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RADIOCARBON DATING IN THE SOUTHERN LEVANT

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INTRODUCTION

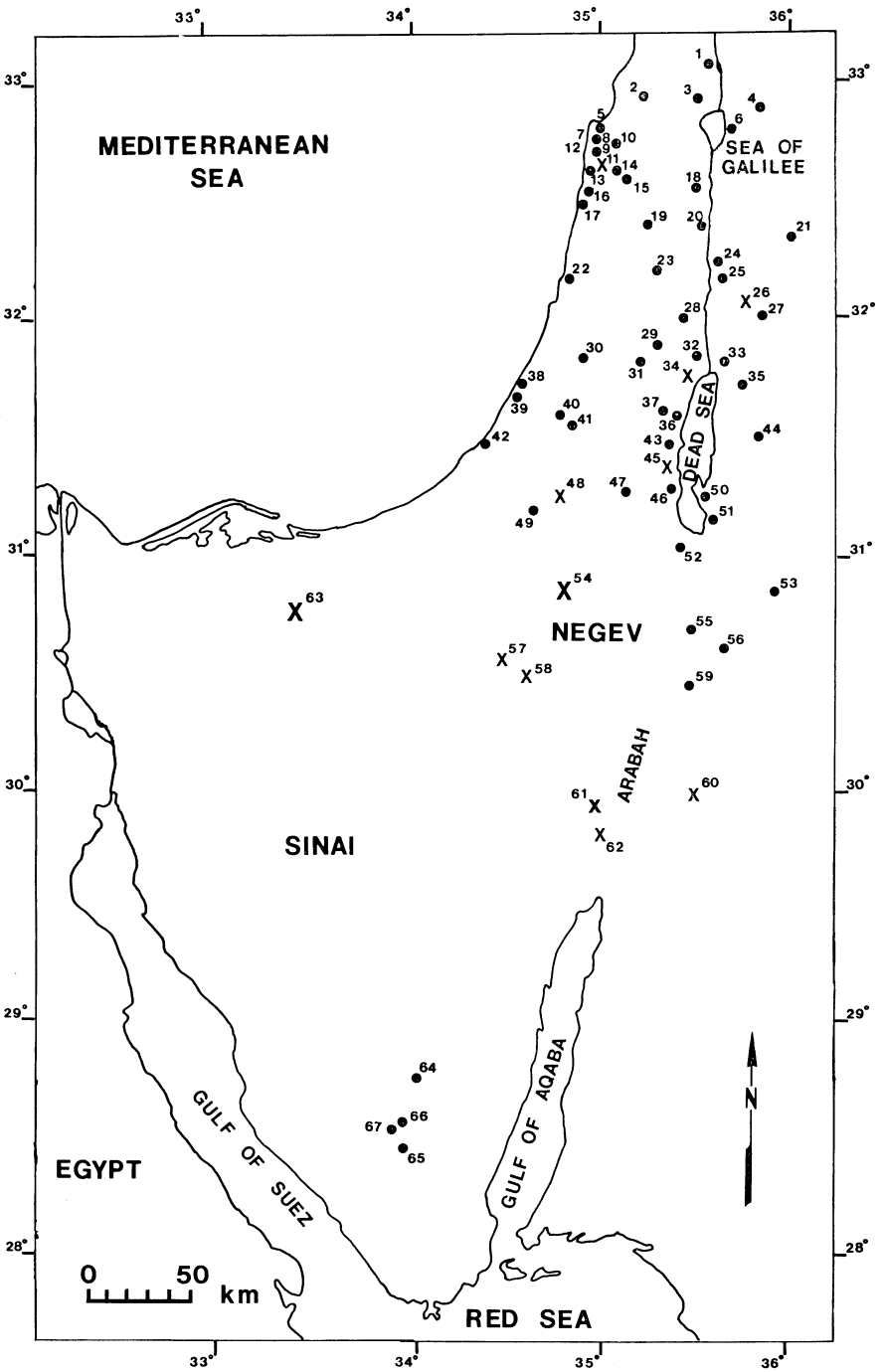
Radiocarbon dating provides the principal chronometric data for the Middle and Upper Palaeolithic, Epipalaeolithic, and Chalcolithic periods in the southern Levant. It is a secondary source of dating evidence for the Early Bronze age, when archaeological correlations with Syria and especially Egypt become available. For the Middle and Late Bronze age, Iron age, Persian, Hellenistic, Roman, and Byzantine periods, ^{14}C dating has only limited value because the technique is less precise than the normally available archaeologic and historic materials.

In recent years, there has been a proliferation of publications containing ^{14}C date lists for the southern Levant. Almost invariably, these lists have focused on the Neolithic and earlier materials (eg, Henry & Servello, 1974; Bar-Yosef, 1981a, p 405; 1981b, p 566-567; Henry, 1983, p 104-105). Only one list (Henry & Servello, 1974) offers an evaluation of the individual dates. The Chalcolithic period is devoid of any published date lists, and the Early Bronze age has but a single comprehensive corpus and interpretive study (Callaway & Weinstein, 1977; see also Mellaart, 1979). For the period from ca 2200 BC to the present, there are no compendia of dates and no analytical studies beyond those for a few individual sites.

Because interest in the ^{14}C data has been focused on the earliest periods, general surveys of the role of ^{14}C in the archaeology and history of this region and systematic studies of the problems that Palestinian archaeologists encounter in utilizing this technique are lacking. As a basis for such future investigations, this paper will (1) present a corpus of ^{14}C dates from the southern Levant, and (2) furnish a brief examination of the chronologic and archaeologic import of the data.

TABLE OF RADIOCARBON DATES

The accompanying table contains 474 dates from Israel, Jordan, the West Bank, Golan Heights, Gaza Strip, and Sinai. Three hundred assays (63.3% of the total) have appeared in the date lists of *Science, Radiocarbon* (through the final issue for 1984), and "Radiocarbon Measurements: Comprehensive Index, 1950-1965"; 150 (31.6%) derive from other sources, and 24 (5.1%) are unpublished. Absent from the table is a "modern" date furnished by a fake antiquity (Mendenhall, 1971, p 99; *cf* Naveh, 1982, p 53-54).


MEDITERRANEAN SEA
SEA OF GALILEE
DEAD SEA
ARABAH
NEGEV
SINAI
EGYPT
GULF OF SUEZ
GULF OF AQABA
RED SEA
N
0 50 km
33°
34°
35°
36°
28°
29°
30°
31°
32°

The dates are arranged by archaeologic period and, within each period, alphabetically by site. If a date could not be assigned to any period because of insufficient information or because the sample was misassociated, it has been relegated to a category entitled "Archaeological Period Unknown." For each entry, the corpus gives the provenience, material, 5568-year half-life BP and BC/AD determinations, the $\delta^{13}C$ measurement, calibrated date, laboratory number, and references. All of the sites are located on the map in figure 1.

Fig 1. Sites in the southern Levant represented by ^{14}C dates. A solid circle indicates an individual site. An "x" indicates an area with two or more sites.

1. Eynan
2. Hayonim Cave and Terrace
3. Amud Cave
4. Rasm Harbush
5. Geula Cave
6. Ein Gev I
7. Sea bed near Kibbutz ha-Hotrim
8. Sefunim Cave and Terrace
9. Nahal Oren Terrace
10. Rakefet Cave
11. Carmel caves:
    - El-Wad Cave and Terrace
    - Tabun Cave
12. Sea of Athlit
13. Newe Yam
14. Tell Qiri
15. Ein el-Jarba
16. Kebara Cave
17. Caesarea
18. Munhata
19. Dothan
20. Tell Tsaf
21. Tell er-Rumeith
22. Tel Michal
23. Shechem
24. Tell es-Saʿidiyeh
25. Deir ʿAlla
26. Baqʿah Valley:
    - Jebel al-Qesir
    - Khirbet Umm ad-Dananir
27. Tell Siran
28. Netiv Hagdud
29. Ai
30. Gezer
31. Gibeon
32. Jericho
33. Teleilat el-Ghassul
34. Qumran:
    - Qumran (settlement)
    - Ain Feshka: Cave IQ
35. Rujm Mekhayyat
36. Wadi Murabba ʿat
37. El-Khiam
38. Nizzanim
39. Ashkelon
40. Tell Areini
41. Lachish
42. Tell el-ʿAjjul
43. Nahal Hever
44. Dibon
45. Nahal Mishmar:
    - Caves 1, 2
46. Masada
47. Arad
48. Beersheba:
    - Bir es-Safadi
    - Horvat Beter
49. Shiqmim
50. Bab edh-Dhra
51. Numeira
52. Mazad Mazal
53. Wadi Hasa
54. Avdat/Aqev area:
    - Boker A
    - Boker BE
    - Boker Tachtit
    - D5
    - D101B
    - Ein Aqev (D31)
    - Nahal Divshon
    - Rosh Ein Mor (D15)
55. Jebel Khirbet en-Nahas
56. Wadi Feinan-Wadi Dana area
57. Kadesh Barnea:
    - Kadesh Barnea 3
    - Kadesh Barnea 8
    - Kadesh Barnea (no number)
58. Har Harif:
    - Abu Salem
    - Rosh Horesha
    - Har Harif G9
59. Beidha
60. Wadi Judayid Basin:
    - Wadi Judayid (J2)
    - Jebel Queisa (J24)
61. Uvda Valley:
    - Nahal Issaron
    - Site 6
62. Timna:
    - Sites 2, 30, 39, 200, 212, F2
    - Wadi Amram
63. Gebel Maghara:
    - Ain Abu Rugum I
    - Lagama IIID, VII, VIII
    - Mushabi I, V, XIV, XVI, XVII, XVIII, 103
64. Wadi Tbeik
65. Monastery of St Catherine
66. Abu Madi
67. Ujrat el-Mehed

The site and context of a sample follow the most recent archaeologic attribution, which frequently is not the one cited in a date list. On the other hand, the identification of the sample material (Column 2) follows the published or unpublished sources precisely. If a published date contains no notation as to the nature of the sample, but the material could be determined with some certainty, the identification is written within parentheses. Quotation marks in the "Material" column call attention to redated samples. The "Refs and Remarks" column also indicates redated samples as well as the application of different pretreatments to any of these samples.

In the third column, an adjustment has been made in computing the BC date whenever a primary publication has used a year other than AD 1950 as the datum year. In such cases, the author has disregarded the published BC date and retained the BP figure alone for subsequent calculations. This procedure is predicated on an assumption, which admittedly may not be justified in every case, that the published BP figure comes from the ^{14}C laboratory, while the BC date was computed by the excavator, who evidently used as the datum year either the year in which he made his calculations or the year in which the laboratory processed the sample. The following 19 entries have required adjustments:

I-616: AD 1961 used as datum year by Aharoni (1962, p 190).

I-285; I-353: AD 1961 used as datum year by Bar-Adon (1980, p 199).

I-1819: AD 1963 used as datum year by Bar-Adon (1980, p 199).

I-? (four dates): AD 1964 used as datum year by Aharoni (1967, p 238).

BONN-2356, -2357, -2359, -2360 to -2363: AD 1975 used as datum year by Conrad and Rothenberg (1980, p 179).

GX-1718: AD 1970 used as datum year by Seger (1972, p 31).

MP-?: AD 1957 used as datum year by Reed (1957, p 8, n 8) and Winnett and Reed (1964, p 49).

L-365: AD 1956 used as datum year by Free (1957, p 37).

RT-? (Crusader period date): AD 1973 used as datum year by Kedar and Kaufman (1975, p 37-38).

The fourth column present the "CRD-1σ" corrections for the conventional ^{14}C dates with BP values between 7230 and 940 years. The unpublished CRD-1σ table employs the same data set and statistical methods as the CRD-2σ table (Klein *et al*, 1982). For the few samples with BP determinations less than 940 years, Stuiver's (1982) high-precision calibration curve has been used.

The laboratory code and sample number appear in Column 5. When a sample number was not available, the laboratory code is followed by a question mark. The last column in the table supplies publication references, information on the provider(s) of unpublished data, miscellaneous archaeologic comments, identification of undersized samples, notes on which samples were re-runs, and notations on any publication errors. References are cited according to a modified social science system: the author's name(s) comes first, then the date of publication and page reference(s). ^{14}C dates published in *Radiocarbon* are cited as "R," followed

by the year of publication, volume number, and page(s). The citation "RMCI" refers to "Radiocarbon Measurements: Comprehensive Index, 1950-1965."

The abbreviations listed in the *Radiocarbon* Style Guide (1984, v 26, p 157-158) are supplemented in the table as follows:

ab—above	min—minimal
br—brick	n—note
bs—below surface	ph—phase
cent.—century	poss—possible, bly
ch—chamber	rm—room
col—column, s	sndg—sounding
confl—conflagration	st—stage
dest—destruction	str—stratum
fl—floor	tr—trench

THE RADIOCARBON DATA

Palaeolithic period

Radiocarbon dating has yielded mixed results in dating Palaeolithic remains in the southern Levant. The Lower Palaeolithic and much of the Middle Palaeolithic lie beyond the range of conventional ^{14}C dating systems, while many Middle and Upper Palaeolithic dates are either aberrant or only minimal values. Fortunately, there are several excellent groups of Upper Palaeolithic assays from southern Israel and northern Sinai.

Uranium series dates obtained from travertines in Zuttiyeh cave on the northwest side of the Sea of Galilee suggest that the Early Levantine Mousterian industry of the Middle Palaeolithic period stretches back to ca 90,000 to 100,000 years BP (Schwarcz *et al,* 1979; Schwarcz, Goldberg, & Blackwell, 1980). The termination of the Middle Palaeolithic is dated by a combination of ^{14}C dates from Boker Tachtit in the central Negev highlands and uranium series dates from travertine deposits in nearby Nahal Mor. These indicate that the Middle Palaeolithic ended ca 47,000 to 45,000 years BP (Marks, 1981a, table I).

There are 49 Middle Palaeolithic assays, associated either with caves in northern Israel (42 dates from Amud, Geula, Kebara, and Tabun caves) or open-air sites in the central Negev highlands (7 dates from Rosh Ein Mor and Boker Tachtit). Nearly all of the dates from Amud, Kebara, and Tabun caves are much too young, with those from the Amud and Kebara caves being extraordinarily low. These dates often show internal inconsistencies, eg, between LJ-2084 and -2090 from Tabun, or the inconsistent and stratigraphically inverted results from throughout the Kebara and Amud sequences. The small amount of carbon in the samples that were processed at the Hanover laboratory may have influenced the poor results obtained for the Middle and Upper Palaeolithic samples from Kebara cave (Schick & Stekelis, 1977, p 135*). Other anomalous dates may be due to an unfavorable environment for ^{14}C samples in the deposits of these caves, eg, recent vegetal growth, groundwater as well as alternating layers of humus and calcium carbonate at Amud (*cf* Hamada, 1970), bat guano

in El-Wad and Kebara caves, and the roof collapse and subsequent ingress of water at Tabun cave. Three ^{14}C assays from Tabun cave (GrN-7408 to -7410) provide an approximate date of ca 50,000 years BP for a late stage of the Middle Palaeolithic period. Finally, GrN-4121 (40,050 ± 1700 BC) from a Late Levantine Mousterian context at Geula cave looks somewhat too recent, based on the Boker Tachtit dates noted above.

In southern Israel, the 3 inconsistent dates from the Early Levantine Mousterian site of Rosh Ein Mor dates are only minimal values and, moreover, are much too recent based on the $^{230}Th/^{234}U$ dates from Nahal Aqev (Schwarcz *et al*, 1979; Marks, 1981a, p 288). On the other hand, 3 of the 4 Late Levantine Mousterian dates from Level 1 at Boker Tachtit and the uranium series dates from Nahal Mor are in good agreement (as noted above). Thus, the assays from Boker Tachtit and the 3 Tabun Cave dates are the only usable groups of Middle Palaeolithic dates in the southern Levant.

The Upper Palaeolithic period is represented by 29 dates. Although the sites of this period are now generally classified according to 1 of 2 industrial traditions, the Levantine Aurignacian or the Ahmarian (Belfer-Cohen & Bar-Yosef, 1981), the number of acceptable Upper Palaeolithic determinations is so small that it is wise to discuss them without regard for the industries they reflect.

The 7 ^{14}C dates from northern Israel are all aberrant. It has already been noted that the Kebara cave assays are inconsistent and much too young. The Hayonim and Sefunim cave dates are also too recent for the Upper Palaeolithic period, but here, the anomalous results may be due to misassociation of the samples (Belfer-Cohen & Bar-Yosef, 1981, p 38).

The earliest Upper Palaeolithic assemblage in the south is represented by Level 4 at Boker Tachtit. It yielded a single date (SMU-579) that is too recent, probably because of contamination by humates (Marks, 1981b, p 345). The 3 dates from Area A at Boker include 2 with minimal values (SMU-187, -260), and 1 at 35,970 ± 2810 BC (SMU-578). Levels I-III from the stratigraphically younger Area BE at Boker yielded a series of 7 dates, which (except for the outlier SMU-565) are nicely bracketed between ca 25,000 and 23,000 BC. In northern Sinai, Lagama VIII and VII have 3 dates between ca 32,000 to 29,000 BC, while Lagama IIID has a single date at ca 28,000 BC. Contemporary with the Lagama VIII and VII dates is Pta-2819 from an unpublished site at Kadesh Barnea in northeastern Sinai. Four of the 5 dates from the late Upper Palaeolithic site of Ein Aqev (D31) fit into the 16th millennium BC; only SMU-5 at 18,030 ± 1200 BC is evidently too early. Based on the overlapping of these 4 Ein Aqev determinations with Kebaran dates from Nahal Oren Terrace (Level IX) and Rakefet cave, the end of the Upper Palaeolithic period in the Negev may be contemporary with the early Epipalaeolithic period in the north (Marks, 1975, p 361).

