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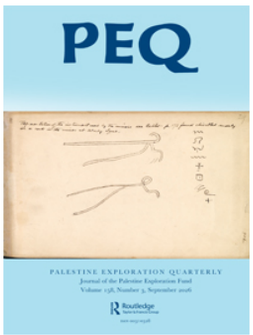
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The Beginning of the Middle Bronze Age in the Levant: New Evidence from Megiddo

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ABSTRACT

This article presents new stratigraphic, ceramic, and radiocarbon data from the recently excavated Area S at Megiddo, providing a refined absolute chronology for the early Middle Bronze Age (MB I) in the southern Levant. Excavations were conducted behind the Stratum XIII fortifications, in the northwestern sector of the mound, initially exposed by the University of Chicago. The aim was to clarify the complex architectural sequence of the MB I gate and fortification systems and establish a well-dated sequence for the late third and early second millennia BCE.

The secure, stratified contexts from Area S provide a ceramic sequence beginning in the Intermediate Bronze Age and extending into the Aphek-based MB I Phases 1, 2, and 3. The accompanying radiocarbon dataset of short-lived samples originating in occupation debris and two destruction layers enables construction of a new absolute chronology of MB I at Megiddo and beyond. Bayesian modeling suggests that MB I began in the late twenty-first or the beginning of the twentieth century BCE, predating some traditional chronologies. The Megiddo dataset, as well as dates from other sites in the southern Levant, reflect also on the chronology of the later part of the Intermediate Bronze Age.

These findings contribute to broader discussions on the transition from the Intermediate Bronze Age to the Middle Bronze Age, the rise of urbanisation in the region, and the synchronisation of Levantine chronologies with Egypt and Syro-Mesopotamia.

KEYWORDS

Megiddo; Middle Bronze Age; Intermediate Bronze Age; Radiocarbon; Ceramic Sequence; Chronology; Urbanisation; Correlation with Egypt

Introduction

The beginning of the Middle Bronze Age (MB) in the southern Levant is defined by a notable shift in material culture from the preceding Intermediate Bronze Age (IBA), characterised by the widespread use of tin bronze for tools and weapons, including

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new forms such as the duckbill axe, the socketed spearhead, and the bronze fibula (Ilan 1995, 297, 300, Fig. 2; Greenberg 2019, 192). Pottery production during this period also changed significantly. In the IBA it is typically handmade and features ledge handles and a focus on goblets and cups as drinking vessels, some inspired by imported Syrian Early Bronze (EB) IV prototypes (Dever 1995, Figs. 3, 5–7; Cohen 2019, 190–1; Greenberg 2019, 154–8). During MB I, wheel-made pottery largely replaced handmade types of all vessel categories, and a new ceramic repertoire emerged that includes two-handled jars (Canaanite amphorae), dipper juglets, platters, drinking bowls, and wheel-made cooking pots (Cohen 2014, 455–8; Greenberg 2019, 192; Ilan and Marcus 2019). These forms continued throughout the Bronze Age. The sharp transformation in ceramic traditions is observed also in the northern Levant, with notable changes at sites such as Tell Arqa (Genz 2017), Ebla (D'Andrea 2019; Peyronel 2019, 750, Figs. 5–6, 7:3–4), and Toprakhisar Höyük (Akar, Bulu, and Kara 2024).

The relative chronology of the MB I is well documented through stratigraphic and ceramic sequences, particularly the pottery phases of Aphek, which has become a shorthand for the MB I: Phases 1–2 for early MB I, Phase 3 for middle and late MB I, and Phase 4 for the transition from MB I to MB II (Cohen 2002, 3–55; Yadin 2009; Ilan and Marcus 2019, Table 1.2.1; see Table 1 below). However, the absolute chronology for the beginning of the southern Levantine MB I remains uncertain due to scarce radiocarbon data (e.g., Höflmayer 2022; Höflmayer and Manning 2022) and limited knowledge on stratigraphic-ceramic phases in the IBA. This lack of data presents significant challenges in understanding the timing of the formation of a complex society, including processes of urbanisation and the rise of palaces, and their relations to major geopolitical developments in Egypt and the northern Levant.

This article presents a new radiocarbon-dated stratigraphic and ceramic sequence of MB I at Megiddo, spanning the transition from the IBA to the early (Aphek Phase 1 or earlier) and middle (Aphek Phases 2–3) MB I. This sequence, along with other radiocarbon determinations from the region, provides a framework for MB chronology. The Megiddo stratigraphic-ceramic-radiocarbon system puts the beginning of the earliest phase of MB I in the southern Levant in the late twenty-first or early twentieth century BCE.

Difficulties in establishing the beginning of MB I in the southern levant

Determining the beginning of the MB cultural horizon in the Levant with accuracy is challenged by the lack of direct synchronisation with Egyptian chronology and

Table 1. IBA and early MB phases at Megiddo: Area S levels and sub-levels and the University of Chicago Strata.

Megiddo Area S Levels	Megiddo Tentative Equation with the University of Chicago Strata	MB I Phases (Ilan and Marcus 2019)	Relative Dating
S-5	XV–IVb	-	IBA
S-4	XIVa	1	MB I early
S-3b, c		1	MB I early
S-3a		2	MB I early
Short gap?	XIIIb?	2–3	MB I middle?
S-2	XIIIb, XIIIa	3	MB I middle–late
S-1	XII–X	-	MB II–III

absence of sufficient radiocarbon data from secure contexts for the latest horizons of the IBA and the earliest phases of the MB.

Correlations with Egypt

The onset of the MB in the Levant has traditionally been associated with the twelfth Dynasty of the Middle Kingdom in Egypt (e.g., Bietak 2002; Marcus 2022) and dated accordingly. A shortcoming of this synchronisation is the absence of correlating finds —Levantine artefacts in early Middle Kingdom contexts in Egypt (Marcus 2022, 783) and Egyptian artefacts in early MB I layers in the Levant. The earliest Egyptian pottery imports from radiocarbon-datable contexts in the Levant were retrieved in Tel Ifshar Phase A 'Late' (that is, not the earliest MB layer at the site; Marcus 2022, 792–801). Similarly, Levantine Painted Ware (LPW) found at 'Ezbet Rushdi (local Strata e/3–4; master Stratum L at Tell el-Dab'a) dates to the mid-twelfth Dynasty, in the late twentieth century BCE (Bagh 2013, 39–45; Höflmayer 2015, 270; Marcus 2021, 334). Hence, the absence of Egyptian pottery in the earliest MB I levels in the Levant and of Levantine pottery from the earliest MB I ceramic phases in Egypt makes it impossible to use the formidable Tell el-Dab'a radiocarbon data to date the beginning of the MB I in the Levant directly.

With the lack of direct evidence, scholars rely on less-secure, indirect synchronisations, such as the depiction of a duckbill axe and socket spearheads (typical of the MB, starting in MB I) carried by 'Asiatics' in wall paintings at Beni Hasan in the tomb of Khnumhotep II, dated to the sixth year of Senwosret II (modeled accession c. 1890–1868 BCE).[1] The earlier Beni Hasan Tombs 2 and 14 from the reigns of Amenemhet I (modeled accession c. 1991–1973 BCE) and Senwosret I (modeled accession c. 1965–1945 BCE) still display fenestrated axes, considered to be typical of the IBA (Bietak 2002, 40; Höflmayer 2015, 270; Höflmayer and Manning 2022; Marcus 2022, 785–8). At Byblos, scarabs of the early Middle Kingdom (late eleventh–early twelfth Dynasties) were found in the Montet Jar. However, based on a cylinder seal with parallels at Kültepe Level II, the jar's sealing date is no earlier than the late twentieth century BCE (Marcus 2022, 811–2).

These ostensible correlations have been crucial factors in dating the beginning of the southern Levantine MB to c. 1900 BCE or slightly earlier, though they indicate the timing of the establishment of large-scale trade between Middle Kingdom Egypt and the Levant (Bietak 2013, Fig. 8.1).

Radiocarbon dates for the beginning of MB I

Another avenue for establishing the beginning of the MB in the Levant, through radiocarbon dating, is hindered by a data gap in the twenty-first and twentieth centuries BCE. There are well-documented radiocarbon dates from mid–late MB I (Aphek Phases 3–4) to early MB II contexts in Israel from sites such as Tel Nami, Tel Ifshar, Ashkelon, and Tel Kabri (Höflmayer et al. 2016; Bruins and van der Plicht 2019; Höflmayer and Manning 2022). In Lebanon, well published dates from the strata corresponding to mid-MB I come from Tell el-Burak (e.g. Höflmayer et al. 2016) and Sidon (a single date; Ogden 2004). However, radiocarbon data for the earliest MB I (Aphek Phases 1–2) are limited (Marcus 2013, Table 15.1; Ilan and Marcus 2019, Table 1.2.1).

The earliest radiocarbon determination from a stratified MB context published to date is from Tel Ifshar Phase A 'early' (68.3% 1943–1779 BCE, 95.4%, 2016–1751 BCE, recalibrated with OXCal 4.4; Marcus 2013, 185–99, Table 15.3). Two short-lived Egyptian ceramic forms found in Phases A 'late' and B suggest that the transition between them occurred before the mid-nineteenth century BCE, the end of Senwosret III's reign (Marcus et al. 2008, 207, 209, 213, Figs. 2:2, 3:1). Tel Ifshar Phase B, with its elite edifice, and the contemporary Palace I at Aphek (MB I Phase 2), mark the beginning of MB monumental architecture and urbanism (Marcus 2013, 202). Eight radiocarbon dates for Ifshar Phase B suggest a date in the early to mid-nineteenth century BCE (Marcus 2013, 190). A complete Egyptian Marl C jar found in the destruction level of Ifshar Phase C provides a rare chronological correlation between Egypt and Canaan, as it could not have been produced after c. 1850 BCE (Marcus 2013, 196). To Marcus (2013, 192), these results suggest that the MB began in the later part of the twentieth century BCE. A recent analysis of the Tel Ifshar data by Höflmayer and Manning (2022, Fig. 10) suggests a transition between the later Phases G and H, in the mid to late nineteenth century BCE. The new chronological scenario following this conclusion compresses the substantial Phases A–F at the site into one century, from c. 1930 BCE (the beginning of the MB, according to Marcus) to 1830 BCE (the new date suggested for Phase H –) – an unlikely situation.

Another set of dates comes from Tell el-Hayyat in Jordan, where Phase 6 is ascribed to the IBA and Phase 5 to the MB I. The age of Phase 6, based on phase boundary medians, is 1921–1887 BCE, while the age for the following Phase 5 is 1887–1834 BCE (Fall, Falconer, and Höflmayer 2021, Table 5), modelling the transition to c. 1900 BCE or slightly earlier. These dates are within the boundaries of Ifshar Phase B, which exhibits the material culture of MB I Phase 2, and is thus much later than the beginning of the period.

A few radiocarbon determinations might support a date of c. 2000 cal BCE for the beginning of the MB; however, these are isolated dates that do not come from stratigraphic sequences. We refer to three ages from a handle of a duckbill axe found in Gesher Tomb 2 (OxA-1955: 68.3% 2135–1903 BCE, 95.4%, 2268–1775 BCE; recalibrated with OXCal 4.4), the first post-EB (MB I) stratum at Pella (OZG-611: 68.3% 2113–1935 BCE, 95.4%, 2135–1890 BCE; recalibrated with OXCal 4.4) and Zahrat adh-Dhra' 1 (OZH-756: 68.3% 2138–1961 BCE, 95.4%, 2204–1890 BCE; recalibrated with OXCal 4.4) (Garfinkel and Cohen 2007; Bourke et al. 2009; Fall, Falconer and Porson 2019, Table 2). Three ages from Jerusalem (RTD-8523, 10446, 10447), one from charcoal and two from seeds, provide dates within the twentieth century BCE (Regev et al. 2021), but their context is not secure.

Radiocarbon dates for the end of the IBA

Pinpointing the beginning of MB I is complicated by the uncertainty surrounding the end of the IBA. Recent radiocarbon studies show that the IBA began c. 2500 BCE and therefore lasted longer than previously thought (Regev et al. 2012; for Tel Yarmuth, Regev, de Miroschedji, and Boaretto 2012; for Megiddo, Regev *et al.* 2014)[2]. Almost none of the substantial IBA radiocarbon datasets considered here (references below) extend beyond c. 2100 cal BCE (see also Falconer and Fall 2016; Fall, Falconer, and Höflmayer 2021, 69). At the Negev sites of 'En Ziq and Nahal Boker, nearly all

determinations predate 2200 BCE, apart from one outlier (RT-2514; Dunseth et al. 2017). In northern Israel, the latest series of IBA dates from Hazor ends before c. 2200 BCE (Lev, Bechar, and Boaretto 2021; Lev et al. 2021). Similarly, the lowest dates within a 95.4% range for Kfar Vradim, Hazorea (tomb), and Sheikh Danon (tomb) are no later than 2200/2150 BCE (Lev et al. 2021; Lev et al. 2022). In the central coastal region, the Yehud tombs continue to c. 2100 CE, with the lowest dates within the 95.4% ranges at ca. 2050 BCE (Lev et al. 2022). This is very similar to the Jebel Qa'aqir shaft tombs where all but two determinations show the lowest dates within the 95.4% ranges at ca. 2050 BCE (Lev et al. 2022). A similar picture emerges at most IBA sites in Jordan, including Tell Abu en-Ni'aj, where the latest IBA Phase 1 produced dates no later than ca. 2150 CE (Fall, Falconer, and Höflmayer 2021, 69).

These data indicate extensive abandonment of IBA sites after 2200 BCE in the lowlands and the Negev, with limited radiocarbon dates as late as 2100/2050 BCE.

A handful of dates from the central Hill Country and the central and southern Jordan Valley may offer IBA dates later than 2050 BCE. Yet these isolated cases do not come from clear, stratified sequences. In the Jebel Qa'aqir cemetery, two outlier determinations for Tomb B54 provide lowest dates in 95.4% ranges in the twentieth century BCE (Lev et al. 2022; RTD-9009: 68.3% 2136–2027 BCE, 95.4% 2195–1960 BCE; RTD-9010: 68.3% 2028–1953 BCE, 95.4%, 2128–1900 BCE; dates for both samples recalibrated with OxCal 4.4.4). These may represent reuse of the tomb (still associated with IBA finds) after most of the IBA cemetery went out of use. A charcoal piece from Nahal Refa'im (RT1711), has a 95.4% range of 2203–1886 BCE and may thus be later than 2100 BCE (recalibrated with OxCal 4.4.4). Two additional charcoal samples come from Bab edh-Dhra' (Beta-134017: 68.3% 2196–1977 BCE, 95.4%, 2281–1899 BCE; SI-2875: 68.3% 2116–1985 BCE, 95.4%, 2141–1748 BCE; both recalibrated with OxCal 4.4.4; Falconer and Fall 2016, Table. 4; Fall, Falconer, and Höflmayer 2021, 69).

