

RESOLVING CHRONOLOGY OF THE 2nd MILLENNIUM B.C.

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Several puzzling problems of Canaanite archaeology and Hyksos times can be resolved by looking for Israel's Exodus and entry into Canaan rather earlier than has been commonly considered.

Key findings include: The Mediterranean campaign of Ur-Nammu, king of Ur and Sumer, fourteen years before he died, corresponds well to the campaign of Amraphel, king of Shinar, fourteen years before Abram's victory over him. Nearly 430 years later, Moses would have been contemporary with Pharaoh Khyan/Iannas (as attested in the N.T.); hence the Exodus from Egypt in B.C. 1615 must have begun the decline of the Hyksos kings. The once unexplained end of the Middle Bronze age in the mid-16th century B.C. is readily explained by the Israelite invasion of Canaan. The Habiru threat of the el-Amarna letters apparently follows the contemporary victories of Deborah/Barak and Gideon. The Biblical accounts appear both reliable and precise.

Introduction

Israel's Exodus from Egypt and entry into Canaan are central to its early history. Over the past many decades scholars have argued only whether it was around the time of Thutmose III (mid-14th century B.C.) or around the end of the reign of Ramesses II (c. BC1237-1212). Abetted by lack of positive evidence for the former and by progressive lowerings of the reigns of the kings of the United Monarchy, the latter has been strongly favored of late. In the light of Palestinian archaeology, this view has made it fashionable to doubt the conquest tradition of Israel, or that any pre-Kings historical details should be taken more seriously than, say, the bizarre Gilgamesh Epic. In particular, chronologies of the period of the Judges and of Israel's sojourn in Egypt have been in chaos.

Nine centuries of chronological problems can be resolved by looking for Israel's history two to four centuries earlier than currently popular. Beginning with Abram (later Abraham), half a dozen interactions between Israel and contemporary peoples fall effortlessly into place.

The Battle of the Kings (Ge 14)

The puzzlement of the battle of the kings in Genesis 14 may be resolved by looking for it around the 21st century B.C.

Rank	Eastern	[postulated equiv.]	Western
1 → 3	Amraphel/Shinar	[Ur-Nammu/Sumer]	Bera/Sodom
2 → 4	Arioch/Ellasar	[Eri-aku/Larsa]	Birsha/Gomorrah
3 → 1	Chedorlaomer/Elam	[Kutir-Lagamer/Elam]	Shinab/Admah
4 → 2	Tidal/Goim	[Tidalmesh/Gutium]	Shemeber/Zeboim ? /Bela (=Zoar)

Over the 14 years between the wars, either Elam and Gutium have risen in influence relative to Sumer and neighboring Larsa (deduced from the change in sequence of names), or Abram left Amraphel's tributaries for Chedorlaomer's.

Lugal-zaggisi of Umma, perhaps two centuries before Ur-Nammu, is the first king known to have taken his army to the west and reached the Mediterranean Sea. [He conquered Larsa and can therefore hardly be the *Amraphel* who was allied with Larsa as a near equal.] The next century was dominated by Akkad; then for 93 years no Gutian ruler reigned as long as 14 years. Finally, Utu-khegal, king of Uruk and all Sumer and Akkad, conquered Gutium, and also squelched the territorial ambition of his vassal Ur-Nammu, king of Ur. When Utu-khegal died, Ur-Nammu claimed the kingship of Sumer and reigned 18 years. (Ur-Nammu composed the oldest known written code of laws and commenced construction of the great ziggurat at Ur, similar to the Tower of Babel.) A date-formula is preserved concerning his 4th year "which proclaims that 'he made straight the road from below to above,' which can be understood to mean a march from the lower sea [Persian Gulf] to the upper sea" [the Mediterranean, on the north Syrian coast].¹ Fourteen years later he apparently died in battle. Subjection of the West apparently ended with Ur-Nammu.

Ur-Nammu was succeeded by his son Shulgi for 48 years (not ruled out as *Amraphel*, but historically and linguistically less attractive). As in Appendix A, the following two kings reign only for 9 years each, while the 25 years of Ibbi-Sin represent decline, rather than a time for distant offensives [in his 9th year he was at war with Elam, and Larsa successfully rebelled]. Thereafter, the kings of Larsa are known until the time of Hammurabi of Babylon (none linguistically akin to *Arioch*; nor would there have been separate kings of Larsa and Sumer during the Isin-Larsa period). Hammurabi's defeat of Elam removed them from the scene of Sumer and points west. Thus, only the Third Dynasty of Ur can likely answer to "*Amraphel king of Shinar*," and Ur-Nammu is the obvious choice.²

¹ CAH₃ ["Cambridge Ancient History," 3rd edn.] v.I, Pt.2, p597. See also Piotr Steinkeller, "The Date of Gudea and His Dynasty," *J. Cuneiform Studies* 40, p47-53 and footnote 22 (1988).

If Ur-Nammu early in his reign captured Puzur-Inshushinak of Elam, then the latter would have been succeeded directly by Kutir-Lagamer. [The telescoping of ancient chronologies seems relentless now, especially in the 3rd millennium B.C.]

² Sitchin also looks for Amraphel in the 3rd dynasty of Ur but apparently accepts Rowton's preference for the Middle Chronology in CAH₃ v.I, Pt.1, p232. However, Amar-Sin's 9 years is shorter than Amraphel's ≥14 years,

The death of Ur-Nammu was 308 years before Hammurabi's first year (or 307 years before his accession).³ In addition to Jacobsen's chronology, Yadin⁴ distinguishes five currently-supported sets of dates for Hammurabi's reign:

<u>Chronology</u>	<u>Hammurabi</u>	<u>Archaeological Period</u>	<u>Ur-Nammu</u>
T. Jacobsen (1939)	BC 2067-2025	Middle Bronze I	2392-2375
ultra high chronology	c.1900-	Middle Bronze IIA	c.2225-2208
high chronology	1848-1806	1900-1750	2173-2156
middle chronology	1792-1750		2117-2100
low chronology	1728-1686	Middle Bronze IIB	2053-2036
very low chronology	1704-1662	1750-1650	2029-2012

Yadin (noting that the Mari letters, contemporary with Hammurabi, often mention Hazor, most of which city is without evidence of occupation in the Middle Bronze IIA or earlier) rules out the high chronology and older, and probably the middle chronology also.⁵

The most likely date for the death of Ur-Nammu is BC 2036.⁶

Shortly after the slaying of "Amraphel" and the other three kings, Abram was promised a son of his own (Ge 15-16). Inferred from the 19th-century Bowen chronology,⁷ Ishmael was born two years later in BC 2034.

and, as Sitchin notes, ally Larsa had already lost sovereignty to Elam. Therefore, it is better to use the Low Chronology. [Zechariah Sitchin, "And it Came to Pass, in the Days of Amraphel King of Shin'ar: Biblical Veracity and Non-biblical Chronology;" *Catastrophism and Ancient History* XII, 1, p49-53 (1990). See also note on p55.]

³ Thorkild Jacobsen, "The Sumerian King List;" *Assyriological Studies* No. 11; Univ. of Chicago Press, 1939.

⁴ Yigael Yadin, "Hazor, the Rediscovery of a Great Citadel of the Bible;" New York: Random House, 1975. p144. Dates inferred for Ur-Nammu sometimes differ slightly from those scaled directly from Hammurabi's dates: For the middle chronology CAH₃ gives 2113-2096; for an unstated chronology R.T. Boyd gives 2044-2007.

⁵ Yadin, *loc. cit.*, notes that Hazor is already mentioned in the days of Shamsi Adad I, who died about 30 years earlier than Hammurabi.