Epipalaeolithic period

The principal industrial traditions of the Epipalaeolithic period are, in chronologic order, Kebaran, Geometric Kebaran A, and Natufian (Bar-

Yosef, 1975; 1981a; Henry, 1983). At Nahal Oren Terrace, these industries occur in stratigraphic succession (Noy, Legge, & Higgs, 1973).

The five Kebaran ^{14}C dates derive from three sites in northern Israel. These determinations range from 16,960 ± 330 BC (I-6865) to 13,750 ± 415 BC (GrN-5576). The small number and limited geographic distribution of the samples and the wide range of the dates give these assays an uncertain significance.

Geometric Kebaran A sites are more widely distributed than the Kebaran. However, the 13 assays for this industry all come from sites in the central and western Negev and northern Sinai. The 10 dates from Mushabi XIV (Level 2), XVI, XVII, and XVIII and Kadesh Barnea 8 fall within the 13th and 12th millennia BC. The 3 remaining samples, from Site D5, were small and the measurements inconsistent. Based on the other Geometric Kebaran A assays, SMU-7 is too early at 16,890 ± 680 BC. Tx-1121 may or may not be aberrant at 13,870 ± 1730 BC, but the standard deviation is too large to inspire confidence in the midpoint.

A recently identified Epipalaeolithic industry in the Negev and northern Sinai is the Mushabian. Although the Mushabian has a lithic inventory distinct from that of the Geometric Kebaran A, the 9 ^{14}C dates belonging to the former complex show that it has significant temporal overlap with the latter. Indeed, the midpoints of 7 Geometric Kebaran A and 7 Mushabian dates fall within the 12th millennium, with the latter entity possibly continuing on into the early 11th millennium BC. Another southern industry is the Negev Variant of the Kebaran, which on typological grounds appears to overlap both the Geometric Kebaran A and the succeeding Early Natufian. Unfortunately, there are no ^{14}C dates for the Negev Variant of the Kebaran.

The best known Epipalaeolithic industry is the Natufian, which develops out of the Geometric Kebaran A and appears widely over the southern Levant, especially in the Mediterranean hill zone. Nine of the 15 Early Natufian dates cluster within the 10th millennium BC. GL-69, -72, and possibly -70, which derive from the same stage and phase at Jericho as P-376 and BM-1407, are too early. These three samples were measured in 1958, and their 9th and early 8th millennia results may be due to inadequate laboratory pretreatment (Waterbolk, 1971, fig 3, legend). The three Wadi Judayid (J2) dates with midpoints falling in the 11th millennium BC, may be correct, but their uncertainties (± 800, ± 1000, and ± 659 years) are uncomfortably large.

The 5 Late Natufian dates are scattered. The oldest determination, I-5496 from Rosh Horesha, is clearly an outlier at 11,140 ± 200 BC. The two remaining dates from this site fall in the early-mid 9th millennium, while the Nahal Oren and El-Wad B_1 dates are late 9th to early 8th millennium. Overall, the Natufian appears to date ca 10,000 to 8500/8000 BC, but the end of this industry will remain uncertainly dated until more assays become available.

Two typologically late Epipalaeolithic industries are the Harifian in the Negev and northern Sinai, and the Khiamian, which has been identified at several widely scattered sites in Sinai and elsewhere in the

southern Levant. The absolute chronology of the Harifian is largely dependent on three remarkably homogeneous ^{14}C dates from a single site in the central Negev, Abu Salem. These assays (I-5498 to -5500) suggest that there may be a slight overlapping of the Harifian and the beginning of the Early Neolithic I period in the late 9th millennium BC, a conclusion not surprising considering the occurrence at Harifian sites of both Epipalaeolithic and Early Neolithic elements (Scott, 1977). As for the Khiamian, it has a single radiometric date (Pta-2699) from Abu Madi, an unpublished site in southern Sinai. The result is similar to the Harifian and earliest Early Neolithic I dates and corresponds nicely with the transitional late Epipalaeolithic-Early Neolithic character of the Khiamian (Bar-Yosef 1981a, p 402; 1981b, p 561-562).

Neolithic period

The Neolithic period is divided into four phases. Many archaeologists follow Kenyon (1979) in referring to these stages as Pre-Pottery Neolithic (PPN) A and B and Pottery Neolithic (PN) A and B. Moore (1982) has recently proposed Neolithic 1, 2, 3, and 4 for these divisions, while the author prefers Early Neolithic I and II and Late Neolithic I and II. Calibration of ^{14}C dates first becomes possible with the Late Neolithic period.

All but 2 of the 22 EN I dates (23 if the "Proto-Neolithic" assay is included) come from Jericho. Most of these dates came out in five series: 1 from the Geochronological Laboratory, London (measured in 1956), 3 from the British Museum, and 1 from Pennsylvania. The GL series is too young, probably because of inadequate sample pretreatment, and BM-105, -110, and -250 may be too old (Burleigh, 1984, p 760, fig 352, legend). The remaining Jericho dates range from ca 7800 to 7200 BC. One of the 2 Netiv Hagdud dates (RT-502A) comes at the upper end of this range, while the second assay (RT-502B) has a late 9th millennium measurement.

Early Neolithic II is represented by no less than 56 dates, 3 of which (Lv-358, M-1792, and Pta-3486) are clearly too young, and 1 (Pta-2700) is too old. The 17 Beidha assays, which run from ca 7100 to 6600 BC, present some internal inconsistencies. For example, GrN-5062 and P-1382 from late Level II are considerably earlier than K-1085, which comes from the same charcoal sample. In fact, these two dates are contemporary with K-1086 and -1410, which were collected from the stratigraphically later Level VI. Also, the four dates obtained from the carbonized trunk of a pistacia tree in Level IV cover the entire chronologic range of the site (though one of these samples, K-1083, may have been mislabeled). The 21 Jericho dates (except for 3 of the GL entries) cover roughly a 600-year period, from ca 7200 to 6600 BC.

Although it was long thought that the Early Neolithic period ended with a general abandonment of the settlements in the southern Levant, perhaps as the result of climatic dessication (Blake, 1969), new ^{14}C dates emanating from the southern Negev, the Arabah valley, and south Sinai suggest a somewhat different picture. Ten of the 11 dates from Mazad Mazal, Nahal Issaron, and Ujrat el-Mehed fall in the 2nd half of the 7th

millennium BC. If these determinations accurately reflect the age of these sites, then EN II had a life-span considerably longer than that of EN I, and the EN II period at Beidha and Jericho came to a close 400 to 500 years earlier than it did in some of the small desertic sites in the south.

There was evidently a gap in occupation at major Palestinian sites between the Early and Late Neolithic periods, but the extent of this discontinuity cannot be estimated with any confidence because of a paucity of LN I dates. The calibrated values of two isolated LN I dates (Hv-8509, Pta-2999) are in the 2nd and 3rd quarters of the 6th millennium BC. There is also a Late Neolithic date from Kadesh Barnea 3 (SMU-662), which, if it could be calibrated, would fall somewhere in the late 7th millennium BC. Such a figure seems much too early for a Late Neolithic site. Although it is not possible to correct the late EN II dates to get a true estimate of the time differential between EN II and LN I, one might hazard a guess that the break lasted for 500-700 years. Needless to say, further excavations and additional ^{14}C dates may show this "gap" to be much shorter than it now appears or to be of unequal duration in different parts of the southern Levant.

The three LN II dates from Newe Yam and Ein el-Jarba, and the single Late Neolithic/Early Chalcolithic determination from Tell Tsaf, have a wide scatter. The amount of collagen in GX-786 from Ein el-Jarba was small, so the result for this sample was understandably anomalous. The 5 Teleilat el-Ghassul samples listed under "Late Neolithic/Early Chalcolithic" come from levels considered early Chalcolithic by the excavator. However, considering the close links between the pottery and flaked stone tools found in these levels and in Late Neolithic contexts elsewhere in the Levant (Hennessy, 1982), it would not be surprising to see these dates, which cover the period from ca 5600 to 4900 BC, eventually classified as LN II assays.

Chalcolithic period

A dearth of well-stratified and fully published sites, difficulties in correlating the archaeologic assemblages between different areas in the southern Levant, an absence of closely datable foreign correlations, and the lack of a distinct stratigraphic or typologic boundary between Late Neolithic and early Chalcolithic has made Chalcolithic chronology a particularly vexing subject. Of 18 Chalcolithic ^{14}C dates, 3 (C-919, P-2572, and BM-1116) are clearly anomalous (the latter perhaps due to misassociation of the sample), and while many of the rest show no obvious deficiencies, cumulatively, they leave a disturbing gap between the end of the Chalcolithic period and beginning of the Early Bronze age.

There are 7 late Chalcolithic dates from the northern Negev. C-919 (a solid-carbon date) from Horvat Beter is much too old and the 3 Bir es-Safadi dates (M-864A to C) have uncomfortably large uncertainties, as does RT-554B from a small sample found at Shiqmim. The 2 remaining dates, W-245, from Horvat Beter, and RT-554A, from Shiqmim, have no apparent technical problems, but their calibrated results, like those from

Bir es-Safadi, leave a gap of several hundred years between the Chalcolithic and the beginning of the Early Bronze age.

Six late Chalcolithic dates also come from caves in the Judean desert. The 4 from Cave 1 at Nahal Mishmar are associated with that grotto's famous copper treasure. Except for BM-140, the assays cluster in the 2nd quarter of the 4th millennium BC, which is somewhat earlier than the date given the treasure on archaeologic grounds (Bar-Adon, 1980, p 199). I-1819, which comes from a piece of cloth found in a burial in nearby Cave 2, is slightly younger, but another short-lived sample, I-616 from the Cave of Horror at Nahal Hever, gave a result in the late 5th millennium.

RT-390A comes from a piece of wood found in a classic "Ghassulian" (*ie*, late Chalcolithic) level at Teleilat el-Ghassul. Since the sample was part of a larger piece of wood left in storage since the original 1928-1939 excavations at this site, too much significance should probably not be attached to the date (4445-4320 BC). SMU-804, a mid-5th millennium BC assay from the lower of two Chalcolithic layers at Jebel Queisa (J24), is reported to lie close to the mean of 21 dates from sites in Sinai associated with the Timnian industry of the late Chalcolithic period (Henry, 1982, p 443). RT-525 from late Chalcolithic Rasm Harbush in the Golan gave a slightly later date (4380-3880 BC).

Altogether, these dates are a mixed lot. They, together with the Late Neolithic/Early Chalcolithic dates, suggest that the Chalcolithic period is fairly long, beginning no later than perhaps the mid-5th millennium. However, many of the assays are simply too early for the late Chalcolithic era. That the period ends in about the 34th century BC can be deduced from the ^{14}C dates available from the following Early Bronze age IA. Little will be gained by further debate on the present assays: what is really needed are several series of dates from well-stratified Chalcolithic sites.

Early Bronze age

The Early Bronze age has four major divisions, designated Early Bronze (EB) I (with Phases A, B, and C), II (A and B), III (A and B), and IV (A, B, and C). (In this paper, the designations EB IVA, B, and C and Middle Bronze I, II, and III follow Dever, 1973, fig 1 and p 60, n 56.) There are 96 Early Bronze age dates, the largest of any period in Palestinian archaeology. Most come from 1 of 6 sites: Ai, Arad, Tell Areini, Bab edh-Dhra, Jericho, or Numeira.

The EB IA and IB periods are roughly synchronous with the late Predynastic period in Egypt and, as such, can be dated ca 3400 to 3200/3100 BC. Four of the 5 EB IA dates from Tomb A 94 at Jericho overlap and support this chronologic scheme. GL-24, which was measured in 1953, is an outlier. The mini-series SI-3310A, -3310B, and -3311 from Bab edh-Dhra is incongruous. The first and second samples came from a transitional EB IA/B tomb and produced an acceptable date (SI-3310A) of 3545-3345 BC and a date that is ca 2000 years too early (SI-3310B). The third sample came from an EB IA tomb and gave a "modern" reading.

The EB IC period is contemporary with the very end of the Predynastic period in Egypt and the first several reigns of Dynasty I, while EB II is contemporaneous with the remainder of Dynasty I, II, and part if not all of Dynasty III. Based on this correlation, EB IC dates ca 3200/3150 to 3000 BC, and EB II ca 3000 to 2750/2700 BC.

The two groups of EB IC and EB II dates from Arad are problematic. The Isotopes date from Stratum I is anomalous, perhaps because of contamination by surface vegetation, while the 3 other carbonized wood samples yielded ^{14}C ages that are virtually identical, despite the fact that they derive from 3 different strata (IV, III, and II). The problems are quite different with the Pennsylvania assays. Six of the 7 Pennsylvania dates come from short-lived samples. Two samples (P-2054 and -2055) were redated because their results were too early; the new determinations (P-2054A and -2109) were considerably lower. Another curious phenomenon is that the calibrated results for the 4 acceptable Stratum II dates (P-1742, -2054A, -2109, and -2110) cover a range of 530 years (3065 to 2535 BC), despite the fact that the samples belong near the end of the stratum.

Tell Areini has yielded 8 ^{14}C dates, including 7 from a British Museum series. Interestingly, the BP measurements for the 4 Stratum IV samples (BM-388, -389, 391, and W-916) average ca 200 years earlier than the 4 Arad Stratum II BP values. Since both groups derive from short-lived samples, and since Stratum IV at Tell Areini probably belongs early in EB II, while Stratum II apparently relates to the end of this period, the ^{14}C dates suggest a fairly long EB II period in Palestine. An extended EB II period has also been postulated by Dever (1982) on the basis of the archaeologic evidence from Arad.

The 23 EB IC, EB II, and EB III dates from Ai are a curious lot. Initially, 14 samples, both short-lived and long-lived, were sent to the Texas and Gakushuin laboratories. One of the resulting dates (GaK-2380) was acceptable; the other 13 (Tx-1026 to -1035, GaK-2379, -2381, and -2382) were too early by anywhere from 300 to 700 years. Subsequently, 9 more samples, all but 2 utilizing additional quantities of the same sample material taken out of the original collection containers, were run at Pennsylvania and Texas. This time the dates (P-2298 to -2304, Tx-2371 to -2372) agreed consistently with what was generally expected on archaeologic and historic grounds (Callaway & Weinstein, 1977, p 5-10). Since the same erroneous results would have shown up in the second batch of dates if the sample material used for both dating runs had originally been exposed to on-site contamination or sampling error, an explanation for the initial group of deviant dates is presumably to be sought in the handling or processing of the samples.

The longest phase of the Early Bronze age is the EB III period, which, on the basis of Egyptian and Syrian connections, can be dated from ca 2750/2700 to perhaps the late 24th century BC. Most of the assays relating to this period come from Bab edh-Dhra, Jericho, and Numeira.

The 2 Jericho series (BM-548 to -554, BM-1778 to -1781, -1783) corroborate the archaeologic evidence that EB III is the longest period of the

Early Bronze age. The first series ranges from 2925 to 2305 BC, while the second series extends from 2920 to 2310 BC. The one notable inconsistency is between BM-552 (2885-2635 BC) and BM-1780 (2430-2305 BC), which come from the same stage and phase, but this discrepancy may simply reflect the dating of wood of different ages.

The Bab edh-Dhra and Numeira dates present some interesting problems. For example, the entire series, SI-4134 to -4138, is anomalous. SI-4134 and -4135 from Bab edh-Dhra are more than 1000 years off. SI-4136 and -4138, which come from late EB III destruction debris at Numeira (Rast, 1981, p 37, 41), are several hundred years too early to pertain to the end of EB III, though they could certainly reflect the dating of early growth rings of older wood. As for SI-4137, the date, which is 500 to 600 years too old, comes from grapes which were collected in a water flotation device. Whether contaminants in the water could have affected the result so significantly must be left to others more qualified than the author to judge.

Six ^{14}C dates (M-2036 to -2037, SI-2497, -2499, -2501, and -2874) come from short-lived and long-lived samples deriving from several of the large charnel houses at Bab edh-Dhra. These assays cover a wide range, but there is nothing intrinsically wrong with them. Charnel houses A 8 and A 51 were first used in EB II and continued on through EB III (R T Schaub, pers commun), while A 55 began in EB II and was not finally abandoned until early EB IV (Rast & Schaub, 1978, p 24). Since the point in time when each of the samples got into the charnel houses cannot be determined, the chronologic range of all of the material in each tomb must be considered. Thus, 2 of the A 55 dates, SI-2501, at 3365-2925 BC, and SI-2497, at 2305-1905 BC, are equally likely to be correct. This situation illustrates an important problem in Near Eastern ^{14}C dating. Many contexts (especially constructional fills, pits, and multiple-burial tombs) contain jumbled materials of several different periods. In such situations it is difficult if not impossible to relate any organic substances not found in a datable container within the context to a specific archaeologic period. As a result, ^{14}C dates from these contexts often have little or no chronologic value, even though such sources normally yield much of the organic material (especially of the short-lived variety) found on Near Eastern sites.

The EB IV period lasts from ca 2350/2300 to 2000/1900 BC. Olive pits from an EB IVA context at Bab edh-Dhra yielded an excellent date (P-2573: 2335-2135 BC), while SI-2869 from the same period at this site is ca 1600 years too early. The pit in which the latter sample was found was partially cut out of the marl-limestone bedrock, but whether water running into the pit or some other contaminant may have influenced the date is a moot question. As for the EB IVB-C assays, the 2 from unpublished sites in the northern Sinai (RT-447B and -447A) have uncertainties that are too large to give the dates real chronologic value, while the 2 assays from EB IVC contexts at Jericho are in good accord with an archaeologic dating of this period to about the 21st or 20th century BC.

