

A Middle Bronze Age Assemblage of Bone Inlays from Lachish: Typological, Technological, and Functional Aspects

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Decorated bone inlays are among the fossiles directeurs of Middle Bronze (MB) Age II and early Late Bronze Age assemblages, having been documented since the beginning of archaeological research in the Levant. During the Fourth Expedition to Lachish, an assemblage of 49 decorated bone inlays restored from ca. 200 fragments was found in the rooms of a late MB II monumental building. The inlays were apparently used to decorate wooden boxes. Although such inlays are usually recovered from mortuary contexts, here they were found among daily objects, indicating that the building played an administrative role. In this paper the typological, technological, and functional aspects of the inlays are examined. We reconstruct the use of these objects and discuss the social context in which they were produced and used, providing an additional perspective on such objects and their role in both life and death during the late MB II. Our technological approach included microscopic examination of the inlays, which provided new information on the variability of craft traditions, suggestive of a decentralized production mode.

Keywords: Lachish; fortress; decorated bone inlays; Middle Bronze Age II

Bone inlays, primarily incised strips decorated with geometric patterns or floral and faunal motifs, were attached to wooden boxes. The production in the southern Levant of such artifacts, which are often recov-

ered from mortuary contexts, commenced in the Middle Bronze (MB) IIA and became frequent during the MB IIB (Liebowitz 1977). The quantity and decorative variety of bone inlays gradually declined toward the end of the MB II and throughout the Late Bronze (LB) I. Bone inlays were outnumbered by ivory ones during the LB II (Weinstein 1975: 6, n. 58; Liebowitz 1987: 5) and reappeared during the Iron Age, though with different forms and motifs.

Levantine bone inlays were usually made from ribs or metapodials of animals such as cattle, fallow deer, sheep, and goat. The outer side of the inlay was cut and modified, while the inner side could remain rough for easier attachment by adhesive to a rough surface. Subsequently, the inlays were decorated on their external side by incisions and drillings (Naeh 2018).

Recent excavations at Tel Lachish unearthed around 200 fragments of bone inlays, from which 49 inlays were restored (see **Table 1**). The excavations (henceforth the Fourth Expedition) were conducted in 2013–2017 by the Hebrew University of Jerusalem and Southern Adventist

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TABLE 1. List of the Bone Inlays from Lachish Fortress

No.	Locus/Reg. No.	Type	Room
1	2610/1	1D	III
2	2610/2	1D	
3	2610/3	1D	
4	2610/4	1D	
5	2610/5	1D	
6	2610/6	1G	
7	2610/7	1F	
8	2610/8	1E	
9	2610/9	1E	
10	2610/10	1E	
11	2610/11	1E	
12	2610/12	1E	
13	2610/13	1E	
14	2610/14	1F	
15	2610/15	1E	
16	2610/16	1A	
17	2610/17	1B	
18	2610/18	3B	
19	2610/19	3C	
20	2610/20	3C	
21	2610/21	3C	
22	2610/22	3C	
23	2610/23	3C	
24	2610/24	2B	
25	2610/25	3A	
26	2610/26	3A	
27	2610/27	3A	
28	2610/28	3A	
29	2610/29	3B	
30	2610/30	3B	
31	2610/31	3D	
32	2610/32	3D	
33	2610/33	3A	
34	2610/34	1C	
35	2610/35	1H	
36	2610/36	1H	
37	2610/37	1H	
38	434/1	2A	I
39	434/2	2A	
40	434/3	1E	
41	4022/1	2A	II
42	4022/2	2A	
43	4022/3	1H	
44	4010/1	3C	
45	4010/2	3C	
46	4010/3	3A	
47	4010/4	2A	
48	4010/5	3C	
49	4010/6	2B	

University, directed by Yosef Garfinkel, Michael G. Hasel, and Martin G. Klingbeil (Garfinkel, Hasel, and Klingbeil 2013; Sass et al. 2015; Garfinkel et al. 2021).¹ The inlays were recovered from a late MB II monumental building located in the northeastern part of the mound, which is assumed to have functioned as a fortress. Their presence among everyday objects in the destruction debris of the building suggested that they belonged to objects related to the daily activities carried out in the building (see below).

Biblical Lachish was first identified at Tell ed-Duweir by William Foxwell Albright (1929: 3), following Flinders Petrie's misidentification of the site with Tell el-Hesi (Petrie 1891). Shortly afterward, the first excavations at Lachish were conducted (1932–1938) by a British expedition, headed by James Leslie Starkey. Six excavation seasons were conducted, until the murder of Starkey in January 1938 brought the expedition to a close (Garfinkel 2016). Yohanan Aharoni, who directed the Second Expedition to Lachish during the 1960s, focused on a limited area of the site (Aharoni 1975). Later, David Ussishkin initiated the Third Expedition to Lachish, conducting large-scale excavations during 1973–1994 (Ussishkin 1978, 1983, 2004). Several MB bone inlays were found in the excavations of the First and Third Expeditions (see **Appendix**). This paper presents the bone-inlay assemblage recovered by the Fourth Expedition and discusses their typological, technological, and functional aspects in an attempt to reconstruct the daily use of these items, while relating to other artifacts excavated in the same context.

Harold Liebowitz (1977: 92–95) summarized the decorative patterns that were common on MB II Canaanite bone inlays. These include geometric motifs: lines in longitudinal, diagonal, transverse, crisscross, and zigzag patterns, chevron and herringbone patterns, oblique crosses, dotted circles, and guilloches formed by connected dotted concentric circles; figurative motifs: animals such as birds, quadrupeds, and snakes, as well as schematized human beings; and other motifs: sheaves, towers (the Egyptian *djed* pillar), and rosettes.

Based on the rich and varied MB II assemblages from the southern Levant, such as those from Jericho, Megiddo, Tell Beit Mirsim, and Tell el-Ajjul, Liebowitz concluded

¹ The Fourth Expedition to Lachish is co-sponsored by the Institute of Archaeology, the Hebrew University of Jerusalem, and Southern Adventist University, under the direction of Yosef Garfinkel, Michael G. Hasel, and Martin G. Klingbeil. Consortium institutions include the Adventist Institute of Advanced Studies (Philippines), Helderberg College (South Africa), Oakland University (USA), Universidad Adventista de Bolivia (Bolivia), Virginia Commonwealth University (USA), and Seoul Jangsin University (Korea). The excavation work was conducted from 2013 to 2017 in cooperation with the Israel Antiquities Authority, the National Parks Authority, and the Israel Exploration Society, and was affiliated with the American Schools of Oriental Research. Each season involved 90–110 staff and volunteers from 18 different countries.

that bone inlays were much more common in this region than in coastal Syria, the Orontes Valley, or the upper Euphrates Valley. This suggested that the southern Levant was the geographic sphere where such items developed. Later, they spread to Egypt and to northern urban centers such as Byblos, Ugarit, and Alalakh, where ivory industries flourished as well (Liebowitz 1977: 96–97). This idea was already briefly expressed by Olga Tufnell in the final report of the Lachish excavations (Tufnell 1958: 86) and has recently been reinforced by Liat Naeh’s study of bone inlays from the Ophel excavations at the southern foot of the Temple Mount in Jerusalem, which identified “a local bone-inlay industry in Jerusalem” during the MB II (2015: 596).