⁶ It is recognized that the calibrated radiocarbon scale (calibration based here solely upon the bristlecone pine) is 475 years older than the "B.P." scale ["Before Present" A.D.1950]. Gordon W. Pearson and Minze Stuiver, "High-Precision Calibration of the Radiocarbon Time Scale, 500-2500 B.C.;" *Radiocarbon* 28, 2B, 1986; p839-862. The single standard is a timber not later than the 3rd year of Ibbi-Sin, of apparent B.C. 1993(±106). [Ur-Nammu died 69 years before the 3rd year of Ibbi-Sin.] In the el-Amarna period (c. B.C. 1370) the calibrated radiocarbon dates are fairly precise but are not consistently accurate to better than ±200 years; accuracy is expected to degrade somewhat as the dates become still older. With some qualms, the radiocarbon dates of this period (c. B.C. 2000) are ignored.

⁷ See Appendix C. Of several chronologies compared, this one alone fits the entire period BC2100-1200. Ussher would place it 124 years later.

It remains to ask whether Abram had known Ur-Nammu in Ur, and whether the latter might have influenced Abram's decision to depart.

Joseph and the Pharaohs

Consistent with the above birth of Ishmael after the battle of the kings, the events of Joseph's life would be dated

Joseph		Egypt (capital near Memphis)	
born	BC 1869	12th Dynasty begins	BC 1991
sold into Egypt	c. 1852	Khakaure Sesostris III	1878-1843
imprisoned	c. 1845		
butler/baker imprisoned	1841	Nymare Ammenemes III	1842-1797
becomes vizier	1839		
years of famine	1831-1825		
buries Jacob	1813	12th Dynasty ends	1786
dies	1759		

Thus, Joseph's slavery in Egypt and imprisonment would have taken place in the latter part of Sesostris III's reign. Early in the next reign, it is likely that a stomach upset led to Ammenemes III suspecting his cupbearer and executing his baker. Zaphenath-paneah [Joseph] would have become vizier (second in command) in Ammenemes' 4th year, and he probably continued in office for sixteen years after burying Jacob in southern Canaan.⁸

The autocratic Sesostris III, departing from the peacefulness of his two predecessors, warred ruthlessly and successfully three times to expand his boundaries in Nubia to the south, and later he penetrated Canaan as far as Sekmem – probably Shechem.⁹ [Southern Canaan was likely still under Egyptian control when Jacob was buried there a generation later.] Potiphar [Ptah-per?] the captain of Pharaoh's guard, likely had one of the highest positions in Sesostris' kingdom (which would have exposed Joseph to the mechanics of government).

⁸ Ammenemes III's 4th-18th years apparently have left no records in the basalt quarries at Hammamat (or elsewhere). The 5th-18th years would correspond to Joseph's seven years of plenty and seven years of famine. When the quarry was reactivated in his 19th year, "The material taken out was intended for a place or building Enekh-Amenemhet, *'Life of Amenemhet.'*" If this circumstantial match of archaeology with Genesis is valid, it is also chronologically precise.

Parker's 12th-Dynasty chronology is properly questioned for correlating only 2 or 3 of six entries in the left column of Document D (Berlin Museum Papyrus 10056), and for being one year early on the heliacal-rising-of-Sothis prediction in the 7th-year of Sesotris III (III *prt* 16 should fit one of the four years BC 1871-1868, but apparently would have been one day late in BC 1872. Rolf Krauss' solution postulates the observatory was at Elephantine (at the southern boundary of Egypt, 400 miles south of the capital and ten times farther away than Heliopolis), but it fails on 5 of 6 entries in Doct. D and requires poor visibility more than 20% of the time in the sunniest region on earth! Ulrich Luft's solution misses on all six entries in Doct. D, is 2 years late on the heliacal rising of Sothis, and to get a really good fit of the data requires an incredible amount of poor visibility. While Parker's chronology is necessarily tentative, it is still preferable. See Lynn E. Rose, "The Astronomical Evidence for Dating the End of the Middle Kingdom of Ancient Egypt to the Early Second Millennium: A Reassessment," *JNES* 53, 4, p.237-261 (October 1994).

Curiously enough, Krauss' date for Sesostris III would work equally well chronologically for Joseph, though with a less likely Pharaoh. R. Krauss, "Das Ende der Amarnazeit" and "Sothis- und Mondaten," *Hildesheimer ägyptologische Beiträge* 7 and 20; Hildesheim, 1978 and 1985. Luft's date would be less attractive.

Joseph likely made no monument for himself (Ge 50:25).

⁹ James Henry Breasted, "Ancient Records of Egypt" [ARE]; 1906 [reprinted London: 1988] Vol. I, para. 680, "Sekmem had fallen, together with Retenu (Rtnw) the wretched, while [Sebek-khu] was acting as rear-guard." Ammenemes III was "opening the land of the Asiatic" in his 2nd year (para. 707).

With the advent of Ammenemes III, a new emphasis appears. The nomarchs (provincial governors) became immensely wealthy early in his reign but were later impoverished (yet without sign of civil unrest). “The growth of national prosperity under the pharaohs of the Twelfth Dynasty reached its peak during the long and peaceful reign of Sesostris III’s son, King Nymare Ammenemes III (1842-1797 B.C.). With Nubia completely under control, Egyptian suzerainty acknowledged by many of the princes of Western Asia, and the provincial nobles no longer a threat to the power of the central government, the king now turned his attention wholeheartedly to the economic expansion of his country and concentrated his energies on increasing the production of the mines and quarries, studying and improving the irrigation system, and carrying forward the plans of his predecessors for the development of the Faiyum” [a major new agricultural region, adding about 90 km²]. “Before his death in 1797 B.C. King Ammenemes III had not only raised Egypt to new heights of wealth and power but had seen his name honoured on monuments from Byblos on the Syrian coast to Kerma above the Third Cataract of the Nile - a scope of influence achieved by few of his predecessors and not many of his successors. He was, however, the last great ruler of the Middle Kingdom and his reign was followed by a decline which opened the way to an Asiatic overlordship of Egypt and the dark days of the Hyksos Period.”¹⁰ Thus, the circumstances are favorable to Joseph/Zaphenath-paneah having been vizier, stressing agriculture and prosperity, over the greater part of Ammenemes’ reign.

A new dynasty could then easily account for “Now there arose a new king over Egypt, who knew not Joseph” (Ex 1:8).

Selection of the Low chronology of Sumer and the Parker chronology of the 12th Dynasty makes it possible to propose the following solution to some Middle Kingdom mysteries:

Date	Proposed History	Question Resolved
≥1852	Potiphar, chief of the executioners, buys a Hebrew slave – Joseph	[Not recorded in Egyptian history]
ca. 1844	Joseph put in King's prison/It-towe (Lisht); learns unpublished details of government?	[Not recorded]
1843	Khakaure Sesostris III dies. (Potiphar possibly demoted in favor of new king's choice.)	–
1841	Ammenemes III (gets food poisoning and imprisons his butler and baker; baker is found guilty and executed.	[Not recorded]
1839	Joseph/Zaphenath-paneah becomes chief vizier (for internal affairs): idles the stone quarries in favor of building granaries; opens up new farmland (especially in the Fayum).	Why does Ammenemes III cease warring early in his reign and become a peaceful king? Why were the stone quarries at Hammamat idle after the 3rd year of Ammenemes III? Why was 90 Km ² of new farmland drained and put into service in the Fayum district (around Lake Moeris)?
1838-1832	Banner years for farming. Nomarchs become immensely wealthy, at the expense of the national treasury. Ammenemes is a hero for providing farm price supports.	Why are the tombs of the nomarchs so extravagant early in the reign of Ammenemes III?

¹⁰ CAH₃ v.I, Pt.2, p509-512.