Based on sherds, the ceramic tradition of Phase 6 at Tell el-Hayyat appears to represent the IBA (Falconer and Berelov 2006, Fig. 4.1). However, 68.3% ranges for the three short-lived samples from this layer (GrM-12040, AA-108792 and AA-108791) are well within the traditional chronological time frame of MB I, in the late twentieth–early nineteenth centuries BCE (Fall, Falconer, and Höflmayer 2021, Table 2). Furthermore, as stated above, they fall within the range of radiocarbon results from Ifshar Phase B, the second MB I phase at the site.

Taken together, the evidence suggests that the vast majority of IBA cultural phenomena ended c. 2100 BCE, with limited continuity beyond this date.

On this background, we turn to the new evidence from Megiddo.

Area S at Megiddo

Area S is located inside part of Area AA of the University of Chicago's excavations (Fig. 1). Our work here focused on two goals: (1) reinvestigating major elements of the Middle Bronze fortifications exposed in the past; and (2) exploring the stratigraphy related to these elements. The latter was carried out in one sector of the area, immediately behind the University of Chicago's Stratum XIII city wall (our Wall 12/S/13, late MB I, Fig. 1:5), where the early debris had not been removed in the past. Here we exposed a well-stratified sequence of architectural remains, living surfaces, and destruction deposits extending from middle and early phases of MB I down to the late IBA. Special attention was given to the collection of samples for radiocarbon dating. The



Figure 1. Aerial picture of Megiddo's northern sector (Area AA of the University of Chicago) with our Area S at its center and left, showing main elements exposed by the University of Chicago and the current dig, looking north: (1) Level S-1 Tower 12/S/38; (2) in dashed yellow lines, location of Tower 12/S/17 unearthed in 2012 under Late Bronze gate plaza and backfilled (only the northern and western faces of the tower were unearthed in the excavation; the eastern and southern ends are reconstructed); (3) City-Wall 12/S/34 of Level S-2; (4) rampart of Level S-2 and later phases of the MB I–II fortification system; (5) City-Wall 12/S/13 (University of Chicago's Stratum XIII, Fig. 2:9), which postdates Level S-1; (6) steps leading to the late MB I gate (Stratum XIII of the University of Chicago); (7) MB III gate western tower (University of Chicago Stratum XI); (8) MB III rampart; (9) Late Bronze gate; the red rectangle marks the location of Fig. 2. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

results shed light on the emergence and development of Megiddo's earliest MB fortification and gate complex.

In what follows, we present the stratigraphy and architecture of the principal layers in this area (Levels S-5 to S-1, Table 1, Fig. 2), together with their ceramic assemblages and associated radiocarbon determinations (Fig. 3). Taken together, these form the basis for the integrated chronological framework discussed below, illustrating the cultural and architectural transformation from the late third to the early second millennium BCE.

Stratigraphy and architecture (Table 1, Figs. 2, 4–5)

Level S-5

The earliest occupational surface reached in Area S was a floor and an associated pit (Fig. 2:1). IBA pottery was found in both contexts (including a complete storage jar; Fig. 6), and

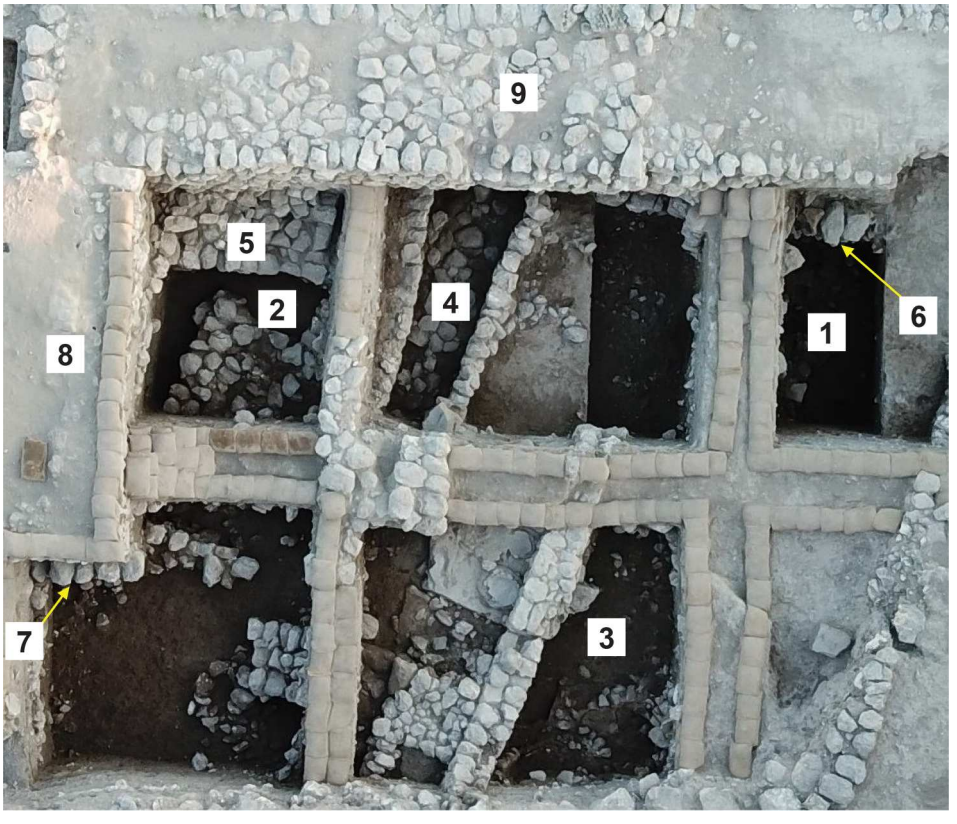


Figure 2. The stratigraphic excavation in Area S, looking north (2018). In stratigraphic order: (1) Level S-5 Surface 18/S/70B over fill with EB and IBA sherds; (2) more of the no. 1 fill unearthed farther below in this square in 2022; (3) Level S-4 surface with kilns: (4) Levels S-4 and S-3 drain; (5) Wall 12/S/31, possibly part of a Levels S-4 and S-3 gate tower; (6) Levels S-4 and S-3 City-Wall 18/S/5; (7) Level S-2 Tower 12/S/22; (8) Level S-1 Tower 12/S/38; (9) City-Wall 12/S/13 (University of Chicago's Stratum XIII, Fig. 1:1), which postdates Level S-1. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

a cluster of seeds was recovered near the pit. Four measurements of carbonised seeds from the same locus (18/S/70B/LB5) were run at Beta Analytic and at the Oxford Radiocarbon Accelerator Unit (Beta746384, Beta746385, Beta746386, OxA37943; Fig. 3:a). A thick fill below the floor contained a large quantity of EB I–III pottery with sporadic IBA sherds. The same fill was reached a short distance to the west (Fig. 2:2). This suggests significant earthwork in the IBA (Adams and Dunseth forthcoming).

Level S-4

Level S-4 presents the earliest living surfaces exhibiting MB I pottery, linked to the earliest MB fortification. The most prominent floor, in the southeast, features two kilns (Figs. 2:3, 4:3). A large, well-preserved drain runs from the settlement area (south) toward the slope (north) (Figs. 2:4, 4:4). The drain widens as it progresses and passes under Wall 18/S/5 (Fig. 2:6) – probably the inner face of a city-wall (Adams *et al.* forthcoming). Wall 12S/31 (Figs. 2:5, 4:5) may be interpreted as part of a gate tower. Gates

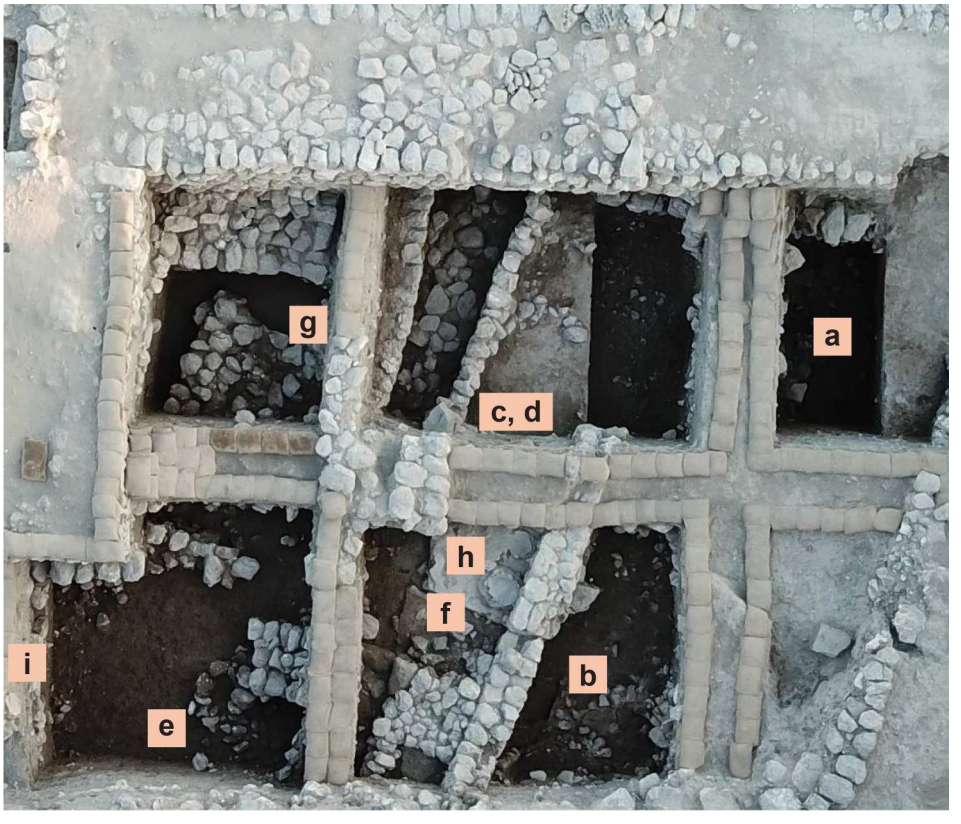


Figure 3. Location of samples for radiocarbon dating; see text: (a) Level S-5 surface, 18/S/70B; (b) Level S-4 kilns, 22/S/48; (c) Level S-4 surface, 22/S/54; (d) Sub-Level S-3c surface, 22/S/47; (e) Sub-Level S-3b, surface 18/S/98; (f) Sub-Level S-3a destruction, Floor 18/S/52; (g) Sub-Level S-3a destruction, Floor 18/S/138; (h) Sub-Level S-3a, 22/S/25; (i) Level S-2 destruction, 18/S/82. Points a, b, c, and i mark the location and elevation of the samples. Points d, e, f, g, and h mark only the location; the elevation was higher than the remains seen in the picture. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

were located in this area throughout the Bronze and Iron Ages (Finkelstein et al. 2019; Adams, Finkelstein, and Levy 2024). Because they occupied the lowest point in the city, they were equipped with elaborate drainage systems running either below the passageway or on the side of a given gate (Loud 1948, Figs. 378, 382, 388, 389; Adams, Finkelstein, and Levy 2024), which seems to be the case here. Two single-seed samples associated with this level originated in one of the kilns (22/S/48/LB3, AA116064; Fig. 3:b) and a nearby surface (22/S/54/LB3, AA116065, Fig. 3:c).

Level S-3

Level S-3 features continuity in the Level S-4 architectural elements, including the drain, with new surfaces on both its sides. These surfaces can be divided into three sub-levels (S-3c–a). The lower surfaces in this sequence (Sub-Levels S-3c and S-3b) yielded three samples from seed clusters (Sub-Level S-3c: 22/S/47/LB3, AA11160; Sub-Level S-3b: 18/S/98/LB1a/b, OxA37868, OxA37942; Fig. 3:d, e). The upper surface, Sub-Level S-3a,

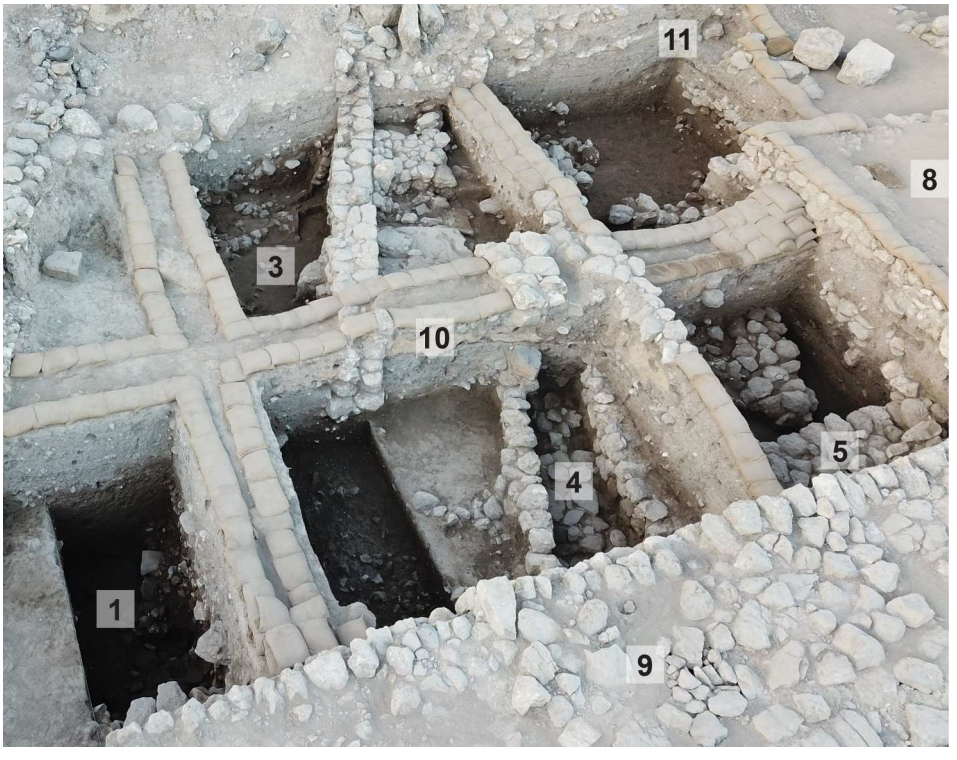


Figure 4. Stratigraphic excavation behind the University of Chicago's Stratum XIII city wall, looking southwest (2018). Added to the features marked in Fig. 2 are (10) destruction of Sub-Level S-3a; (11) destruction of Level S-2. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

terminated in a conflagration identified across the entire area. This destruction is represented by a layer up to 0.75 m thick of reddish burnt brick debris (Figs. 4:10, 5), which produced five radiocarbon samples. Two derive from a seed cluster on a floor in Locus 18/S/52 (18/S/52/PT7/LB8b, OxA37867; 18/S/52/PT7/LB8a, OxA37940; Fig. 3:f); two were extracted from a cluster of seven seeds found on a floor in Locus 18/S/138 (18/S/138/PT1/LB3a, OxA38188; 18/S/138/PT1/LB3b, OxA37941; Fig. 3:g), and one is an isolated seed from Locus 22/S/25 (22/S/25/PT2/LB10, AA116062; Fig. 3: h).