Data

The Fourth Expedition to Lachish excavated, *inter alia*, three rooms of a fortress strategically located in the north-eastern part of the mound (Area BB, **Figs. 1–4**), control-

ling an ancient route that ran along the Lachish stream (Wadi Ghufr), which extended from the Judean Mountains in the east to the coastal plain in the west. This building is approximately 8 × 14 m in size, was constructed from mudbrick walls on stone foundations, and was destroyed in a fierce conflagration that was clearly discernible in the accumulation of burnt mudbrick debris and ash (see Garfinkel et al. 2021: 429–435). The three rooms (Rooms A–C, **Figs. 3–4**) were constructed on terrain that sloped down from west to east. In addition to the bone inlays that are the subject of this paper, various small finds were recovered from the destruction layer in the fortress, including four scarabs (Garfinkel et al. 2021: 433–435, fig. 13), 31 clay sealings, 10 loom weights, a bronze pin, an alabaster alabastron, and a pot bellows (Garfinkel et al. 2021: 432, fig. 12). In addition, restorable jars and pithoi containing burnt grains were unearthed (**Fig. 5**). The latter were subjected to radiocarbon dating, which yielded a date at the very end of the MB II (mid-16th century B.C.E.; Garfinkel, Hasel, Klingbeil et al. 2019: 12, 14). A limited



Fig. 1. The excavation areas at Tel Lachish. (Photo by the Fourth Expedition to Lachish)

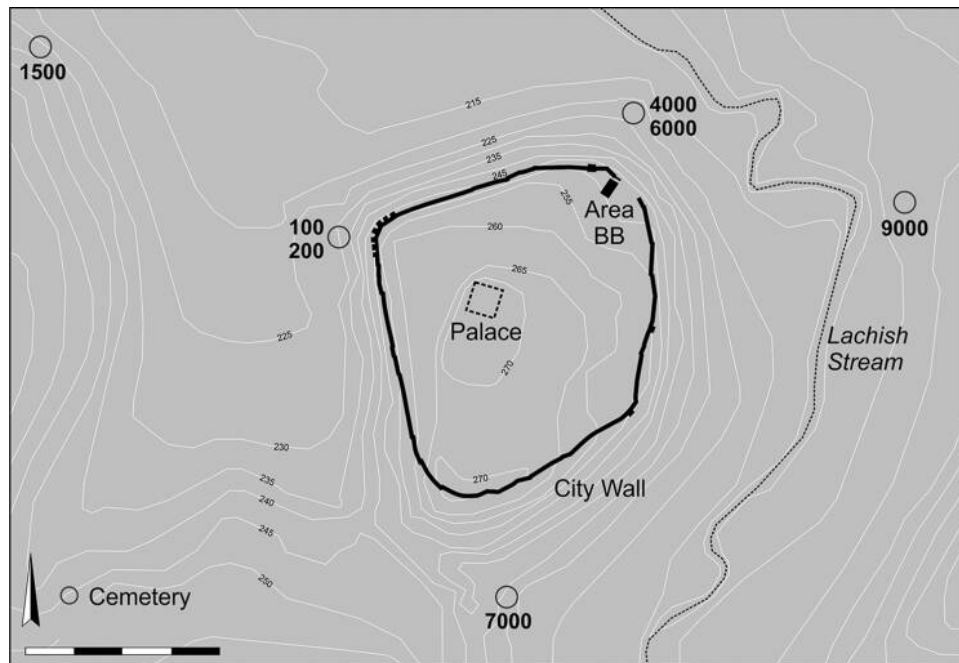


Fig. 2. Middle Bronze Age Lachish. (Plan by J. Rosenberg)

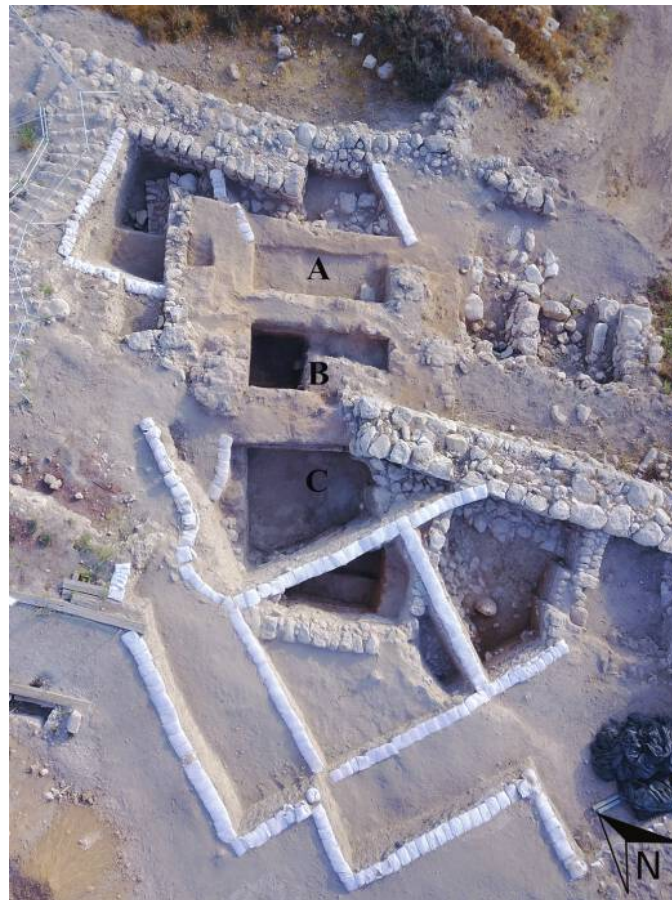


Fig. 3. Aerial photograph of the rooms of the Middle Bronze Age fortress. (Photo by the Fourth Expedition to Lachish)

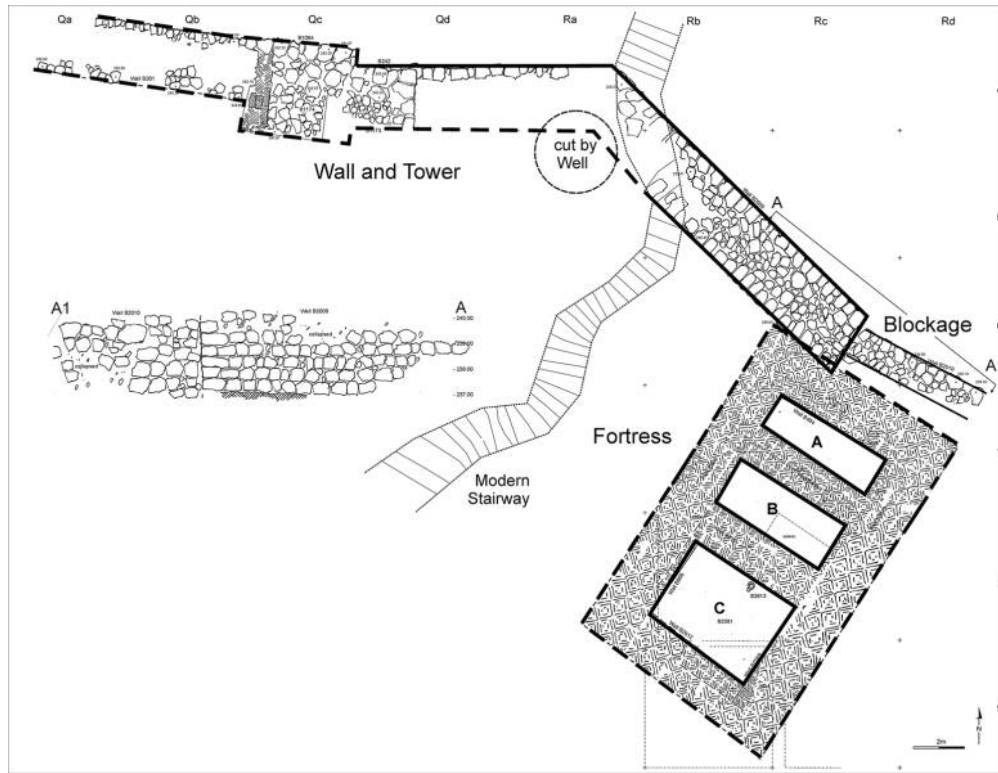


Fig. 4. The Middle Bronze Age fortress. (Plan by J. Rosenberg)



Fig. 5. Pithoi and jars that originated in the fortress. (Photo by T. Rogovsky)