1831-1825	Famine years internationally. Nomarchs and general population become impoverished, as Ammenemes becomes fabulously wealthy. But all Egyptians/Canaanites have food from the national storehouses. Egypt is major grain exporter. Ammenemes is a hero both domestically and internationally. Jacob comes to Egypt in BC 1830 and settles in Goshen, in the eastern delta.	Why do the grandiose tombs of the nomarchs disappear from the latter part of the reign of Ammenemes III? [BC 1830 ± 50 was an abnormally warm period; what were the consequences?]
1824	Joseph reopens stone quarries at Hammamat. Plans begin for two great statues at the gateway to the Fayum – at an investment that paid off well. The district becomes known as Enekh Amenemhet – <i>Life from Ammenemes</i> .	Why were the stone quarries at Hammamat reopened in the 19th year of Ammenemes III? What was the reason for the two great statues of Ammenemes III at the entrance to the Fayum? What was Enekh Amenemhet?
1797	Nymare Ammenemes III dies; Joseph was likely retired at age 72.	–
1786	Youth never knew the famine, are discontent with poverty. Hyksos overthrow Dynasty XII, are therefore enemies of Joseph and relatives.	Why did the Middle Kingdom end so suddenly after Ammenemes III?

Israelite Slaves and the Hyksos Kings

Consistent with the above dates for Abram/Ishmael and Jacob/Joseph, the Exodus should have taken place B.C. 1615, Nisan 15 [Julian May 2 (or 3)].¹¹ This is the era of the Great Hyksos kings, the *Asiatics*, whose memory subsequent dynasties have attempted to eradicate.

There is now a logical explanation of this hatred of the Hyksos, and of the *barbarians* in the later Hatshepsut inscription:

“I have restored that which was ruins,
I have raised up that which was unfinished,
Since the Asiatics [Hyksos] were in the midst of Avaris¹² of the Northland,

¹¹ The 430 years is taken to include all the sojourning from the time Abram left Haran (the Samaritan and Septuagint unambiguously add “and in Canaan” to Ex 12:40-41), in which Gal 3:17 concurs.

¹² Avaris, situated midway down the Bubastite branch of the Nile Delta, was originally built by the Hyksos (though not necessarily by those of the 15th Dynasty) c. B.C. 1720, by implication about 24 years before the birth of Moses. It was later rebuilt by Ramesses II and renamed “per-Ramesses” (Ex 12:37, Nu 33:3-5). After the Hyksos, the 17th and 18th Dynasty kings reigned from Thebes in Upper Egypt, too far from Goshen for the communications described in Exodus. Not again until the 19th Dynasty (including Ramesses II) do the kings reign from the Delta, but that leaves too few centuries to make sense of the Judges (Deliverers) period. [Pentateuch references to the capital city of “Rameses” appear to be an intentional anachronism.]

Manfred Bietak has been excavating Avaris [Tell el Dab^a, which is in Goshen]. Tentative approximate datings compare as follows:

<u>Condition</u>	<u>Level</u>	<u>Bietak</u>	<u>Dever</u>	<u>This paper</u>
Hyksos city [ending in destruction]	E/3 ⁺ -D/2	1680-1530	1800-1525	1678-1570
New town plan	F	1710-1680	1825-1800	1720-1678
Palestinian materials	G/4-1	1770-1710	1875-1825	≥1785-≥1720
Middle Kingdom materials [ending in destruction]	H	1800-1770?	1950-1875	≥1991-1786

And the barbarians [Israelites] were in the midst of them.
Overthrowing that which was made...”¹³

The Egyptians considered the country ruined already some months before the Exodus (Ex 10:7) and would logically have considered the Israelites to be terrorists, or barbarians. Just as modern presidents and prime ministers are blamed for national disasters, so the Hyksos came to be hated back then. Lacking reliable and complete records for this 15th Dynasty, from the Turin Canon and the citations of Manetho, it may be suggested:

<u>King</u>	<u>Reign</u>	<u>Possible Dates</u>	<u>2Tm 3:8</u>
Saite[s]	19	c.1690-1671	–
Meruserre Yakubher [Bnon?]	8?	c.1671-1663	–
Apachnan	?	c.1663-1657	–
Seuserure Khyan [Iannas]	c.39	1657-1618	Iannes
Mayebre Sheshi [As-sis]	3?	1618-1615	Iambres
Auserre Apophi[s]	<u>40+x</u>	1615-1570	–
	>108?		

We also have an explanation of Paul’s “Iannes and Iambres [who] withstood Moses:” Ianna[s], the strongest and most famous of the Hyksos kings, was the king from whom Moses fled forty years, while Iam-bre[s] [May-ebre] was the over-ambitious king who died at the Exodus.

The Israelite Invasion of Canaan

Following the BC1615 Exodus date, the entry into Canaan would have come BC1575 Nisan 10, with the fall of Jericho at the end of the month. Thereafter, the main war would have lasted 5-6 years, with lesser battles for several years more in the south. This period of time coincides with the end of the Middle Bronze Age, variously estimated in the range BC 1580-1550.¹⁴ Weinstein¹⁵ and

Manfred Bietak, “Egypt and Canaan During the Middle Bronze Age;” *BASOR* **281**, p27-72 (Feb. 1991).
William G. Dever, “Tell el Dab’a and Levantine Middle Bronze Age Chronology: A Rejoinder to Manfred Bietak;” *BASOR* **281**, p73-79 (Feb. 1991).

¹³ James Henry Breasted, “Ancient Records of Egypt,” 5 vols.; 1906-1907; v.II, para. 303. Against W.M. Mueller, Breasted argues that “them” is parallel to “Northland” and that barbarians and Asiatics can be the same people. But the parallelism would be to “Avaris of the Northland,” which seems too localized to sustain his argument. Rather, it would seem the fears of the 13th Dynasty had been realized - “the people of the children of Israel are more and mightier than we...” (Ex 1:9-10): 240,000 Hyksos faced 600,000 Israelite men (including the mixed multitude), per Manetho and Ex 12:37.

¹⁴ Bimson and Livingston proposed that Israel’s conquest of Canaan ended the Middle Bronze Age, but at a date close to BC1400. Halpern’s sarcastic official rebuttal defended the generally-accepted mid-16th century end of the Middle Bronze Age. The conquest of Canaan fits the early mid-16th century B.C.; so the principal point of each article is correct. John J. Bimson and David Livingston, “Redating the Exodus;” *BAR* **13**, Sept. 1987, p40-68. Baruch Halpern, “Radical Exodus Redating Fatally Flawed;” *BAR* **13**, Nov. 1987, p57-61.

The conflict is repeated for Jericho, where Bryant Wood shows a remarkable fit between the archaeological evidence and the account in Jg 6, but opts for a date near BC 1400; Bienkowski defends a date nearer BC

others list over two dozen cities already identified as destroyed in the 16th century B.C., typically mid-century.

Cities Destroyed in the 16th Century B.C.

Jericho [Tell-es-Sultan]	Hazor [Tell el-Kedah]
Bethel [Beitin]	Dan [Tell el-Qadi]
Hebron [Mazar]	Achzib [ez-Zib]
Lachish [Tell ed-Duweir]	Acco [Acre, Tell el-Fukhkhar]
Debir =Kirjath-Sepher [Tel Beit Mirsim]	Aphek (15th C) [Tell Ras el-Ain]
Tel Malhata	Tell Megadim
Tell el-Far ^a ah(S.) (Sharuhēn?)	Beth-shean(?) [Tell el-Husn]
Tell el- ^a Ajjûl (Sharuhēn??)	Ta ^a anach [Tell Tiinik]
Eglon [Tell el-Hesi]	Dothan [(Boyd)]
Tell en-Nagila (by Lachish)	Tirzah [Tell el-Far ^a ah(N.)]
Ashkelon [Tell el-Hader]	Shechem [Tell Balatah]
Beth-zur [Khirbet et-Tubeiqeh]	
Beth-shemesh [Tell er-Rumeileh]	
Gezer	
Shiloh [Khirbet Seilun]	
{Gibeon [el-Jib]}	

“If an inference may be drawn from the considerable number of site destructions that...are to be ascribed to the end of the Middle Bronze Age, it is likely that they were due to attacks by the groups of Asiatics displaced from Egypt at this stage.”¹⁶

“And these are the kings of the land whom Joshua and the children of Israel smote beyond the Jordan westward” (Josh 12:7-23):

1550. Bryant G. Wood, “Did the Israelites Conquer Jericho?,” *BAR* **16**, March 1990, p44-59. Piotr Bienkowski, “Jericho Was Destroyed in the Middle Bronze Age, Not the Late Bronze Age,” *BAR* **16**, Sep. 1990, p45-46, 69. Bryant G. Wood, “Dating Jericho’s Destruction: Bienkowski is Wrong on All Counts,” *BAR* **16**, Sep. 1990, p45-49, 68-69. Wood’s evidence and Kenyon’s dating need not be mutually exclusive. Correlation with the other datings in this paper favors a destruction of Jericho by Joshua, but at a date nearer BC 1550, viz. BC 1575.