Middle and Late Bronze age

There are relatively few Middle Bronze age (ca 2000/1900 to 1550

BC) and Late Bronze age (ca 1550 to 1200 BC) ^{14}C dates. As explained above, after ca 2000 BC, historic and archaeologic data generally provide more precise dating evidence for most cultural remains and stratigraphic phases then can be obtained through ^{14}C dating.

The Middle Bronze (MB) I period (ca 1900 to 1750 BC) has no ^{14}C dates. Seven of the 8 MB II ^{14}C dates (ca 1750 to 1650 BC) come from tombs at Jericho. The samples were dated in the 1950's, and except for GL-6, the assays are quite satisfactory considering when they were produced. The eighth date, P-842 from Gibeon, is too young.

Late MB III (ca 1550 BC) contexts at Jericho, Lachish, and Shechem have each provided a single ^{14}C date. The Jericho assay (BM-1790) is too recent. The Lachish (Hel-809) and Shechem (GX-1718) samples derive from destruction debris associated with the end of the Middle Bronze age. The dates, though acceptable from a ^{14}C standpoint if the samples are from re-used wood or from the inner rings of older trees, are too early, at 1945-1675 BC and 2000-1700 BC, respectively, to have much archaeologic value. Unfortunately, although destruction debris in Palestinian Bronze and Iron age strata yields more wood and charcoal samples than any other contexts, the ^{14}C measurements from these types of samples rarely produce results of any significance for dating the destruction.

Only 6 ^{14}C dates can be assigned to the Late Bronze (LB) age alone: 2 from burial cave B3 at Jebel al-Qesir and 1 from the nearby settlement at Khirbet Umm ad-Dananir in Jordan's Baqᶜah valley, 2 from Lachish, and 1 from Deir ᶜAlla. The first 2 dates (P-3209 and -3210) are too early for the LB II (ca 1400 to 1200 BC) tomb in which they were discovered, but not nearly as early as the date of 2120-1865 BC (P-3219) from the settlement. The Lachish dates evidently come from cedar-wood architectural elements in a LB IIB (13th century) sanctuary, and though 1 of the 2 assays is more than 400 years too early, this is not unexpected in view of the nature of the sample. *Cedrus libani*, which was used extensively in the Levant during the Bronze age and Iron age for its excellent building properties, is extremely long-lived, with a potential life span of perhaps a millennium or more (Bryant Bannister, pers commun). Many supposedly anomalous dates derived from charcoal and wood of unidentified species are probably the result of the sample material being cedar or other long-lived wood. Unfortunately, few wood samples submitted for ^{14}C dating have been analyzed botanically. Moreover, the author has been able to find only one instance (BM-1222 from the Monastery of St Catherine) where the specific location in a section of a beam or trunk sampled for ^{14}C dating has been noted.

Iron age

Numerouts dates derive from the copper-mining installations at Timna on the western side of the southern Arabah. Nineteen are associated with Egyptian mining activity at Sites 2, 30, and 212 in the 13th and first half of the 12th centuries BC, *ie*, LB IIB and Iron age IA. BM-1368 from Site F2, entered in the corpus under "Chalcolithic Period (?)," also appears to belong to this time. The Hamburg series shows a peculiar

phenomenon. HAM-207 to -212 (except HAM-211) are consistent with archaeologic expectations, while HAM-213 to -215 are ca 1000-1200 years too early, and HAM-216 is perhaps several hundred years too old. Possibly some of the Site 212 samples were mislabeled, and they actually come from one of the EB II shaft-and-gallery systems at this site; if not, then a processing error must be considered as a possible explanation for these extraordinarily early dates. Incidentally, 3 ^{14}C dates (W-4051, -4054, and -4456) come from slag heaps found on the eastern side of the Arabah. These have had to be listed under "Archaeological Period Unknown" because the slag cannot be dated independently.

The Iron age proper (ca 1200 to 586 BC) consists of the Iron IA (ca 1200 to 1150 BC), IB (ca 1150 to 1000 BC), Iron IIA (ca 1000 to 900 BC), IIB (900 to 800 BC), and IIC (800 to 586 BC) periods. In terms of Biblical history, Iron age I is the time of the purported Israelite conquest, the Philistines, and the Judges, while Iron IIA witnesses the United Monarchy of David and Solomon, and Iron IIB-C is the time of the Divided Monarchy, which terminates with the Babylonian destruction of Jerusalem in 586 BC.

The Iron age has yielded more than 3 dozen ^{14}C dates, mostly from wood and charcoal samples, but few are of archaeologic or historic interest since they come from contexts already more closely dated than ^{14}C analysis can achieve. For example, no less than 12 assays are associated with Stratum 5 at Tell es-Saʿidiyeh. According to the ceramic evidence, this stratum belongs in the 8th century BC, but while 9 of the 12 assays overlap this century, the remaining 3 are younger. Similarly, only 1 of the 3 Lachish dates is consonant with the archaeologic evidence, and even this determination (Hel-1027) has too wide a range to be chronologically useful. The other 2 dates, which include 1 (Hel-1026) from the mid- to late 8th century BC level destroyed by the Assyrians in 701 BC, are too early for their contexts, but this is not unexpected, since both samples were wood (Hel-1025 being identified specifically as cedar).

The Tell er-Rumeith dates include several anomalous determinations, all on the young side. On ceramic grounds (Lapp, 1963; 1968) Stratum VIII at this site may be dated to the Solomonic age, so M-2031 is at least a century too young. The succeeding Stratum VII was destroyed at the beginning of the 9th century, so M-2029 and -2030 are too recent. The two Stratum VI assays are acceptable for a late 9th century archaeologic date, but M-2035 is much too young at 400 BC-AD 15 for Stratum V, the destruction of which has been related to the Assyrian invasion of 733 BC under Tiglath-pileser III.

Grain found inside a bronze bottle at Tell Siran in Amman furnished a ^{14}C date (P-2207: 440-395 BC) that is more recent than the date of 600 BC attributed to the Ammonite inscription on the bottle itself. Since the vessel was found in a context that also contained post-Iron age remains, the grain was possibly put in the bottle later on during the Persian period. An alternative explanation is that moisture and corrosion products inside the bottle contaminated the sample material (Thompson, 1983; *cf* Helback, 1974).

Persian period to the Modern era

Less than 50 dates relate to the long time span from 586 BC to the present day, and few of these have chronologic value either for archaeologists or ^{14}C specialists. For example, the Late Hellenistic/Early Roman and Roman period dates were produced mostly during the 1950's and early 1960's. The samples originated from important excavations on the west side of the Dead Sea, such as the settlement at Qumran, Qumran Cave I, the Cave of Horror at Nahal Hever, and the caves in the Wadi Murabba ᶜat. These assays vary widely in their accuracy and reliability, and are generally considered curiosities today rather than sources of useful chronologic information.

Ten dates are associated with buildings of the Persian (525-332 BC) and Hellenistic (332-37 BC) periods on the acropolis at Tell es-Saᶜidiyeh. Four of the dates are from grain and charcoal samples found beneath the floor of a large Persian period administrative building. P-1445 is an outlier; the other 3 dates are acceptable. A single date from within the building itself (P-1446: 405-180 BC) has too wide a range to be of much use. A Hellenistic building, probably of the 2nd century BC, yielded 5 dates, of which 4 derive from wood beams. It may be entirely fortuitous that the lower limits for 3 of the 5 dates are 180, 170, and 165 BC. The early result for P-1098 (410-370 BC) probably signifies nothing more than the dating of inner rings from an older tree.

A unique find made in 1980 off the coast of northern Israel is the bronze battering ram from a ship. The archaeologic date of this piece of naval architecture is uncertain and could in theory be almost anywhere within the period of the 4th to 1st centuries BC. Wood evidently taken from the covering of the ram gave a corrected reading of 625-370 BC, which may lend support to an earlier archaeologic date.

Two samples (Hv-2675, Hv-?) of unspecified material from hearths found at the top of the Natufian Stratum B at Hayonim cave yielded considerably later dates (AD 610-780, AD 35-230). These determinations show that the hearths are not connected with Stratum B, but should be connected with Late Roman-Early Byzantine Stratum A, above (Belfer-Cohen & Bar-Yosef, 1981, p 19-20).

St Catherine's Monastery in south Sinai was founded ca AD 530 by the Byzantine ruler, Justinian I. Within the monastery is the Church of the Transfiguration, from which 13 dates, derived from various architectural elements, have been published. The majority belong with the original construction of the church; the few that do not are evidently either aberrant (M-1677, as shown by the result for BM-1222) or possibly the result of restoration work carried out in the Church in more recent times (M-1812 and -1814).

Finally, there are 2 dates from organic inclusions in the mortar of city walls. The first (RT-?) relates to a known-age structure, the impressive Crusader wall at Caesarea, which has been dated on architectural grounds to the 13th century, possibly the 4-year period immediately following the Seventh Crusade (AD 1248-1250), when Louis IX of France was actively engaged in fortifying the Christian cities of Syria-Palestine. The assay,

AD 890-1235, indicates the usefulness of ^{14}C for dating walls bonded with mortar, but is not sufficiently accurate to place the Caesarea wall more precisely within the Crusader period. The foundations of the city wall at Ashkelon have been attributed to Late Roman or Byzantine times, the upper section to the Crusader period. A sample taken from 50 to 120cm above ground level yielded a date of AD 245-465 (GrN-7987). This suggests that at least part of the upper section of the wall may be earlier than previously supposed.

CONCLUSION

It seems appropriate to conclude this paper with a list of the principal problems and needs of ^{14}C dating as it applies to the southern Levant. The items noted below are those that the author, as an archaeologist, feels are most critical at this point. It is not unlikely that ^{14}C specialists will wish to delete some entries and substitute others.

1. More care is needed regarding the identification of natural contaminants on archaeologic sites and their effects on ^{14}C samples. This is especially necessary if samples collected from Palaeolithic caves are ever to yield useful chronologic results.
2. Additional series of dates are needed for most of the earliest periods, notably the Middle and Upper Palaeolithic, Epipalaeolithic (especially the Kebaran industry), Late Neolithic, and Chalcolithic. Accelerator dating systems would be especially appropriate for the Palaeolithic samples.
3. Archaeologists should publish more information in *Radiocarbon* on the stratigraphic position and archaeologic relationships of ^{14}C samples. Close to 150 dates from the southern Levant have appeared only in *Radiocarbon*, and the absence of detailed archaeologic data for many of these samples seriously limits their use for chronologic purposes.
4. More concern must be given for eliminating the systematic misdating of entire series of samples. Whether these errors arise through on-site contamination, mishandling and improper storage, or laboratory equipment failure, the fact is that large numbers of dates (from the Amud, Kebara, and Tabun caves, Ai, Bab edh-Dhra and Numeira, Timna, and Tell er-Rumeith) have genuine problems. Difficulties with the Palaeolithic assays may well be attributable to special conditions existing within the caves, and archaeologic misattribution or mislabeling may be responsible for problems with a few other dates, but such explanations will not suffice for the majority of the anomalous dates.
5. Botanical analysis of all wood and charcoal samples is essential, as is identification by the archaeologist of the precise location of the sample in the section of a beam or tree trunk.
6. ^{14}C samples should not be collected from Middle Bronze age or later contexts unless the archaeologic dating evidence is inadequate (eg, in the case of a furnace or slag heap unaccompanied by any pottery or inscriptions).
7. Archaeologists should limit their collection of samples to deposits possessing chronologically homogeneous remains; by-and-large, organic ma-

terials from pits, levelling and glacis fills, multi-period tombs, and even many destruction deposits should be ignored.

Radiocarbon dating has made major contributions to the archaeology of the southern Levant in dating isolated contexts, strata, whole sites, and even entire periods. With more help from scientists in the areas of natural and artificial contaminants and laboratory processing problems, and with more care on the part of archaeologists in collecting and submitting better samples and interpreting the resulting dates, this technique will become an even more valuable chronometric tool in the archaeology of the southern Levant.

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Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
		Middle Palaeolithic Period			
Amud Cave: Bed B4, basal	Organic material in black soil	10,600 ± 400 (8650)	---	TK-12	R (1969) 11: 511; Chinzei (1970): 46-48
Amud Cave: Bed B2, middle	Bone (carbonate)	10,500 ± 140 (8550)	---	TK-33a	R (1969) 11: 512; Chinzei (1970): 46-48; same sample as TK-33b & poss N-854 & -852 (see below)
Amud Cave: Bed B2, middle	" (20% H_2SO_4-leached portion)	4630 ± 470 (2680)	3900-2800 BC	TK-33b	R (1971) 13: 95; cf TK-33a
Amud Cave: Bed B2, middle	" (?) (collagen)	14,400 ± 350 (12,450)	---	N-854	Chinzei (1970): 46-47; R (1977) 19: 82; same sample as N-852; same sample no. as TK-33a
Amud Cave: Bed B2, middle	" (?) (carbonate)	13,100 ± 230 (11,150)	---	N-852	Chinzei (1970): 46-47; R (1977) 19: 82; cf N-854; same sample no. as TK-33a
Amud Cave: Bed B1, upper	Bone (carbonate)	5710 ± 80 (3760)	4590-4430 BC	TK-86a	Chinzei (1970): 46-48; R (1971) 13: 101
Amud Cave: Bed B2, middle	Bone (carbonate)	7030 ± 120 (5080)	6125-5555 BC	TK-86a'	Chinzei (1970): 46-47; R (1971) 13: 101-102
Amud Cave: Bed B1, lower	Bone (collagen)	9010 ± 160 (7060)	---	N-763	Chinzei (1970): 46-48; R (1977) 19: 81; same sample as N-786 and -785
Amud Cave: Bed B1, lower	" (collagen)	10,700 ± 190 (8750)	---	N-786	Chinzei (1970): 46-48; R (1977) 19: 81; cf N-763, diff pretreatment
Amud Cave: Bed B1, lower	" (carbonate)	11,700 ± 200 (9750)	---	N-785	Chinzei (1970): 46-48; R (1977) 19: 81-82; cf N-763

Amud Cave: Bed B1, lower	Bone (collagen)	7340 ± 150 (5390)	---	N-765	Chinzei (1970): 46-48; R (1977) 19: 81
Amud Cave: Bed B2, upper	Bone (collagen)	11,500 ± 250 (9550)	---	N-764	Chinzei (1970): 46-47; R (1977) 19: 82
Amud Cave: Bed B2, upper	Bone (collagen)	14,700 ± 310 (12,750)	---	N-766	Chinzei (1970): 46-47; R (1977) 19: 82
Amud Cave: Bed B2, middle	Bone (collagen)	15,700 ± 370 (13,750)	---	N-767	Chinzei (1970): 46-47; R (1977) 19: 82
Amud Cave: Bed B4, basal	Bone (collagen)	18,300 ± 400 (16,350)	---	N-768	Chinzei (1970): 46-47; R (1977) 19: 82
Boker Tachtit: Level 1, firepit	Charcoal	>45,490 (>43,540)	---	SMU-184	Marks (1977a): table 1-1; (1977b): 64; SMU-184, -259, -580, & GX-3642 from same firepit
Boker Tachtit: Level 1, firepit	Charcoal	44,930 ± 2420 (42,980)	---	SMU-259	Marks (1977a): table 1-1; (1977b): 64
Boker Tachtit: Level 1, firepit	Charcoal	47,280 ± 9050 (45,330)	---	SMU-580	Marks (1981b): table 1; Hietala & Marks (1981): 306 (cited as SMU-5081)
Boker Tachtit: Level 1, firepit	Charcoal	>35,000 (>33,050)	---	GX-3642	Marks (1977a): table 1-1; (1977b): 64; small sample
Geula Cave: Layer B1	Bone ash	42,000 ± 1700 (40,050)	---	GrN-4121	R (1967) 9: 119-120; Wreschner (1967): 84, 86; context of sample follows Wreschner
Kebara Cave: Upper Levalloiso-Mousterian level	Charcoal	>30,000 (>28,050)	---	L-336D	Broecker & Kulp (1957): 1330; small sample

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Kebara Cave: 2.5m bs	Charred wood or bone ("bone" fraction)	41,000 ± 1000 (39,050)	---	GrN-2561	R (1963) 5: 174; same sample as GrN-2551
Kebara Cave: 2.5m bs	" ("rest" fraction)	35,300 ± 500 (33,350)	---	GrN-2551	R (1963) 5: 174; cf GrN-2561
Kebara Cave: 4.5m bs	Charred wood	9725 $^{+1105}_{-925}$ (7775)	---	Hv-2666	Schick & Stekelis (1977): table 7
Kebara Cave: 4.85m bs	Ashes	8975 ± 1170 (7025)	---	Hv-2667	Schick & Stekelis (1977): table 7
Kebara Cave: 5.2m bs	Ashes	17,320 $^{+985}_{-815}$ (15,370)	---	Hv-2668	Schick & Stekelis (1977): table 7
Kebara Cave: 5.29m bs	Ashes	20,945 $^{+3430}_{-2125}$ (18,995)	---	Hv-2669	Schick & Stekelis (1977): table 7
Kebara Cave: 5.7m bs	Ashes	10,555 ± 1665 (8605)	---	Hv-2670	Schick & Stekelis (1977): table 7
Kebara Cave: 6.08m bs	Ashes	12,495 $^{+1365}_{-1105}$ (10,545)	---	Hv-2671	Schick & Stekelis (1977): table 7
Kebara Cave: 6.44m bs	Ashes	11,615 $^{+795}_{-700}$ (9665)	---	Hv-2672	Schick & Stekelis (1977): table 7
Rosh Ein Mor (D15): Test pit, 20-90cm bs	Ostrich egg shell	> 37,000 (> 35,050)	---	Tx-1119	R (1972) 14: 484; Crew (1976): 77
Rosh Ein Mor (D15): 20-30cm bs	Ostrich egg shell	>44,000 (>42,050)	---	Pta-543	Crew (1976): 77
Rosh Ein Mor (D15): 45-55cm bs	Ostrich egg shell	>50,000 (>48,050)	---	Pta-546	Crew (1976): 77