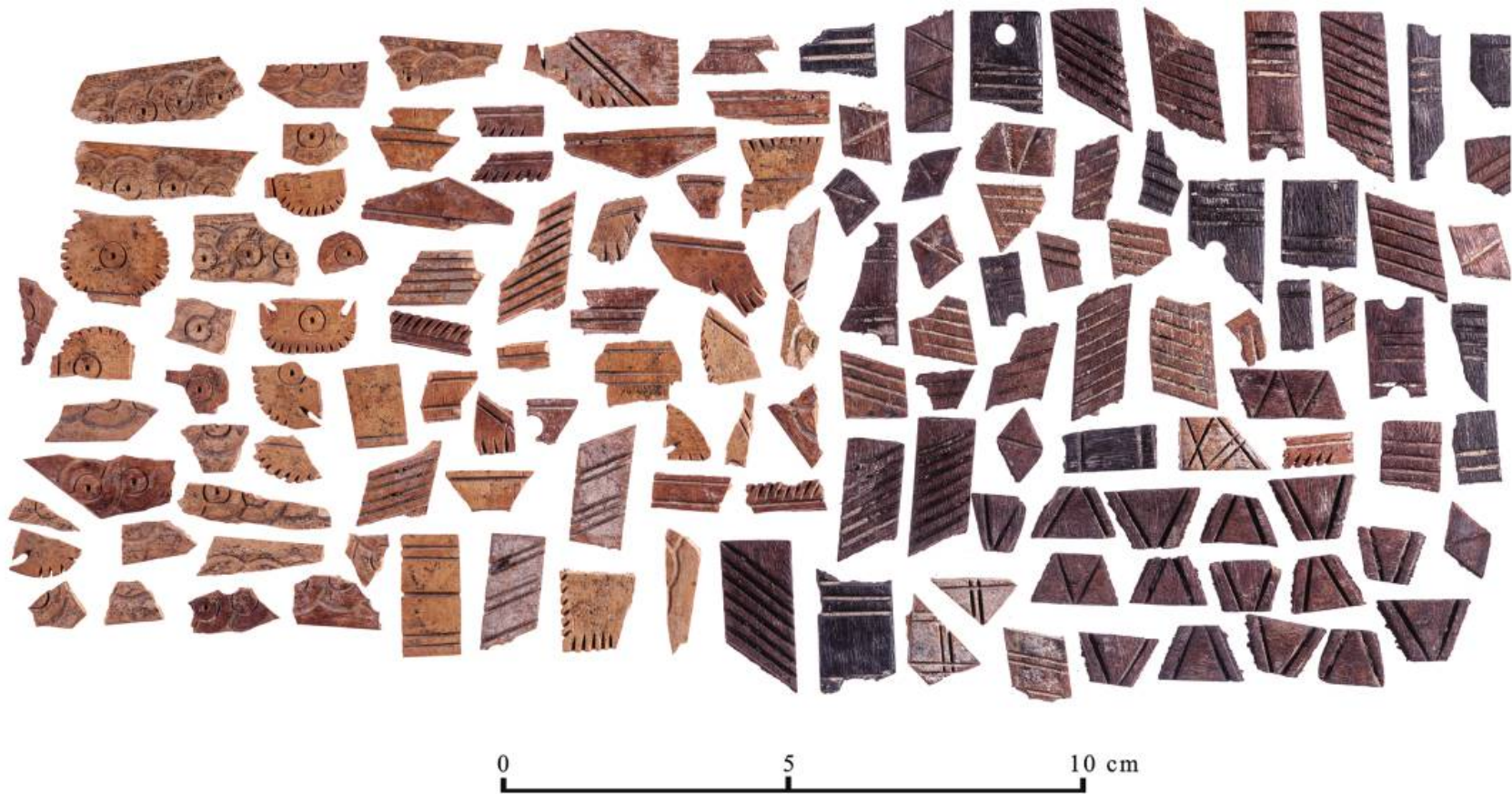


Fig. 6. Fragments of bone inlays before restoration. (Photo by T. Rogovsky)

number of inlays was found in Rooms A and B, while approximately 175 fragments and most of the small finds listed above were retrieved from Room C, particularly from the accumulation above the burnt floor (Loci 2610, 2611, **Fig. 6**), which was buried under considerable destruction debris. Notably, most of the fragments and the small finds mentioned above were found in wet sifting.²

The bone inlays from the MB fortress were smoothed and then drilled and incised for decorative reasons. In some of the inlays, functional drilled holes for attachment by rivets were found. We have divided them into three typological groups, which were further divided into 14 sub-groups. The bone inlays also vary in color, from black to gray and to different hues of brown.

Typology

The assemblage was divided into decorated elongated strips and inlays of additional shapes. The decorated elongated strips were further divided based on their incised geometric patterns, which are either linear or circular (see **Table 1**).

ELONGATED STRIPS: PLAIN (TYPE 1A) OR DECORATED WITH LINEAR GEOMETRIC INCISIONS (TYPES 1B–1H)

Type 1A

Plain (No. 16, **Fig. 7**).

Type 1B

Two linear incisions along the length (No. 17, **Fig. 7**).

Type 1C

One linear incision along the length, with short feather-like incisions on the margin (No. 34, **Fig. 7**).

Type 1D

Groups of four horizontal parallel lines separated by spaces (Nos. 1–5, **Fig. 7**). Note that three of the five items were drilled for attachment of the inlay.

Type 1E

Diagonal parallel lines oriented right to left or left to right (Nos. 8–13, 15, 40, **Fig. 8**).

Type 1F

Diagonal parallel lines arranged in groups (Nos. 7, 14, **Fig. 8**).

Type 1G

A combination of polygons (No. 6, **Fig. 8**).

Type 1H

Zigzag pattern along the strip (Nos. 35–37, 43, **Fig. 9**).

ELONGATED STRIPS WITH CIRCULAR GEOMETRIC INCISIONS (TYPES 2A AND 2B)

Type 2A

Concentric circles with one or more circles surrounding a central perforation (Nos. 38–39, 41–42, 47, **Fig. 10**).

Type 2B

Guilloche (Nos. 24, 49, **Fig. 10**).

SILHOUETTES (TYPES 3A–3D)

Type 3A

Birds (Nos. 25–28, 33, 46, **Fig. 11**).

Type 3B

Vegetal motifs (Nos. 18, 29–30, **Fig. 11**).

Type 3C

Egyptian djed pillar (Nos. 19–23, 44–45, 48, **Fig. 12**).

Type 3D

Triangular in shape, decorated with a line along the base (Nos. 31–32, **Fig. 12**).

The elongated strips with geometric patterns (Types 1A–1H, 2A–2B) were frequent in the Levant during the MB II and have many parallels, as do the schematic bird-shaped inlays (Type 3A; see **Appendix**).

Type 3B is restricted to the southern Levant, with limited occurrences at Megiddo, Jericho, and Tell es-Salihiye (see **Appendix**). The motif may represent sheaves (as suggested by Liebowitz 1977: 92) or reeds. Alternatively, it may depict the silhouette of a palm tree or even the Egyptian “sunshade.” The sunshade, described as a “semicircular fan on a short handle” by John McDonald (1999: 8), had the functional purpose of shading high-ranking persons, but also had symbolic/protective roles. It is possible that Types 3A and 3B were parts of a single composition, as they often appear together in ancient Egyptian art. An example of such a scene, in which birds emerge from a thicket of reeds, is painted on a wall of the 18th Dynasty tomb of Nebamun in Thebes (Parkinson 2008).

Other Egyptian motifs include the djed pillar, representing the backbone of Osiris and thus symbolizing stability as well as regeneration and renewal (Clark 1959: 236; Remler 2010: 52). It has been suggested that the djed was originally used in cultic activity related to harvest rituals (Clark 1959: 235–36). It was also affiliated with Ptah, the deity of Memphis (Pinch 2002: 128; Remler 2010: 52) and was believed to support the skies, preventing them from falling (Clark 1959: 237). Be that as it may, Egyptian influence is clearly attested by the choice of motifs, joining other Egyptian influences in this building. Such influences, reflected in the use of scarabs, Egyptian hieroglyphs on bullae, and Egyptian or Egyptianizing alabaster vessels, are not unusual for the period (Dever 1987).

² Most of the bone inlay fragments were found during wet sifting in the framework of the Ancient Jerusalem Sifting Project in Emek Tzurim National Park, Jerusalem.