It is noteworthy that the Jericho radiocarbon date of "BC1410±40," published in 1983, when corrected for the new calibration scale, is BC1339 +67/-75 (i.e., a span of BC1406-1264), for specimen BM1790. Fourteen other Middle-Bronze specimens show median calibrated dates no more recent than BC1514. The lone Iron-Age specimen BM1791 yields BC36 +54/-54, which clearly seems five centuries too late. Thus, the argument for a late Middle-Bronze radiocarbon dating based solely on BM1790 seems weak. See Appendix B. [Kathleen M. Kenyon and Thomas A. Holland, “Excavations at Jericho,” Volume 5: “The Pottery Phases of the Tell and Other Finds,” London: BSAJ, 1983. Gordon W. Pearson and Minze Stuiver, “High-Precision Calibration of the Radiocarbon Time Scale, 500-2500 BC,” *Radiocarbon* **28**, 2B, p839-862 (1986).]

¹⁵ James M. Weinstein, “The Egyptian Empire in Palestine: A Reassessment,” *BASOR (Bulletin of the American Schools of Oriental Research)* **241**, p1-28 (1981). Robert T. Boyd, “Tells, Tombs and Treasure;” New York: Bonanza Books, 1969 [source material for Dothan]. Amihai Mazar, “Archaeology of the Land of the Bible, 10,000-586 B.C.E.,” Anchor Bible Reference Library; New York: Doubleday, 1990.

¹⁶ CAH₃ v.II, Pt.1, p526. This expression hardly rules out the Israelites. Kenyon abandoned the idea that the Egyptian army may have caused the destruction, but the debate continues: James K. Hoffmeier, *Levant* **XXI**, p181-193 (1989) and **XXIII**, p117-124 (1991) [says, not the Egyptians], vs. William G. Dever, *Levant* **XXII**, p75-81 (1990) and James Weinstein, *Levant* **XXIII**, p 105-115 (1991).

List of Peoples Defeated by Israel under Joshua

Hittite Perizzite	Amorite Hivite	Canaanite Jebusite
Jericho	Debir	Tappuah
Ai	Geder	Hepher
Jerusalem	Hormah	Aphek
Hebron	Arad	Lassharon
Yarmuth	Libnah	Madon
Lachish	Adullam	Hazor
Eglon	Makkedah	Shimeron-meron
Gezer	Bethel	Achshaph
		Taanach
		Megiddo
		Kedesh
		Jokneam/Carmel
		Dor
		Goiim/Gilgal
		Tirzah

[Note that the defeat of the army of a city does not necessarily indicate whether or not the city was conquered or destroyed. The answer is often available only through archaeological excavation.]

Jericho: The entire city was apparently violently destroyed by fire at the end of the Middle Bronze Age and abandoned until at least BC1400. There is no evidence the walls were rebuilt until at least the ninth century B.C.; so the Joshua 6 account fits only the 16th century B.C. (or possibly long before).

Hebron: An important fortified city during Middle Bronze II, but destroyed and then abandoned c.1550-1200. [The utter destruction of the city (as well as the people) in Josh 10:37 may be taken to imply Hebron was the head of the south central military league.] Thus, the Joshua 10 account fits only the 16th century B.C.

Hazor: The city was burned about the same time as Jericho, though Hazor began rebuilding within a century. Israel burned only Hazor among the tells of the north, according to Josh 11:13. In contrast, the tells of Megiddo and Taanach were damaged at this time but not destroyed. [That Hazor was the capital of the northern cities, per Josh 11:10, is now recognized generally.] The regional capitol of Hazor was evidently rebuilt in time to be a power in the time of Barak (the el-Amarna period).

Following the death of Joshua, the conquest continued (mainly in the south), though likely at a slower rate:

<u>Book of Judges</u>	<u>Archaeology</u>
Bezek: captured the king	
Jerusalem: conquered and set on fire, but habitation uninterrupted	[destroyed, abandoned?]
Debir: conquered	[Tell Beit Mirsim destroyed, abandoned]
Hormah: destroyed	
Gaza-Ashkelon-Ekron regions: conquered	[destroyed?]
Bethel: “smitten”	[abandoned?]

Thutmose III warred in Palestine and Syria in most of his 22nd-42nd years (B.C. 1482-1462 or 1468-1448), beginning with victory at Megiddo and ten years later challenging the Mitanni kingdom

across the Euphrates.¹⁷ Likely these campaigns commenced while Israel was subjected to Moab; no contact with Israel is recorded. [Israel was not allied with Egypt's enemies: the Mitanni kingdom and its vassals in northern Canaan and Syria.]

¹⁷ If the Hittite king 'Kheta the Great,' who congratulated Thutmose after the Mitanni encounter, was Khantilish II, then "Cushan-rishathaim [Kushan the Very Wicked] king of Mesopotamia," sixty or so years earlier, was likely the Hittite king Khuzziyash I. The palace intrigue ascribed to him in CAH₃ v.II, Pt.1, p663, would certainly fit the Hebrew appellation. [Nevertheless, a Mitanni king would seem geographically more likely.]

A Chronology of the Israelite Judges

To proceed further with correlations between ancient history and the history of the Israelite period of the Judges [*lit.* Deliverers (from foreign oppressions)], it is necessary to reconstruct the chronology of the Judges.

Three key points are sufficient to fix a chronology of the Judges period; the rest is straightforward:

1. Jephthah's battle came in the 300th year after the entry into Canaan (Jg 11:26).

2. The Deborah/Barak victory came only weeks before Gideon's. In the formula, "And the children of Israel *again* did that which was evil in the sight of the LORD," the word "again" implies sequence in time. The word "again" is lacking only three times: Jg 2:11, 3:7 (both before the first time Israel was conquered), and 6:1 (following the Deborah account, and introducing the Gideon account). Therefore, we may assume Midian and Gideon did not come after Deborah and the subsequent forty years; rather it is the same forty years following both Deborah and Gideon (Jg 5:31 and 8:28).

3. It is here assumed [designated by "*"] that the last year of foreign rule is reckoned as the first year of relief gained by the Deliverer (and vice versa), much as King Saul used the non-accession year reckoning. (1Sam 13:1 would be better translated, "Saul was in his first [*regnal*] year when he began to reign.") But years ascribed to consecutive judges would then be reckoned as in an accession-year system, as used by the kings of Judah following Saul.

