesis 5. . . .

Ken Klarner

Appleton, WI

Dear Ken,

The question of whether the problem of aging can be solved can be answered with an unequivocal yes—Isaiah 65:20 assures us of this fact. Whether *now* is God's time for this mystery to be revealed is quite another question. Time will tell.

You are quite right about the “600”. It should have been “500”. I referenced Genesis 5:32 in the article, which quite clearly says 500, and then, by mistake, typed 600, Noah’s age at the coming of the Flood, rather than 500, his age when he fathered Shem, Ham, and Japheth. Thank you for pointing this out. I am sure other readers wondered about it too.

Gerald E. Aardsma, Ph.D.  
Loda, IL

Dear Dr. Aardsma,

I just read an article in *Biblical Archaeology Review* called “Exodus Itinerary Confirmed by Egyptian Evidence” (Sept./Oct. ‘94) which traces city lists in Numbers 33, Joshua 10:36 and Judges 4–5 as recorded in Egyptian sources. The main chronological thesis is that these Egyptian lists are from the Late Bronze Age—1500 to 1300 B.C. This makes the Bible record [of the Exodus/Conquest at the traditional dates] seem to be “verified”. However, the digs they mention seem to require that these cities were uninhabited or destroyed in the 1500 to 1300 BC period and only “existed” in *ca.* 900 B.C. – very late [and contrary to the traditional dates of the Exodus/Conquest].

The question, then, is do you know if any of the digs mentioned in the article are complete enough to go back your extra 1000 years? I.e., if any of these digs showed evidence of existence and or destruction in 2400/2300 B.C. it would support your chronology. What do you think?

William Francis  
Alpine, CA

Dear William,

Yes, the archaeological evidence from the first two of the three cities discussed in this article by Charles R. Krahmalkov does support the missing millennium chronology.<sup>22</sup> (The third city, Qishon, is not mentioned in the Bible in connection with the Exodus/Conquest.) The first two cities, Dibon and Hebron, tell the same story as Jericho and Ai. That is, they are cities which, according to the archaeological evidence, were uninhabited at the traditional 1400–1200 B.C. dates for the Conquest

<sup>22</sup>Charles R. Krahmalkov, “Exodus Itinerary Confirmed by Egyptian Evidence,” *Biblical Archaeology Review* 20.5 (September/October 1994): 54–62, 79.

(Late Bronze Age), but which were clearly inhabited 1000 years earlier (at the close of Early Bronze III) as the missing millennium chronology requires.

The first is Dibon, east of the Jordan, mentioned in Numbers 33, where the invading Israelites are said to have encamped. The excavation of Tell Dhiban, ancient Dibon, has revealed no city there in the Late Bronze Age II (c. 1400–1200 B.C.E.), when the Exodus supposedly occurred. Indeed, nothing was found there earlier than the ninth century B.C.E. How could the Israelites encamp at (and presumably conquer) a city that didn’t exist?<sup>23</sup>

From *The New Encyclopedia of Archaeological Excavations in the Holy Land* we find:

There is evidence for an Early Bronze Age occupation of the mound. At the southeast corner, a few sherds of this period (mostly from the Early Bronze Age III) have been found. These are mixed with later Iron Age sherds and apparently are not associated with any structures. Farther to the north, however, pure Early Bronze Age levels resting on bedrock have been reported and, in the northeast, a section of a curved and sloping wall and possibly a gate dated to this period.

After an apparent gap in occupation, there is important evidence for Moabite occupation (possibly as early as Iron Age I) on the summit of the mound.<sup>24</sup>

This shows both that the Early Bronze III strata required by the missing millennium chronology are present at Dibon, and that the Late Bronze strata required by the traditional dates for the Exodus/Conquest are absent.

Krahmalkov continues:

<sup>23</sup>Charles R. Krahmalkov, “Exodus Itinerary Confirmed by Egyptian Evidence,” *Biblical Archaeology Review* 20.5 (September/October 1994): 55.

<sup>24</sup>A. D. Tushingham, “Dibon,” *The New Encyclopaedia of Archaeological Excavations in the Holy Land*, vol. 1 (New York: Simon & Schuster, 1993), 350.