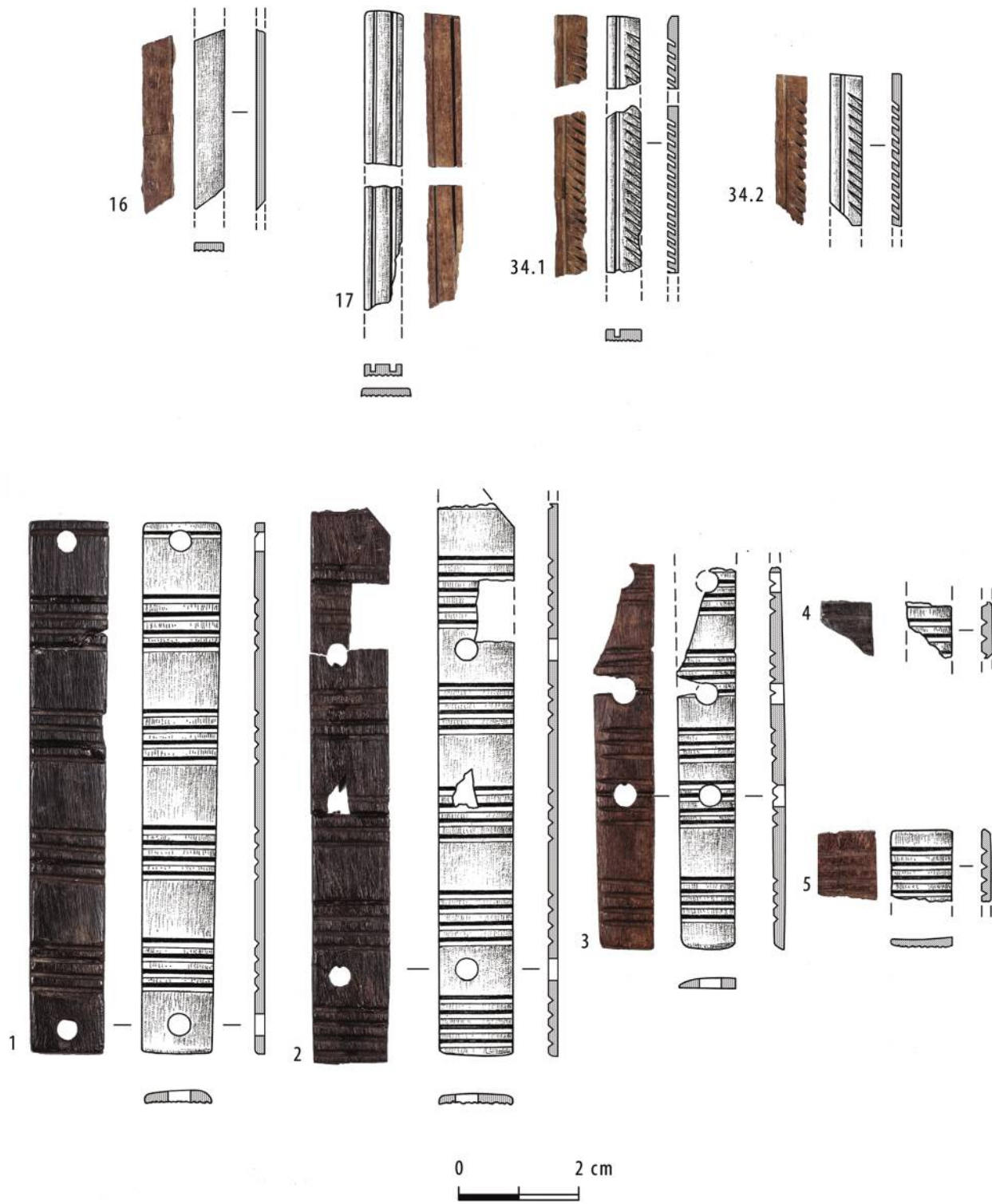


Fig. 7. Lachish bone inlays, Types 1A (No. 16), 1B (No. 17), 1C (No. 34:1-2), and 1D (Nos. 1-5). (Photos by T. Rogovsky, drawings by O. Dubovsky)

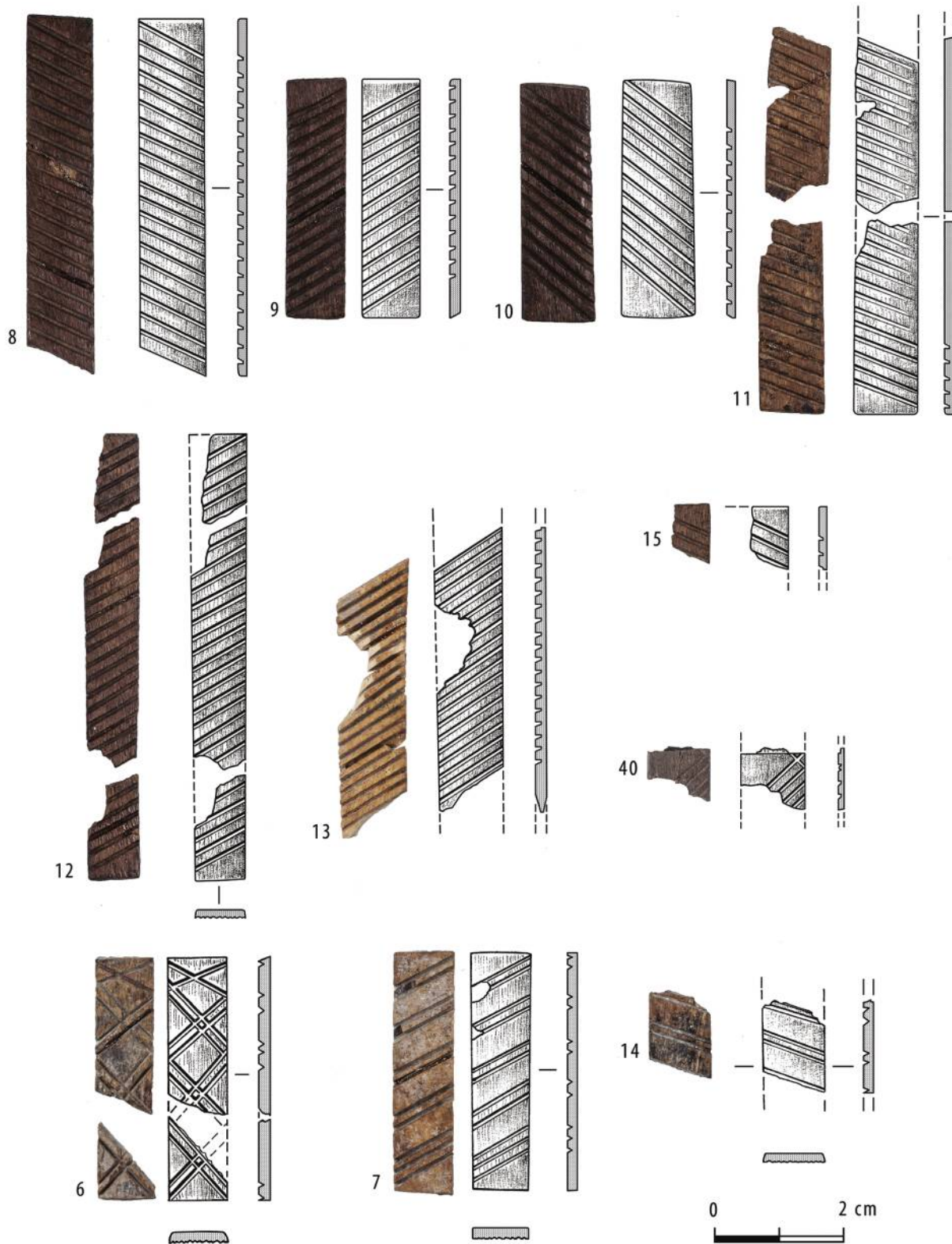


Fig. 8. Lachish bone inlays, Types 1E (Nos. 8-13, 15, 40), 1F (Nos. 7, 14), and 1G (No. 6). (Photos by T. Rogovsky, drawings by O. Dubovsky)