Level S-2

Level S-2 represents a significant break from the destroyed Level S-3 (Sub-Level S-3a) and exhibits clearer evidence of fortifications, consisting of a city wall (12/S/34, Fig. 1: 3) connected to the foundation of a massive L-shaped brick-on-stone structure, Tower 12/S/22 (Fig. 2: 7). To the east lies another massive tower (12/S/17, Fig. 1: 2), at least 10 × 22 m in size. Part of the space between the two towers may have formed the gateway during this period, which is currently overbuilt by a later fortification (Wall 12/S/13). Wall 12/S/18 (seen in the southeastern corner of the red rectangle marked in Fig. 1) may have belonged to a drainage system that passed beneath the gate.



Figure 5. Orange destruction debris of Sub-Level S-3a seen in the sections (Fig. 4:10). Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

Tower 12/S/22 also featured evidence of fire (Fig. 4: 11), though the accumulation was not as substantial as the Sub-Level S-3a destruction layer. A cluster of burnt seeds behind the tower yielded two samples for radiocarbon dating (18/S/82/LB6, OxA37779; OxA37780; Fig. 3: i).

Level S-1

This layer is represented by the post-burning rebuilding of the L-shaped tower on a grander scale, designated as Tower 12/S/38 (Figs. 2:8, 4, 8). No radiocarbon determinations are available for this level, as the remains lay too close to the surface; later layers had been removed by the University of Chicago expedition.

The elements of the University of Chicago's Stratum XIII (Loud 1948, Fig. 378), dating, according to our work, to the late MB I, postdate Level S-1. We refer to the city wall (our Wall 12/S/13, Fig. 1:5) the steps approaching the gate (Fig. 1:6) and the gate structure. The rampart seen slightly to the west (Fig. 1:4) also belongs to this post-Level S-1 system.

Pottery[3]

The pottery sequence from Megiddo Levels S-4 to S-2 reflects an uninterrupted early MB I ceramic tradition, with little or no continuity from the IBA (apart from possible survivals in goblets and open carinated bowls). This sequence is preceded by Level S-5, which yields a distinct IBA ceramic assemblage. In the discussion below, the assemblage for

each level is described briefly, with parallels to other sites presented in the tables accompanying Figs. 6–12. Parallels are suggested, mainly from Tel Aphek (Yadin 2009), Tel Ifshar (Marcus 2013), and Tell el-Hayyat (Falconer and Berelov 2006).

Below we start with a short reference to the pottery of Level S-5 of the IBA.

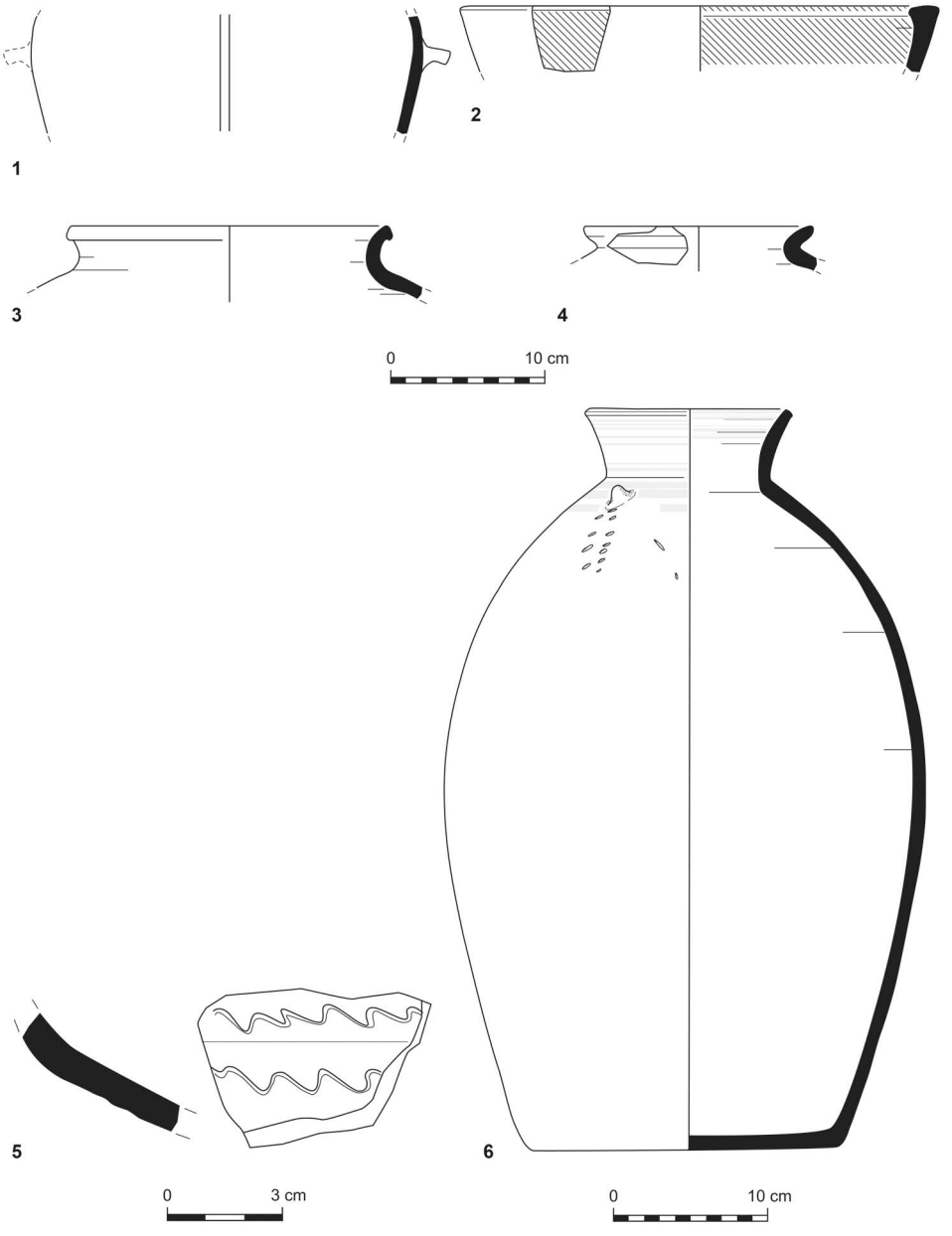


Figure 6. Level S-5 ceramic assemblage. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

Table 2. Level S-5 Ceramic Types and Selected Comparanda

Fig. No.	Reg. No.	Vessel Description	Comparanda
6:1		Body sherd of a globular vat with two envelope handles	'Ein el-Hilu, Unit A Room 212 (Covello-Paran 2015, Fig. 4.21. 2); Nahal Rimmonim Stratum II (Covello-Paran 2008, Fig. 6:11–12)
6:2		Open, deep bowl with straight, slanting walls and internally thickened, flattened rim	'Ein el-Hilu, Eastern open area, Locus 300 (Covello-Paran 2015, Fig. 4.22:1–2); Nahal Rimmonim Stratum II (Covello-Paran 2008, Fig. 6:6); Nein/'En Ha-More (Covello-Paran 2011, Fig. 5:2, 5–6)
6:3		Wide-necked storage jar with tapered rim	'Ein el-Hilu, Unit E Room 883 (Covello Paran 2015, Fig. 4.74:5); Murhan, Unit B (Covello-Paran 2015, Fig. 4.168:5); Nein/'En Ha-More (Covello-Paran 2011, Fig. 5:18)
6:4		Low-necked storage jar with an everted rim	'Ein el-Hilu, Unit B (Covello-Paran 2015, Fig. 4.30:17); Unit D Room 247 (Covello-Paran 2015, Fig. 4:60); Nein/'En Ha-More (Covello-Paran 2011, Fig. 5:11–12)
6:5		A shoulder sherd of a storage jar with an incised, wavy decoration	Megiddo, E = 5139 (Loud 1948, Pl.13:6)
6:6		Elongated, handle-less storage jar with a flaring neck	Er-Rujum/Sha'alabim Level IIIC (constructional fills) (Milevski et al. 2012, Fig. 21:1–5); Level IV (occupational remains) (Milevski et al. 2012, Fig. 20:3, 5); Jebel Qa'aqir (Dever 2014, Fig. 3.31:4–5); Nahal Repha'im, Type SJ2b, many examples (Roth forthcoming)

Level S-5

The Level S-5 assemblage (Fig. 6) consists of diagnostic sherd material and a single complete storage jar. The diagnostic sherds find parallels in Jezreel Valley IBA sites (Fig. 6:1–4, Table 2). A decorated shoulder fragment (Fig. 6:5) displays a late IBA style characterised by an incised wave. While this motif – typically executed with a combed tool – occurs in southern sites primarily on small drinking vessels (Roth 2025: Table 3.84: DT2), a single-line incision of two similar waves on a local IBA storage jar was recorded at Megiddo (Loud 1948, Pl. 13:6).[4] The only complete vessel in the assemblage, an elongated handle-less storage jar with a flaring rim, is characteristic of later IBA phases, particularly in the Judean Highlands and Lowlands (Roth forthcoming). This suggests a late IBA date for Level S-5. The presence of late IBA at Megiddo and the Jezreel Valley is supported by the find of the precursors of characteristic MB I metal artifacts, which appear as early as the late IBA. Several IBA tombs in the Jezreel Valley contain metal assemblages featuring types that later become diagnostic of the MB I. Thus, the tomb in Maz'arib, which has only an IBA ceramic phase, yielded a socketed spearhead as well as a toggle pin with an eyelet. Covello-Paran dates this tomb to the terminal IBA phase. A combination of a toggle pin and a socketed spearhead is also found in T. 1101b Lower at Megiddo, also attributed only to the IBA (Covello-Paran 2015, 361, 367). Toggle pins with eyelets of types common in the MB I, including the early MB I cemetery of Gesher, appear at Megiddo in clear contexts of IBA – e.g., T.1014 and T.1101b (Covallo-Paran 2015, 367).

Level S-4

The Level S-4 assemblage (Table 3; Fig. 7) includes open plater bowls (Fig. 7:1–2) and large S-shaped bowls or kraters with everted rims (Fig. 7:5), along with storage jars

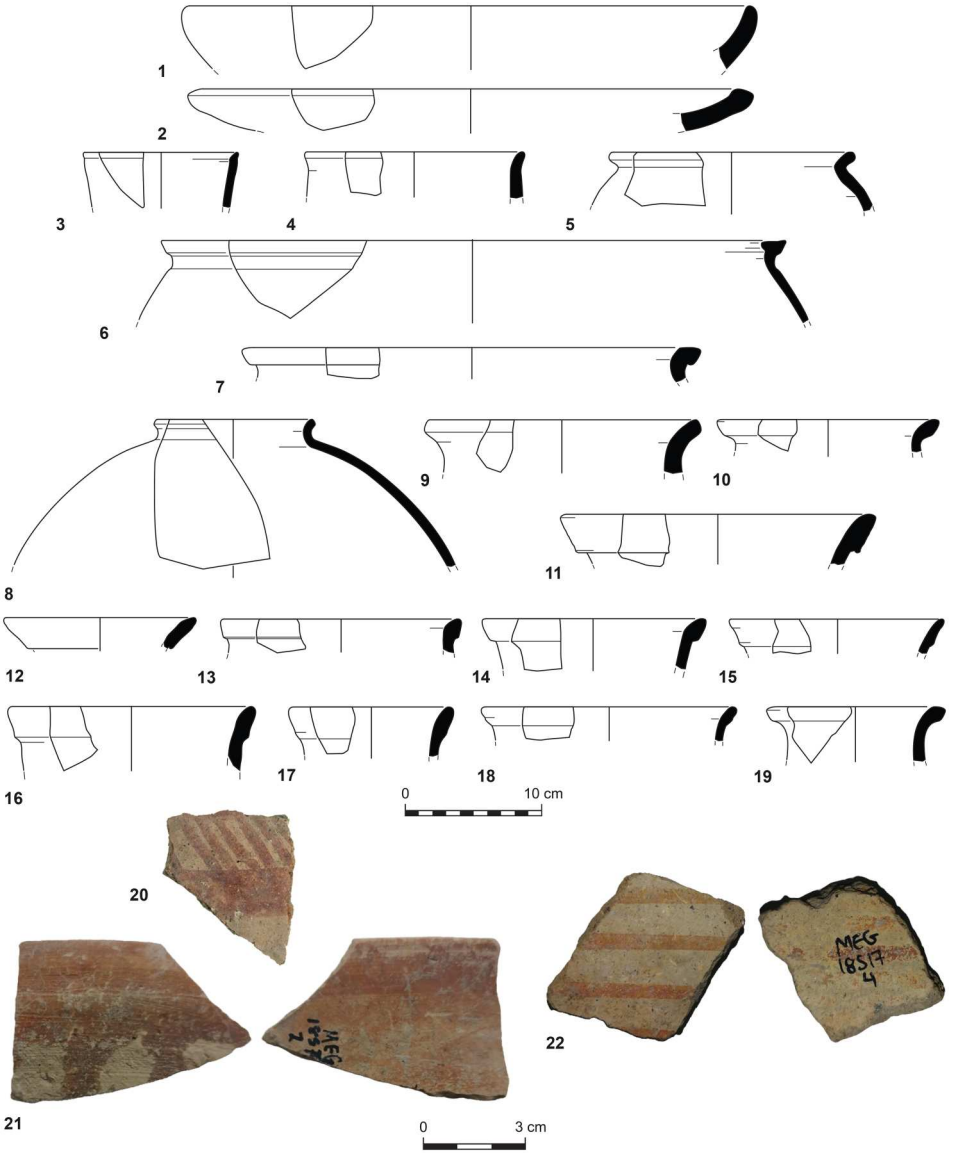


Figure 7. Level S-4 Ceramic assemblage. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

and jugs featuring everted (Fig. 7:8–9), elongated out-folded (Fig. 7:10–18), or rounded thickened rims (Fig. 7:19). Two sherds of goblets (Fig. 7:3–4), an IBA ceramic tradition, may be residual or may indicate limited persistence of this form into MB I. Parallels for these vessels appear in Aphek Stratum X19 and contemporaneous Stratum B Vd, as well as in Stratum X18, in the Gesher cemetery, and in Tell el-Hayyat Phase 5 (Table 5). Kraters from Level S-4 (Fig. 7:6–7) represent the earliest examples of their types known in the southern Levant.