The second site is Hebron. According to the Bible, Moses sent spies to reconnoiter Hebron in preparation for the Israelite invasion: “And they went up into the Negeb and came to Hebron” (Numbers 13:22). When the invasion came, Hebron was a principal target (Joshua 10:36–37, 11:12 [sic; 11:21 possibly intended]; Judges 1:10). Again the skeptics call on the archaeologist to support their case: There was no city at Hebron in the Late Bronze Age.<sup>25</sup>

From *The New Encyclopedia of Archaeological Excavations in the Holy Land* once again we find:

Settlement continued through the early Bronze Age II–III, but no remains have been excavated as yet. . . .

During the Late Bronze Age, the city of Hebron was abandoned; . . .<sup>26</sup>

So score two on two for the missing millennium chronology, and zero on two for the traditional chronology.

Having said this I feel I need to add that I don’t find there is any real contest between these two chronologies any longer, at least as far as the evidence is concerned. In terms of evidence, it is unquestionably the case that a millennium has accidentally been dropped from the text of 1 Kings 6:1 in antiquity. Said another way, traditional Biblical chronology prior to 1000 B.C. is unquestionably wrong and should simply be discarded—one needs to restore 1000 years to 1 Kings 6:1 to get Biblical chronology right. How to get this simple chronological fact into the heads of Biblical archaeologists so they stop maligning Biblical historicity, and into the hands of lay Christians so they can defend their faith intelligently against the present barrage coming out of Biblical archaeology, are the only remaining difficulties.

Gerald E. Aardsma, Ph.D.  
Loda, IL ◊

<sup>25</sup>Charles R. Krahmalkov, “Exodus Itinerary Confirmed by Egyptian Evidence,” *Biblical Archaeology Review* 20.5 (September/October 1994): 55.

<sup>26</sup>Avi Ofer, “Hebron,” *The New Encyclopaedia of Archaeological Excavations in the Holy Land*, vol. 2 (New York: Simon & Schuster, 1993), 608.

## Biblical Chronology 101

*I’ve asked my eldest son, Mark, to step into “class” this session and introduce us to a new tool he is putting together for us on the web. I am personally very excited about this new tool. Here’s Mark.*

### Introducing *Persona*

In the fall of 1999 I was a sophomore in the communications program at Moody Bible Institute in Chicago. Adam Crumpton, my good friend and unofficial roommate at the time, was working through a large book on the history of art, and another thick volume called (as I recall) *A History of the World*. I was reading Francis Schaeffer’s *How Shall We Then Live*, a historical review of western thought as it relates to the Christian worldview. We felt we needed a way to store and organize the mass of historical facts we were reading so we could find and use the information at a later date.

Adam and I began to visualize a computerized database of historical information. Adam, believing that history centers around persons, suggested the name “*Persona*” for this database. This seemed fitting since *persona* means a person as a character in a story.

From the start Adam and I wanted *Persona* to be able to generate custom timelines from the historical facts stored in its database. Geography, the study of the surface of the earth, is inherently spatial. It involves the use of physical coordinates to indicate the positions of places on earth. Although it is possible to communicate geographical information in words or lists of numbers, the graphical nature of maps makes it much easier to understand and learn geography. Similarly, history, the study of the past, is inherently chronological. It involves the use of calendar dates to indicate the positions of events in time. The “maps” of chronology are timelines. Just as good maps are helpful when studying geography, good timelines are helpful when studying history—including, of course, Bible history.

Adam and I quickly imagined web-based timelines that could be navigated, zoomed, and scrolled according to the user’s interest and preference.

Now, almost three years later, our ideas are becoming reality. This month the beginnings of *Persona* are accessible on *The Biblical Chronologist* web site. I’ve entered the facts that are most