Proposed Chronology of Israel in the Time of the Judges

Avaris (near Faqus, Egypt) built	c.1720
Exodus of Israel from Egypt	1615
Israel enters Canaan	1575
Hyksos driven from Egypt	c.1570
Land divided for inheritance	1569
Hyksos capitulate to Egyptians at Sharuhén	c.1567
Cushan/Mesopotamia rules	1539*-1532
Othniel	1532*-1493
Eglon/Moab	1493*-1476
Ehud, Shamgar	1476*-1397
Jabin/Canaan in Hazor (in N.)	1397*-1378
Midian (in S. & E.)	1384*-1378
Deborah & Barak	1378*- ?
Gideon	1378*-1339
King Abimelech	1339*-1337
Tola	1337*-1315
Jair	1315 -1293
Ammon (in E.)	1293*-1276
Philistines (in S. & W.)	1293*-1276
Jephthah	1276*-1271
Ibzan	1271 -1264
Elon	1264 -1254
Abdon	1254 -1246
Philistines	1246*-1207
Samson	1207*-1188
Eli, Samuel	
Saul becomes king	1119*
Israel separates from Judah	1000

The end of the Judges period is taken to be 450 years after the land was divided among the tribes of Israel, or BC1119.¹⁸ (In accordance with best Greek manuscripts and early versions, translate Acts 13:19-20, “And when he had destroyed seven nations in the land of Canaan, he gave *them* their land for an inheritance, for about 450 years: also after these things [*destroying seven nations*] he gave *them* judges until Samuel the prophet.”)

As a partial check, if it is assumed Joshua was not older than Caleb (who outlived him), he died not later than 70 years after spying the land of Canaan, or BC1544. That would still be an ample five years before Israel was conquered the first time. (Josh 14:7, 24:29-31, Jg 1:12)

The Habiru of the el-Amarna Letters

The el-Amarna tablets, in the royal archives around the time of Akhenaten, were written to Amenophis III, Akhenaten, and Smenkhkare, usually assigned to c.1380 to c.1350 B.C. Nearly 300 of these letters are from vassal rulers in and around Canaan, pleading for help against the Habiru/Apiru overrunning the country and threatening their cities, and often also complaining of the treachery of other rulers supposedly loyal to the Egyptian king.

The above chronology of the Judges locates this time period early in the forty years after Barak’s and Gideon’s surprise military victories.¹⁹ Thus, the Israelite Hebrews can indeed explain the Habiru who conquered the Shechem region and threatened Urusalim [Jerusalem], Gezer, etc.

¹⁸ If the kings of the united monarchy seem to be too early for the contemporary kings of Egypt, it may be noted that the latter are dated from Solomon. “The Egyptian chronology for the 21st and 22nd Dynasties depends entirely on the Israelite chronology of that time, for which reason it has first to be determined how accurately Solomon’s reign can be dated.” Siegfried H. Horn, “Who Was Solomon’s Egyptian Father-in-Law?,” *Biblical Research* (Papers of the Chicago Society of Biblical Research) **XII**, 1967; p5. (Quotes E. Hornung, “Untersuchungen zur Chronologie und Geschichte des Neuen Reiches;” Wiesbaden, 1964, p24-25.)

There is an incompatibility between 1Ki 6:1 and Jg 11:26. In the former, the 480th year after the Exodus in BC1615 would be BC1136 for the 4th year of Solomon. In the latter, the 300th year after the victory over Heshbon (and Bashan) - in the same year as the entry into Canaan (reckoned according to Tishri 1, near the autumnal equinox) - would be BC1276. Thereafter, 30 years of judges, (Jephthah through Abdon), 40 years of Philistine domination, 20 years of Samson, some decades for Eli and Samuel, Saul’s reign (40 years in Ac 13:21), and 40 years of David’s reign [minus perhaps three years for non-accession-year type of reckonings]. Attempts at overlapping Samson, Eli and Samuel with the Philistine domination, and of foreshortening Saul’s reign, constitute “maybe, could have been” approaches. But the 450 years in Ac 13:19, from the division of the land for an inheritance until the accession of King Saul, would require a time much larger than 480 years from the Exodus to the 4th year of Solomon. [Counting 46 years from the Exodus to division of the land, 40 years each for Saul and David, and 4 into Solomon’s reign, would increase the total to 580 years. When it is recalled that Hebrew alphanumeric ends with the last letter tav=400, it is not unlikely that a simple scribal error would reduce 580 to 480, tav (+ qoph?) + pe {400 (+ 100?) + 80}.]

As a partial check, if it is assumed Joshua was not younger than Caleb (who outlived him), he died not later than 70 years after spying the land of Canaan, or BC1544. That would still be an ample five years before Israel was conquered the first time. (Josh 14:7, 24:29-31, Jg 1:12)

¹⁹ Midian was almost certainly in league with Egypt. Hazor would likely have been allied with the Mitanni kingdom. (“Jabin” is probably a title, rather than a name.) Akhenaten may have been quite willing to swallow a bit in order to see his major northern rival weakened.

Akhenaten's usual unwillingness to send military aid, sometimes even to ensure collection of tribute, may be understood from the memory of the devastations immediately preceding the Hebrews' Exodus from Egypt. (Indeed, no king of the Egyptian 18th or 19th Dynasty records any encounter with Israel, nor is there any recorded in the Book of Judges.)

The Merneptah Stele

A stele constructed by Merneptah in commemoration of his 5th year claims victory over many peoples, and adds "Israel is laid waste, his seed is not."²⁰ Coming in one of the years BC1207, 1218, or 1232, it merely describes Israel as no longer a sovereign nation. This meaning is confirmed by a quick glance at the chronology of the Judges during the main Philistine captivity. [Merneptah does not claim to have encountered Israel himself.]

Estimating Chronological Uncertainties and Errors

Estimates of the uncertainties and plausible errors of the Israelite chronology used herein, relative to current archaeologically-based chronologies, have been made and are shown in Table I: Column 2 assesses the degree of qualitative agreement of the event(s) in Column 1, ranging from an indeterminate "ok" or "neutral" to an "excellent" fit. Column 4 estimates the number of years the Israelite chronology could be made older (+) or more recent (-) than the probable archaeological chronology. Column 3 or 5 gives the number of years by which the Israelite chronology would have to be adjusted if an alternative archaeological chronology were accepted: For Ur-Nammu the +64 represents the middle chronology, while -24 is for the ultra-low chronology, relative to the low chronology utilized here. For Ammenemes III the +35 represents the difference according to Krauss. For the Exodus -15 is about the lowest date for Hyksos chronologies, even for those which ascribe only 33 years to Auserre Apopi.

²⁰ J.B. Pritchard, "Ancient Near Eastern Texts Relating to the Old Testament;" Princeton Univ. Press, 1950, 1955, p376-378. [Or, "The Ancient Near East," Vol. I, ed. James B. Pritchard; Princeton Univ. Press, 1958.] "The statement that the 'seed,' i.e. offspring of Israel, had been wiped out is a conventional boast of power at this period."

Bimson shows from the context that "Israel's origins must lie earlier than the final decades of the thirteenth century B.C.E." John J. Bimson, "Merneptah's Israel and Recent Theories of Israelite Origins;" *J. for Study of the O.T.* **49**, p3-29 (Feb. 1991).

Table I
Plausible Errors in Israelite Historical Events and Dates

	<u>Qualitative</u>	<u>Earlier</u>	<u>Near</u>	<u>Later</u>
Abram vs. Ur-Nammu	excellent	[not +64]	±1	(-24 ?)
Joseph/Sesostris III	ok		–	
Joseph/Ammenemes III	good	(+35?)	+3/- a few ²¹	
Exodus	excellent		±5 ?	(-15?)
into Canaan/end Mid-Bronze	excellent		+5 ?/-20 ?	
Cushan = Khuzziyash I	ok		–	
Thutmose III	neutral	–	–	–
Barak & Gideon/el-Amarna	good		+2 ?/-11 ?	
Merneptah stele	ok-good		–	

Conclusion: The chronology of Israel cannot be moved back more than 1 year, or later more than about 10 years, relative to present archaeological chronologies of Egypt and other major nations, with ±1 year being much more probable.