The assemblage also exhibits both monochrome (Fig. 7:20) and bichrome (Fig. 7:21–22) varieties of LPW. The bowl in Fig. 7:21 has parallels in the temple at Nahariya

Table 3. Level S-4 Ceramic Types and Selected Comparanda

Fig. No.	Reg. No.	Vessel Description	Comparanda
7:1	2018/S/81_2	Shallow bowl with incurved walls and simple rim	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.2:1, although more closed)
7:2	2022/S/54_1_2	Large open bowl with straight walls and slightly internally thickened rim	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.2:3); Megiddo Stratum XV, T.3171 (Loud 1948, Pl. 9:4); Megiddo Stratum XIV (Loud 1948, Fig. I.14:39)
7:3	2018/S/17_3	Goblet with upright walls and tapered upright rim	Tell el-Hayyat Phase 5 (Falconer and Berelov 2006, Fig. 4.2:d)
7:4	2022/S/55_1_1	S-shaped goblet with upright walls and everted rim	Aphek Stratum X19, Phase 1 (Yadin 2009, Fig. 7.1:3); Aphek Stratum B Vd, Phase 1 (Beck 2000b, Fig. 8.11:1); Tell el-Hayyat Phase 5 (Falconer and Berelov 2006, Fig. 4.2:h); Megiddo Stratum XIV (Loud 1948, Fig. I.14:37)
7:5	2018/S/90_2_2	Deep S-shaped globular bowl or neckless krater with everted rim	Gesher Grave 9 (Garfinkel and Cohen 2007, Fig. 3.40:3 an S shaped bowl); Aphek Stratum B Vd, Phase 1 (Beck 2000b, Fig. 8.10:5 bowl)
7:6	2018/S/17_1	Necked krater with out-turned triangular wedge-ledged rim	Tell Mishrifeh/Qatna, Phases J-17–18, MB I, (Iamoni and Morandi Bonacossi 2010, Fig. 7:5–7 identified as cooking pots); Aphek Stratum B Vc Phase 2 (Beck 2000b, Fig. 8.12:8); Qiryat Shemona, Stratum VII (Yasur-Landau 2012, Fig. 3.2:13)
7:7	2022/S/55_1	Krater with out-turned molded rectangular ledge rim	Tell Mishrifeh/Qatna Phases J-17–18, MB I (Iamoni and Morandi Bonacossi 2010, Fig. 7:1); Hama H5 (Fugmann 1958, Fig. 109:3C551)
7:8–9	2022/S/27_2, 2022/S/54_1	Storage jar with simple everted rim	Gesher Grave 23 (Garfinkel and Cohen 2007, Fig. 3.93:2)
7:10–13	2018/S/70A_2, 2018/S/70A_4_1, 2018/S/70A_4_2, 2018/S/17_2	Storage jar with out-folded triangular rim	Aphek Stratum B Vd = Stratum X19, Phase 1 (Beck 2000b, Figs. 8.10:10, 17, 18; 8.11:8, 11); Aphek Stratum X19, Phase 1(Yadin 2009, Fig. 7.1:8, 9, 13); Gesher Grave 8 (Garfinkel and Cohen 2007, Fig. 3.37:2)
7:14 – 18	2022/S/48_2, 2018/S/17_4_1, 2018/S/70A_1, 2018/S/17_5_2, 2018/S/90_1_3	Storage jar with out-folded elongated rim	Aphek Stratum B Vd = Stratum X19, Phase 1 (Beck 2000b, Fig. 8.10:27)
7:19	2018/S/17_4_2	Storage jar with everted thickened rim	Grave 20 (Garfinkel and Cohen 2007, Fig. 3.83:2)
7:20	18/S/70/VS1	LPW Monochrome	Ifshar A 'early' (Marcus 2013, 190); For discussion on occurrence of the family ware see main text
7:21–22	18/S/70/VS2, 18/S/17/VS11	LPW Bichrome	For discussion on occurrence of the family ware see main text

(Ben-Dor 1950, 39, Fig. 46; Bagh 2013, Fig. 54f) and may be related to the EB IV Trickle-Painted Ware (TPW) tradition, documented in the Jezreel Valley (Covello-Paran 2015, Fig. 6.5:2), the Great Rift Valley (e.g., Tell Iktanu: Prag 1988, Fig. 5:2; Tell el-Hayyat: Falconer and Berelov 2006, Figs. 4.1:a–b; 4.7:b), and possibly in Megiddo Stratum XVI (Loud 1948, Pl. 7:6). A second bichrome LPW example from Level S-4 is a bowl decorated with thin orange horizontal bands on the exterior and alternating orange and dark-brown bands on the interior (Fig. 7:22). This bichrome LPW decorative style has been previously identified in Aphek Stratum X18 Phase 1 (Yadin 2009, Fig. 7.4:4), and Tel Ifshar Phase A 'late' (Marcus, Porath, and Paley 2008, Fig. 9:7). In Area S, however, bichrome LPW decoration appears already in the earliest MB I layer (Level

S-4), marking the earliest documented occurrence of this ware in the MB I Phase 1 in the southern Levant.

Red slip and burnish are absent. This may reflect a ceramic phase predating their first appearance in the region. Cooking wares are also not present. Level S-4 is probably contemporaneous with the earliest MB I habitation levels attributed to MB I Phase 1 at the sites noted above.

Level S-3

Sub-Levels S-3c–b (Table 4; Fig. 8) feature hemispheric and open bowls (Fig. 8:1–2), globular cooking pots with flaring rims (Fig. 8:6–10), and handmade straight-sided cooking pots (Fig. 8:11–12). Storage jars with elongated out-folded rims (Fig. 8:13–16) persist, alongside storage jars and possibly jugs with more elaborate rim forms, including strongly everted ring rims (Fig. 8:17, 20), double-ridged out-folded rims (Fig. 8:18), possibly of cylindrical jars, and ridge-necked storage jars (Fig. 8:19). Kraters with out-turned triangular rims and a wedged ledge continue from Level S-4 (Fig. 8:5).

Sub-Levels S-3c–b also show the first appearance in our assemblages of open carinated bowls (Fig. 8:3). These find parallels in western Syria and appear at other southern Levantine sites only in later stages. The bowl in Fig. 8:3 is monochrome LPW (see additional examples for the ware in Fig. 8:21–22). Bichrome LPW decoration also appears in these sub-levels, including a hemispheric bowl (Fig. 8:1). Level S-3b further marks the first appearance of red-slip decoration albeit with no burnish (e.g., Fig. 8:20) in Area S's assemblages. Overall, the pottery from Sub-Levels S-3c–b finds its closest parallels in Tel Ifshar Phase A 'early', Tell el-Hayyat 5 (and possibly 4), Aphek Stratum X18, and Tomb 235 at Tel Nami. These are all still MB I Phase 1 forms (Tables 3, 6).

The Sub-Level S-3a destruction yielded pottery that is typologically similar to that of Sub-Level S-3b but incorporates several slightly later ceramic features (Table 5; Figs. 9–11). Continuity from Sub-Level S-3b is reflected in hemispheric bowls (Fig. 9:1), open bowls with thickened rims (Fig. 9:2, 4), and storage jars with strongly everted (Fig. 11:10), simple everted (Fig. 11:11), or elongated out-folded rims (Fig. 11:12–19), as well as globular wheel-made cooking pots with everted gutter rims (Fig. 11:1–6) and straight-sided cooking pots (Fig. 10:8–11).

New elements include closed carinated bowls (Fig. 9:5) and open bowls with ridged collar rim (Fig. 9:3). This level is further characterized by a variety of kraters (Fig. 9:6–10, 10:1–7), one of which is noteworthy for its skirt-like ring base (Fig. 10: 7), a feature with no parallel in the southern Levant. This characteristic is common in a vessel type from the lower alluvial plains of Mesopotamia and Susiana, which dates to the late twentieth and early nineteenth centuries BCE (Group 135C2; Armstrong and Gasche 2014, Pls. 74–75, Table 5). Other new types include handle-less elongated oval storage jars with externally thickened rims (Fig. 11:9). Red slip, more prevalent than in the preceding sub-level, is now accompanied by burnishing (e.g., Fig. 9:5). LPW with bichrome decoration continues to appear (Figs. 9:2, 6; 11: 22, 23). Juglets make their first appearance here, including a type with a 'candlestick' rim (Fig. 11:21).

In sum, Sub-Levels S-3c–b may already date to the earliest days of MB I Phase 2, with parallels in Aphek Strata X17a–c, B Vc, and A XVII (Palace I), Yoqneʿam Stratum XXV,

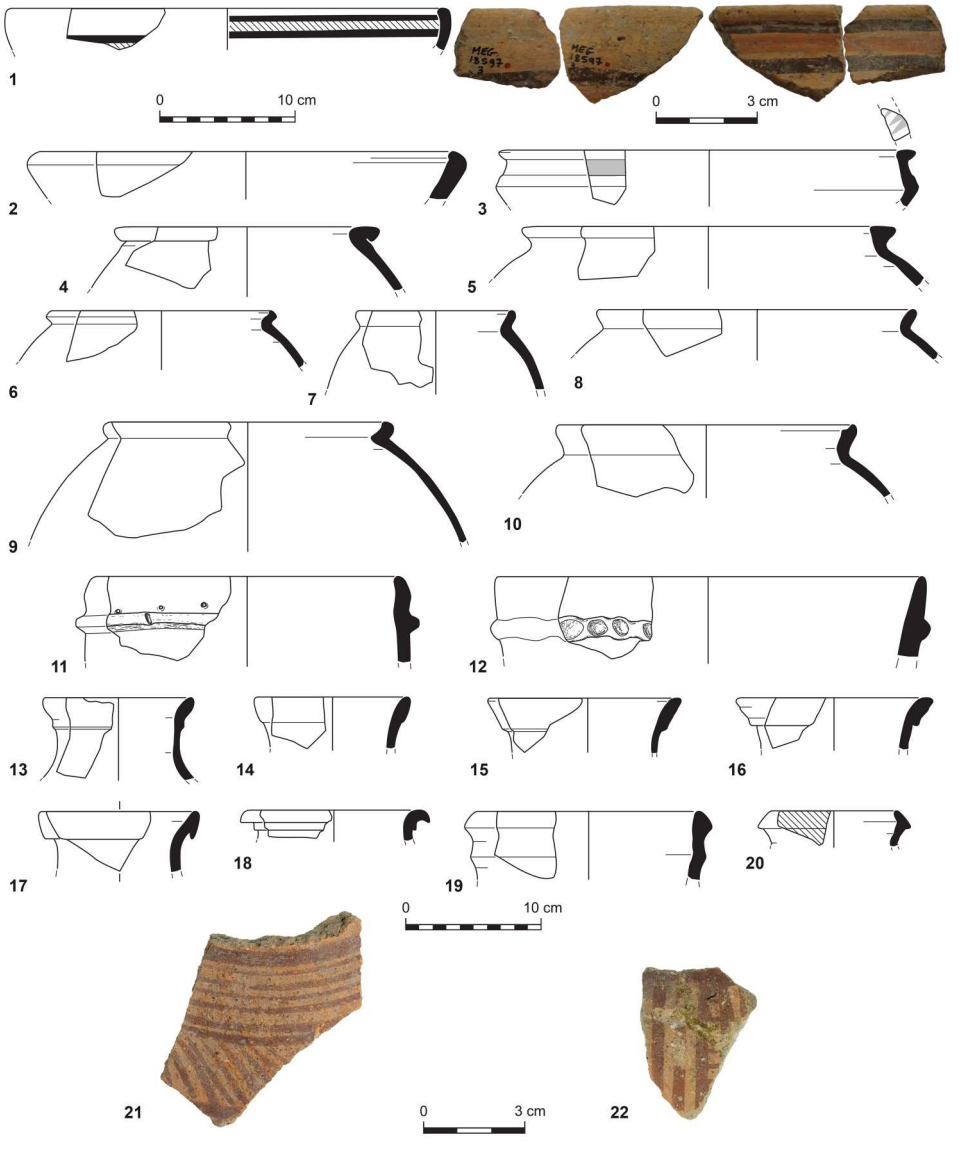


Figure 8. Sub-Level S-3b ceramic assemblage. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

Tell Ifshar Phases A 'late' and B, Tel Nami 4b, Tell el-Hayyat 4, and the earliest pottery published from Pella (Stratum XB). The termination of Sub-Level S-3a corresponds well with MB I Phase 2.

Level S-2

Level S-2 (Table 8; Fig. 12) belongs to a later phase of MB I. It shows continuity from the destruction level of Sub-Level S-3a in its open bowls (Fig. 12:1) and storage jars with

Table 4. Level S-3b Ceramic Types and Selected Comparanda

Fig. No.	Reg. No.	Vessel Description	Comparanda
8:1	2018/S/97_3	Deep hemispheric bowl with plain rim and LPW decorations: traces of red dashed on rim, orange band between two brown bands of similar width on interior, and orange band under a brown band on exterior	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.2:1, undecorated example); bichrome LPW 'Band-zone C' decoration (Bagh 2013, 28). Comparanda for decoration: Nami Tomb 235 (Bagh 2013, 92, Fig. 51 h, description in the last row in the associated table); Kabri Tomb 990 (Kempinski, Gershuny, and Scheftelowitz 2002, Fig. 5.58:4)
8:2	2022/S/28_5_1	Large open bowl with straight walls and inverted thickened rim	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.2:3); Tell el-Hayyat Phase 5 (Falconer and Berelov 2006, Fig. 4.2:a); Megiddo Strata XIV–XIII, T.5118 (Loud 1948, Pl. 14:9)
8:3	2022/S/5_1_3	Open carinated bowl with sharp and high carination and everted ledge rim and decorations: red dashed on rim and red band under rim's exterior. The dashes are a typical LPW decorative element	Tell el-Hayyat Phase 5 (Falconer and Berelov 2006, Fig. 4.2:j); Tell Mardikh/Ebla, Archaic Palace Phase II (Matthiae 2006, Fig. 10:3–4); Tell Mishrifeh/Qatna (Peyronel 2019, Fig. 5:4). Parallels for dashes on rim: Nami Tomb 235 (Bagh 2013, 93); Megiddo Stratum XV (Loud 1948, Pl. 8:8)
8:4	2022/S/5_1_4	Neckless holemouth krater with out-folded rim	Tel Dan Stratum XII, Phase B1 (Ilan and Marcus 2019, Pl. 1.2.10:5)
8:5	2022/S/7_2	Necked krater with out-turned triangular wedged ledge rim	Tell Mardikh/Ebla, Archaic Palace Phase II (Matthiae 2006, Fig. 10:2); Aphek Stratum B Vc, Phase 2 (Beck 2000b, Fig. 8.12:8); Qiryat Shemona Stratum VII (Yasur-Landau 2012, Figs. 3.2:13, 3.8:8)
8:6–10	2022/S/28_3, 2022/S/115_2_1, 2022/S/28_1, 2022/S/28_5	Globular wheel-made cooking pots with flaring gutter rim	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.2:6)
8:11–12	2018/S/93_1_2, 2018/S/97_1	Straight-sided handmade cooking pots	Aphek Stratum X18, Phase 1 (Yadin 2009, 7.3:8, 11); Ifshar Phase A 'early' (Marcus, Porath, and Paley 2008, Fig. 4.1); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.4:q, no holes)
8:13–14	2018/S/97_1_7, 2022/S/28_3	Storage jars with out-folded elongated rim	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.4:19)
8:15–16	2018/S/93_1_1, 2022/S/5_1_2	Storage jars with out-folded triangular rim	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.3:13, 14, 17)
8:17	2018/S/49_1	Storage jar with strongly everted ring rim	Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:m); Megiddo Stratum XIV, E = T.5147 (Loud 1948, Pl. 13:5)
8:18	2012/S/91_6	Storage jar with wide out-folded rim and double-ridged profile	Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:d); Megiddo Stratum XIV, T.5121 (Loud 1948, Pl. 12:18); Ifshar Phase A 'late', L1133 (Marcus, Porath, and Paley 2008, Fig. 8:11)
8:19	2022/S/28_3_3	Storage jar with ridged neck	Aphek Stratum B Vd (Beck 2000b, Fig. 8.11:9); Ifshar Phase A 'late' (Marcus, Porath, and Paley 2008, Fig. 9:4); possibly also Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:l)

(*Continued*)

Table 4. Continued.