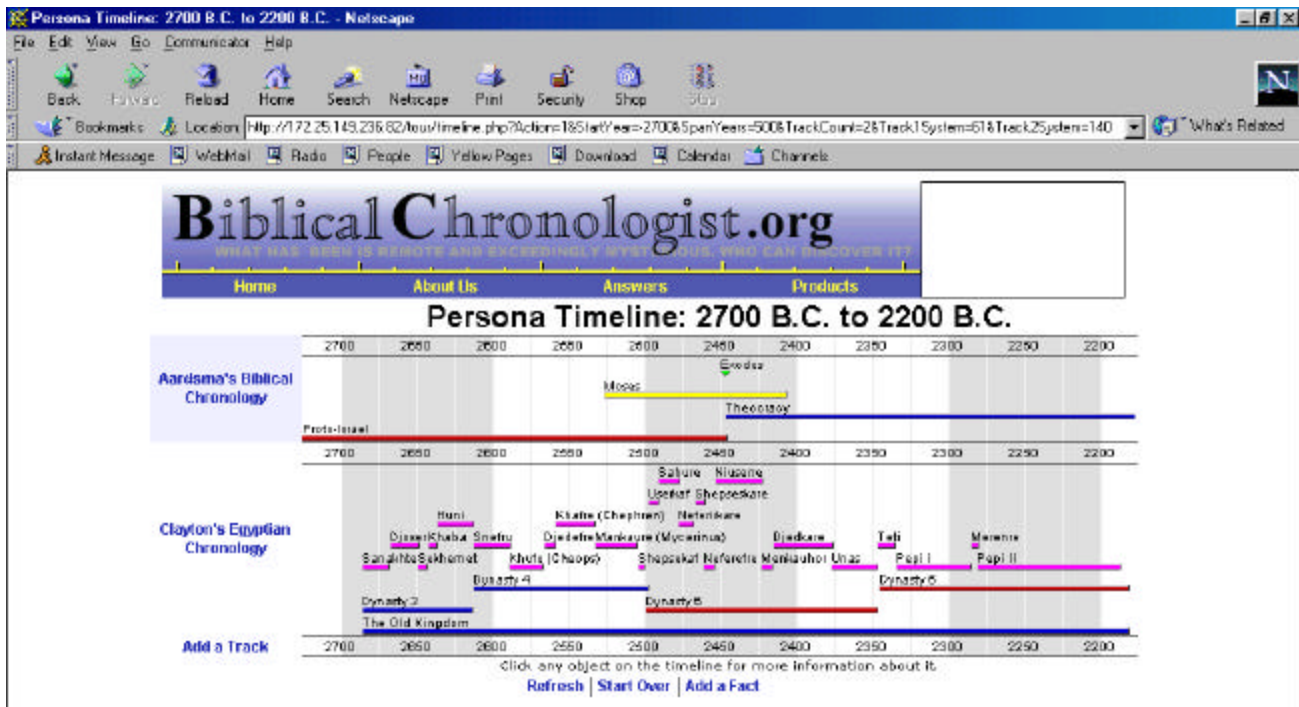


Figure 4: Screen shot of *Persona* in an early stage of development on the Biblical Chronologist web site.

relevant to this issue's discussion of the date of the Exodus and Old Kingdom Egyptian chronology into the *Persona* database. You can use *Persona* to view and browse this information at [www.biblicalchronologist.org](http://www.biblicalchronologist.org).

This is just a beginning. The goal is to make it possible for users to input chronological information of interest to themselves. A typical example might be genealogical records from your family tree. Once entered, the information would then be easily viewable as a timeline on your computer screen, and easily compared with other timelines, such as your spouse's family tree, or the history of America. As another example, teachers and students of history could enter information relating to a project or theory, and then compare this information with other archaeological data or radiocarbon dates.

My desire is that *Persona* should contribute significantly to the ongoing research efforts of *The Biblical Chronologist*. I also desire to see it contribute significantly to effective communication of the truth about Bible history. I hope to develop *Persona* into a tool that is broadly useful for organizing, accessing, and presenting historical information of all sorts. By making it easier to "see" history and to see ourselves as part of history, I am hoping *Persona* will contribute to effective integration of historical truth into our lives today.

You are invited to be among the first to log on to *Persona* and learn to navigate it. There's a small amount of useful historical information to be found there already, and much more to come. ◊

*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.

An introductory packet containing three sample issues and a subscription order form is available for \$9.95 US regardless of destination address. Send check or money order in US funds and request the "Intro Pack."

*The Biblical Chronologist* (ISSN 1081-762X) is published six times a year by Aardsma Research & Publishing, 412 Mulberry St., Loda, IL 60948-9651.

Web address: [www.biblicalchronologist.org](http://www.biblicalchronologist.org).

Copyright © 2002 by Aardsma Research & Publishing.

Duplication or distribution in whole or in part by any means electronic or otherwise is strictly prohibited without written permission from the publisher.