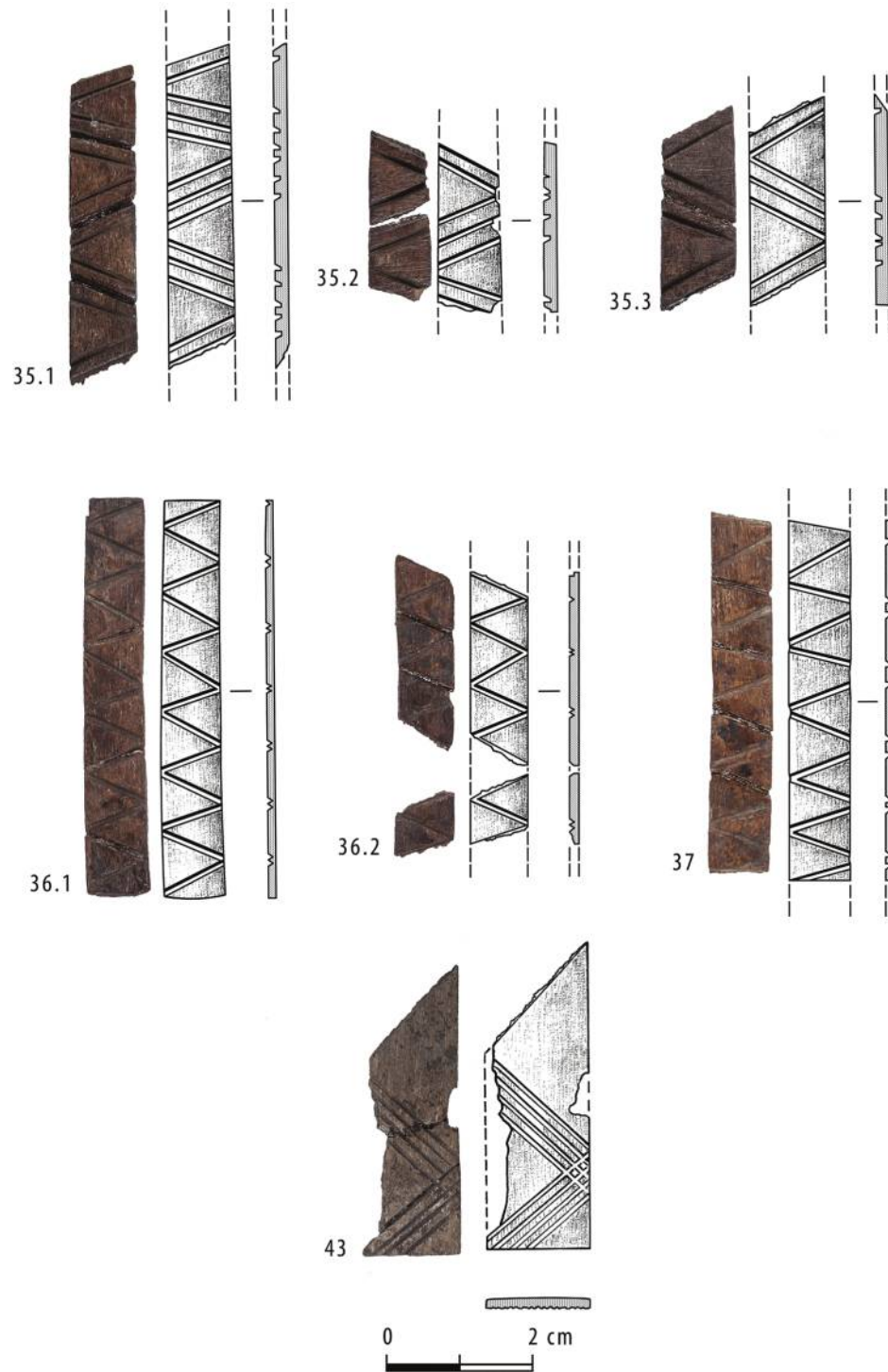


Fig. 9. Lachish bone inlays, Type 1H. (Photos by T. Rogovsky, drawings by O. Dubovsky)

Since the great majority of the inlays were recovered from Room C, the distribution of the types between the rooms is largely insignificant. However, it is worth noting that six of the seven inlays with circular geometric incisions (Types 2A and 2B) originated in Rooms A and B. This suggests that inlaid boxes in different rooms had different compositions.

Technology

Formation Technique

The bone inlays were examined using a stereo microscope (Zeiss Stemi 508 with Axiocam 105 color) and a

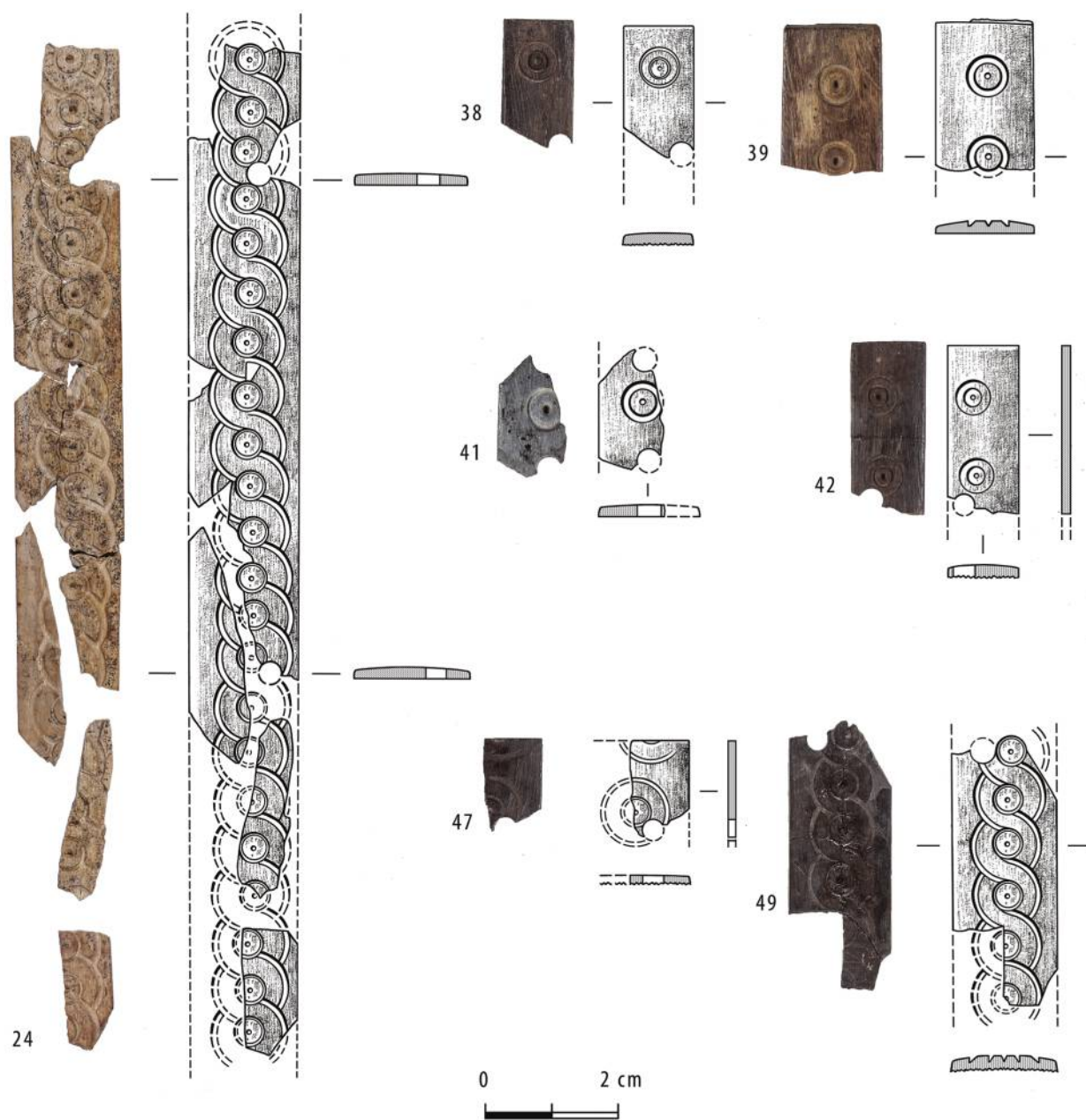


Fig. 10. Lachish bone inlays, Types 2A (Nos. 38–39, 41–42, 47) and 2B (Nos. 24, 49). (Photos by T. Rogovsky, drawings by O. Dubovsky)

metallographic microscope (Zeiss Axio Scope A1 with Axio-cam ERc 5s) in the Laboratory for Archaeological Materials and Ancient Technologies (LAMAT) at the Institute of Archaeology of the Hebrew University of Jerusalem. The first stage was an (unsuccessful) attempt to identify the bones used as raw materials. Although we assume that split ribs or metapodials were used, we were unable to acquire any information on the type of animal or the element used.³ Microscopic observation did reveal, however, evidence for the

³ The inlays were examined by Ariel Shatil of the Israel Antiquities Authority

preparation of the bones prior to the incision of the decoration and for the drilling technique used for creating the circular geometric decorations (see below).