Concerning Later Chronology

Past efforts to reconcile a late Exodus with the kings of Israel and Judah have generated no satisfactory abridged chronology of the Judges period and have necessarily squeezed the reigns of Saul, David and Solomon. It is now unnecessary to foreshorten either period to less than the lengths recorded. Thiele's dictum that there can be no gaps between the kings (as there are in Babylonian, Assyrian, and Egyptian chronologies), but only overlaps,²² might need to be reassessed.

93Sp30

²¹ Considering the 15 idle years at the Hammamat stone quarries, this uncertainty might be reduced to +1/-0.

²² Edwin R. Thiele, "The Mysterious Numbers of the Hebrew Kings," New revised edn.; Grand Rapids: Zondervan, 1984.

Chronological Summary

A comparative chronology may now be constructed, as shown in Table II.

Table II
Comparative Chronology

Israel (Bowen)		Archaeology (low chronology)	
Abram left Haran	BC2045	Ur-Nammu/king of Ur & Sumer	BC2053-2036
Abram into Egypt	c.2044	Mentuhotpe II (11th Dynasty)	2061-2011
Abram slays Amraphel	c.2036		
Ishmael born	2034		
Isaac <u>not</u> to go into Egypt	c.1971(±11)	Ammenemes I (b. 12th Dynasty)	1991-1962
Joseph born	1869		
Joseph sold into Egypt	c.1852		
Joseph imprisoned	c.1845	Sesostris III (12th Dynasty)	1878-1843
butler/baker imprisoned	1841	Ammenemes III (12th Dynasty)	1842-1797
Joseph becomes vizier	1839	(apex of "Middle Kingdom")	
years of famine	1831-1825		
Joseph buries Jacob	1813		
Joseph dies	1759	12th Dynasty ends	1786
Hyksos build Avaris	c.1720		
Moses born	1696	15th Dynasty begins (Hyksos)	c.1690
Moses flees Egypt	1656-1616	Khyan [=Iannas]	?1657-1618
Exodus from Egypt	1615	Mayebre Sheshi [=Iambres As-sis?]	?1618-1615
Israel in wilderness	1615-1575		
Entry into Canaan	1575	Hyksos driven from Egypt	1570
"inheritance" begins	1569	Hyksos driven from Sharuhén	c.1567
destruction in Canaan	1575-c.1545	Palestine mass destruction	c.1580-1550
under	1539-1532	Khuzziyash I/Hittites	<i>fl.</i> 1535?
Cushan/Mesopotamia			
Barak & Gideon 40 years	1378-1339	el-Amarna letters	c.1380-1350
under Philistines (2 nd	1246-1207	Merneptah stele	c.1220(±13)
capt'y.)			
Solomon	?1040-1000	21st Dynasty	{depends upon Solomon}

JBPww93Sp27,96Oc18

Appendix A Chronological Reconstructions

Reconstructions of the chronology of the 3rd Dynasty of Ur are given by Jacobsen, *op. cit.*, and CAH₃, in addition to the low chronology accepted here. The lengths of reigns given in the Sumerian King List for this dynasty appear reliable, as date codes have already been found up to the following years: Ur-Nammu 18, Shulgi 47, Amar-Sin [=Bur-Sin] 9, Shu-Sin 9. Ibbi-Sin was conquered and taken captive shortly after a lunar eclipse, which furnishes partial astronomical dating. (The possible astronomical dates recur in cycles.)

The "Ur-III" dates scale almost directly with those of Babylon Dynasty I (#6 Hammurabi for 43 years, Samsuiluna 38, Abieshu' 28, Ammiditana 37, Ammizaduqa 21, Samsuditana 31), the end of which is dated by recorded observations of the planet Venus in the reign of Ammizaduqa; between BC 1750 and 1500 the only allowable solutions appear to be 1651, 1595, 1587, and 1531 (and possibly 1539). [Pottery finds at Alalakh rule out earlier dates, and the Kassite dynasty likely rules out later dates. CAH₃ v.I, Pt.1, p231f.] Ur-Nammu's death is about 505 years earlier.

Reconstructions of the Chronology of the 3rd Dynasty of Ur

<u>King of Ur/Sumer</u>	<u>Reign</u>	<u>T. Jacobsen</u>	<u>Low Chron.</u>	<u>CAH₃</u>
Ur-Nammu	18 yrs	BC 2392-2375	BC 2053-2036	BC 2113-2096
Shulgi	48	2374-2327	2035-1988	2095-2048
Amar-Sin	9	2326-2318	1987-1979	2047-2039
Shu-Sin	9	2317-2309	1978-1970	2038-2030
Ibbi-Sin	25	2308-2284	1969-1945	2029-2006

In Egypt, the pertinent astronomical datings generally revolve around the heliacal rising of Sothis [Sirius], when that star emerges from the solar corona [at Memphis, about July 19 on the Julian calendar], or psdntyw, which is the first day on which the waning lunar crescent is no longer visible just before sunrise (the day began at sunrise). [One of the 1461-year Sothic cycles began BC1321 July 19.] The following events are pivotal to Egyptian dating of this period:

Sesostris III - 7th year	heliacal rising on VIII.16 (civil calendar)
Amenophis I - 9th year	heliacal rising on XI.9
Thutmose III - 23rd year	psdntyw = Ishmw21
Thutmose III - 24th year	psdntyw = IIprt30
Ramesses II - 52nd year	psdntyw = IIprt27

Reconstructions of Egyptian chronologies of the 2nd Millennium B.C., given below, are based on the following:

Richard A. Parker, "The Calendars of Ancient Egypt" (*Studies in Ancient Oriental Civilization* **26**); Univ. of Chicago Press, 1950; "The Lunar Dates of Thutmose III and Ramesses II;" *JNES* **16**, p39-43 (1957); unpublished notes c. 1960.

CAH₃: The Cambridge Ancient History, 3rd edition; Cambridge Univ. Press (1970-).

Lee W. Casperson, "The Lunar Dates of Thutmose III;" *JNES* **45**, 2, p139-150 (1986); "The Lunar Date of Ramesses II;" *JNES* **47**, 3, p181-184 (1988).

R. Krauss, "Das Ende der Amarnazeit;" *Hildesheimer ägyptologische Beiträge* **7**; Hildesheim [Germany], 1978; and "Sothis- und Monddaten;" *Hildesheimer ägyptologische Beiträge* **20**; Hildesheim, 1985. But see Lynn E. Rose, "The Astronomical Evidence for Dating the End of the Middle Kingdom of Ancient Egypt to the Early Second Millennium: A Reassessment;" *JNES* **53**, 4, p.237-261 (October 1994), concerning Parker, Krauss, and Luft.

From the dates as determined by Krauss and Casperson, reasonable extrapolations have been made, as shown in italics. It is fair to say, the last word on this subject has not yet been written.