Fig. No.	Reg. No.	Vessel Description	Comparanda
8:20	2018/S/97_2	Strongly everted ring rim of a jug with red-slipped exterior	Aphek Stratum B vd (Beck 2000b, Fig. 8.10:12); Megiddo Stratum XIV (Loud 1948, Pl. 13:1–5)
8:21–22	2022/S/5, 2018/S/40_2	Monochrome LPW	Ifshar A 'early' (Marcus 2013, 190). Comparanda for LPW decoration: Ifshar Phase A 'late' (Marcus, Porath, and Paley 2008, Fig. 9:7); Nami Tomb 235 (Bagh 2013, 92, reporting a latter pattern)

either elongated out-folded rims (Fig. 12:7–14) or strongly everted ring rims (Fig. 12:15. New forms in this layer include bowls with incurved walls and out-folded rectangular collar rims, decorated with a red band on the exterior (Fig. 12:2), globular neckless

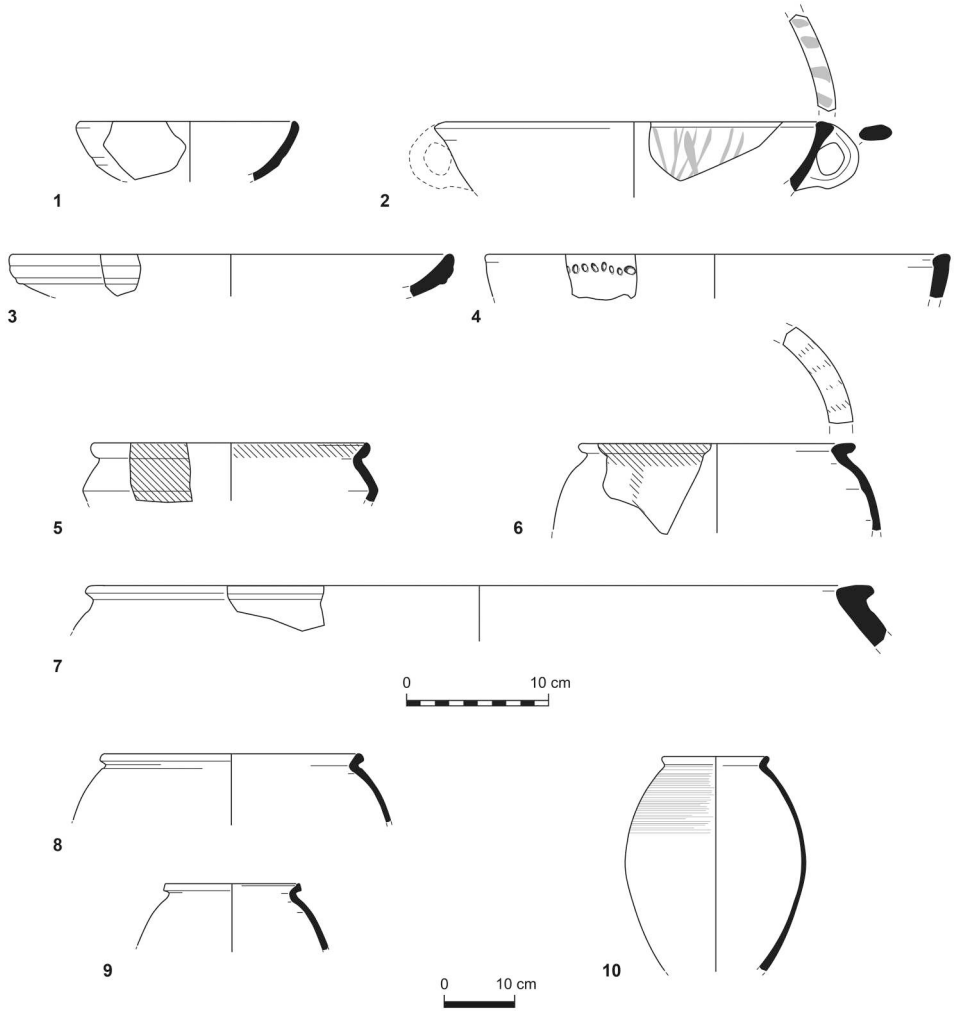


Figure 9. Sub-Level S-3a ceramic assemblage. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

Table 5. Sub-Level S-3a Ceramic Types and Selected Comparanda

Fig. No.	Reg. No.	Type	Comparanda
9:1	2018/S/80_2	Deep hemispheric bowl with plain rim and mild mid-body ridge	Aphek Stratum A XVII, Phase 2 (Beck 2000a, Fig. 10.1:2); Aphek Stratum X17c, Phase 2 (Yadin 2009, Fig. 7.6:1); Yoqne'am Stratum XXV (Livneh 2005, Fig. II.2:13, 14)
9:2	2018/S/44_2_1	Shallow bowl with straight walls, thickened inverted rim, and handles, decorated with dashes on rim and vertical and oblique thin bands resembling textile-like fringes on interior walls, typical of LPW	Aphek Stratum X17c, Phase 2 (Yadin 2009, Fig. 7.6:3, with no handles or decoration); parallels for LPW dashes on rim: Beirut, Kharji tombs (Saidah 1993–1994, Pl. 6.1a, b); Ifshar Phase B (Marcus, Porath, and Paley 2008, Fig. 11:1, 4); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:m); Megiddo Stratum XIV (Loud 1948, Pl. 13:5); parallels for textile-like vertical and oblique fringes: Megiddo Stratum XIV (Loud 1948, Pl. 11:20, 21)
9:3	2022/S/10_1_1	Open bowl with incurved neck walls and out-folded ridged collar rim	Yoqne'am Stratum XXV (Livneh 2005, Fig. II.3:2)
9:4	2018/S/44_2_VS3	Deep bowl with incurved walls and rectangular rim, decorated with band of incised ovals under the rim	Parallel for decorations of band of incised ovals: Aphek Stratum X19, Phase 1 (Yadin 2009, Fig. 7.1:23); Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.3:1), Aphek Stratum X17c, Phase 2 (Yadin 2009, Fig. 7.6:22, 23); possible typological comparanda: Aphek Stratum X17c, Phase 2 (Yadin 2009, Fig. 7.6:2, 3)
9:5	2022/S/10_1_4	Closed carinated bowl with angular carination and gutter rim, red slipped and burnished	Aphek Stratum A XVII, T2127, Phase 2 (Beck 2000a, Fig. 10.6:1); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.4:n); Megiddo Stratum XIV, T.S = T.2152 (Loud 1948, Pl. 14:31); Strata XIV–XIII, T.5114 (Loud 1948, Pl. 16:14); Strata XIV–XIII A, T.5252 (Loud 1948, Pl. 19:4)
9:6	2022/S/25_1	Globular neckless krater with everted ledge rim, decorated with red dashed on top of rim, a red band on and below rim's exterior, and vertical trickle bands, typical of LPW (TPW)	Aphek Stratum A XVII, Phase 2 (Beck 2000a, Fig. 10.1:19, undecorated, red slipped); parallels for LPW dashes on rim: Beirut, Kharji tombs (Saidah 1993, Pl. 6.1a, b); Ifshar Phase B (Marcus, Porath, and Paley 2008, Fig. 11:1, 4); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:m); Megiddo Stratum XIV (Loud 1948, Pl. 13:5); parallels for LPW TPW decoration: Tell el-Hayyat Phase 5 (Falconer and Berelov 2006, Fig. 4.2:b)
9:7	2022/S/6_1	Neckless krater with thick folded triangular rim	Ashkelon, Phase 14, Ash Street (2.67 F20) (Stager and Voss 2018, Fig. 4.26:2), Moat Fill (Stager and Voss 2018, Fig. 4.25:2).Qiryat Shemona, Stratum VII (Yasur-Landau 2012, Fig. 3.2:3)
9:8–10	2012/S/96_4, 2018/S/52_4, 2018/S/53_1	Globular neckless kraters with inward-slanting rim	Aphek, Stratum B Vc, Phase 2 (Beck 2000b, Fig. 8.13:1); T.373, Stratum B Vc, Phase 2 (Beck 2000b, Fig. 8.14:4); Aphek Strata B Vc–b, Phase 2 (Beck 2000b, Fig. 8.18:2); Ashkelon, Phase 14, Moat Fill (Stager and Voss 2018, Fig. 4.23:1)

kraters with out-folded ridge-ledged rims (Fig. 12:4), and storage jars with externally thickened molded rectangular rims (Fig. 12:17).

Level S-2 appears to belong to MB I Phase 3 with parallels in Aphek Strata A XIVa and A XIVb, associated with Palace II. To this phase one may also compare Ifshar Phases D–G, Tell el-Hayyat 4–3, and possibly also Pella Stratum IX.

The radiocarbon dataset and bayesian modeling

The Area S IBA–MB dataset (Table 9 and Table 10) comprises 16 samples, all published here for the first time. The sampling strategy emphasised secure contexts (accumulation on floors, destruction debris) with well-defined ceramic assemblages, short-lived samples, and clusters of finds (rather than isolated items). Results are reported in years before present (BP), following international convention.

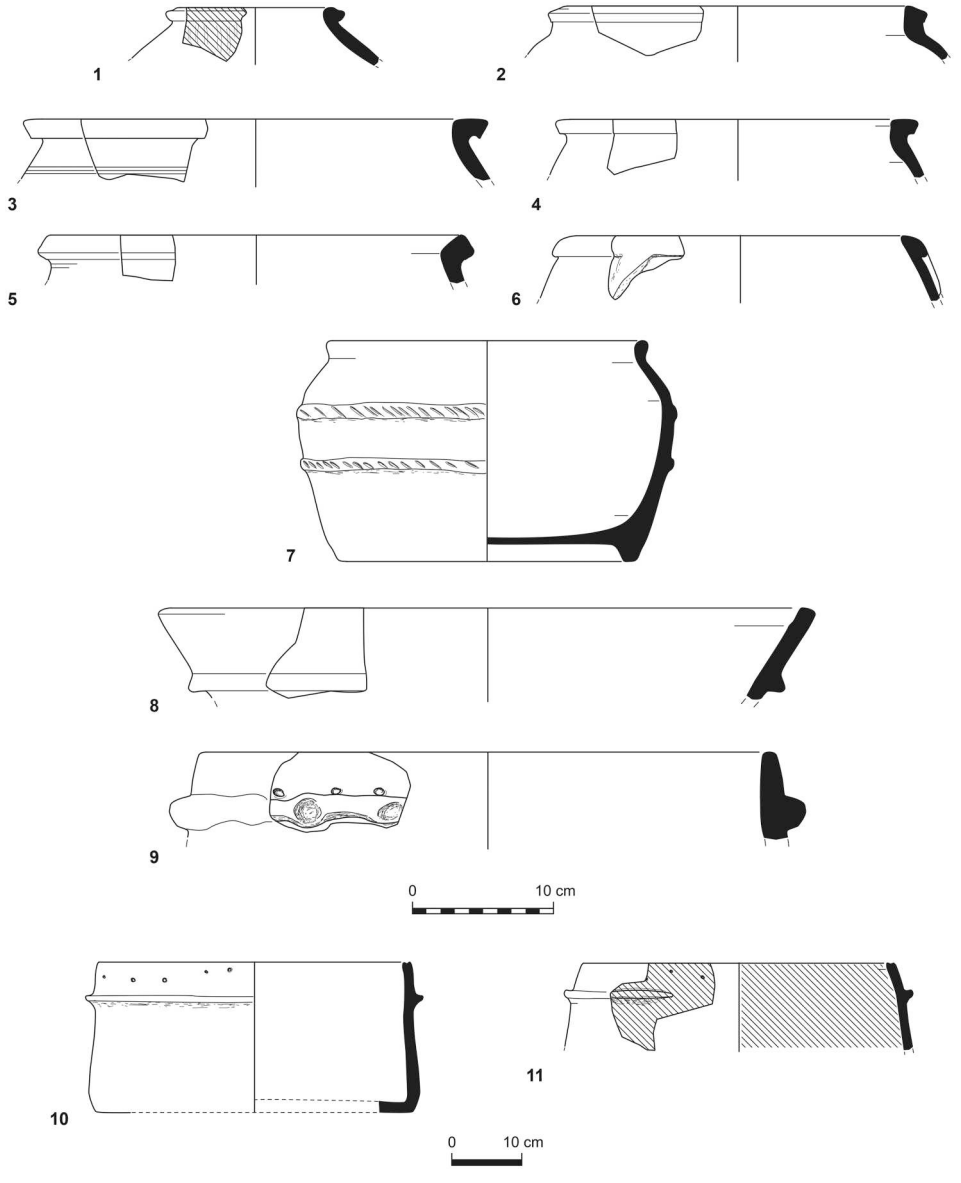


Figure 10. Sub-Level S-3a ceramic assemblage, continued. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

Table 6. Sub-Level S-3a Ceramic Types and Selected Comparanda, continued.