Smoothing Prior to Decoration

Characteristic smoothing modifications were observed on many of the inlays. All the inlays were polished on the outer side and were smoothed on the inner side, in such a way that the soft tissue of the bone could still be detected. On the outer side, decorative incisions and functional and decorative perforations were detected. Between the

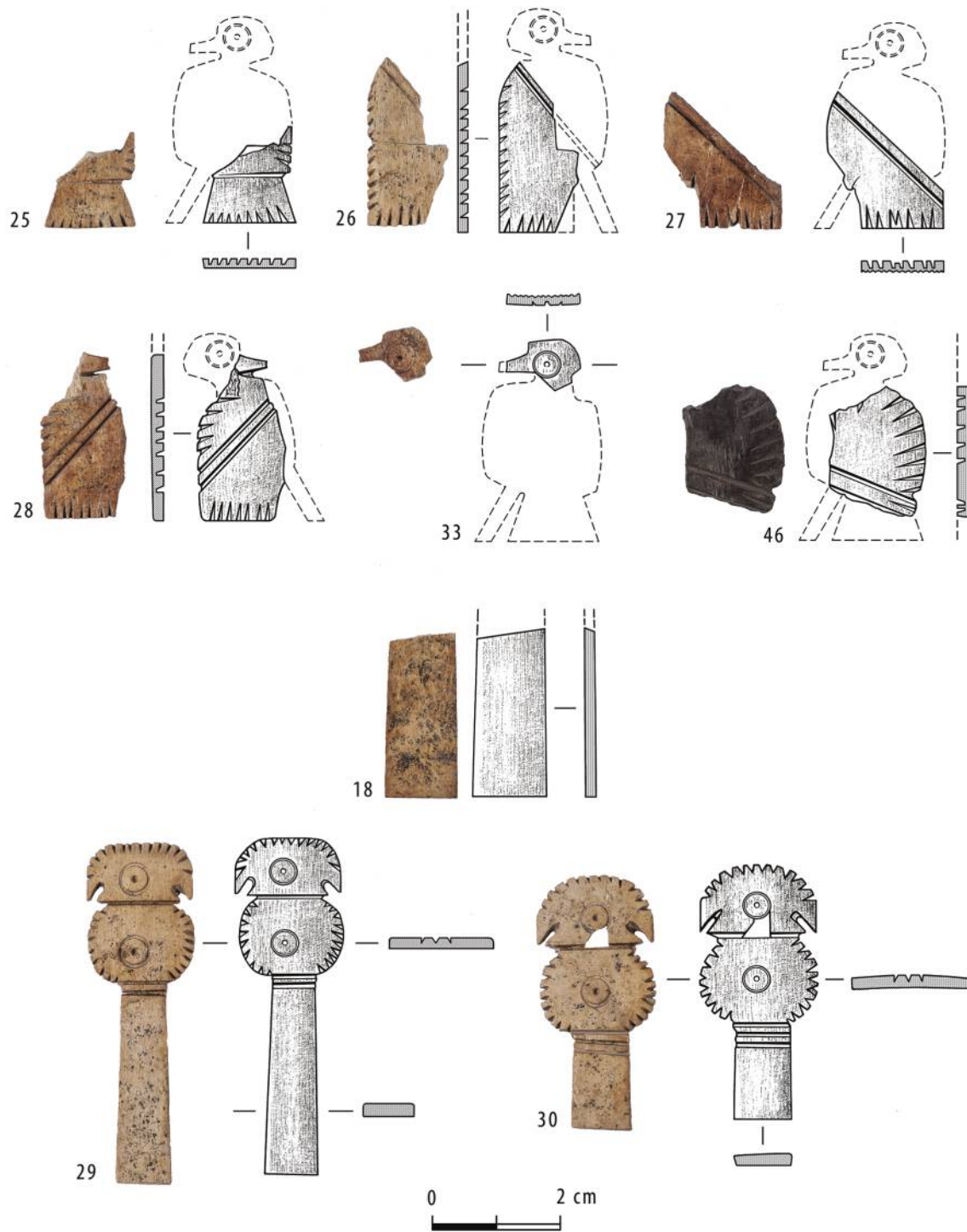


Fig. 11. Lachish bone inlays, Types 3A (Nos. 25–28, 33, 46) and 3B (Nos. 18, 29–30). (Photos by T. Rogovsky, drawings by O. Dubovsky)

decorative incisions were light incisions visible only with a microscope. Most of these were created during the preparation of the bones prior to the application of the incised decoration, as indicated by the stratigraphy of the incisions (the lighter ones being cut by the incised decoration). We identified three types of incisions, which appear to reflect three different tools used for the initial preparation of the bones:

Group I1: Shallow light incisions (0.25–0.53 mm wide), sometimes parallel and occasionally crossing one another, probably made by a pointed tool (Fig. 13)

Group I2: Shallow incisions (2–3.5 mm wide), probably made by a flat-edged, chisel-like tool (Fig. 14 and enlargement in Fig. 15)

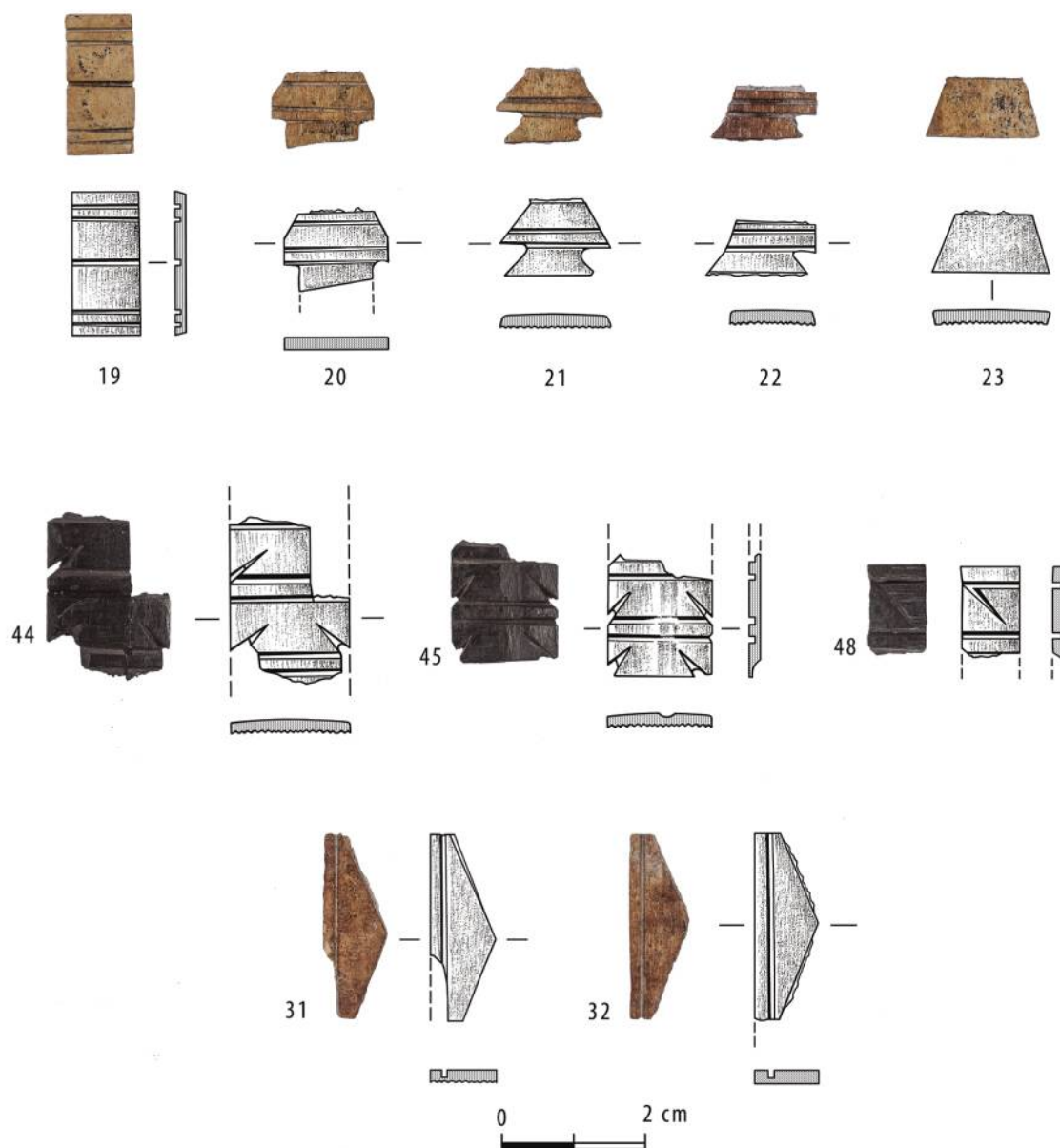


Fig. 12. Lachish bone inlays, Types 3C (Nos. 19–23, 44–45, 48) and 3D (Nos. 31–32). (Photos by T. Rogovsky, drawings by O. Dubovsky)