Tabun Cave: Layer B	Charcoal (probably charred bone)	39,700 ± 800	(37,750)	GrN-2534	R (1963) 5: 172
Tabun Cave: Layer C	Charcoal (probably charred bone)	40,900 ± 1000	(38,950)	GrN-2729	R (1963) 5: 172
Tabun Cave: Layer D	Same as two previous samples?	35,400 ± 900	(33,450)	GrN-2170	R (1963) 5: 172-173
Tabun Cave: Unit I	?	>47,900	(>45,950)	GrN-7408	Jelinek (1982): 1375, n2
Tabun Cave: Unit I	?	51,000 $^{+4800}_{-3000}$	(49,050)	GrN-7409	Jelinek (1982): 1375, n2
Tabun Cave: Unit I	?	45,800 $^{+2100}_{-1600}$	(43,850)	GrN-7410	Jelinek (1982): 1375, n2
Tabun Cave: Bed 30	Very black soil	23,000 ± 2500	(21,050)	LJ-2059	R (1972) 14: 371
Tabun Cave: Bed 15	Very black soil	30,500 ± 2500	(28,550)	LJ-2061	R (1972) 14: 371
Tabun Cave: Bed 15, top	Very black soil	31,400 ± 3500	(29,450)	LJ-2068	R (1972) 14: 371
Tabun Cave: Bed 7, basal	Very black soil	>30,000	(>28,050)	LJ-2070	R (1972) 14: 371
Tabun Cave: Bed 7, basal	Very black soil	31,500 ± 3200	(29,550)	LJ-2075	R (1972) 14: 371
Tabun Cave: Bed 18, basal	Very black soil	28,200 ± 3000	(26,250)	LJ-2078	R (1972) 14: 371
Tabun Cave: Bed 18	Very black soil	35,300 ± 2800	(33,350)	LJ-2082	R (1972) 14: 372

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Tabun Cave: Bed 42	Very black soil	38,800 ± 2400 (36,850)	---	LJ-2084	R (1972) 14: 372
Tabun Cave: Bed 21	Very black soil	24,900 ± 3000 (22,950)	---	LJ-2087	R (1972) 14: 372
Tabun Cave: Bed 42	Very black soil	28,500 ± 2400 (26,550)	---	LJ-2090	R (1972) 14: 372
		Upper Palaeolithic Period			
Boker A: Level 1	Charcoal	>33,400 (>31,450)	---	SMU-187	Marks (1977a): table 1-1; (1977b): 75; min sample
Boker A: Level 1	Charcoal	>33,420 (>31,470)	---	SMU-260	Marks (1977a): table 1-1; (1977b): 75; min sample
Boker A: Level 1	(Charcoal)	37,920 ± 2810 (35,970)	---	SMU-578	Marks (1981b): table 1
Boker BE: Level I	(Charcoal)	25,610 ± 640 (23,660)	---	SMU-186	Marks (1977a): table 1-1; (1981b): table 1
Boker BE: Level I	(Charcoal)	25,250 ± 345 (23,300)	---	SMU-566	Marks (1981b): table 1
Boker BE: Level II	(Charcoal)	24,630 ± 390 (22,680)	---	SMU-565	Marks (1981b): table 1
Boker BE: Level II	(Charcoal)	26,950 ± 520 (25,000)	---	SMU-227	Marks (1977a): table 1-1; (1981b): table 1
Boker BE: Level III	(Charcoal)	26,030 ± 600 (24,080)	---	SMU-228	Marks (1977a): table 1-1; (1981b): table 1
Boker BE: Level III	(Charcoal)	26,660 ± 500 (24,710)	---	SMU-229	Marks (1977a): table 1-1; (1981b): table 1
Boker BE: Level III	(Charcoal)	27,510 ± 1300 (25,560)	---	SMU-188	Marks (1977a): table 1-1; (1981b): table 1

Boker Tachtit: Level 4	Charcoal	35,055 ± 4100 (33,105)	---	SMU-579	Marks (1981b): table 1; "humates could not be extracted"
Ein Aqev (D31): Test pit, ca Levels 8-9, hearth	Charcoal	16,900 ± 250 (14,950)	---	I-5494	R (1973) 15: 295; Marks (1976a): table 9-1
Ein Aqev (D31): Test pit, ca Levels 9-10, hearth	Charcoal	17,510 ± 290 (15,560)	---	I-5495	R (1973) 15: 295; Marks (1976a): table 9-1 (17,520 ± 790 BP cited here)
Ein Aqev (D31): Levels 8 & 9	Charcoal	17,890 ± 600 (15,940)	---	SMU-6	R (1974) 16: 378-379; Marks (1976a): table 9-1
Ein Aqev (D31): Level 11	Charcoal	17,390 ± 560 (15,440)	---	SMU-8	R (1974) 16: 379; Marks (1976a): table 9-1
Ein Aqev (D31): Level 12	Charcoal	19,980 ± 1200 (18,030)	---	SMU-5	R (1974) 16: 379 (18,080 BC cited here); Marks (1976a): table 9-1
Hayonim Cave: Level D, hearth	Charred bone	16,240 ± 440 (14,290)	---	Hv-2676	Bar-Yosef & Goren (1973): 51
Kebara Cave: Layer 26	Ash	18,500 ± 300 (16,550) $\delta^{13}C = -29.0‰$	---	RT-227	R (1971) 13: 418-419
Kebara Cave: 4.85m bs	Charred wood	9860 ± 530 (7910)	---	Hv-2662	Schick & Stekelis (1977): table 7
Kebara Cave: 4.7m bs	Charred wood	11,565 $^{+\ 850}_{-\ 740}$ (9615)	---	Hv-2663	Schick & Stekelis (1977): table 7
Kebara Cave: 4.75m bs	Charred wood	7155 $^{+\ 860}_{-\ 745}$ (5205)	---	Hv-2664	Schick & Stekelis (1977): table 7
Kebara Cave: 4.62m bs	Charred wood	6490 ± 325 (4540)	5790-5060 BC	Hv-2665	Schick & Stekelis (1977): table 7

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Lagama IIID: Surface	Ostrich egg shell	30,050 ± 1240 (28,100)	---	SMU-118	R (1975) 17: 361-362; Gisis & Gilead (1977): 87; Bar-Yosef & Phillips (1977): tables 66-67
Lagama VIII: Surface	Ostrich egg shell	32,980 ± 2140 (31,030)	---	SMU-119	R (1975) 17: 362; Bar-Yosef & Phillips (1977): tables 66-67
Lagama VII: Vicinity of hearths	Charcoal impregnated with silt	34,170 ± 3670 (32,220)	---	SMU-172	R (1975) 17: 362; Bar-Yosef & Belfer (1977): 54; Bar-Yosef & Phillips (1977): 263, tables 66-67; small sample; same sample as SMU-185
Lagama VII: Vicinity of hearths	"	31,210 ± 2780 (29,260)	---	SMU-185	R (1975) 17: 362; Bar-Yosef & Belfer (1977): 54; Bar-Yosef & Phillips (1977): 263, tables 66-67; small sample; cf SMU-172
Lagama VII: Same provenience as SMU-172 & -185 (?)	Charcoal	>19,900 (>17,950)	---	RT-413A	Bar-Yosef & Belfer (1977): 54; Bar-Yosef & Phillips (1977): table 67; small sample
Kadesh Barnea: Hearth below Upper Palaeolithic site	?	"33,800-33,940 B.P."	---	Pta-2819	Belfer-Cohen & Goldberg (1982): 189
Sefunim Cave: Level 9	?	12,250 ± 65 (10,300)	---	Hv-4074	Ronen (1973): 62
		Epipalaeolithic Period: Kebaran			
Ein Gev I: Near burial	Charred bone	15,700 ± 415 (13,750) $\delta^{13}C = -22.2°/_{oo}$	---	GrN-5576	R (1972) 14: 49

Nahal Oren Terrace: Layer IX	Burned bone	18,250 ± 320 (16,300)	---	UCLA-1776C	Noy, Legge, & Higgs (1977): 77
Nahal Oren Terrace: Layer VIII	Burned bone	16,880 ± 340 (14,930)	---	UCLA-1776B	Noy, Legge, & Higgs (1973): 77
Nahal Oren Terrace: Layer VIII (from slightly ab UCLA-1776B)	Burned bone	15,800 ± 300 (13,850)	---	UCLA-1776A	Noy, Legge, & Higgs (1973): 77
Rakefet Cave: Kebaran level	Burned bone	18,910 ± 330 (16,960)	---	I-6865	Noy, Legge, & Higgs (1973): 96
		Epipalaeolithic Period: Kebaran (?)			
Har Harif G9: Hearth	Charcoal	5960 ± 100 (4010)	5080-4725 BC	Tx-1122	R (1972) 14: 484
Wadi Hasa: Terrace III, 1m bs	Charcoal	3950 ± 150 (2000)	2665-2295 BC	Q-729	R (1966) 8: 398; Vita-Finzi (1966): 388; Copeland & Vita-Finzi (1978): 12
		Epipalaeolithic Period: Geometric Kebaran A			
D5: Rodent hole, Unit 8	Charcoal	13,170 ± 230 (11,220)	---	I-5497	R (1973) 15: 296; Marks (1976b): 296, table 10-1; min sample
D5: Rodent hole, Unit 8	Charcoal	18,840 ± 680 (16,890)	---	SMU-7	R (1974) 16: 379; Marks (1976b): 296, table 10-1; min sample
D5: Firepits, Units 4 & 5	Charcoal	15,820 ± 1730 (13,870)	---	Tx-1121	R (1972) 14: 484; Marks (1976b): 296, table 10-1; min sample
Mushabi XIV: Level 2	Charcoal	14,330 ± 120 (12,380)	---	SMU-226	Haas (1977): table 66

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Mushabi XIV: Level 2	Charcoal	13,750 ± 285 (11,800)	---	QC-201	Bar-Yosef & Phillips (1977): table 67
Mushabi XIV: Level 2	Charcoal	13,830 ± 490 (11,880)	---	RT-447D	Bar-Yosef & Phillips (1977): table 67
Mushabi XIV: Level 2	Charcoal	13,690 ± 150 (11,740)	---	MC-992	Bar-Yosef & Phillips (1977): table 67
Mushabi XIV: Level 2	Charcoal	14,500 ± 100 (12,550)	---	RT-473B	Bar-Yosef & Phillips (1977): table 67
Mushabi XVI	Charcoal	13,060 ± 220 (11,110)	---	RT-447C	Bar-Yosef & Phillips (1977): table 67
Mushabi XVII	Charcoal	14,170 ± 480 (12,220)	---	SMU-661	Bar-Yosef (1981a): 405
Mushabi XVIII	Charcoal	13,930 ± 110 (11,980)	---	SMU-217	Haas (1977): table 66; Bar-Yosef & Goring-Morris (1977): 140
Kadesh Barnea 8: Level D/E	Charcoal	13,930 ± 120 (11,980)	---	Pta-2158	Bar-Yosef (1981a): 405
Kadesh Barnea 8: Level G	Charcoal	14,130 ± 160 (12,180)	---	Pta-2159	Bar-Yosef (1981a): 405
		Epipalaeolithic Period: Mushabian			
D101B: Level 8	Charcoal	13,530 ± 144 (11,580)	---	SMU-268	Marks (1977): 9; Kaufman (1983): 333
Mushabi I: Surface	Ostrich egg shell	13,310 ± 100 (11,460)	---	SMU-117	R (1975) 17: 362; Haas (1977): table 66; Phillips & Mintz (1977): 153
Mushabi V: Hearth	Charcoal	12,990 ± 110 (11,040)	---	SMU-171	R (1975) 17: 362; Phillips & Mintz (1977): 164; Haas (1977): table 66
Mushabi V	Charcoal	12,700 ± 90 (10,750)	---	Pta-2157	Bar-Yosef (1981a): 405

Mushabi XIV: Level 1	Charcoal	13,800 ± 150 (11,850)	---	RT-473A	Bar-Yosef & Phillips (1977): table 67; Bar-Yosef (1981a): 405
Mushabi XIV: Level 1	Charcoal	12,900 ± 235 (10,950)	---	QC-202	Bar-Yosef & Phillips (1977): table 67
Mushabi XIV: Level 1, hearth	Charcoal (Juniperus phoenicea)	13,260 ± 200 (11,310)	---	MC-993	Phillips & Mintz (1977): 170; Bar-Yosef & Phillips (1977): table 67
Mushabi XIV: Level 1, hearth	Charcoal (Juniperus phoenicea)	13,900 ± 400 (11,950)	---	RT-417	Phillips & Mintz (1977): 170; Bar-Yosef & Phillips (1977): table 67, pl 9, no. 4-6
Mushabi XIV: Level 1, hearth	Charcoal (Juniperus phoenicea)	13,800 ± 130 (11,850)	---	SMU-225	Haas (1977): table 66; Phillips & Mintz (1977): 170
		Epipalaeolithic Period: Early Natufian			
El-Wad Cave: Layer B_2	Bone	11,920 ± 660 (9970)	---	UCLA-?	Bar-Yosef (1981a): 405
El-Wad Terrace: Layer B_2	Bone	11,475 ± 600 (9525)	---	UCLA-?	Bar-Yosef (1981a): 405
Eynan: Level III, soil of House 51	Charcoal	11,310 ± 880 (9360)	---	Ly-1662	R (1979) 21: 442
Eynan: Level III, soil of House 51	Charcoal	11,740 ± 570 (9790)	---	Ly-1661	R (1979) 21: 443
Eynan: Level IV sol b, soil of House 131	Charcoal	11,590 ± 540 (9640)	---	Ly-1660	R (1979) 21: 443
Hayonim Terrace: Layer D	Charcoal	11,920 ± 90 (9970)	---	SMU-231	Henry & Leroi-Gourhan (1976): 394

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Jericho: Site E I, II, V, St/ph I.ii	Charcoal	9850 ± 240 (7900)	---	GL-69	Kenyon (1959): 8 & n4; Burleigh (1981): 502-503
Jericho: Site E I, II, V, St/ph I.ii	Charcoal	10,800 ± 180 (8850)	---	GL-70	Burleigh (1981): 503
Jericho: Site E I, II, V, St/ph I.ii	Charcoal	9800 ± 240 (7850)	---	GL-72	Kenyon (1959): 8 & n4; Burleigh (1981): 503
Jericho: Site E I, V, St/ph I.ii	Charcoal, ash	11,166 ± 107 (9216)	---	P-376	R (1963) 5: 84
Jericho: Site E I, II, V, St/ph I.ii	Charcoal	11,090 ± 90 (9140) $\delta^{13}C = -25.2°/_{oo}$	---	BM-1407	Burleigh (1981): 502-503; R (1982) 24: 166
Kebara Cave: Layer B	Bone	11,150 ± 400 (9200)	---	UCLA-?	Bar-Yosef (1981a): 405
Wadi Judayid (J2): Layer C	Charcoal	12,090 ± 800 (10,140)	---	SMU-805	Henry (1982): 437; Henry et al (1983): 12
Wadi Judayid (J2): Layer C	Charcoal	12,750 ± 1000 (10,800)	---	SMU-806	Henry (1982): 437; Henry et al (1983): 12
Wadi Judayid (J2): Layer C	Charcoal	12,784 ± 659 (10,834)	---	SMU-803	Henry (1982); 437; Henry et al (1983): 12
		Epipalaeolithic Period: Late Natufian			
El-Wad: Layer B_1	Bone	9795 ± 600 (7845)	---	UCLA-?	Bar-Yosef (1981a): 405
Nahal Oren Terrace: Layer V	Animal bone (collagen)	10,046 ± 318 (8096)	---	BM-764	R (1977) 19: 152
Rosh Horesha: Midden: 25-40cm	Charcoal	13,090 ± 200 (11,140)	---	I-5496	R (1973) 15: 295; Marks & Larson (1977): 196
Rosh Horesha: Feature 13: 45cm	Charcoal	10,490 ± 430 (8540)	---	SMU-9	R (1974) 16: 379; Marks & Larson (1977): 196