Fig. No.	Reg. No.	Type	Comparanda
2–10:1	2022/S/17_1, 2018/S/31_1	Globular neckless kraters with out-folded stepped or beveled rim	Pella, Phase X (Bourke, Sparks, and Schroder 2006, Fig. 10:14); Qiryat Shemona, Stratum VII (Yasur-Landau 2012, Figs. 3.3:7, 3.5:15, 3.6:1), Stratum VI (Yasur-Landau 2012, Fig. 3.11:11)
4–10:3	2022/S/13_2_1, 2022/S/22_2	Globular kraters with undercut out-folded molded ledge rim	Ifshar, Phase B, (Marcus, Porath, and Paley 2008, Fig. 10:3)
10:5	2018/S/56_1	Globular krater with inward-slanting rectangular rim	Aphek, Stratum B Vc, Phase 2, (Beck 2000b, Fig. 8.12:10)
10:6	2018/S/73	Globular krater with out-folded rounded rim, vertical applied band, and possibly the beginning of a handle or spout	Aphek, Stratum X17a, Phase 2 (Yadin 2009, Fig. 7.12:2 a spouted bowl); Ashkelon, Phase 14, Moat Fill (Stager and Voss 2018, Fig. 4.27:1)
10:7	2018/S/52_1	Carinated krater with soft carination, everted rim, two applied bands with rope decorations on and below carination, and skirt-like disc base	
11–10:8	2018/S/20_1_1, 2022/S/25_1, 2018/S/138_1, 2012/S/96_1	Straight-sided handmade cooking pots; No. 3.21 is burnt	Aphek, Stratum B Vc, Phase 2, (Beck 2000b, Fig. 8.13:3); Aphek, Stratum A XVI, Phase 2 (Beck 2000a, Fig. 10.1:24, 25); Aphek T494 Stratum A XVII, Phase 2 (Beck 2000a, Fig. 10.2:12); Ifshar Phase A 'late' (Marcus, Porath, and Paley 2008, Fig. 8.6); Ifshar Phase B (Ilan and Marcus 2019, Pl. 1.2.12:1, 4); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.4:q (no holes); Pella Phase X (Bourke, Sparks, and Schroder 2006, Fig. 10:2, 12, 13)

We also present the results of a Bayesian analysis (S1; S2) using version 4.4 of the OxCal program (Bronk Ramsey 2009), in conjunction with the IntCal20 calibration curve (Reimer et al. 2020).[5] All samples included in the present model consist of short-lived seeds. The model consists of two simple sequences: one representing the stratigraphic layers (Levels S-5, S-4, S-3c, S-3b, S-3a, and S-2) and the other featuring the ceramic phases (IBA, MB I S-4–S-3b, MB I S-3, and MB I S-2). The two sequences are synchronised using OxCal's cross-reference function, following the approach employed in previous publications (e.g., Finkelstein and Piasetzky 2023). Levels that did not terminate in destruction start and end with a simple uniform distribution boundary. For Level S-3, which ended in destruction, the samples from Sub-Level S-3a were entered as the end boundary, following Finkelstein and Piasetzky 2023 (Figs. 13–15).

As in the Finkelstein and Piasetzky method, we adopt a conservative strategy for estimating the durations of the ceramic phases. Durations are defined as the interval between the earliest 68% limit of the end boundary of the preceding phase and the latest 68% limit of the start boundary of the subsequent phase.

Outlier analysis was conducted using the 'General' option in OxCal, applying the default manual parameters, as detailed in Bronk Ramsey (2009). To constrain the model within a plausible chronological framework, we set the transition from the IBA to MB I (S5–S4) after 2100 BCE and the end of MB I (S2) before 1750 BCE. Both points are widely accepted.

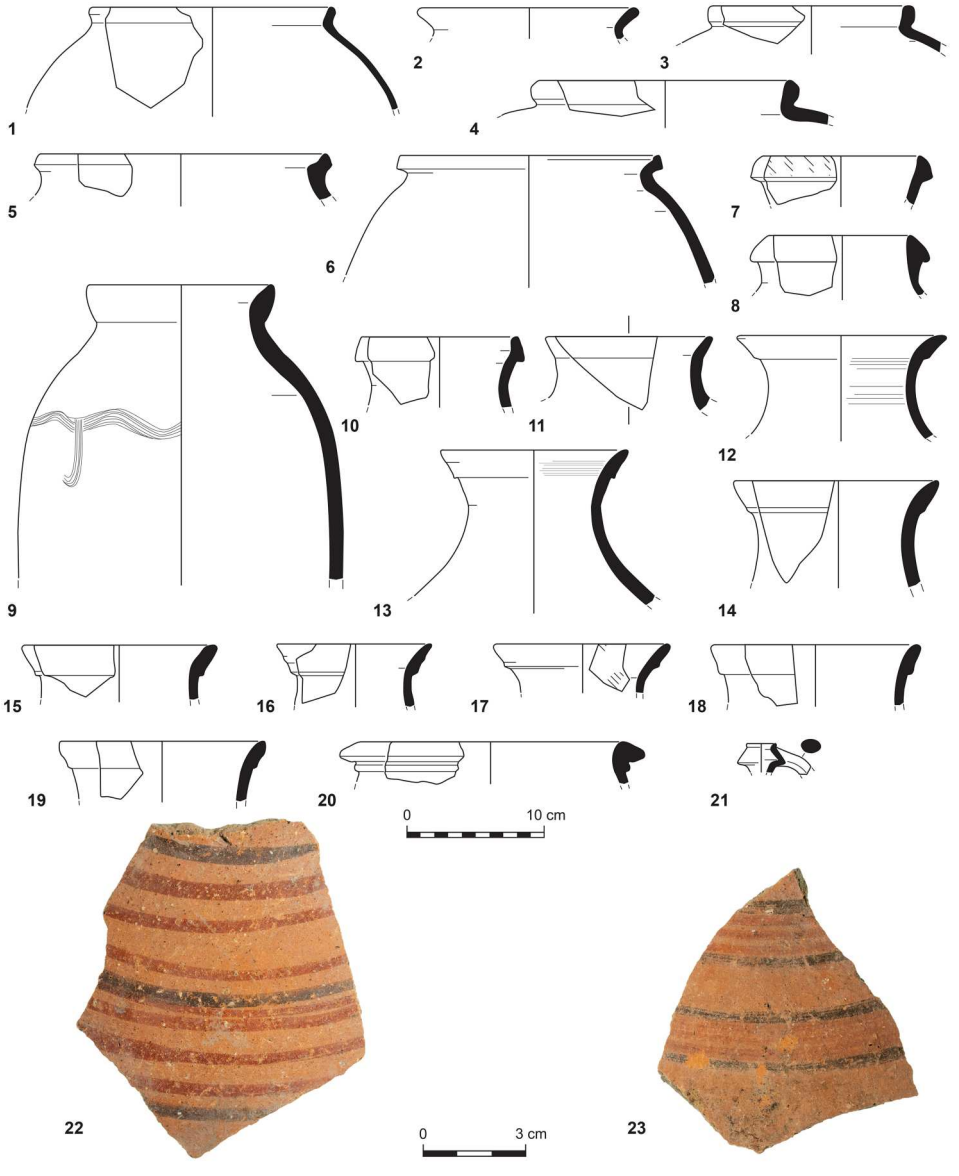


Figure 11. Sub-Level S-3a ceramic assemblage, continued. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

The upper constraint of 2100 BCE for the onset of MB I is justified, as earlier dates are unsupported by our data and are not reflected in current scholarship (Fig. 13). With this constraint applied, the model yields a 68.3% range of 2101–2031 BCE and a 95.4% range of 2104–1977 BCE for the beginning of MB I (Fig. 14)[6]. It should be noted that while Level S-5 shows late-terminal IBA ceramic traditions, there is still the possibility of a brief occupational gap between the end of S-5 and the beginning of S-4; this issue is addressed below.

Table 7. Sub-Level S-3a Ceramic Types and Selected Comparanda, continued.

Fig. No.	Reg. No.	Type	Comparanda
11:1–2	2018/S/44_1_VS14, 2018/S/136_2_VS4	Globular wheel-made cooking pot with everted rim	Aphek Stratum B Vc, Phase 2 (Beck 2000b Fig. 8.13:2); Aphek Stratum A XVI, Phase 2 (Beck 2000a, Fig. 10.1:21, 23); Aphek Stratum X17a, Phase 2 (Yadin 2009, Fig. 7.9:7)
11:3–4	2018/S/136_2_VS3, 2022/S/10_1_3	Globular wheel-made cooking pot with upright thickened rim	Ashkelon, Phase 14, Moat Fill (Stager and Voss 2018, Fig. 4.34:1)
11:5	2018/S/44_2_2	Globular wheel-made cooking pot with triangular gutter rim	Ashkelon, Phase 14, Moat Fill (Stager and Voss 2018, Fig. 4.43:1-3)
11:6	2012/S/96_5	Globular wheel-made cooking pot with flaring molded triangular rim	Aphek, Stratum X17a, Phase 2 (Yadin 2009, Fig. 7.9:8); Yoqne'am, Stratum XXIVb (Livneh 2005, Fig. II.7:14)
11:7	2012/S/96_5_VS5	Storage jar or large jug with V-shaped neck and out-folded molded triangular rim, decorated with dashes on the rim, typical of LPW	Aphek, Stratum B Vc, Phase 2 (Beck 2000b, Fig. 8.12:16); Aphek, Stratum X17a, Phase 2 (Yadin 2009, Fig. 7.10:5); Ifshar, Phase A 'late' (Marcus, Porath, and Paley 2008, Fig. 9:1). Parallels for the LPW dashes on rim-Beirut, Kharji tombs, (Saidah 1993–1994, Pl. 6.1a, b), Ifshar, Phase B (Marcus, Porath, and Paley 2008, Fig. 11:1, 4); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:m); Megiddo Stratum XIV (Loud 1948, Pl. 13:5).
11:8	2018/S/20_1_2	Handless storage jar or large jug with upright or slightly closed neck and thickened folded triangular rim	Tell el-Hayyat, Phase 4 (Falconer and Berelov 2006, Fig. 4.5:i); Ifshar Phase B (Ilan and Marcus 2019, Pl. 1.2:18:1; Qiryat Shemona, Stratum VII (Yasur-Landau 2012, Fig. 3.7:3)
11:9	2018/S/80	Elongated oval storage jar with externally thickened rim and wavy-line incisions on shoulder	Aphek Stratum A XVI, Phase 2, T589 (Beck 2000a, Fig. 10.6:4); Ifshar, Phase B (Marcus 2021, Fig. 2:3)
11:10	2018/S/44_2_4	Storage jar with strongly everted ring rim	Aphek Stratum A XVI, Phase 2 (Beck 2000a, Figs. 10.2:5; 10.4:4); Aphek Stratum X17a, Phase 2 (Yadin 2009, Fig. 7.11:9, 10); Ifshar Phase A 'late' (Marcus, Porath, and Paley 2008, Fig. 9:2); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:m [decorated with dashes, as SJ105]; Megiddo Stratum XIV, T.3143 and T.5181 (Loud 1948, Pl. 12:16, 22)
11:11	2018/S/80_2	Storage jar with simple or thinned everted rim	Aphek Stratum B Vc, Phase 2 (Beck 2000a, Fig. 8.13:5)
11:12–16	2012/S/87_2_VS3, 2018/S/114_1, 2018/S/20_1_4, 2022/S/44_3_VS5, 2022/S/13_2_2	Storage jar with out-folded triangular rim	Aphek Stratum B Vc, Phase 2 (Beck 2000b, Fig. 8.13:6, 7); Aphek Stratum B Vc–b, Phase 2 (Beck 2000b, Fig. 8.18:4, 5); Aphek Stratum X17c, Phase 2 (Yadin 2009, Fig. 7.6:10, 11)
11:17–19	2022/S/6_1_2, 2018/S/20_1_3, 2012/S/106_1	Storage jar with out-folded elongated rim	Ifshar Phase B (Ilan and Marcus 2019, Pl. 1.2.15:9); Nami Phase 4a (Ilan and Marcus 2019, Pl. 1.2.15:10)
11:20	2022/S/6_1	Storage jar with wide out-folded rim and double-ridged profile	Aphek Stratum B Vc, Phase 2 (Beck 2000b, Figs. 8.12:28, 8.13:8); Aphek Stratum X17a, Phase 2 (Yadin 2009, Fig. 7.8:5); Megiddo Stratum XIV, T.5121 (Loud 1948, Pl. 12:18); Ifshar

(*Continued*)

Table 7. Continued.

Fig. No.	Reg. No.	Type	Comparanda
			Phase A 'late', L1133 (Marcus, Porath, and Paley 2008, Fig. 8:11); Ashkelon Phase 14, sub-floor fill (Stager and Voss 2018, Fig. 4.57:2)
11:21	2018/S/138	Juglet with 'candlestick' rim	Ifshar Phase B (Marcus 2021, Fig. 9:12); Tell el-Hayyat Phase 4 (Falconer and Berelov 2006, Fig. 4.5:a); Nami Tomb 235 (Ilan and Marcus 2019, Pl. 1.2:27); Kabri Phase DW VI, mid–late MB I (Samet 2014, Fig. 3:26); Ashkelon Phase 14 sub-floor fill (Stager and Voss 2018, Fig. 4.57:2)
11:22–23	2012/S/96_1_VS9, 2018/S/136_2	Bichrome LPW	Ifshar Phase A 'late' (Marcus 2021, 334; 2013, 185); Megiddo Stratum XIV, E = T.5147 (Loud 1948, Pl. 13:5); bichrome LPW 'Band-zone A' decoration (Bagh 2013, Fig. 2a); Ifshar Phase B (Marcus, Porath, and Paley 2008, Fig. 11:3); Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.4:4)

From a ceramic-chronological perspective, the end of MB I Phase 1 at Megiddo coincides with the occupation of Sub-Level S-3b, prior to the destruction of Sub-Level S-3a (Fig. 15). In our model, this transition falls within the 68.3% range of 1926–1898 BCE (89.3% range of 1942–1886 BCE). The pottery assemblage of Level S-3a represents MB I Phase 2, which is estimated to span 1918–1886 cal. BCE. The end of MB I Phase 2 is modeled at the transition from S-3a to S-2, falling within the 68.3% range of 1906–1858 BCE and the 95.4% range of 1916–1810 BCE (Fig. 16).

Thus, MB I Phase 2 probably began in the final quarter of the twentieth century BCE and continued into the mid-nineteenth century BCE. The transition from MB I to MB II appears to have taken place c. 1750 BCE or slightly earlier (cf. Höflmayer and Manning 2022).

Discussion

The end of the IBA

The fully urban structure of EB III collapsed c. 2500 BCE (Regev et al. 2012). The reasons for this momentous episode remain unclear. Within a short period, populations across the region shifted to an agro-pastoral mode of subsistence, with a significant village component, a pattern that characterises the period between c. 2500 and 2200 BCE. A major economic anchor during these centuries was the continuous demand for copper in Egypt's Old Kingdom, which promoted uninterrupted production in the Arabah and the emergence of many IBA sites in the Negev Highlands. This pattern is clearly reflected in the radiocarbon results from Wadi Faynan and the Negev Highlands, all of which fall in the first centuries of the IBA (Dunseth et al. 2017; Finkelstein et al. 2018).