Group I3: Shallow transverse incisions (0.1–0.5 mm wide) made by a tool with pronged edge (Fig. 16 and enlargement in Fig. 17)

Notably, many of the inlays were smoothed to such a degree that no traces of the original working of the bone could be found. Since traces of pre-decoration smoothing were identified on only a third of the inlays, we assume that some of the craftsmen invested considerable effort in the basic preparation of the bones, resulting in the elimination of these traces. The varying degree of smoothing may possibly be taken as a further indication of the variability of production techniques.

Incised Linear Decoration

The size and shape of the decorative incisions basically correlates with the typology, suggesting that in this assemblage inlays with certain decorative patterns were produced by the same technique. Future work will determine whether similar inlays from other sites were produced in a similar way.

Within some of the decorative incisions, a trail of particles composed of unidentified crystals in different sizes and colors was detected, perhaps remaining from the tool. Remnants of black material, possibly paint, were also observed within some of the decorative incisions. A bright



Fig. 13. Group I1, bone inlay No. 49. (Photo by N. Silverberg)



Fig. 16. Group I3, bone inlay No. 36. (Photo by N. Silverberg)

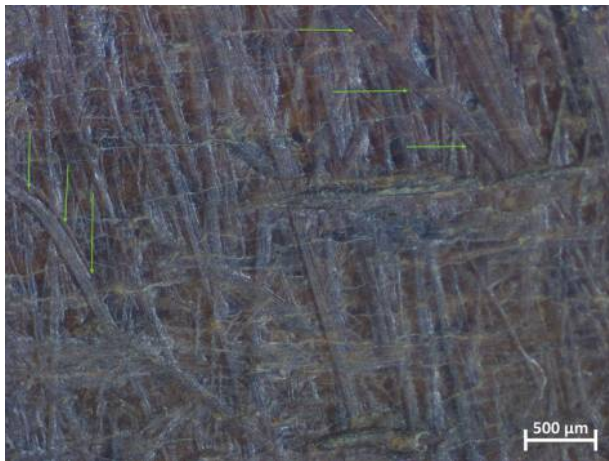


Fig. 14. Group I2, bone inlay No. 35. (Photo by N. Silverberg)

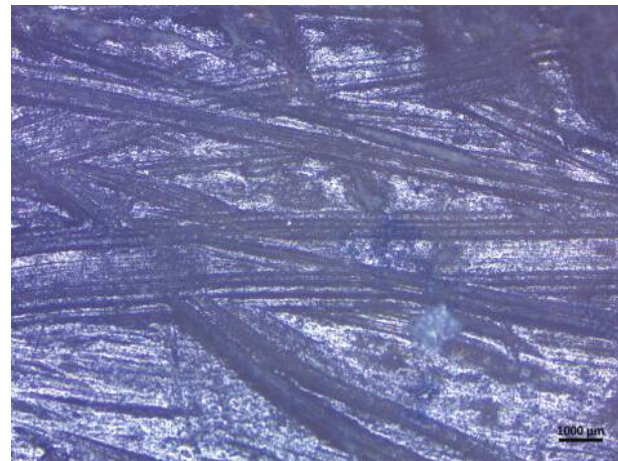


Fig. 17. Enlargement of Group I3, bone inlay No. 36. (Photo by N. Silverberg)

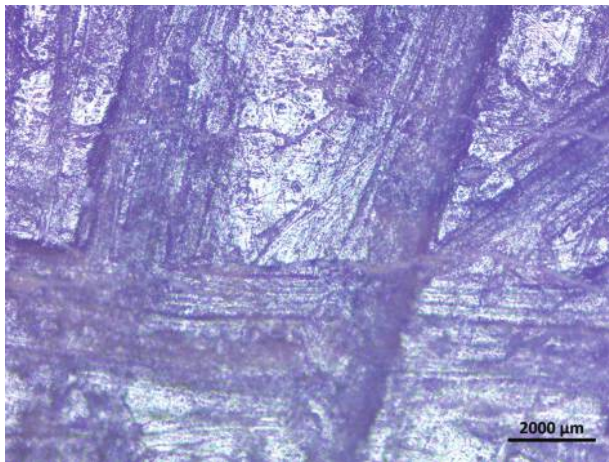


Fig. 15. Enlargement of Group I2, bone inlay No. 35. (Photo by N. Silverberg)

sheen detected in some of the incisions may have been created by the interaction between the tool and the bone material, while miniscule dark patches that were occasionally detected could be post-depositional patina.

Perforation Techniques

In addition to the linear incised decorations, circular geometric incisions (Types 2A and 2B) were identified. These were divided into two technological groups:

Group P1: Concentric circles (Fig. 10)

Group P2: Guilloche, combining concentric circles and a wavy pattern (Fig. 18)

Microscopic observation verified the use of a drill to form the perforations. We suggest that a wide flat drill bit with three spikes was used to produce the central



Fig. 18. Group P2, bone inlay No. 24. (Photo by N. Silverberg)

perforation and the external circular incision in a single act, as suggested in Biro et al. 2012 (pp. 55–63) for the Roman era and later. In order to incise an additional outer circle, the drill bit would have had to be replaced with a wider one. The guilloche pattern also required the use of different drill bits for the central circle and for the outer wavy pattern. For the latter, a wider tool was needed, with wider spikes; this tool was rotated only halfway to create the wavy pattern.

As far as we know, no other Levantine assemblage of bone inlays has been investigated microscopically to allow comparison of the results.

Color

A variety of colors was detected in the bone inlays: black, gray, light brown, and dark brown. Of the 39 brown inlays, 34 originated in Room C and 5 in Rooms A and B. Of the 9 black inlays, 6 originated in Room B, while the rest were unearthed in Room C. Despite our efforts to determine analytically by the use of X-ray fluorescence spectroscopy and Fourier transform infrared spectroscopy whether the color was intentionally applied during production or is related to the final destruction of the building or to post-depositional processes, we were unable to shed light on this question. The distribution of the inlays in the different rooms, each including inlays of more than one color, suggests that the color is the result of a deliberate choice rather than the intense fire. We suspect that if the latter were the case, each room would have yielded a particular color due to a certain burning temperature, and that this would be reflected in the microstructure of the bone (see Shahack-Gross, Bar-Yosef, and Weiner 1997). We would also expect in that case that fragments of a single inlay would vary in color. This conclusion is reinforced by the above-mentioned distribution of the black inlays, present mainly in Room B; the concentration of inlays

of a specific color in one room indicates a preference for a particular color for a particular inlaid box.

Discussion

The richness and diversity of the MB bone-inlay assemblage from Lachish and other contemporary assemblages from the southern Levant support earlier suggestions regarding the presence of a developed bone-inlay industry in the region during this time (Liebowitz 1977: 94).

Whether the bone-inlay industry was a local innovation or a local development of a Syrian tradition remains to be determined. However, the simple and rather homogeneous geometric patterns that characterize the inlays in Syria (see **Appendix**), in contrast to the large and stylistically diverse southern Levantine assemblages, hint at the possibility that this was a local development in the southern Levant region. This may originally have resulted from a shortage of ivory in the southern Levant (Barnett 1982: 19, 25), but nonetheless a local preference for bone may have developed over time. This choice of readily available material certainly enabled the industry to prosper.