Rosh Horesha: Features 15 & 16: 35-45cm	Charcoal	10,880 ± 280 (8930)	---	SMU-10	R (1974) 16: 379; Marks & Larson (1977): 196
		Epipalaeolithic Period: Harifian			
Abu Salem: Midden: 15-25cm	Charcoal	9970 ± 150 (8020)	---	I-5498	R (1973) 15: 296; Marks & Scott (1976): 47; Scott (1977): 281; I-5498 to -5500 from same midden
Abu Salem: Midden: 25-30cm	Charcoal	10,230 ± 150 (8280)	---	I-5499	R (1973) 15: 296; Marks & Scott (1976): 47; Scott (1977): 281
Abu Salem: Midden: 45-55cm	Charcoal	10,230 ± 150 (8280)	---	I-5500	R (1973) 15: 296; Marks & Scott (1976): 47 (cited as I-5499); Scott (1977): 281
		Epipalaeolithic Period: Khiamian			
Abu Madi	Charcoal	10,110 ± 100 (8160)	---	Pta-2699	Bar-Yosef (1981b): 566
		Epipalaeolithic Period: Natufian/Early Neolithic			
Sefunim Terrace: Layer V, hearth	Ash	7730 ± 115 (5780)	---	Hv-2597	Ronen (1973): 62; Hv-2597 & -3368 from same hearth
Sefunim Terrace: Layer V, hearth	Ash	9395 ± 130 (7445)	---	Hv-3368	Ronen (1973): 62
		Early Neolithic Period: "Proto-Neolithic"			
Jericho: Site D I, St/ph VI A.x-xi	Charcoal	10,300 ± 200 (8350)	---	BM-106	R (1963) 5: 107; Burleigh (1981): 502-503

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
		Early Neolithic I Period			
Jericho: Site F I, St/ph IV.iiib	Charcoal	10,250 ± 200 (8300)	---	BM-105	R (1963) 5: 107; Burleigh (1981): 502, 504
Jericho: Site D II, St/ph IX.xxii-xxiii	Charcoal	10,180 ± 200 (8230)	---	BM-110	R (1963) 5: 107; Burleigh (1981): 502-503
Jericho: Site D I, St/ph IV A.iva	Charcoal	10,300 ± 500 (8350)	---	BM-250	R (1969) 11: 290; Burleigh (1981): 502-503
Jericho: Site D II, St/ph VI.via	Charcoal	9390 ± 150 (7440)	---	BM-251	R (1969) 11: 290; Burleigh (1981): 502-503
Jericho: Site D I, St/ph VIII A.xvia	Charcoal	9320 ± 150 (7370)	---	BM-252	R (1969) 11: 290; Burleigh (1981): 502-503
Jericho: Site F I, St/ph VIII A.xvib	Charcoal	9230 ± 80 (7280) $\delta^{13}C = -25.4°/_{oo}$	---	BM-1321	Burleigh (1981): 502, 504; R (1982) 24: 165
Jericho: Site F I, St/ph IV A.iiib	Charcoal	9380 ± 85 (7430) $\delta^{13}C = -24.0°/_{oo}$	---	BM-1322	Burleigh (1981): 502, 504; R (1982) 24: 166
Jericho: Site D I, St/ph VI A.x-xi	Charcoal	9380 ± 85 (7430) $\delta^{13}C = -25.1°/_{oo}$	---	BM-1323	Burleigh (1981): 502-503; R (1982) 24: 166
Jericho: Site E I, II, V, St/ph VI. xxvii	Charcoal	9430 ± 85 (7480) $\delta^{13}C = -24.9°/_{oo}$	---	BM-1324	Burleigh (1981): 502-503; R (1982) 24: 166
Jericho: Site F I, St/ph VIII A.xvib	Charcoal	9230 ± 220 (7280) $\delta^{13}C = -24.6°/_{oo}$	---	BM-1326	Burleigh (1981): 502, 504; R (1982) 24: 166
Jericho: Site F I, St/ph IV A.iiib	Charcoal	9560 ± 65 (7610) $\delta^{13}C = -25.4°/_{oo}$	---	BM-1327	Burleigh (1981): 502, 504; R (1982) 24: 166

Jericho: Site F, St/ph VIII A.xv	Charcoal	9280 ± 100 (7330) $\delta^{13}C = -26.0°/_{oo}$	---	BM-1787	R (1982) 24: 280; Burleigh (1984): 762-763
Jericho: Site F, St/ph IX.xx-xxia	Charcoal	9200 ± 70 (7250) $\delta^{13}C = -27.1°/_{oo}$	---	BM-1789	R (1982) 24: 280; Burleigh (1984): 762-763
Jericho: Site F I, St/ph VIII B.xviia	Charcoal	8770 ± 150 (6820)	---	GL-39	RMCI (1967): 31; Burleigh (1981): 502, 504; cf GL-40, -43, -46
Jericho: Site F I, St/ph VIII B.xviia	"	8690 ± 150 (6740)	---	GL-40	RMCI (1967): 31; Burleigh (1981): 502, 504; cf GL-39, diff pretreatment
Jericho: Site F I, St/ph VIII B.xviia	"	8895 ± 150 (6945)	---	GL-43	RMCI (1967): 31; Burleigh (1981): 502, 504; cf GL-39, diff pretreatment
Jericho: Site F I, St/ph VIII B.xviia	Humic extract	7300 ± 200 (5350)	---	GL-46	RMCI (1967): 31; Burleigh (1981): 502, 504; cf GL-39
Jericho: Site E I, II, V, St/ph IV. viii	Charcoal, ash, and/or gravel	9582 ± 89 (7632)	---	P-377	R (1963) 5: 84; Burleigh (1981): 503
Jericho: Site F I, St/ph IV A.iiib	Charcoal	9775 ± 110 (7825)	---	P-378	R (1963) 5: 84; Burleigh (1981): 503-504
Jericho: Site D I, St/ph VI A.x-xi	Charcoal	9655 ± 84 (7705)	---	P-379	R (1963) 5: 84; Burleigh (1981): 503
Netiv Hagdud: 80cm bs	Charcoal	9790 ± 380 (7840)	---	RT-502A	Bar-Yosef, Gopher, & Goring-Morris (1980): 201; Bar-Yosef (1981b): 566

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Netiv Hagdud: Pipe-line tr near edge of site	Charcoal (tamarisk)	10,180 ± 300 (8230)	---	RT-502C	Bar-Yosef, Gopher, & Goring-Morris (1980): 201; Bar-Yosef (1981b): 566
		Early Neolithic II Period			
Beidha: Level VI, debris	Charcoal (Quercus sp)	8940 ± 160 (6990)	---	K-1086	R (1968) 10: 323
Beidha: Level VI	Carbonized nuts (Pistacia atlantica)	8710 ± 130 (6760)	---	K-1082	R (1968) 10: 324; same sample as P-1379 & GrN-5063
Beidha: Level VI	"	8546 ± 100 (6596)	---	P-1379	R (1969) 11: 152; cf K-1082
Beidha: Level VI	"	8640 ± 50 (6690) $\delta^{13}C = -23.5°/_{oo}$	---	GrN-5063	R (1972) 14: 50 (cited as 860 ± 50 BP); cf K-1082
Beidha: Level IV, posthole	Carbonized tree trunk (Pistacia sp)	8810 ± 50 (6860) $\delta^{13}C = -22.5°/_{oo}$	---	GrN-5136	R (1972) 14: 50; same sample as BM-111, P-1380, & poss K-1083
Beidha: Level IV, posthole	"	8790 ± 200 (6840)	---	BM-111	R (1968) 10: 4-5; cf GrN-5136
Beidha: Level IV, posthole	"	9128 ± 103 (7178)	---	P-1380	R (1969) 11: 152; cf GrN-5136
Beidha: Level V (?), posthole (see "refs and remarks" column)	" (?)	8640 ± 160 (6690)	---	K-1083	R (1968) 10: 324; should be same sample as GrN-5136, but provenience said to be Level V
Beidha: Level IV, roof debris	Charcoal (Juniperus sp)	8730 ± 160 (6780)	---	K-1084	R (1968) 10: 324

Beidha: Late Level II, pit	Charcoal (Juniperus cf phoenicia)	9030 ± 50 (7080) $\delta^{13}C$ = -20.7°/₀₀	---	GrN-5062	R (1972) 14: 50; same sample as K-1085 & P-1382
Beidha: Late Level II, pit	"	8550 ± 160 (6600)	---	K-1085	R (1968) 10: 324; cf GrN-5062
Beidha: Late Level II, pit	"	8892 ± 115 (6942)	---	P-1382	R (1969) 11: 152; cf K-1085
Beidha: Level VI, posthole	Charred wood	8715 ± 100 (6765)	---	P-1378	R (1969) 11: 152 (8175 BP cited here; correct date confirmed by B Lawn, pers commun)
Beidha: Level VI, fill	Charcoal	8765 ± 102 (6815)	---	P-1381	R (1969) 11: 152
Beidha: Level VI	Charcoal	8850 ± 150 (6900)	---	K-1410	Bar-Yosef (1981b): 566
Beidha: Level VI	Charcoal	8770 ± 150 (6820)	---	K-1411	Bar-Yosef (1981b): 566
Beidha: Level VI	Charcoal	8720 ± 150 (6770)	---	K-1412	Bar-Yosef (1981b): 566
El-Khiam: Level Ib, Area IIb	Bones	2990 ± 250 (1040)	1540-1010 BC	Lv-358	R (1970) 12: 158
Jericho: Site E I, II, V, St/ph XII. xlviia	Charcoal	9170 ± 200 (7220)	---	BM-115	R (1963) 5: 107; Burleigh (1981): 502, 504
Jericho: Site E I, II, V, St/ph XIII. i	Charcoal	8710 ± 150 (6760)	---	BM-253	R (1969) 11: 291; Burleigh (1981): 502, 504
Jericho: Site M I, St/ph XI.1v	Charcoal	8540 ± 65 (6590) $\delta^{13}C$ = -20.4°/₀₀	---	BM-1320	Burleigh (1981): 502, 504; R (1982) 24: 165
Jericho: Site M, St/ph XI.1via	Charcoal	8700 ± 110 (6750) $\delta^{13}C$ = -23.3°/₀₀	---	BM-1769	R (1982) 24: 279; Burleigh (1984): 762-763

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Jericho: Site M, St/ph XI.lxa	Charcoal	8680 ± 70 (6730) $\delta^{13}C = -25.8°/_{oo}$	---	BM-1770	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Site M, St/ph XIII.lxxa	Charcoal	8660 ± 260 (6710) $\delta^{13}C = -23.6°/_{oo}$	---	BM-1771	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Site M, St/ph XIII.lxxiv-XIV.lxxv	Charcoal	8810 ± 100 (6860) $\delta^{13}C = -25.2°/_{oo}$	---	BM-1772	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Site M, St/ph XIV.lxxvi	Charcoal	8730 ± 80 (6780) $\delta^{13}C = -26.4°/_{oo}$	---	BM-1773	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Site D I, St/ph XIV.xxxvii	Charcoal	8660 ± 130 (6710) $\delta^{13}C = -25.5°/_{oo}$	---	BM-1793	R (1982) 24: 280; Burleigh (1984): 762-763
Jericho: Site E I, II, V, St/ph XIII.liv	Charcoal	8200 ± 200 (6250)	---	GL-28	Zeuner (1956): 197; Burleigh (1981): 502, 504
Jericho: Site E I, II, V, St/ph XIII.li	Charcoal	8390 ± 200 (6440)	---	GL-36	RMCI (1967): 31; Burleigh (1981): 502, 504
Jericho: Site F I, St/ph XVII.xxx	Charcoal (tamarisk)	7800 ± 160 (5850)	---	GL-38	Zeuner (1956) 197; RMCI (1967) 31; Burleigh (1981): 502, 504; same sample as GL-41, -42, Gro-942, GrN-942, Gro-963, & GrN-963
Jericho: Site F I, St/ph XVII.xxx	"	8670 ± 150 (6720)	---	GL-41	RMCI (1967): 31; Burleigh (1981): 502, 504; cf GL-38, diff pretreatment
Jericho: Site F I, St/ph XVII.xxx	"	8700 ± 200 (6750)	---	GL-42	RMCI (1967): 31; Burleigh (1981): 502, 504; cf GL-38, diff pretreatment

Jericho: Site F I, St/ph XVII.xxx	"	8900 ± 70 (6950)	---	Gro-942	de Vries & Waterbolk (1958): 1555; Burleigh (1981): 503; cf GL-38, -41, -42
Jericho: Site F I, St/ph XVII.xxx	"	9140 ± 70 (7190)	---	GrN-942	RMCI (1967): 35; Burleigh (1981): 503-504; corrected date for Gro-942
Jericho: Site F I, St/ph XVII.xxx	"	8785 ± 100 (6835)	---	Gro-963	de Vries & Waterbolk (1958): 1555; Burleigh (1981): 503-504; cf GL-38, -41, -42
Jericho: Site F I, St/ph XVII.xxx	"	9025 ± 100 (7075)	---	GrN-963	RMCI (1967): 35; Burleigh (1981): 503-504; corrected date for Gro-963
Jericho: Site D I, St/ph XV A. xxxviiia	Charcoal, ash	8610 ± 75 (6660)	---	P-380	R (1963) 5: 84; Burleigh (1981): 503-504
Jericho: Site E I, II, V, St/ph X. xliii	Charcoal, ash	8658 ± 101 (6708)	---	P-381	R (1963) 5: 84; Burleigh (1981): 503-504
Jericho: Site E I, II, V, St/ph XII. xlviia	Charcoal, ash	8956 ± 103 (7006)	---	P-382	R (1963) 5: 84; Burleigh (1981): 503-504
Mazad Mazal	Charcoal	8480 ± 70 (6530)	---	B-2737	Bar-Yosef (1981b): 566
Mazad Mazal	Charcoal	8070 ± 75 (6120)	---	KN-2443	Bar-Yosef (1981b): 566
Mazal Mazal	Charcoal	8240 ± 95 (6290)	---	Hv-9106	Bar-Yosef (1981b): 566
Mazad Mazal	Charcoal	8350 ± 75 (6400)	---	KN-2444	Bar-Yosef (1981b): 566
Mazad Mazal	Charcoal	8330 ± 75 (6380)	---	Hv-9107	Bar-Yosef (1981b): 566

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Mazad Mazal	Charcoal	8440 ± 80 (6490)	---	Hv-9108	Bar-Yosef (1981b): 566
Munhata: Level IVA, fireplace 644	Soil	7370 ± 400 (5420)	---	M-1792	R (1970) 12: 178
Munhata: Level IVB or V	Soil	9160 ± 500 (7210)	---	M-1793	R (1970) 12: 179
Nahal Divshon: Level 5/6, firepit	Charcoal	8170 ± 180 (6220)	---	Tx-1123	R (1972) 14: 484; Servello (1976): 250-251 (cited as Tx-1125); Tx-1123, I-5501, & SMU-3 from same firepit
Nahal Divshon: Level 6, firepit	Charcoal	8620 ± 140 (6670)	---	I-5501	R (1973) 15: 296; Servello (1976): 350-351
Nahal Divshon: Level 6, firepit	Charcoal	8900 ± 180 (6950)	---	SMU-3	R (1974) 16: 379; Servello (1976): 350-351
Nahal Issaron: Layer C	Charcoal	8430 ± 80 (6480)	---	Pta-3000	Goring-Morris & Gopher (1983): 159-160, n12
Nahal Issaron: Layer C	Charcoal	8050 ± 80 (6100)	---	Pta-3376	Goring-Morris & Gopher (1983): 159-160, n12
Nahal Issaron: Layer C	Charcoal	8180 ± 80 (6230)	---	Pta-3377	Goring-Morris & Gopher (1983): 159-160, n12
Nahal Issaron: Layer C	Charcoal	6130 ± 70 (4180)	5235-4955 BC	Pta-3486	Goring-Morris & Gopher (1983): 159-160, n12
Ujrat el-Mehed (Banana I): Loc 2	Charcoal	8220 ± 80 (6270)	---	Pta-2703	Bar-Yosef (1981b): 566
Wadi Tbeik: Loc 13, middle levels	Charcoal	10,350 ± 100 (8400)	---	Pta-2700	Bar-Yosef (1981b): 566; Tchernov & Bar-Yosef (1982): 19

		Late Neolithic I Period			
Nizzanim	Bones	6740 ± 90 (4790)	5790-5385 BC	Hv-8509	Yeivin & Olami (1979): 131
Nahal Issaron: Layer B	Charcoal	6460 ± 80 (4510)	5520-5235 BC	Pta-2999	Goring-Morris & Gopher (1983): 159-160, n12
		Late Neolithic II Period			
Newe Yam: Kiln	Charcoal	6310 ± 395 (4360)	5675-4880 BC	Hv-4256	Prausnitz & Wreschner (1971): 121, n*; Wreschner (1977): 271*
Ein el-Jarba: Phase IV	Animal bones (collagen)	4920 ± 240 (2970)	3895-3505 BC	GX-786	Kaplan (1969): 25, 27; Levy (1981): table 4:3; small collagen fraction
Ein el-Jarba: Phase IV, Pit 19	Charcoal	5690 ± 140 (3740)	4730-4415 BC	GX-787	Kaplan (1969): 25, 27; Levy (1981): table 4:3
		Late Neolithic Period			
Kadesh Barnea 3	?	7530 ± 100 (5580)	---	SMU-662	Goring-Morris & Gopher (1983): 160
Uvda Valley: Site C, temple courtyard, Basin 615	Charcoal	6560 ± 90 (4610)	5610-5285 BC	RT-?	Yogev (1983): 120
Uvda Valley: Site C, temple courtyard, Basin 615	Charcoal	6400 ± 200 (4450)	5515-5180 BC	RT-?	Yogev (1983): 120
		Late Neolithic/Early Chalcolithic Period			
Teleilat el-Ghassul: Area A III, 201.9 Pit A	Wood	6550 ± 160 (4600)	5620-5265 BC	SUA-732	Unpub; pers commun, J B Hennessy