Reconstructions of Egyptian Chronology

	<u>R.A. Parker</u>	<u>CAH3</u>	
Dynasty 11 [Thebes]			
Sehertowy Inyotef I	<i>2134-2132</i>	2133-2118	
Wahankh Inyotef II	<i>2131-2083</i>	2117-2069	
Nakhtnebtpefer Inyotef III	<i>2082-2080</i>	2068-2061	
[S'ankhibtawi Mentuhotpe I	<i>2079-2062</i>	2060-2010]	
Nebhepetre Mentuhotpe II	<i>2061-2011</i>	2060-2010	
S'ankhkare Mentuhotpe III	<i>2010-1999</i>	2009-1998	
[Interregnum: Neb. Mentuhotpe IV	<i>1998-1992</i>	1997-1991]	
Dynasty 12 [Memphis, Fayum]			
Sehetepibre Ammenemes I	<i>1991-1962</i>	1991-1962	
Kheperkare Sesostris I (10)	<i>1971-1928</i>	1971-1928	
Nubkaure Ammenemes II (2)	<i>1929-1895</i>	1929-1895	
Khakheperre Sesostris II (3)	<i>1897-1879</i>	1897-1878	-1843
Khakaure Sesostris III	<i>1878-1843</i>	1878-1843	1843-1807
Nymare Ammenemes III	<i>1842-1797</i>	1842-1797	
Makherure Ammenemes IV (2)	<i>1798-1790</i>	1798-1790	
Sebekkare Sobkneferu (queen)	<i>1789-1786</i>	1789-1786	
Dynasty 13 [Thebes]			
	<i>1785-</i>	1786-1633	
Dynasty 14 [Xois in W. Delta]			
	<i>1785-c.1603</i>	1786-c.1603	
Dynasty 15 [Avaris in E. Delta]			
	<i>1678-1570</i>	1674-1567	
?	<i>1678-</i>		
?			
?	? <i>-1647</i>		
Seuserenre Khyan	<i>1647-1607</i>		
?	<i>1607-1603</i>		
Auserre Apopi	<i>1603-1570</i>		
Dynasty 16 [Thebes]			
	? <i>-1647</i>	c.1684-1567	
Dynasty 17 [Thebes]			
	<i>c.1600-1570</i>	c.1650-1567	
Dynasty 18 [Thebes]			
Nebpehtyre Amosis	<i>1570-1545</i>	1570-1546	
Djeserkare Amenophis I	<i>1545-1525</i>	1546-1526	
Akheperkare Tuthmosis I	<i>1525-1508</i>	1525-c.1512	
Akheperenre Tuthmosis II	<i>1508-1490</i>	c.1512-1504	-1504
Makare Hatshepsut	<i>1484-1469</i>	1503-1482	
Menkheperre Tuthmosis III (21)	<i>1490-1436</i>	1504-1450	1504-1450
Akheprure Amenophis II	<i>1436-1411</i>	1450-1425	1450-1419
Menkheprure Tuthmosis IV	<i>1411-1397</i>	1425-1417	1419-1408?
Nebmare Amenophis III	<i>1397-1360</i>	1417-1379	?1408-1370
Neferkheprure Amenophis IV (Akhenaten)	<i>1370-1353</i>	1379-1362	1370-1352
(Ankhkheprure) Smenkhkare (3)	<i>1364-1361</i>	1355-1352	1352-1349
Nebkheprure Tutankhamun	<i>1352-1343</i>	1361-1352	1348-1338
Kheperkheprure Ay	<i>1343-1339</i>	1352-1348	1337-1333
Djeserkheprure Horemheb	<i>1339-1304</i>	1348-1320	1333-1295
Dynasty 19 [Delta]			
Menpehtyre Ramesses I	<i>1304-1303</i>	1320-1318	1295-1294
Menmare Sethos I	<i>1303-1290</i>	1318-1304	1294-1279
Usermare Ramesses II	<i>1290-1223</i>	1304-1237	1279-1212
Baenre Merneptah	<i>1223-1211</i>	1236-1223	1212-
Menmare Amenmesses (?)	<i>1211- ?</i>	1222-1217(?)	
end	<i>-1181</i>	-1200(?)	
Dynasty 20 [Thebes]			
	<i>1181-1075</i>	1200-1085	

Appendix B Notes on Radiocarbon Dating

Radiocarbon dating potentially offers an objective systematic dating of artifacts, which is too often found wanting in other methods. Accuracies of one or two centuries may be achievable, though not often of a few decades.

Reliability of Radiocarbon Dating in Egypt

Shaw (Table 6) gives fifteen Egyptian 2nd-Millennium BC radiocarbon dates with stated errors small enough to be reliably compared with "known" dating from the Middle Kingdom to the 19th Dynasty. These dates have been converted from "BP" to "BC" by the Pearson-Stuiver high-precision calibration; the median calibration date ("B") and the one-standard-deviation points ("A" and "C") are given in the sequence "A-B-C." (Reasons behind the coarse- and fine-structure in the calibration are summarized in John A. Eddy, "The Sun Since the Bronze Age," in *Physics of Solar Planetary Environments*, Vol. 2; American Geophysical Union, 1976.) Some 40% of the radiocarbon dates fully agree with the error bars (\pm standard deviation; 68% should be expected to agree, based solely on statistics). Another 40% are only marginally out of agreement (perhaps the British Museum [BM-] and Pennsylvania [P-] have been underestimating their probable errors, maybe by 50% - a common problem already outlined by Pearson and Stuiver). About 20% of these radiocarbon dates are simply incorrect - far outside the reported probable errors. Thus, a single P-S calibrated radiocarbon date should be regarded as probably a good indication of the actual date, to within perhaps a century, and agreement of three or more radiocarbon dates as a probably-reliable dating (at least back to BC 2000).

Selected Radiocarbon Dates in Egypt

Specimen	Historical Dating	BP Date	P-S Calib. Date	Evaluation*
BM1844 rope	Sesostris I ca. BC 1970	3232 \pm 45 [-23.3]	1525- 1511 -1426	×
BM1845 cedar	Sesostris I ca. 1970	3555 \pm 40 [-22.5]	1942- 1886 -1778	≈
BM1420 bull's hair	Sesostris II 1897-1878	3420 \pm 80 [-17.1]	1873- 1721 -1549	≈
P-1821 wood	Sesostris III** 1878-1843	3600 \pm 70	2035- 1936 -1785	✓
BM1225 charcoal	Hyksos ca. 1650	3436 \pm 43 [-24.8]	1860- 1738 -1677	≈
BM736b tree roots	Tuthmosis III 1504-1450	3101 \pm 52	1422- 1392 -1266	≈
Q-2401 wood	Amarna ca. 1375-1350	3030 \pm 35	1380- 1265 -1208	✓
Q-2402 charcoal	Amarna ca. 1375-1350	3055 \pm 35	1393- 1310 -1225	✓
Q-2403 skin	Amarna ca. 1375-1350	3050 \pm 35	1390- 1306 -1222	✓
Q-2404 horn	Amarna ca. 1375-1350	3025 \pm 35	1377- 1263 -1169	✓
Q-2405 bone	Amarna ca. 1375-1350	3088 \pm 35	1408- 1338 -1267	✓
BM1641 charcoal	Horemheb ca. 1297	2910 \pm 40 [-24.5]	1191- 1101 -1004	×
P-1730a reed	Nebwenenef ca. 1279-1262	3210 \pm 50 [+10.01]	1521- 1486 -1413	×
P-1730 reed	Nebwenenef ca. 1279-1262	3120 \pm 50 [+6.6]	1430- 1401 -1310	≈
P-1825 halfa grass	Nebwenenef ca. 1279-1262	2940 \pm 50 [+7.65]	1257- 1125 -1021	≈

* Evaluation: ✓ Agrees within error bars; ≈ Only slightly beyond stated error bars; × Disagreement.

** The name was given as "Sesostris II," but the dates given were for Sesostris III.

Refs.: Ian M. Shaw, "Egyptian Chronology and the Irish Oak Calibration;" *JNES* **44**, 4, p295-317 (Oct. 1985). The ¹³C corrections of BP dates have been retained in brackets (when given).

Gordon W. Pearson and Minze Stuiver, "High-Precision Bidecadal Calibration of the Radiocarbon Time Scale, 500-2500 B.C.;" *Radiocarbon* **35**, 1, p25-33, 1993. See also p1-24, and *Radiocarbon* **28**, 2B, p839-862, 1986.