The IBA agro-pastoral system began to deteriorate c. 2200 BCE. Radiocarbon evidence indicates cessation of production at Faynan, the abandonment of the Negev sites, and a

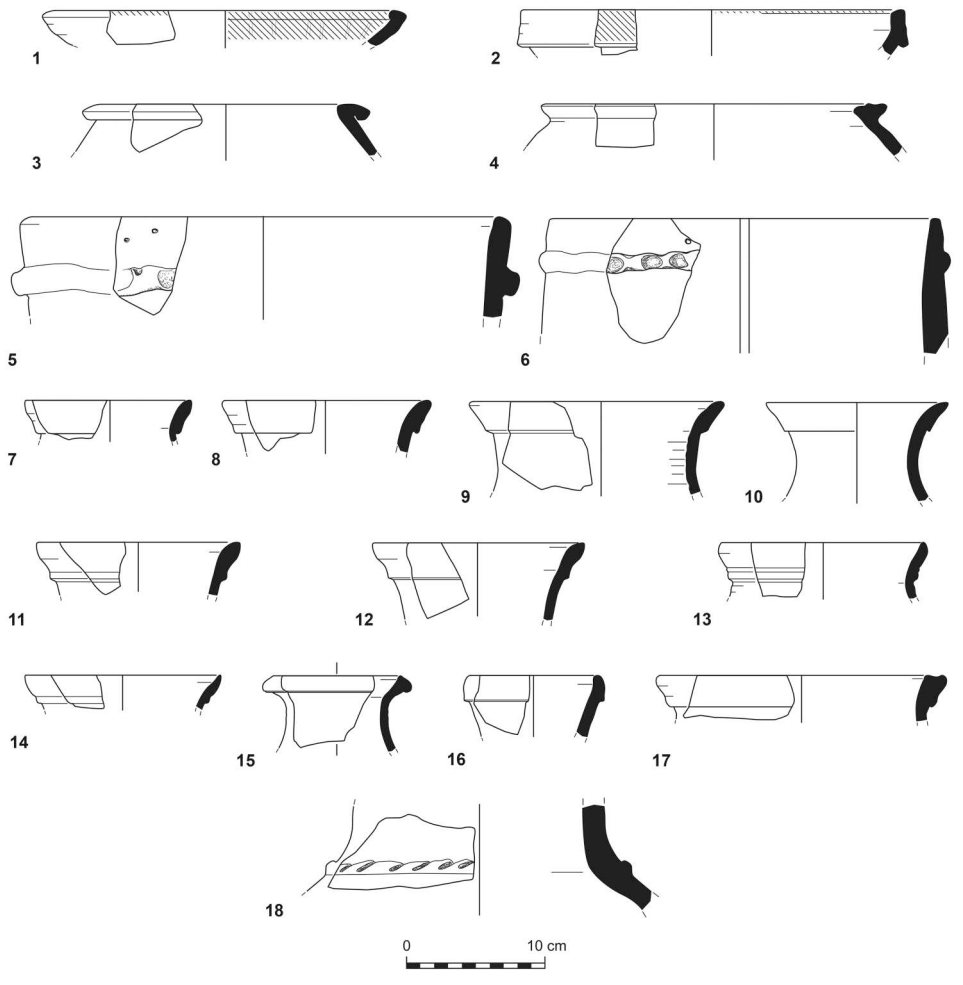


Figure 12. Level S-2 ceramic assemblage. Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

decline in the rural sector in the greener regions of the southern Levant. This significant development appears to have been influenced by two factors: First was the collapse of the Old Kingdom in Egypt, which disrupted the copper industry in the Arabah and the related Negev settlements (Dunseth et al. 2017). Second was a dry-climate event that reduced agricultural activity across much of the region, from Mesopotamia to the southern Levant. This climatic stress triggered a shift of substantial portions of society toward a more pastoral mode of subsistence (Finkelstein and Langgut 2014; Weiss 2017; Burke 2021, 81–86). In the southern Levant, this climatic event is attested in the palynological record from the Sea of Galilee (Langgut et al. 2015; Langgut and Finkelstein 2023, 16), by a significant drop in the level of the Dead Sea, and by several other paleoclimatic proxies (Kagan et al. 2015). Although the precise onset of this event – whether c. 2200 BCE or slightly later – remains debated, it is likely that it was underway by c. 2100 BCE (see summary in Finkelstein and Langgut 2014; Langgut and Finkelstein 2023). This may explain the limited radiocarbon evidence for IBA occupation after c. 2100 at settlement sites in the

Table 8. Level S-2 Ceramic Types and Selected Comparanda

Fig. No.	Reg. No.	Vessel Description	Comparanda
12:1	2018/S/133_1_1	Shallow bowl with straight walls and thickened inverted rim; red slipped and burnished	Nami Phase 4a (Ilan and Marcus 2019, Pl. 1.2.1:12); Aphek Stratum A XIVb, Phase 3 (Beck 2000a, Fig. 10.10:11); Ashkelon Phase 14, moat fill (Stager and Voss 2018, Fig. 4.14:3, not slipped nor burnished) (Falconer and Berelov 2006, Fig. 4.6:g, j); Qiryat Shemona Stratum VI (Yasur-Landau 2012, 3.10:5)
12:2	2018/S/133_1_2	Shallow bowl with incurved walls and out-folded rectangular collar rim; red band on rim exterior	Aphek Stratum A XIVb, Phase 3 (Beck 2000a, Fig. 10.10:14); Ashkelon Phase 14 (Stager and Voss 2018, Fig. 4.18 is the best comparanda); Megiddo Strata XIV–XIII A, T.5103 (Loud 1948, Pl. 19:7)
12:3	2018/S/76_2_1	Neckless holemouth krater with externally folded rim	Ashkelon Phase 14, moat fill (Stager and Voss 2018, Fig. 4.13:1) ; Tel Dan Stratum XII, Phase B1 (Ilan and Marcus 2019, Pl. 1.2.10:5)
12:4	2018/S/131_1_1	Globular neckless krater with out-folded ridge-ledged rim	Tell el-Hayyat Phase 3 (Falconer and Berelov 2006, Fig. 4.6:g, j); Aphek Stratum B Vc, Phase 2 (Beck 2000b, Fig. 8.12:8) Na'ama Phase 2 (Greenberg *et al.* 1998: Fig. 17:3); Qiryat Shemona Stratum VII (Yasur-Landau 2012, Fig. 3.8:1)
12:5–6	2018/S/133_1_3, 2018/S/82_2_1	Straight-sided handmade cooking pots	Aphek Stratum A XIVb (Beck 2000a, Fig. 10.12:18); Aphek Stratum A XIVa (Beck 2000a, Fig. 10.13:20); Tell el-Hayyat Phase 3 (Falconer and Berelov 2006, Fig. 4.7:a–f, h)
12:7–10	2018/S/82, 2018/S/131_1_2, 2018/S/76_2_2, 2018/S/68_1	Storage jars with out-folded triangular rim	Aphek Stratum A XIVb, Phase 2 (Beck 2000a, Fig. 10.11:2, 3, 4)
12:11–12	2018/S/82_2_2, 2018/S/82_2_3	Storage jars with out-folded elongated rim	Aphek Stratum A XIVb, Phase 2 (Beck 2000a, Fig. 10.12:21)
12:13–14	2018/S/76_2_3, 2018/S/82_2_5	Storage jars with out-folded elongated swollen rim	Tell el-Hayyat Phase 3 (Falconer and Berelov 2006, Fig. 4.8:h); Nami Phase 4a (Ilan and Marcus 2019, Pl. 1.2.15:11)
12:15	2018/S/133_1_4	Storage jar with strongly everted ring rim	Aphek Stratum A XIVb, Phase 2 (Beck 2000a, Figs. 10.11:14, 10.12:27); Megiddo Stratum XIV, T.3143, T.5181 (Loud 1948, Pl. 12:16, 22)
12:16	2018/S/82_2_4	Storage jar or large jug with V-shaped neck and out-folded molded triangular rim	Aphek Stratum A XIVb, Phase 2 (Beck 2000a, Fig. 10.11:13)
12:17	2018/S/133_1_5	Storage jar with externally thickened molded rectangular rim	Aphek Stratum A XIVa (Beck 2000a, Fig. 10.13:26, 27); Megiddo Strata XIV–XII, T.3138 (Loud 1948, Pl. 12:17); Megiddo Strata XII–XII, T.3092 (Loud 1948, Pl. 27:6)
12:18	2018/S/82_2_6	Storage jar neck decorated with applied rope-like band on neck–shoulder seam	Aphek Stratum X18, Phase 1 (Yadin 2009, Fig. 7.4:11); Ashkelon Phase 14A (Stager and Voss 2018, Fig. 4.70:7); for similar shoulder–body seam decorations, see Tel Dan Stratum XII, Phase B1 (Ilan and Marcus 2019, Pl. 1.2.13:1); Ifshar Phase B (Paley and Porath 1997, Fig. 13.6:1)

southern Levant. Particularly, the Coastal Plain and Jezreel Valley, which present the earliest MB I habitation, have not yet produced dates indicating IBA settlement in the twenty-first century BCE. There may be, however, some evidence of continued use of IBA cemeteries until c. 2050 BCE, including in those at Yehud and Jebel Qa'aqir (mentioned above).

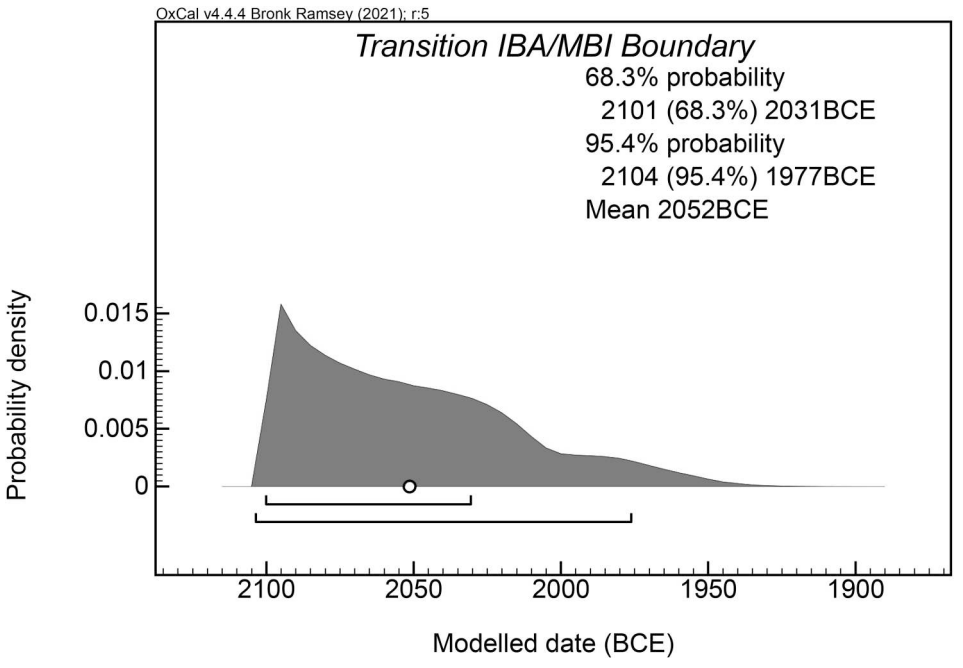


Figure 13. Transition from Level S-5 to S-4 (IBA and MB I). Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

Table 9. Synchronisation between Levels in Area S at Megiddo and Other MB I Sites in the Southern Levant

MB I Phases (Ilan and Marcus 2019)	Megiddo Area S Levels	Aphek Strata (Yadin 2009, 10)	Tel Ifshar Phases (Marcus 2013, 191)	Nami Phases/ Contexts (Ilan and Marcus 2019)	Tell el-Hayyat Phases (Falconer and Berelov 2006)	Pella (Bourke, Sparks, and Schroder 2006)
1 (MB I early)	S-4	X19 ('Phase 1', pre-Palace I)	A 'early'	-	5 (likely begins later than the beginning of Megiddo S4)	Unknown when MB begins at the site
1 (MB I early)	S-3b, c	X18 ('Phase 1' pre-palace I)	A 'early'	Tomb 235	5(–4?)	?
2 (MB I early)	S-3a	X 17a–c; A XVII (Phase 2, Palace I)	A 'late' + B	4b	4	XB, X, earliest pottery published
2–3 (MB I middle?)	Short gap?	A XVI–XV (Phases 2–3, pre-Palace II)	C	4a + destruction	4	IX
3 (MB I middle–late)	S-2	A XIV (Phase 3, Palace II)	D, E, F, G	-	4–3	IX?

The new radiocarbon data from Level S-5 at Megiddo, which is assigned by pottery to a late phase within the IBA, fits within this broader regional trend, indicating an end date of c. 2100 BCE or slightly later. The sharp transition in ceramic traditions between the end of Level S-5 and the beginning of Level S-4 may suggest a brief hiatus between these layers still within the twenty-first century BCE.

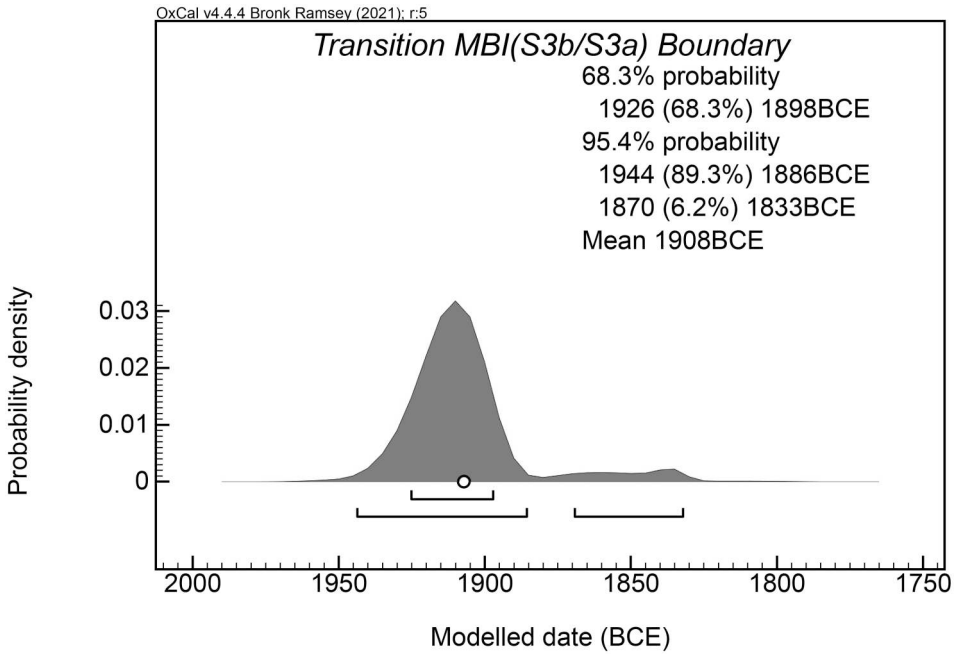


Figure 14. Transition from Sub-Level S-3b to Sub-Level S-3a (end of MB I Phase 1). Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

On the basis of the available data, we propose a plausible range of 2050–2000 BCE for the final remnants of the IBA culture in the southern Levant.