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Teleilat el-Ghassul: Area A III, 201.12A	Wood	6370 ± 105 (4420)	5415-5200 BC	SUA-734	Unpub; pers commun, J B Hennessy
Teleilat el-Ghassul: Area A II, p.107.3 & 4	Wood	6430 ± 180 (4480)	5540-5195 BC	SUA-736	Unpub; pers commun, J B Hennessy
Teleilat el-Ghassul: Area E X, p.2.3a	Wood	6300 ± 110 (4350)	5350-5085 BC	SUA-738/1	Unpub: pers commun, J B Hennessy
Teleilat el-Ghassul: Area E X, p.3.3B.3c	Wood	6070 ± 130 (4120)	5235-4880 BC	SUA-739	Unpub; pers commun, J B Hennessy
Tell Tsaf: Lower of 2 pre-Ghassulian levels	Burned wood (Euphrates poplar)	6980 ± 180 (5030)	6125-5485 BC	RT-?	Gophna (1979): 56; Gophna & Kislev (1979): 112
		Chalcolithic Period			
Bir es-Safadi: Lower ph, Loc 309, f1	Burned wood (terebinth ?)	5420 ± 350 (3470)	4570-3850 BC	M-864A	R (1961) 3: 122; Perrot (1968): col 439
Bir es-Safadi: Middle ph, Loc 318, fireplace	Burned wood (terebinth ?)	5270 ± 300 (3320)	4435-3770 BC	M-864B	R (1961) 3: 122; Perrot (1968): col 439
Bir es-Safadi: Upper ph, Loc 325, silo	Burned wood (terebinth ?)	5120 ± 350 (3170)	4405-3535 BC	M-864C	R (1961) 3: 122; Perrot (1968): col 439
Horvat Beter: Str III	Charcoal	7420 ± 520 (5470)	---	C-919	Libby (1954): 734; (1955): 84; solid-carbon date
Horvat Beter: Str III, Pit 50	Charcoal	5280 ± 150 (3330)	4385-3880 BC	W-245	Rubin & Suess (1956): 448; Dothan (1956)

Jebel Queisa (J24): Layer B, hearth	Charcoal	5720 ± 149 (3770)	4740-4425 BC	SMU-804	Henry (1982): 439; Henry et al (1983): 15
Nahal Hever: Cave of Horror, grave	Charred mat	5460 ± 125 (3510)	4430-4115 BC	I-616	Aharoni (1962): 189-190; Levy (1981): table 4:3
Nahal Mishmar: Cave 1, treasure hoard	Reed mat (inner part)	5390 ± 150 (3440)	4425-3920 BC	BM-140	R (1968) 10: 4; Bar-Adon (1980): 199, 216, n2; cf W-1342, I-285
Nahal Mishmar: Cave 1, treasure hoard	" (outer edge)	4880 ± 250 (2930)	3885-3490 BC	W-1341	R (1965) 7: 396-397; Bar-Adon (1980): 199, 216, n2; cf BM-140
Nahal Mishmar: Cave 1, treasure hoard	" (outer edge)	4780 ± 100 (2830)	3675-3485 BC	I-285	Bar-Adon (1980): 199, 216, n2; cf BM-140
Nahal Mishmar: Cave 1	Wood	4760 ± 120 (2810)	3670-3475 BC	I-353	Bar-Adon (1980): 86-87: no. 115, 199
Nahal Mishmar: Cave 2, burial	Cloth	4725 ± 230 (2775)	3690-3350 BC	I-1819	Bar-Adon (1980) 6: 199
Rasm Harbush: House	Charred wood	5270 ± 140 (3320)	4380-3880 BC	RT-525	Epstein, (1979): 226; (1981): 116; Levy (1981): table 4:3
Shiqmim: Bldg 1, Fl 1	Charcoal	5250 ± 140 (3300)	4355-3870 BC	RT-554A	Levy (1981): 150, table 4:3
Shiqmim: Bldg 1, Fl 2	Charcoal	5050 ± 490 (3100)	4425-3355 BC	RT-554B	Levy (1981): 150, table 4:3; small sample
Teleilat el-Ghassul: Level III	Charred wood	5500 ± 110 (3550)	4445-4320 BC	RT-390A	Lee (1973): 329-330

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Tell Qiri: Loc 834, Level 61.40	Charcoal	3740 ± 230 (1790)	2425-1885 BC	P-2572	R (1978) 20: 226; archaeol date from A Ben-Tor, pers commun; small sample
Timna: Site 39, furnace	Charcoal	1945 ± 309 (AD 5) $\delta^{13}C$ = -25.0°/₀₀	390 BC-AD 410	BM-1116	R (1979) 21: 349; poss misassoc of sample
		Chalcolithic Period (?)			
Timna: Site F2, Sq 3, Str 3	Charcoal	3030 ± 50 (1080) $\delta^{13}C$ = -23.5°/₀₀	1400-1235 BC	BM-1368	R (1982) 24: 165; site poss LB IIB-Iron IA
		Early Bronze Age IA			
Bab edh-Dhra: Tomb A 78, SE ch	Powdery wood, ash	"Modern"	---	SI-3311	Unpub; pers commun, W E Rast & R T Schaub; "small sample, diluted"
Jericho: Tomb A 94	Charcoal	5210 ± 110 (3260)	4135-3870 BC	GL-24	Zeuner (1956): 196; Kenyon (1961): 25; same sample as BM-1329
Jericho: Tomb A 94	"	4500 ± 60 (2550) $\delta^{13}C$ = -24.0°/₀₀	3370-3050 BC	BM-1329	Burleigh (1981): 502, 504; R (1982) 24: 166; cf GL-24
Jericho: Tomb A 94	Charcoal	4570 ± 50 (2620) $\delta^{13}C$ = -23.7°/₀₀	3385-3165 BC	BM-1328	Burleigh (1981): 502, 504; R (1982) 24: 166
Jericho: Tomb A 94	Charcoal	4380 ± 50 (2430) $\delta^{13}C$ = -26.1°/₀₀	3175-2920 BC	BM-1774	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Tomb A 94	Charcoal	4480 ± 50 (2530) $\delta^{13}C$ = -26.1°/₀₀	3370-3035 BC	BM-1775	R (1982) 24: 279; Burleigh (1984): 762-763
		Transitional Early Bronze Age IA/B			
Bab edh-Dhra: Tomb A 100, Ch E	Powdery wood	4630 ± 90 (2680)	3545-3345 BC	SI-3310A	Unpub; pers commun, W E Rast & R T Schaub

Bab edh-Dhra: Tomb A 100, Ch E	Powdery wood	6415 ± 110 (4465)	5480-5220 BC	SI-3310B	Unpub; pers commun, W E Rast & R T Schaub
		Early Bronze Age IB			
Gezer: Cave I.3A	Charcoal	4995 ± 180 (3045)	3945-3640 BC	GX-1873	Dever et al (1974): 18
		Early Bronze Age IB (?)			
Bab edh-Dhra: Field F.3, Loc 9, pit	Charcoal, soil	5000 ± 65 (3050)	3890-3760 BC	SI-2871	Unpub; pers commun, W E Rast & R T Schaub
		Early Bronze Age IC			
Ai: Ph III, Bldg C, wall timber, dest debris	Charred wood	4920 ± 90 (2970)	3875-3645 BC	Tx-1027	R (1972) 14: 483; Callaway (1972): 115
Ai: Ph III, Hearth area	Charred seeds	5120 ± 70 (3170)	3955-3795 BC	Tx-1034	R (1972) 14: 483 Callaway (1972): 115
Ai: Ph III, Bldg C, roof debris	Charred wood (Quercus calliprinos)	4320 ± 70 (2370)	3150-2895 BC	P-2302	R (1977) 19: 210; same sample as Tx-2372, -1032, GaK-2379, & probably -2381
Ai: Ph III, Bldg C, roof debris	"	4940 ± 90 (2990)	3880-3650 BC	Tx-1032	R (1972) 14: 483; Callaway (1972): 115; cf P-2302
Ai: Ph III, Bldg C, roof debris	"	4330 ± 80 (2380)	3170-2885 BC	Tx-2372	Callaway & Weinstein (1977): 8, table 2; cf P-2302
Ai: Ph III, Bldg C, roof debris	"	4980 ± 120 (3030)	3890-3660 BC	GaK-2379	R (1973) 15: 66; Callaway (1972): 115; cf P-2302

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Ai: Ph III, Bldg C, roof debris	"	5000 ± 120 (3050)	3900-3665 BC	GaK-2381	R (1973) 15: 66; Callaway (1972): 116, n†, 200; cf P-2302
Ai: Ph III, Tower C, dest debris	Charred wood	4550 ± 60 (2600)	3380-3160 BC	P-2303	R (1977) 19: 210; Callaway & Weinstein (1977): 9, table 2
Ai: Ph III, Tower C, dest debris	Charred wood	4360 ± 60 (2410)	3170-2910 BC	P-2304	R (1977) 19: 210; Callaway & Weinstein (1977): 9, table 2
Ai: Ph III, house, dest debris	Charred lentils	4250 ± 60 (2300)	3015-2865 BC	P-2300	R (1977) 19: 209; Callaway & Weinstein (1977): 8-9, table 2; same sample as Tx-2371 & -1035
Ai: Ph III, house, dest debris	"	4310 ± 130 (2360)	3175-2795 BC	Tx-2371	Callaway & Weinstein (1977): 8-9, table 2; cf P-2300
Ai: Ph III, house, dest debris	"	4810 ± 90 (2860)	3690-3495 BC	Tx-1035	R (1972) 14: 483; Callaway (1972): 116; cf P-2300
Arad: Str IV	Carbonized wood	4600 ± 220 (2650)	3655-3035 BC	I-?	Aharoni (1964): 159; (1967): 238
Tell Areini: Area N, below city wall	Charcoal	4470 ± 140 (2520)	3380-2930 BC	BM-392	R (1971) 13: 183
Tell Areini: Area N, below city wall	Charred grain	4450 ± 140 (2500)	3375-2915 BC	BM-393	R (1971) 13: 183
		Early Bronze Age II			
Ai: Ph IV, Bldg B, roof debris (EB IIA)	Charred wood	4800 ± 90 (2850)	3685-3490 BC	Tx-1028	R (1972) 14: 483; Callaway (1972): 158

Ai: Ph IV, Bldg B, roof debris (EB IIA)	Charred wood	4840 ± 130 (2890)	3810-3490 BC	GaK-2382	R (1973) 15: 66; Callaway (1972): 158-15
Ai: Ph V, Bldg B courtyard (EB IIB), dest debris	Charred wood	4740 ± 90 (2790)	3665-3370 BC	Tx-1026	R (1972) 14: 483; Callaway (1972): 200
Ai: Ph V or VI, near Tower A foundation trench, dest debris	Charcoal	4570 ± 120 (2620)	3390-3175 BC	Tx-1029	R (1972) 14: 483; Callaway (1972): 200
Ai: Ph V, house, in store-jar (EB IIB), dest debris	Charred lentils	4200 ± 70 (2250)	2925-2780 BC	P-2299	R (1977) 19: 209; Callaway & Weinstein (1977): 9, table 2; same sample as Tx-1030
Ai: Ph V, house, in store-jar (EB IIB), dest debris	"	4700 ± 50 (2750)	3650-3370 BC	Tx-1030	R (1972) 14: 483; Callaway (1972): 200; cf P-2299
Ai: Ph V, house (EB IIB), dest debris	Charred lentils	4270 ± 70 (2320) $\delta^{13}C_w$ = +1.82°/₀₀	3030-2875 BC	P-2301	R (1977) 19: 209; Callaway & Weinstein (1977): 9, table 2
Ai: Ph V, house (EB IIB), dest debris	Charred seeds	4730 ± 90 (2780)	3665-3370 BC	Tx-1031	R (1972) 14: 483; Callaway (1972): 200
Ai: Ph V, house (EB IIB), dest debris	Charcoal	4160 ± 120 (2210)	2920-2640 BC	GaK-2380	R (1973) 15: 66
Arad: Str III	Carbonized wood	4585 ± 220 (2635)	3650-3030 BC	I-?	Aharoni (1964): 159; (1967): 238
Arad: Str III, Loc 4610	Charred wood (Pistacia atlantica	4210 ± 60 (2260)	2935-2785 BC	P-2415	R (1977) 19: 211; Callaway & Weinstein (1977): 9, table 2

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Arad: Str II, Rm 2326, f1	Charred barley	4050 ± 50 (2100)	2675-2535 BC	P-1742	R (1977) 19: 210; Callaway & Weinstein (1977): 9-10, table 2; Amiran et al (1978): 116
Arad: Str II, Loc 4058-4071	Charred barley	4510 ± 60 (2560) $\delta^{13}C_w$ = +0.88°/₀₀	3375-3135 BC	P-2054	R (1977) 19: 211; Callaway & Weinstein (1977): 9, table 2; same sample as P-2054A
Arad: Str II, Loc 4058-4071	"	4230 ± 60 (2280) $\delta^{13}C_w$ = +4.07°/₀₀	2970-2795 BC	P-2054A	R (1977) 19: 211; Callaway & Weinstein (1977): 9-10, table 2; cf P-2054
Arad: Str II, Loc 4155-4158	Charred wheat	4910 ± 60 (2960) $\delta^{13}C_w$ = +3.54°/₀₀	3860-3650 BC	P-2055	R (1977) 19: 210; Callaway & Weinstein (1977): 9, table 2; same sample as P-2109
Arad: Str II, Loc 4155-4158	"	4070 ± 50 (2120) $\delta^{13}C_w$ = +2.23°/₀₀	2805-2545 BC	P-2109	R (1977) 19: 211; Callaway & Weinstein (1977): 9-10, table 2; cf P-2055; no NaOH pretreatment
Arad: Str II, Loc 4151	Charred barley	4310 ± 60 (2360) $\delta^{13}C_w$ = +3.15°/₀₀	3065-2890 BC	P-2110	R (1977) 19: 211; Callaway & Weinstein (1977): 9-10, table 2
Arad: Str II	Carbonized wood	4585 ± 220 (2635)	3650-3030 BC	I-?	Aharoni (1964): 159; (1967): 238
Arad: Str II, Loc 1240	Charcoal	4335 ± 65 (2385)	3160-2900 BC	GrN-4704	R (1967) 9: 139
Arad: Str I	Carbonized wood	2431 ± 200 (481)	805-380 BC	I-?	Aharoni (1964): 159; (1967): 238

Tell Areini: Area D, Str IV, Loc 4001	Carbonized wheat	4410 ± 250 (2460)	3375-2880 BC	W-916	R (1961) 3: 97; standard deviation reported with >1σ
Tell Areini: Area D, Str IV, Loc 4702, confl layer	Carbonized wheat	4340 ± 130 (2390)	3355-2870 BC	BM-388	R (1971) 13: 182
Tell Areini: Area D, Str IV, Loc 4702, confl layer	Carbonized wheat	4400 ± 130 (2450)	3365-2895 BC	BM-389	R (1971) 13: 182
Tell Areini: Area D, Str IV, Loc 4533, in jar	Carbonized olive stones	4430 ± 140 (2480)	3370-2905 BC	BM-391	R (1971) 13: 183
Tell Areini: Area D, Str II, Loc 2062, confl layer	Carbonized wheat	4500 ± 130 (2550)	3385-2965 BC	BM-387	R (1971) 13: 182
Tell Areini: Area D, Str II3, Loc 2301, confl layer	Charcoal	4200 ± 130 (2250)	3035-2635 BC	BM-390	R (1971) 13: 182
		Early Bronze Age II (?)			
Timna: Site 212, Mine S28	Charcoal	3890 ± 70 (1940)	2430-2305 BC	BONN-2362	Conrad & Rothenberg (1980): 179
Timna: Site 212, Mine S28	Charcoal	4000 ± 90 (2050)	2670-2505 BC	BONN-2363	Conrad & Rothenberg (1980): 179
		Early Bronze Age IA/III (?)			
Bab edh-Dhra: Field F3, Loc 13, occ debris	Charcoal, charred wood fragments, bits of burned bone	6615 ± 145 (4665)	5690-5305 BC	SI-2502	Unpub; pers commun, W E Rast & R T Schaub; "small sample, diluted and counted at reduced pressure"

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Bab edh-Dhra: Field F3, Loc 13, occ debris	Wood fragments in soil & ash	7235 ± 215 (5285)	---	SI-2877	Unpub; pers commun, W E Rast & R T Schaub; "small sample, diluted and counted at reduced pressure"
		Early Bronze Age IB-III			
Bab edh-Dhra: Field XIII, Loc 9, dest debris	Wooden beam	4205 ± 85 (2255)	3005-2765 BC	SI-2868	Rast & Schaub (1980): 46 (cited as SI-2686), table 3; corrected archaeol data from W E Rast & R T Schaub, pers commun
		Early Bronze Age II-III			
Bab edh-Dhra: Charnel house A 8, entryway	Burned cloth	4160 ± 180 (2210)	3035-2535 BC	M-2036	R (1970) 12: 179; Callaway & Weinstein (1977): 10, table 2
Bab edh-Dhra: Charnel house A 51, f1	Burned cloth, wood	4350 ± 180 (2400)	3365-2790 BC	M-2037	R (1970) 12: 179; Callaway & Weinstein (1977): 10, table 2
Bab edh-Dhra: Field XII.2, Loc 9	Powdery wood, ash	4245 ± 80 (2295)	3040-2785 BC	SI-2503	Rast & Schaub (1980): 46, table 3; corrected archeol date from W E Rast & R T Schaub, pers commun
Bab edh-Dhra: Field XII.2, Loc 13	Wood fragments	5080 ± 90 (3130)	3945-3775 BC	SI-2876	Unpub; pers commun, W E Rast & R T Schaub
		Early Bronze Age III			
Ai: Ph VIII, house, dest debris (EB IIIB)	Charred wood	4170 ± 70 (2220)	2905-2760 BC	P-2298	R (1977) 19: 209; Callaway & Weinstein (1977): 10, table 2; same sample as Tx-1033