Radiocarbon Dates at Jericho

Fifteen Middle-Bronze-Age artifacts (mostly charcoal) with radiocarbon dates are given by Richard Burleigh, appendices in K.M. Kenyon, "Excavations at Jericho," vols. 3 and 5 (1981, 1983). Corrected for the Pearson-Stuiver high-precision calibration, they were distributed around Jericho as follows:

Location	Middle	Bronze	Age	Iron Age
	ca. BC2500	ca. BC2000-1500	BC1410-1200	"BC1200-586"
City (charcoal)				
Building (center)			1406- 1346 -1264{BM1790	
Trench II (north)	2562- 2459 -2288 {BM1783	2032- 1957 -1890{BM1784		
Trench III(south)	2885- 2738 -2580 {BM1779	1946- 1887 -1780{BM1782		
	2865- 2651 -2580 {BM1781			
	2861- 2586 -2484 {BM1778			
	2464- 2348 -2210 {BM1780			
Trench I (west)				90- 36 -AD19{BM1791
Tombs	2887- 2615 -2459:B35{GL-6	1974- 1808 -1679: J14{GL-33		
		1865- 1674 -1513:G73{GL-56		
		1737- 1613 -1510:G73{GL-64		
		1876- 1664 -1443: J54{GL-52		
		1681- 1520 -1413:B35{GL-5		
		1525- 1483 -1413: J19{GL-30		
Totals	6	8	1	1

(There is an almost complete gap of BP-scale radiocarbon dates for three millennia prior to about BC 3000, and then an abundance of artifacts going back nearly to the last ice age. This approximate radiocarbon age gap is commonly seen around the Earth, though apparently not in Egypt.)

Philosophically, a single P-S calibrated date should be tentatively accepted, whenever there is no compelling evidence to the contrary. (Tentatively, because only about half of the artifacts of known dating are within their stated error bars, and perhaps 20% are seriously in error.)

All but one or two of the fifteen Middle Bronze (MB) artifacts are consistent with a 16th-century end of MB, including BC1575 indicated here for the end of Jericho. There is one chance in twelve (1.35σ) that the Geophysics Lab GL-30 sample is consistent with the BC1575 date. There is only about one chance in 350,000 (4.5σ) that BM-1790 could by random statistics be consistent with the 1575 date. Indeed, one should be watchful for other evidences of a late ending to the MB Age. But, just as the one sample BM-1791 should not be taken to prove the Iron Age (BC 1200-586) ended five centuries late, the single late MB sample should not by itself be taken as proof that MB ended later than the 16th century BC.

Further suggestion of dating for the fall of Jericho, and perhaps for the plague of darkness just preceding the Exodus of Israel from Egypt, is summarized by Hendrik J. Bruins and Johannes van der Plicht, "The Exodus enigma;" *Nature* **382**, 18 July 1996, p. 213-214. Two samples each of three different cereal grains yield a radiocarbon age of $3,311 \pm 13$ years B.P. [A radiocarbon age is the years prior to AD 1950, with the slightly inaccurate assumption that the initial radiocarbon concentration has always been constant. Also, the ^{14}C half-life standardized since 1955, 5570 years, turns out to be about 3% too short. Consequently, tree-ring measurements have been used to calibrate "radiocarbon years" to calendar years, with the latter being commonly 200 ± 100 older in the

second millennium B.C.] The smoothing function they used (S=1) for correlation with the calibration usually yields improved results, but tends to generate false peaks and valleys when the calibration curve is too irregular, such as near the inverse correlation around BC 1560. There a linear interpolation is likely preferable. The tabulation below is given for both interpolation methods and for two different degrees of confidence (1σ - 68.269%, 2σ - 95.45%). In any event, unless the error reported above is understated, there is less than one chance in 10¹² (7 to 10σ) that the cereal grains could be as recent as BC 1405.

Peter Ian Kuniholm, et. al., “Anatolian tree rings and the absolute chronology of the eastern Mediterranean, 2220-718 B.C.,” *Nature* **381**, 27 June 1996, p. 780-783, estimate a ±30 year possible error in wiggle-matching tree-ring chronologies (actually +76 years older to -22 years more recent), and postulate that the Anatolian tree-growth spurt in BC 1628-1626 (Rings #854-856) resulted from the cold damp weather following the eruption of the volcano Thera, an island 80 miles (130 Km) north of Crete. In support of BC 1628, some Greenland ice cores show volcanic activity in BC 1628, while frost damage at the upper timber line is seen in California in BC 1627.

However, correlation of wider tree rings with cold and damp weather is tenuous. Gordon C. Jacoby, Rosanne D. D’Arrigo, and Tsevegyn Davaajamts, “Mongolian Tree Rings and 20th-Century Warming,” *Science* **273**, 1996 Aug. 09, p. 771-773 [Fig. 2(B)] remind us, “Higher values [of ring-width indices] indicate wider rings and warmer temperature; lower values indicate narrower rings and cooler temperatures.” Note Kuniholm’s Figure 3. The eruption of Thera may correlate better with the sudden, and persistent, slowdown of growth 13 years later (Rings #867-874, BC 1615-1608). If so, agreement with the chronology used in this paper is ideal.

B.C. Dates inferred from Radiocarbon for the Thera Eruption and for the Fall of Jericho

Event	Bruins and van der Plicht smoothed (S=1) interpolation		Here Suggested linear interpolation		Bowen chronology
	1σ	2σ	1σ	2σ	
Thera (possibly just weeks prior to the Exodus)	1685-1654 or 1631-1607	1687-1648 or 1638-1603 or 1581-1539	1676-1615	1683-1599 or 1570-1529	(Exodus in early 1615)
Jericho destroyed and burned	1603-1580 or 1556-1547 or 1543-1527	1606-1576 or 1572-1524	1612-1525	1623-1521	1575

Note on Radiocarbon and the Ur-III Dynasty

A beam used to construct a house at Nippur, not later than the third year of Ib-bi-Sin (and up to twelve years earlier), was originally dated to about BC1993 (BP3942±106) in the pioneering days of Willard Libby, *Science* **119**, “Chicago Radiocarbon Dates, IV,” p135f. (Jan. 1954). The calibrated date range would be BC2576-2460-2277 (1σ), or 2889-2460-1945 (3σ). Although this radiocarbon date favors Jacobsen’s original dating more than any other, three standard deviations (about one chance in 750) encompasses even the Very Low chronology. Thus, this radiocarbon date does not

absolutely rule out any of the chronologies for Ur-Nammu (who died 69 years earlier than the third year of Ibbi-Sin), although it would favor the higher chronologies.

Appendix C

Selected Bible Chronologies of the 2nd Millennium B.C.

A number of chronologies of the Bible have been compared. Several have been selected for comparison, below, from among those derived independently of the historical/archaeological dates used for comparison here. The Anstey, Bowen, and perhaps Clinton, chronologies are in close agreement; the Bowen chronology requires no adjustment to agree with a good set of historical dates, and is used in this paper for the Bible chronology of the second millennium B.C. (No representation is made here that any chronology in the period of the kings is either validated or invalidated by its accuracy or inaccuracy in the period of Judges and earlier.)

<u>Chronologer</u>	<u>Abram Lv Haran</u>	<u>Israel's Exodus</u>	<u>K. Saul's 1st year</u>
Early Christian			
Africanus*	BC 2225	BC 1795	BC 1210
Hippolytus/Rome*	2219		
Hippolytus/Thebes*	2015		
Eusebius/Caesarea*	1942	1512	1067
17th-19th C.			
D. Petavius	1961	1531	(1095?)
J. Ussher	1921	1491	(1095?)
J. Jackson	2023	1593	(1097?)
W. Hales	2078	1648	(1110?)
F. Clinton	2055	1625	1096
C. Bowen	2045	1615	1119
McClintock & Strong	2088	1658	1053
20th Century			
M. Anstey	2042	1612	1102
A. Rutherford	1923	1493	1097
Watchtower (1971)	1943	1513	(1117?)

* Based on Jesus' birth in BC2. Data taken from J. Finegan, "Handbook of Biblical Chronology;" Princeton Univ. Press, 1964.

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