The beginning of the MB I

The change in the ceramic repertoire at Megiddo between the IBA and MB I is profound, with no indication of continuity in vessel types and no hybrid IBA/MB I forms. This phenomenon is seen elsewhere in the southern Levant (Cohen 2022, 225). Only one MB I type in the Jordan Valley, the bottle, may represent a continuation of a rare IBA form (Cohen 2009, 9; Maeir 2010, 183). Another isolated case is an IBA jar from Tell Umm Hammad decorated with a wavy band, a motif that appears also on some MB I vessels (Kennedy 2015). Beyond the shift in settlement patterns described above, the reasons for this deep change in the ceramic assemblage are beyond the scope of this article.

From a chronological standpoint, the combined ceramic and radiocarbon data from Megiddo indicate that MB I Phase 1, represented by Level S-4, began no later than the beginning of the twentieth century BCE, and possibly toward the end of the twenty-first century BCE; the former is more likely if a short occupational gap followed the end of the IBA occupation at the site. The transition from MB I Phase 1 to Phase 2 occurred during the last quarter of twentieth century BCE. MB I Phase 3 began c. 1850 BCE. The MB I–II transition may have taken place c. 1800 BCE (Höflmayer and Manning 2022).

Table 10. Radiocarbon Dates from Megiddo Area S

Level	Locus	Context	Lab & Sample No.	Type of Sample	Date before Present	cal BCE (68.3%)	cal BCE (95.4%)
S-5	18/S/70b	Accumulation on floor	Beta 746384	Charred seeds	3930 ± 30	2470 (46.3%) 2402 2381 (22.0%) 2348	2561 (3.9%) 2538 2492 (86.2%) 2336 2326 (5.3%) 2298
S-5	18/S/70b	Accumulation on floor	Beta 746385	Charred seeds	3750 ± 30	2204 (55.1%) 2134 2082 (13.2%) 2057	2204 (55.1%) 2134 2082 (13.2%) 2057
S-5	18/S/70b	Accumulation on floor	Beta 746386	Charred seeds	3780 ± 30	2282 (22.0%) 2251 2231 (5.6%) 2220 2210 (12.4%) 2192 2180 (28.3%) 2142	2296 (91.2%) 2132 2085 (4.2%) 2051
S-5	18/S/70b	Accumulation on floor	OxA 37943	Charred seeds	3749 ± 26	2202 (60.1%) 2135 2078 (8.2%) 2064	2281 (7.6%) 2251 2229 (0.8%) 2222 2210 (64.4%) 2118 2098 (22.6%) 2038
S-4	22/S/48	Kiln 18/100 and 18/102	AA 116064	Charred seeds	3570 ± 17	1941 (68.3%) 1891	2010 (2.1%) 2000 1973 (91.4%) 1880 1838 (2.0%) 1828
S-4	22/S/54	Accumulation on floor	AA 116065	Charred seeds	3609 ± 16	2018 (22.3%) 1997 1979 (46.0%) 1938	2026 (30.5%) 1990 1986 (64.9%) 1900
S-3c	22/S/47	Accumulation on floor (hiatus?)	AA 116063	Olive pit	3483 ± 16	1876 (13.0%) 1862 1856 (11.4%) 1843 1822 (25.6%) 1795 1779 (12.3%) 1766 1759 (6.1%) 1751	1881 (95.4%) 1744
S-3b	18/S/98	Ashy surface	OxA 37868	Charred seeds	3552 ± 28	1942 (59.1%) 1878 1840 (9.2%) 1826	2011 (1.6%) 2000 1974 (66.7%) 1871 1848 (27.2%) 1773
S-3b	18/S/98	Ashy surface	OxA 37942	Charred seeds	3514 ± 27	1888 (12.4%) 1872 1847 (55.9%) 1774	1922 (95.4%) 1748
S-3a	18/S/52	Destruction on floor	OxA 37867	Charred seeds	3580 ± 30	2008 (1.7%) 2004 1971 (66.6%) 1888	2028 (90.9%) 1878 1841 (3.4%) 1824 1791 (1.1%) 1782
S-3a	18/S/52	Destruction on floor	OxA 37940	Charred seeds	3555 ± 27	1946 (60.6%) 1879 1839 (7.7%) 1826	2014 (2.2%) 1999 1976 (70.7%) 1872 1848 (13.4%) 1813 1806 (9.2%) 1774

(*Continued*)

Table 10. Continued.

Level	Locus	Context	Lab & Sample No.	Type of Sample	Date before Present	cal BCE (68.3%)	cal BCE (95.4%)
S-3a	18/S/138	Destruction on floor	OxA 37941	Charred seeds	3572 ± 26	1953 (68.3%) 1886	2021 (7.6%) 1994 1981 (81.6%) 1877 1842 (4.5%) 1823 1792 (1.7%) 1780
S-3a	18/S/138	Destruction on floor	OxA 38188	Charred seeds	3601 ± 29	2019 (16.7%) 1996 1980 (46.7%) 1920 1910 (4.9%) 1902	2034 (95.4%) 1883
S-3a	22/S/25	Destruction on floor	AA 116062	Charred seeds (*Vicia faba*?)	3531 ± 17	1896 (24.6%) 1875 1844 (25.8%) 1821 1796 (17.9%) 1778	1930 (40.3%) 1870 1849 (55.2%) 1772
S-2	18/S/82	Floor and floor makeup	OxA 37779	Charred seeds	3536 ± 29	1926 (37.3%) 1875 1844 (17.7%) 1821 1797 (13.3%) 1778	1952 (48.1%) 1862 1856 (46.7%) 1766 1757 (0.7%) 1751
S-2	18/S/82	Floor and floor makeup	OxA 37780	Charred seeds	3514 ± 29	1888 (12.6%) 1871 1847 (55.6%) 1774	1925 (95.4%) 1747

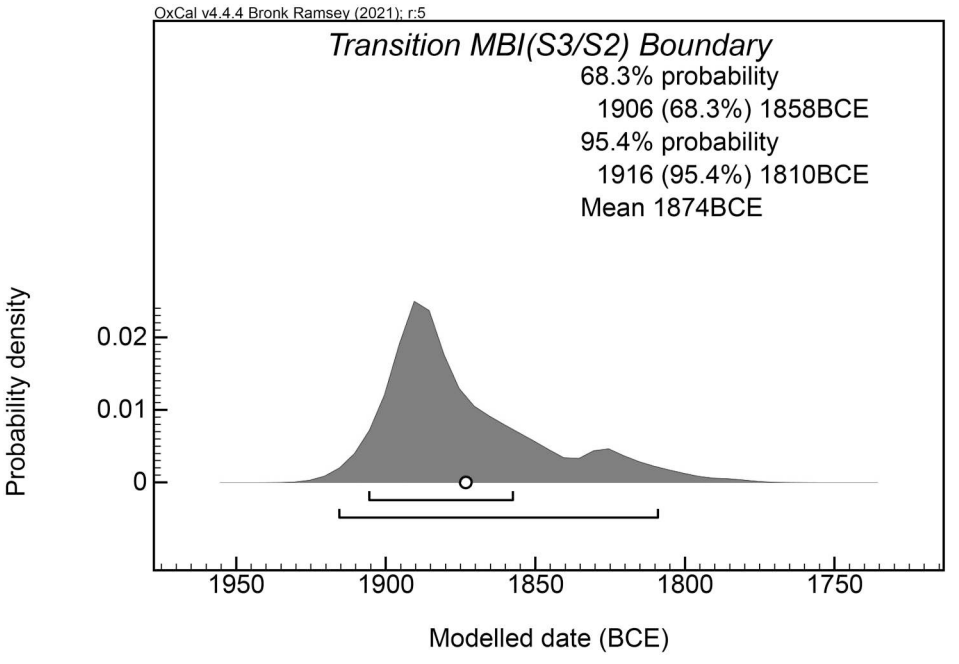


Figure 15. Transition from Sub-Level S-3a to Sub-Level S-2 (end of MB I Phase 2). Courtesy of the Megiddo expedition (co-directors: Israel Finkelstein and Matthew J. Adams).

A long MB I, spanning roughly 250 years (c. 2000–1750 BCE), may account for the four distinct ceramic phases observed at Aphek, Megiddo, Ifshar, and other sites. A proposed beginning of MB I around 1900 BCE (e.g. Fall, Falconer, and Höflmayer 2021; Höflmayer 2022, 28) is less plausible, as all four ceramic phases, each represented by distinct architectural remains, would need to be compressed into a single century (or even less, if the MB I–MB II transition occurred between 1850 and 1800 BCE; Höflmayer 2022, 29). Furthermore, at Tel Nami, MB I Phase 3 is well documented in a destruction dating to the first half of the nineteenth century BCE – that is, before 1850 BCE (Ilan and Marcus 2019, Table 1.2.1; Höflmayer 2021). If the MB were to begin c. 1900 BCE, MB I Phases 1–2 – both architecturally well-defined – would have to be compressed into less than 50 years.

Implications for chronological correlation with Egypt

A date in the twentieth century BCE or the late twenty-first century for the beginning of MB I does not conflict with the current understanding of synchronisms between Egypt and the southern Levant. Archaeological finds and textual evidence show that maritime trade between the two regions resumed only during the reign of Amenemhat II (Marcus 2022, 792–7; modeled accession c. 1922–1901 BCE; see also Bronk Ramsey et al. 2010).

Theoretically, a terminal eleventh-Dynasty date for the beginning of MB I in the Levant could align with the siege scene depicted in the tomb of Antef/Intef, a general of Mentuhotep II (modeled accession c. 2057–2040 BCE; Bronk Ramsey et al. 2010). This scene portrays Egyptians storming a fortified stronghold garrisoned by Asiatics (Bietak 2010, 145–6; Marcus 2022, 784). Bietak (2010, 145) correctly notes that this

cannot represent an IBA reality, as fortifications are unknown in Canaan during that period. A higher chronology for the beginning of the MB adds the option that the scene documents an Egyptian expedition to Canaan. Alternatively, it may simply reflect an artistic convention.

The modeled destruction date of Level S-3a (1918–1886 cal BCE [68.3%]) coincides with the end of Amenemhat II's reign and the beginning of Senwosret II's reign modeled accession c. 1890–1868 BCE (Bronk Ramsey et al. 2010) or located within the recently suggested higher ascension range for the same ruler (1907–1889 BCE; Erdil et al. 2025, S3, model MK P1). Slightly later, Egyptian presence at Megiddo was proposed by Adams (2017) based on the inscribed statue fragment of the Egyptian dignitary Djehutihotep, discovered by the University of Chicago team in Temple 2048 in their Area BB. This high official, educated as a child in the court of Amenemhet II, was active in the days of Senwosret II and died during the reign of Senwosret III (Adams 2017). If indeed the statue arrived as a dedication to the Megiddo temple in the days of Djehutihotep, it provides rare evidence for direct Egyptian activity at Megiddo during late MB I.

The correlation between the S-3a destruction and the radiocarbon-anchored Middle Kingdom sequence thus situates this event within a broader horizon of intensified Egyptian–Levantine engagement in the early nineteenth century BCE. Within the same historical window, the *Annals of Amenemhet II* from Mit Rahina (Memphis) attest a distinctly belligerent posture toward the Asiatic sphere (Altenmüller and Moussa 1991; Marcus 2007). In column M8, the king records dispatching forces 'to cut down the fortified towns (*ḫwt*) of *T-t*', a term conventionally denoting the Asiatic lands – the Levant. Subsequent entries describe the destruction of the walled towns of *Iw-j* and *J-sy*, possibly in the northern Levant, and the capture of more than fifteen hundred Asiatic prisoners, alongside substantial booty. Although no textual or archaeological evidence directly links Egypt to the destruction of Sub-Level S-3a, the annals reveal that Egypt was engaged in a sanctioned aggressive campaign in precisely this period. The destruction at Megiddo – if a result of an attack on the city – therefore occurred within a broader milieu of Middle Kingdom expansionist ambition directed toward Asia.

Summary

Megiddo Area S presents a rare combination of stratigraphic, ceramic, and radiometric data on the transition between the IBA and MB I in the southern Levant. It offers, for the first time, strong indications not only of the transition between the periods, but also of the earliest ceramic phases in MB I. As Phases 1 and 2 are well defined ceramically, the radiometric chronology from Megiddo may be used to ascribe date ranges to strata at other key sites, such as the earliest MB levels at Tel Aphek and Tel Ifshar, which clearly belong to the same regional ceramic tradition. The 'sloping horizon' (for the term, see Cohen 2022; 2019) of 2050/2000 for the end of the IBA and the beginning of MB I in the Coastal Plain and Jezreel Valley proposed here does not require any modification of stratigraphic or ceramic sequences and contradicts no historical synchronisation or radiocarbon indicators. In fact, it may provide a firmer platform for understanding of international processes in the critical period of the transition between the third and second millennia BCE.

Notes

1. Dates for Egyptian pharaohs cited in this paper refer to modeled accession-year intervals (68% probability) derived from the Bayesian radiocarbon chronology (Bronk Ramsey *et al.* 2010, with suppl. Table S7). These intervals represent the most probable accession years (beginning dates) of each reign, not the total durations of the latter, obviating discussion on contested reign lengths or co-regencies that affect historically reconstructed chronologies. See however, recently, Erdil et al. 2025, Supplement Table 3, suggesting accession dates for most Middle Kingdom rulers that are considerably higher – e.g., according to the MK PI model: 1998–1973 BCE for Amenemhat I, 1981–1957 BCE for Senwosret I, and 1907–1889 BCE for Senwosret II.
2. Jüngling and Höflmayer (2023) raise questions on the 2500 BCE date for the end of the EB, yet do not present an explicit alternative.
3. Rim descriptions in this paper follow primarily the Tel Aphek terminology set by Yadin (2009) and Beck (2000a, 2000b). For types discussed in Megiddo VI (Martin 2022), the same descriptions are used here.
4. Morphological IBA parallels to the storage jar form occur in other tombs at Megiddo (e.g., T.884 and T.891, Guy 1938, Pls. 20:30, 21:21).
5. For the eastern Mediterranean (EM) region, small but potentially significant radiocarbon offsets have been reported between short-lived plant remains and the IntCal curve, which is primarily based on tree-ring datasets from higher latitudes (e.g., Manning et al. 2020; Höflmayer and Manning 2022). We therefore acknowledge that the use of IntCal20 without a regional correction may result in slightly older modeled age estimates relative to models incorporating the suggested eastern Mediterranean growing-season offset (and see below for relatively small impact on the IBA–MB I transition).
6. Using the suggested regional correction (above) for the modeling of the beginning of MB I yields a 68.3% range of 2102–2011 BCE, a 95.4% range of 2104–1947, and a distribution mean difference of −18 (2054–2036). Hence, in the question of the beginning of the MB I, the inclusion of the offset does not change the overall result – i.e., placing beginning of the MB I around the onset of the twentieth century BCE or slightly earlier.

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Conflict of interest statement

The authors have no interests to declare.

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