Ai: Ph VIII, house, dest debris (EB IIIB)	"	4400 ± 80 (2450)	3360-2910 BC	Tx-1033	R (1972) 14: 483; Callaway (1972): 305-306; cf P-2298
Bab edh-Dhra: Field X.3, Loc 29 (late EB III)	Charcoal, soil	4320 ± 85 (2370)	3165-2880 BC	SI-2870	Unpub; pers commun, W E Rast & R T Schaub
Bab edh-Dhra: Field X.3, Loc 49, br fall (late EB III)	Charcoal	3805 ± 60 (1855)	2405-2165 BC	SI-2872	Unpub; pers commun, W E Rast & R T Schaub
Bab edh-Dhra: Field X.3, Loc 60 (late EB III)	Charcoal	3595 ± 70 (1645)	2140-1880 BC	SI-2875	Unpub; pers commun, W E Rast & R T Schaub
Bab edh-Dhra: Field XIV.4, Loc 9, occ surface	Charcoal	5070 ± 85 (3120)	3935-3770 BC	SI-4134	Unpub; pers commun, W E Rast & R T Schaub
Bab edh-Dhra: Field XII.5, Loc 24, beam on fl	Charcoal (dicot, sp unid.)	5030 ± 75 (3080)	3900-3770 BC	SI-4135	Unpub; pers commun, W E Rast & R T Schaub
Jericho: Tr III, St/ph XIV.xliva	Charcoal	4175 ± 48 (2225)	2910-2765 BC	BM-548	R (1977) 19: 152; Burleigh (1981): 502, 504
Jericho: Tr III, St/ph XV.li-lii	Charcoal	4204 ± 49 (2254)	2925-2780 BC	BM-549	R (1977) 19: 152; Burleigh (1981): 502, 504
Jericho: Tr III, St/ph XVI.lxi-lxii	Charcoal	4126 ± 50 (2176)	2890-2640 BC	BM-550	R (1977) 19: 152; Burleigh (1981): 502, 504
Jericho: Tr III, St/ph XVI.lxv-lxvi	Charcoal	4080 ± 42 (2130)	2870-2545 BC	BM-551	R (1977) 19: 152; Burleigh (1981): 502, 504
Jericho: Tr III, St/ph XVII.lxviiia	Charcoal	4115 ± 39 (2165)	2885-2635 BC	BM-552	R (1977) 19: 152; Burleigh (1981): 502, 504

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Jericho: Tr III, St/ph XVIII.lxxii	Charcoal	3922 ± 78 (1972)	2640-2305 BC	BM-553	R (1977) 19: 152; Burleigh (1981): 502, 504
Jericho: Tr III, St/ph XIX.lxxvi	Charcoal	4170 ± 42 (2220)	2905-2760 BC	BM-554	R (1977) 19: 153; Burleigh (1981): 502, 504
Jericho: Tr III, St/ph XVI.lxii-lxiii	Charcoal	4080 ± 70 (2130) $\delta^{13}C = -23.6°/_{oo}$	2870-2545 BC	BM-1778	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Tr III, St/ph XVI.lxii-lxiii	Charcoal	4160 ± 80 (2210) $\delta^{13}C = -25.5°/_{oo}$	2920-2640 BC	BM-1779	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Tr III, St/ph XVII.lxviiia	Charcoal	3890 ± 60 (1940) $\delta^{13}C = -25.7°/_{oo}$	2430-2305 BC	BM-1780	R (1982) 24: 279; Burleigh (1984): 762-763
Jericho: Tr III, St/ph XIX.lxxvi-lxxviia	Charcoal	4120 ± 40 (2170) $\delta^{13}C = -25.6°/_{oo}$	2885-2635 BC	BM-1781	R (1982) 24: 280; Burleigh (1984): 762-763
Jericho: Tr II, St/ph XVIII.lviii	Charcoal	3940 ± 80 (1990) $\delta^{13}C = -26.1°/_{oo}$	2645-2310 BC	BM-1783	R (1982) 24: 280; Burleigh (1984): 762-763
Numeira: SE 3/4, Loc 7, base of town wall, dest debris	Charcoal	4085 ± 55 (2135)	2875-2620 BC	SI-4136	Rast & Schaub (1980): 47, table 3
Numeira: SE 3/1, Loc 9, W of Wall 4, collected in water flotation system	Grapes (Vitis vinifera)	4310 ± 70 (2360)	3065-2890 BC	SI-4137	Rast & Schaub (1980): 46, table 3; additional data from W E Rast & R T Schaub, pers commun
Numeira: NE 3/1, Loc 15, dest debris	Charcoal	4130 ± 70 (2180)	2890-2640 BC	SI-4138	Rast & Schaub (1980): 47, table 3
Numeira: NE 4/4, Loc 16, dest debris	Charred grain	4090 ± 70 (2140) $\delta^{13}C_{PDB} = -26.32 \pm 0.26°/_{oo}$	2875-2620 BC	P-3367	Unpub; pers commun, W E Rast & R T Schaub

Numeira: SE 8/1, Loc 12, roof fall and occ debris	Roof thatching	4180 ± 60 (2230)	2910-2765 BC	P-3454	Unpub; pers commun, W E Rast & R T Schaub
		Early Bronze Age III (?)			
Gibeon: Sndg in Area 10-M-6, "Early Bronze level"	Charcoal, limestone	4501 ± 65 (2551)	3370-3050 BC	P-837	R (1965) 7: 194; Callaway & Weinstein (1977): 11, table 2
Bab edh-Dhra: Field VIII.IA, Loc 3, town wall collapse (loc not sealed)	Charcoal	1090 ± 45 (AD 860)	AD 875-1020	SI-2873	Unpub; pers commun, W E Rast & R T Schaub
		Early Bronze Age II-IVA			
Bab edh-Dhra: Charnel house A55, NW corner, left of doorway	Burned fabric, charcoal, ash	3680 ± 90 (1730)	2305-1905 BC	SI-2497	Unpub; pers commun, W E Rast & R T Schaub; "small sample, diluted"
Bab edh-Dhra: Charnel house A 55, fl, opposite doorway	Charcoal	4015 ± 75 (2065)	2660-2530 BC	SI-2499	Rast & Schaub (1980): 46-47, table 3
Bab edh-Dhra: Charnel house A 55, doorway	Charcoal	4420 ± 80 (2470)	3365-2925 BC	SI-2501	Unpub; pers commun, W E Rast & R T Schaub
Bab edh-Dhra: Charnel house A 55, NE corner	Charcoal	4320 ± 65 (2370)	3150-2895 BC	SI-2874	Rast & Schaub (1980): 46, table 3
		Early Bronze Age IVA			
Bab edh-Dhra: Field X, Ph 3	Olive stones	3770 ± 60 (1820)	2335-2135 BC	P-2573	R (1978) 20: 226

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Bab edh-Dhra: Field X.1, Loc 28	Charcoal	5090 ± 85 (3140)	3955-3775 BC	SI-2869	Unpub; pers commun
		Early Bronze Age IVB-C			
Mushabi 103	Charcoal	3800 ± 330 (1850)	2680-1765 BC	RT-447B	Bar-Yosef & Phillips (1977): table 67
Ain Abu Rugum 1	Charcoal	4180 ± 300 (2230)	3355-2395 BC	RT-447A	Bar-Yosef & Phillips (1977): table 67
Jericho: Tr III, St/ph XX.lxxxa	Charcoal	3560 ± 40 (1610) $\delta^{13}C$ = -26.2°/₀₀	2035-1855 BC	BM-1782	R (1982) 24: 280; Burleigh (1984): 762-763
Jericho: Tr II, St/ph XXI.lxviii-XXII.lxix(a)	Charcoal	3620 ± 40 (1670) $\delta^{13}C$ = -25.3°/₀₀	2155-1890 BC	BM-1784	R (1982) 24: 280; Burleigh (1984): 762-763
		Middle Bronze Age II (formerly MBA IIB)			
Gibeon: Sndg in Area 15-K-18, Level 4a	Charcoal, limestone	3154 ± 56 (1204)	1565-1375 BC	P-842	R (1965) 7: 195; for archaeol context, see Pritchard (1964): 42-43, 45-47
Jericho: Tomb J 14	Wood	3510 ± 110 (1560)	2000-1700 BC	GL-33	RMCI (1967): 31; Burleigh (1981): 502, 504
Jericho: Tomb B 35, funerary furniture	Wood	3270 ± 110 (1320)	1710-1425 BC	GL-5	Zeuner (1956): 196; Burleigh (1981): 502, 504
Jericho: Tomb B 35, funerary furniture	Wood	4100 ± 150 (2150)	2910-2530 BC	GL-6	Zeuner (1956): 196: Burleigh (1981): 502, 504
Jericho: Tomb J 19	Flesh	3220 ± 60 (1270)	1665-1415 BC	GL-30	Zeuner (1956): 196; Burleigh (1981): 502, 504

Jericho: Tomb G 73	Wood	3360 ± 150 (1410)	1885-1535 BC	GL-52	RMCI (1967): 31; Burleigh (1981): 502, 504
Jericho: Tomb G 73	Flesh	3370 ± 115 (1420)	1870-1570 BC	GL-56	RMCI (1967): 31; Burleigh (1981): 502, 504; same sample as GL-64
Jericho: Tomb G 73	"	3330 ± 90 (1380)	1770-1545 BC	GL-64	Burleigh (1981): 502, 504; cf GL-56
		Middle Bronze Age III (formerly MBA IIC)			
Jericho: Site H, St/ph XII.1i	Charcoal	3080 ± 40 (1130) $\delta^{13}C = -23.9°/_{oo}$	1430-1260 BC	BM-1790	R (1982) 24: 280; Burleigh (1984): 762-763
Lachish: Level VIII palace, dest debris	Charred wood	3450 ± 120 (1500)	1945-1675 BC	Hel-809	Ussishkin (1978): 90
Shechem: Field XIII, Rm D, dest debris (MB Ph IA)	Charcoal	3510 ± 120 (1560)	2000-1700 BC	GX-1718	Seger (1972): 31; lab no. from J D Seger, pers commun
Tell el-'Ajjul: Burial 1474	Horse bone (Equus caballus) (collagen)	8150 ± 300 (6200)	---	BM-2114	R (1984) 26: 69
		Late Bronze Age I/Iron Age IIC-Persian Period			
Khirbet Umm ad-Dananir: Field V, Area 2, Loc 18	Charcoal	3440 ± 60 (1490)	1890-1685 BC	P-3216	R (1984) 26: 223
Khirbet Umm ad-Dananir: Field V, Area A, Loc 18 (from lower level than P-3216)	Charcoal	3770 ± 70 (1820)	2335-2135 BC	P-3217	R (1984) 26: 223

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
		Late Bronze Age II			
Baq'ah Valley: Jebel al-Qesir, Cave B3	Charcoal	3200 ± 60 (1250)	1655-1405 BC	P-3209	R (1984) 26: 223
Baq'ah Valley: Jebel al-Qesir, Cave B3	Charcoal	3350 ± 70 (1400)	1760-1590 BC	P-3210	R (1984) 26: 223
Khirbet Umm ad-Dananir: Field V, Area 2, Loc 19, carbonized beams	Charcoal (olive)	3580 ± 70 (1630)	2120-1865 BC	P-3219	R (1984) 26: 223; material from Patrick McGovern, pers commun
		Late Bronze Age IIB			
Lachish: Level VI temple, roof beams	Charred wood (cedar)	3090 ± 120 (1140)	1545-1245 BC	Hel-810	Ussishkin (1978): 90
Lachish: Level VI temple, door paneling (?)	Charred wood (cedar)	3510 ± 120 (1560)	2000-1700 BC	Hel-1028	Ussishkin (1978): 90
		Late Bronze Age IIB (?)			
Deir 'Alla: LB temple, roof beam	Charred wood	3130 ± 60 (1180)	1550-1360 BC	GrN-4553	R (1967) 9: 140
		Late Bronze Age IIB-Iron Age I			
Timna: Site 2, Area E, Pit C	Charcoal	1350 ± 50 (AD 600)	AD 595-660	GrN-4381	R (1967) 9: 141
Timna: Site 2, Area F, hearth	Charcoal	3000 ± 40 (1050)	1380-1225 BC	GrN-4493	R (1967) 9: 141; Rothenberg & Lupu (1967): 69, n10 (3000 ± 50 cited here)
Timna: Site 212/1, Egyptian tunnel	Charcoal	2910 ± 70 (960)	1250-1035 BC	HAM-207	R (1976) 18: 286

Timna: Site 212/1, Egyptian tunnel	Charcoal	2910 ± 60 (960)	1250–1035 BC	HAM-208	R (1976) 18: 287
Timna: Site 212/1e, Egyptian tunnel	Charcoal	3050 ± 70 (1100)	1410–1245 BC	HAM-210	R (1976) 18: 287
Timna: Site 212/1g, Egyptian tunnel	Charcoal	2640 ± 60 (690)	840–780 BC	HAM-211	R (1976) 18: 287
Timna: Site 212/2, Egyptian tunnel	Charcoal	2780 ± 90 (830)	1110–810 BC	HAM-212	R (1976) 18: 287
Timna: Site 212/2, Egyptian tunnel	Charcoal	3890 ± 70 (1940)	2430–2305 BC	HAM-213	R (1976) 18: 287
Timna: Site 212/2a, Egyptian tunnel	Charcoal	4000 ± 90 (2050)	2670–2505 BC	HAM-214	R (1976) 18: 287
Timna: "Mining site, slag pile (Cut 25, Layer 2)"	Charcoal	4020 ± 100 (2070)	2680–2515 BC	HAM-215	R (1976) 18: 287; sample presumably from Site 30
Timna: Site 30, slag pile, Layer 1	Charcoal	3340 ± 60 (1390)	1750–1575 BC	HAM-216	R (1976) 18: 287
Timna: Site 2, Area E, Pit B	Charcoal	2840 ± 51 (890) $\delta^{13}C = -23.8°/_{oo}$	1115–880 BC	BM-1115	R (1979) 21: 349
Timna: Site 30, Area C5, Stratum I, slag	Charcoal inclusions	2480 ± 35 (530) $\delta^{13}C = -24.6°/_{oo}$	645–555 BC	BM-1162	R (1979) 21: 349
Timna: Site 30, Str 3	Charcoal	2790 ± 50 (840) $\delta^{13}C = -21.3°/_{oo}$	1095–830 BC	BM-1598	R (1982) 24: 165
Timna: Site 212, Mine S27	Charcoal	2910 ± 70 (960)	1250–1035 BC	BONN-2356	Conrad & Rothenberg (1980): 179
Timna: Site 212, Mine S27	Charcoal	2910 ± 60 (960)	1250–1035 BC	BONN-2357	Conrad & Rothenberg (1980): 179

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Timna: Site 212, Mine S18	Charcoal	3050 ± 70 (1100)	1410–1245 BC	BONN-2359	Conrad & Rothenberg (1980): 179
Timna: Site 212, Mine S19	Charcoal	2640 ± 60 (690)	840–780 BC	BONN-2360	Conrad & Rothenberg (1980): 179
Timna: Site 212, Mine S28	Charcoal	2780 ± 90 (830)	1110–810 BC	BONN-2361	Conrad & Rothenberg (1980): 179
		Late Bronze Age II/Iron Age I (?)			
Sea bed near Kibbutz ha-Hotrim: Poss shipwreck	Charcoal	2560 ± 360 (610)	1120–375 BC	P-3099	R (1984) 26: 222 for assoc archaeol finds, see Wachsmann & Raveh (1981)
Sea bed near Kibbutz ha-Hotrim: Poss shipwreck	Wood or charred wood	2500 ± 100 (550)	800–420 BC	P-3226	R (1984) 26: 222 for assoc archaeol finds, see Wachsmann & Raveh (1981)
		Iron Age IB			
Deir 'Alla: "One of 'first' seasonal layers"	Ash, chaff, charred grain	3290 ± 50 (1340)	1700–1545 BC	GrN-4748	R (1967) 9: 140
Deir 'Alla: Ph D	Charred beans, grain	3140 ± 35 (1190)	1545–1375 BC	GrN-4749	R (1967) 9: 140; Franken (1969): 245
Deir 'Alla: Ph J	Charcoal	3000 ± 40 (1050)	1380–1225 BC	GrN-4554	R (1967) 9: 140; Franken (1969): 245
		Iron Age I (12th century BC ?)			
Gibeon: Sndg in Area 10-M-3/4, Fl 4	Charcoal	3505 ± 59 (1555)	1970–1740 BC	P-843A	R (1965) 7: 194

Gibeon: Sndg in Area 10-M-3/4, below Fl 4	Charcoal limestone	3073 ± 48 (1123)	1425-1255 BC	P-941	R (1965) 7: 194
		Iron Age I/Early Arab Period			
Timna: Wadi Amram, Site 33, slag heap	Charcoal inclusions	1240 ± 36 (AD 710) $\delta^{13}C = -24.1°/_{oo}$	AD 635-875	BM-1163	R (1979) 21: 350
		Iron Age IIA			
Tell er-Rumeith: Str VIII, gateway, dest debris	Charcoal	2860 ± 160 (910)	1330-825 BC	M-2028	R (1972) 14: 218
Tell er-Rumeith: Str VIII, posts	Charcoal	2530 ± 150 (580)	825-420 BC	M-2031	R (1972) 14: 218
		Iron Age IIB-C			
Tell Areini: Area A, oven, "Middle Israelite layer"	Charcoal	2640 ± 140 (690)	905-750 BC	BM-394	R (1971) 13: 183
Deir 'Alla: Ph M, pit	Charcoal	2690 ± 60 (740)	890-765 BC	GrN-5283	R (1972) 14: 53
Deir 'Alla: Ph M, dest debris	Charred grain	2600 ± 50 (650) $\delta^{13}C = -23.3°/_{oo}$	820-765 BC	GrN-5633	R (1972) 14: 53
Dibon: Str IV, Area C, rm	Grain	2815 ± 165 (865)	1145-810 BC	MP-?	Reed (1957): 9; Winnett & Reed (1964): 49
Dothan: Level 6-A, Area 12, roof beams (?)	Charcoal	2760 ± 80 (810)	1100-805 BC	L-365	Broecker & Kulp (1957): 1330; Free (1957)
Jericho: Tr I (Sq C), St/ph XLVII. lxxii-lxxiii(1)	Charcoal	2040 ± 40 (90) $\delta^{13}C = -26.3°/_{oo}$	170 BC-AD 20	BM-1791	R (1982) 24: 280; Burleigh (1984): 762-763

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Lachish: Level IV, later ph	Charred wood	2830 ± 150 (880)	1255-815 BC	Hel-1027	Ussishkin (1978): 90
Lachish: Level III, Loc 3561	Charred wood	2940 ± 110 (990)	1360-1030 BC	Hel-1026	Ussishkin (1978): 90
Lachish: Level II, Loc 4084, shelves/ jar-stands	Charred wood (cedar)	2830 ± 110 (880)	1125-835 BC	Hel-1025	Ussishkin (1978): 90
Tell er-Rumeith: Str VII, posts in fort wall	Charcoal	2420 ± 140 (470)	785-390 BC	M-2029	R (1972) 14: 218
Tell er-Rumeith: Str VII, posts in fort wall	Charcoal	2580 ± 140 (630)	870-560 BC	M-2030	R (1972) 14: 218
Tell er-Rumeith: Str VI, dest debris	Charcoal	2610 ± 150 (660)	890-590 BC	M-2032	R (1972) 14: 219
Tell er-Rumeith: Str VI (?), dest debris	Charcoal	2820 ± 150 (870)	1145-810 BC	M-2033	R (1972) 14: 219
Tell er-Rumeith: Str V, kiln	Charcoal	2800 ± 150 (850)	1130-805 BC	M-2034	R (1972) 14: 219
Tell er-Rumeith: Str V, house, burned debris	Charcoal	2130 ± 140 (180)	400 BC-AD 15	M-2035	R (1972) 14: 219
Tell es-Sa'idiyeh: Str 5, ab Fl 2	Charcoal, sand, dirt	2596 ± 56 (646)	820-765 BC	P-829	R (1965) 7: 195
Tell es-Sa'idiyeh: Str 5, street with level of Fl 2	Charcoal, limestone	2572 ± 59 (622)	810-755 BC	P-830	R (1965) 7: 195

Tell es-Sa'idiyeh: Str 5, below street pavement	Charcoal, sand, limestone	2542 ± 46 (592)	800-600 BC	P-831	R (1965) 7: 195
Tell es-Sa'idiyeh: Str 5, Fl 2	Mildewed charcoal, sand, limestone	2406 ± 52 (456)	615-410 BC	P-832	R (1965) 7: 195
Tell es-Sa'idiyeh: Str 5, Fl 2	Mildewed charcoal, sand, limestone	2537 ± 52 (587)	800-600 BC	P-833	R (1965) 7: 195
Tell es-Sa'idiyeh: Str 5, Fl 2	Charcoal	2726 ± 157 (776)	1105-780 BC	P-834	R (1965) 7: 195
Tell es-Saidiyeh: Str 5, Fl 2	Charcoal, limestone	2418 ± 54 (468)	620-410 BC	P-835	R (1965) 7: 195
Tell es-Sa'idiyeh: Str 5, roof beam from ab Fl 2	Charcoal, dirt, limestone	2523 ± 53 (573)	795-585 BC	P-836	R (1965) 7: 195
Tell es-Sa'idiyeh: Str 5	Charcoal	2577 ± 53 (627)	810-760 BC	P-1099	R (1970) 12: 583
Tell es-Sa'idiyeh: Str 5, Fl 2, beam	Charcoal	2424 ± 57 (474)	620-410 BC	P-1100	R (1970) 12: 583
Tell es-Sa'idiyeh: Str 5, beam	Charcoal	2609 ± 58 (659)	825-770 BC	P-1101	R (1970) 12: 583
Tell es-Sa'idiyeh: Str 5, Fl 2	Charcoal	2633 ± 60 (683)	835-775 BC	P-1444	R (1970) 12: 583
		Iron Age IIB-C (?)			
Rujm Mekhayyat: Moabite fortress or watch tower, wall	Wood ("worm-eaten and partially charred")	2575 ± 100 (625)	825-600 BC	IVIC-108	R (1965) 7: 64; 8th cent. BC archaeol date suggested by James Sauer, pers commun

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Rujm Mekhayyat: Moabite fortress or watch tower, log in wall filling	Wooden log	2530 ± 100 (580)	805-555 BC	IVIC-109	R (1965) 7: 64; for archaeol date, see IVIC-108 above
Tell Siran: Area A, Sq 1, Loc 1, in bronze bottle	Grain	2350 ± 50 (400)	440-395 BC	P-2207	R (1977) 19: 211; Thompson (1983); for archaeol context, see Thompson (1973)
		Persian Period			
Deir 'Alla: Burned layer between Ph N & O	Charred grain	2410 ± 55 (460) $\delta^{13}C = -23.4°/_{oo}$	615-410 BC	GrN-5634	R (1972) 14: 53
Tell es-Sa'idiyeh: Sndg below Str 3 "palace"	Grain	2415 ± 54 (465)	620-410 BC	P-1442	R (1970) 12: 582
Tell es-Sa'idiyeh: Sndg below Str 3 "palace," furnace	Charcoal	2310 ± 100 (360)	440-375 BC	P-1443	R (1970) 12: 582
Tell es-Sa'idiyeh: Sndg below Str 3 "palace," House 4	Grain	2141 ± 55 (191)	255-145 BC	P-1445	R (1970) 12: 582
Tell es-Sa'idiyeh: Sndg below Str 3 "palace," Rm 5/1W	Grain	2485 ± 57 (535)	785-550 BC	P-1448	R (1970) 12: 582
Tell es-Sa'idiyeh: Str 3 "palace," Fl 1c	Charcoal	2226 ± 50 (276)	405-180 BC	P-1446	R (1970) 12: 582
		Persian Period (?)			
Tel Michal: Pit	Charcoal	230 ± 40 (AD 1720)	AD 1635-1665 (Stuiver corrected)	P-2718	R (1981) 23: 232

Sea of Athlit: Bronze ship's ram	Wood (silver fir)	2350 ± 130 (400)	625-370 BC	RT-?	Linder & Ramon (1981); sample poss from covering of ram, cf Steffy (1983): 235, 246, n4
		Hellenistic Period			
Tell es-Sa'idiyeh: Str 2 bldg, roof beam	Wood	2098 ± 55 (148)	190-15 BC	P-1095	R (1970) 12: 582
Tell es-Sa'idiyeh: Str 2 bldg, beam	Burned Wood	2199 ± 55 (249)	395-170 BC	P-1096	R (1970) 12: 582
Tell es-Sa'idiyeh: Str 2 bldg, beam	Charcoal	2179 ± 53 (229)	390-165 BC	P-1097	R (1970) 12: 582
Tell es-Sa'idiyeh: Str 2 bldg, beam	Charcoal	2267 ± 53 (317)	410-370 BC	P-1098	R (1970) 12: 582
Tell es-Sa'idiyeh: Str 2 bldg, ab Fl 1	Charcoal	2228 ± 48 (278)	405-180 BC	P-1447	R (1970) 12: 582
		Late Hellenistic/Early Roman Period			
Qumran: Period Ib or II, poss from rafters	Charred wood (date palm)	1940 ± 80 (AD 10)	40 BC-AD 85	GL-25	Zeuner (1956): 196; (1960): 27-28; RMCI (1967): 31; same sample as GL-47
Qumran: Period Ib or II, poss from rafters	"	1965 ± 80 (15)	160 BC-AD 70	GL-47	Zeuner (1960): 27-28; RMCI (1967): 31; cf GL-25, diff pretreatment
		Roman Period			
Masada: Roman rampart	Wood	2000 ± 90 (50)	170 BC-AD 55	TF-1002	R (1973) 15: 580

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Nahal Hever: Cave of Horror	Cloth (impregnated with blood & flesh)	1649 ± 100 (AD 301)	AD 230-560	Q-621	R (1962) 4: 70; same sample as Q-771
Nahal Hever: Cave of Horror	"	1795 ± 100 (AD 155)	AD 40-335	Q-771	R (1964) 6: 134; cf Q-621
Qumran (Ain Feshka): Cave IQ, poss scroll wrappings	Cloth	1917 ± 200 (AD 33)	175 BC-AD 245	C-576	Libby (1951): 291; (1955): 84; Sellers (1951a; 1951b); Crowfoot (1955): 27; solid-carbon date
Wadi Murabba'at: Cave 1 or 2 (precise cave not stated)	Woolen textile	1350 ± 60 (AD 600)	AD 595-660	GL-37	Zeuner (1960): 28; Crowfoot & Crowfoot (1961): 5, nl; RMCI (1967): 31; same sample as Gro (GrN)-940, -943, -965
Wadi Murabba'at: Cave 1 or 2	"	1665 ± 42 (AD 285)	AD 235-435	Gro-940	de Vries & Waterbolk, (1958): 1555; cf GL-37, diff pretreatment
Wadi Murabba'at: Cave 1 or 2	"	1910 ± 42 (AD 40)	1 BC/AD 1-AD 80	GrN-940	RMCI (1967): 35; corrected date for Gro-940
Wadi Murabba'at: Cave 1 or 2	"	1575 ± 50 (AD 375)	AD 375-575	Gro-943	de Vries & Waterbolk (1958): 1555; cf GL-37, diff pretreatment
Wadi Murabba'at: Cave 1 or 2	"	1815 ± 50 (AD 135)	AD 190-235	GrN-943	RMCI (1967): 35; corrected date for Gro-943

Wadi Murabba'at: Cave 1 or 2	"	1550 ± 75 (AD 400)	AD 410-585	Gro-965	de Vries & Waterbolk (1958): 1555; cf GL-37, diff pretreatment
Wadi Murabba'at: Cave 1 or 2	"	1790 ± 75 (AD 160)	AD 205-245	GrN-965	RMCI (1967): 35; corrected date for Gro-965
		Roman Period (?)			
Timna: Site 200, Nabataean furnace	Charcoal	2779 ± 55 (829) $\delta^{13}C = -13.8°/_{oo}$	930-825 BC	BM-1117	R (1979) 21: 349
		Late Roman/Byzantine Period			
Ashkelon: City wall, just S of E gate, 50-120cm ab ground level	Organic inclusions in mortar	1630 ± 50 (AD 320)	AD 245-465	GrN-7987	Kedar & Mook (1978)
		Late Roman-Early Byzantine Period			
Hayonim Cave: Hearth at top of Str B (= Natufian)	?	1310 ± 65 (AD 640)	AD 610-780	Hv-2675	Bar-Yosef & Goren (1973): 51; Belfer-Cohen & Bar-Yosef (1981): 19-20
Hayonim Cave: Hearth at top of Str B (= Natufian)	?	1845 ± 65 (AD 105)	AD 35-230	Hv-?	Bar-Yosef & Goren (1973): 51; Belfer-Cohen & Bar-Yosef (1981): 19-20
		Byzantine Period			
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	Wood	1435 ± 120 (AD 515)	AD 540-635	M-1673	R (1966) 8: 283

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	Wood	1215 ± 120 (AD 735)	AD 630-895	M-1674	R (1966) 8: 283
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	Wood	1315 ± 120 (AD 635)	AD 595-855	M-1675	R (1966) 8: 283
Monastery of St Catherine: Church of the Transfiguration, window chassis	Wood	1700 ± 120 (AD 250)	AD 215-440	M-1676	R (1966) 8: 283; cf entry below
Monastery of St Catherine: Church of the Transfiguration, window chassis	"	1500 ± 120 (AD 450)	AD 420-610	M-1676	R (1966) 8: 283; re-run of sample, no change in lab no.
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	Wood	150 ± 100 (AD 1800)	Too young to be meaningfully calibrated	M-1677	R (1966) 8: 283; cf entry below
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	"	0 ± 100 (AD 1950)	---	M-1677	R (1966) 8: 283; re-run of sample, no change in lab no.

Monastery of St Catherine: Church of the Transfiguration, withe from window armature	Wood	"Modern"	---	M-1812	R (1968) 10: 108
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	Wood	1280 ± 140 (AD 670)	AD 595-890	M-1813	R (1968) 10: 108
Monastery of St Catherine: Church of the Transfiguration, window	Wood	200 ± 100 (AD 1750)	AD 1630-1850 (Stuiver corrected)	M-1814	R (1968) 10: 108
Monastery of St Catherine: Church of the Transfiguration, roof truss over nave	Wood (sapwood, bark and branches visible)	1330 ± 40 (AD 620) $\delta^{13}C = -24.6°/_{oo}$	AD 605-765	BM-1222	R (1982) 24: 164
Monastery of St Catherine: Church of the Transfiguration, NW corner tower ceiling	Wood	1450 ± 50 (AD 500) $\delta^{13}C = -23.0°/_{oo}$	AD 560-615	BM-1223	R (1982) 24: 165
Monastery of St Catherine: Church of the Transfiguration, roof purlin over nave	Wood	1490 ± 60 (AD 460) $\delta^{13}C = -24.9°/_{oo}$	AD 445-600	BM-1224	R (1982) 24: 165

Provenience	Material	^{14}C date BP (BC)	CRD-1σ date	Lab no.	Refs and Remarks
		Crusader Period			
Caesarea: City wall, S of E gate	Organic inclusions in mortar (poss Phoenix dactylifera)	960 ± 160 (AD 990)	AD 890-1235	RT-?	Kedar & Kaufman (1975)
		Ottoman Period (?)			
Khirbet Umm ad-Dananir: Field V, Area 2, Surface of Loc 6	Dessicated wood	250 ± 50 (AD 1700)	AD 1540-1795 (Stuiver corrected)	P-3218	R (1984) 26: 223
		Modern Period (?)			
Bab edh-Dhra: Field H.3, Loc 4	Peach pit	"Modern"	---	QL-1558	Unpub; pers commun, W E Rast & R T Schaub
		Archaeological date unknown			
Caesarea: Burial, 125cm bs	Human bone (collagen)	240 ± 150 (AD 1710)	AD 1465-1700 (Stuiver corrected)	UCR-276	R (1982) 24: 64
Gibeon: Sndg in Area 10-N-4, Level 6	Charcoal, limestone	3164 ± 48 (1214)	1570-1380 BC	P-838	R (1965) 7: 194
Gibeon: Sndg in Area 10-N-4, Level 6	Charcoal	3148 ± 119 (1198)	1640-1340 BC	P-839	R (1965) 7: 194
Gibeon: Sndg in Area 10-M-4/4, Rm 2	Charcoal, dirt	3231 ± 57 (1281)	1670-1420 BC	P-840	R (1965) 7: 194
Jebel Khirbet en-Nahas: Slag pile	Charcoal	2540 ± 200 (590)	875-410 BC	W-4051	Overstreet, Grimes, & Seitz (1982): 97, 107, table 20

Jebel Khirbet en-Nahas: Slag pile	Charcoal	3220 ± 200 (1270)	1750-1270 BC	W-4456	Overstreet, Grimes, & Seitz (1982): 97, 124, table 20
Jericho: "1/3 to 1/2 of total depth of pit, 250 cm"	Charcoal	4200 ± 70 (2250)	2925-2780 BC	BONN-746	R (1973) 15: 36
Jericho: "Same location...350 cm"	Charcoal	5110 ± 110 (3160)	3965-3780 BC	BONN-747	R (1973) 15: 36
Jericho: Site M I, St/ph XIII.lxxiva	Charcoal	40,500 ± 2700 (38,550) $\delta^{13}C = -28.0°/_{oo}$	---	BM-1325	Burleigh (1981): 502; R (1982) 24: 166; "invalidated by misassoc"
Timna: "Grave" in "Wadi Fimnah"	Charcoal	2655 ± 65 (705)	870-785 BC	Gro-938	de Vries & Waterbolk (1958): 1555; "Fimnah" evidently a misprint for "Timnah"
Wadi Feinan-Wadi Dana area: slag pile	Charcoal	3000 ± 300 (1050)	1670-825 BC	W-4054	Overstreet, Grimes, & Seitz (1982): 97, 107, table 20

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Addendum

Two items came to the author's attention too late to be included in the article above. (1) Fourteen new dates (Hel-1417 to -1424, Pta-3320, -3336, -3364, -3368 to -3370) from Middle and Late Bronze age and Iron age strata at Lachish have just appeared in print (Ussishkin, 1983, p 164-165, tables 2-3). (2) Based on conversations with other archaeologists and remarks made in several recent publications, it would appear that there are at present 35-40 unpublished ^{14}C dates. They come from at least 6 sites in Jordan, southern Israel, and Sinai and derive mostly from Neolithic and Chalcolithic contexts, though there are a few Epipalaeolithic and EB IV dates.