Based on the location near the city entrance of the fortress (see Tufnell 1953: 92; Garfinkel, Kreimerman, Hasel et al. 2019: 125–126, 133) that yielded the bone-inlay assemblage (**Fig. 2**), and on the numerous finds, including glyptics and storage vessels retrieved from this building, we assume that the fortress had administrative functions in addition to its defensive role. These may have included daily management and supervision of commodities brought from nearby or more distant locations, as well as temporary storage (see Burke 2008: 65). Similar contemporary buildings with such administrative roles include, for example, the fort in Qiryat Shemona (South) (Gadot and Yasur-Landau 2012) and the western fort of Ebla (Pinnock 2001: 28, fig. 13).

As demonstrated by the **Appendix** (which is not an exhaustive list), other bone-inlay assemblages have been found mainly in tombs. This indicates a mortuary custom in which bone-inlaid boxes and possibly other artifacts (e.g., furniture) decorated by inlays were buried with the deceased. While tombs are sealed and potentially preserve bone objects better than unsealed contexts, bone inlays have also been found, albeit in smaller numbers, in living contexts. According to the data compiled in the **Appendix**, these contexts are primarily located in public buildings such as the MB palace of Area P at Lachish, the LB I elite building at Tel Batash, and the western fort of Ebla. At MB II–LB I Beth Shean these inlays derive from both residential and public contexts, in addition to tombs (see **Appendix**). These contexts reinforce the association of such items with elites and their dual use in life and death. Lachish, where such objects were exposed in both palatial and mortuary contexts (i.e., Tombs 119, 121, 6028, which encircled the northern side

of the mound; Fig. 2, Appendix), and now in what appears to be an administrative building, is a prime example of this duality.

Of particular interest in our attempt to reconstruct the function of inlaid boxes is a bone-inlaid box from the 13th century B.C.E. ceremonial palace on the acropolis of Hazor. Although the plaques decorating this box differ considerably from the MB II–LB I bone inlays, this inlaid box can shed light on the function of such items in the Canaanite culture, as it was found with its contents: ten cylinder seals, beads, and semiprecious stones (A. Ben-Tor 2009: 6). Another example is a bone-inlaid box from Sidon that was found in situ in the MB Burial 100 and contained a cylinder seal and a scarab (Doumet-Serhal 2011: 93). In Jericho, some remnants of wooden “toilet boxes” were found in Tomb H22 in association with bone inlays and scarabs (Kenyon 1960: 510–12). Regarding Lachish, bone inlays were found in association with scarabs in two MB tombs at the foot of the mound (Tombs 119, 6028; see Appendix). These examples, and the physical association between bone inlays and scarabs in the newly excavated Lachish fortress, suggest that decorated boxes with bone inlays were used to hold scarabs and other precious objects. As scarabs were used, *inter alia*, for sealing containers, as clearly seen on several of the stamped bullae from the Lachish fortress, an association between elite administrators and inlaid boxes is warranted. One may suggest that inlaid boxes that were used in daily life by officials to hold their precious and semi-precious belongings accompanied them into the afterlife (see D. Ben-Tor 1994: 8, 1997: 187).

Beside the inlaid boxes reconstructed at Jericho, Sidon, and Hazor, there have been many sporadic occurrences (mostly in tombs) of inlays at various sites, such as Tel Dan, Ginosar, Megiddo, Gibeon, Rephaim Valley, and Tel Batash (see Appendix). We cannot say whether these inlays decorated boxes or other artifacts, such as handles or furniture.

Technological Aspects

The importance of the technological aspects of bone-inlay production is only now gaining recognition (Naeh 2018), in contrast to the ivory industry that has typically commanded such attention up to now (Barnett 1982: 9–15). Although bone and ivory artifacts could be manufactured for the same uses, there are major differences in their processing that stem from their different material structures (St. Claire 2003: 1–6).

The bone inlays from Lachish, despite their typological variability, appear to have been decorated using generally similar technology. High-resolution examination of the surface of the bone inlays under an optical microscope, however, revealed differences in the initial processing of

the bones prior to the application of the incised decoration, indicating the use of several different tools.

The *chaîne opératoire* for inlay production required preparation of the raw material (MacGregor 1985, Ayalon and Sorek 1999, Ayalon 2005, Wapnish 2008, Shatil 2012). The fresh bone that we suspect was used would have needed to be selected and cleaned of the adhering meat, marrow, fat, and tendons. This process may have been performed by the inlay specialists as the first step of the operational chain or may have been carried out separately. In the latter case, the inlay specialists would have acquired the blanks from other individuals, specialists in their own right (see Shatil 2012: 128–29). We favor the former option, because of the limited scale of this industry. Moreover, evidence from production venues of other periods, such as the Early Islamic bone industry revealed in the Givati Parking Lot excavations, indicates that craftsmen began their work on the bone with the initial processing stage (Shatil 2021).

The variability in the polishing of the inlays from the Lachish MB fortress, carried out prior to decoration as attested in this study, suggests that the inlays were processed by different individuals working in different traditions. The traditional nature of crafts suggests that the use of a particular tool or formation technique is not arbitrary but is rather related to specific crafting traditions that exist within a cultural framework (e.g., Rice 2015: 212–13; Roux 2019). We thus suggest that the inlays originated in several workshops rather than in a single centralized one. While a decentralized production mode seems reasonable when considering the wide availability of the raw material, there are two aspects to be considered: 1) the association of these inlays with the ruling elite, suggestive of a more controlled production, perhaps according to the mode of “attached specialization” (Costin 1991); and 2) the wide distribution of inlays and the standardization of the decorative patterns and decorative techniques, suggestive of a common and widespread tradition.

The availability of bone qualifies as one aspect of the concept of “attached specialization,” as there was no need for the commissioner to supply the raw material (Stein 1996: 25). However, this does not mean that the inlaid boxes were not commissioned; in the Lachish MB fortress, the distribution of the different colors and motifs in different rooms, such as the clustering of black inlays in Room B and inlays with circular geometric pattern (for the most part) in Rooms A and B, as opposed to Room C, suggests that at least two inlaid boxes of different compositions originated in different rooms. In other words, each box in each room was distinctive in color and decoration, indicating that each box was unique.

On the other hand, the widespread distribution of inlays mostly in tombs, whether used in boxes or other objects, might suggest that inlays are not only to be associated

with administrative elites, but also played a role on other cultural levels, perhaps for sub-elites. It is unknown whether this was done by the same producers or by other artisans attempting to emulate the elite-attached craftsmen and their customers.

It appears that much additional study is needed in order to reconstruct the organization of production of such artifacts during the MB-LB I. Greater numbers of inlays may be retrieved through wet sifting, and we suggest here that microscopic observations are essential in the study of bone inlays in particular and craft production in general.

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Appendix: Selected Middle Bronze Age and Early Late Bronze Age Bone-Inlay Assemblages from the Southern Levant

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<i>Inlays from Fortress</i>		<i>Occurrence in Other Contexts at Lachish</i>			<i>Parallels at Other Sites</i>			
<i>Type</i>	<i>Frequency</i>	<i>Date</i>	<i>Context</i>	<i>Reference</i>	<i>Site⁴</i>	<i>Date⁵</i>	<i>Context</i>	<i>Reference</i>
1A	1/49				Dan	MB II	Tomb 8096	Ilan 1996: 231–32, fig. 4.102:1
					Jericho	MB II Tomb J39	Tombs H6, J7 Kenyon 1965: 419	Kenyon 1960: 416, 468
1B	1/49				Tell es-Salihiye	MB II		Henning von der Osten 1956: pl. 28
					Dan	MB II	Tomb 8096	Ilan 1996: 231–32, figs. 4.101:5, 4.102:1
					Kabri	MB II	Tombs	R. Oren 2002: 376–77, fig. 10.18:12
					Megiddo	MB II	Tombs 3070, 3175, 4055, 5013 B	Loud 1948: pls. 193:9–10, 194:11, 195:15
					Beth Shean (Northern Cemetery)	LB I	Tomb 42	E. Oren 1973: 6–8, fig. 34:1
					Jericho	MB II Tombs A136, G82, J14, J39, P1, P19	Tombs H6, J1 Kenyon 1965: 223, 321, 387, 419	Kenyon 1960: 416, 468
					Gibeon	MB II	Tombs 15, 18	Pritchard 1963: 30–31, figs. 25, 26:15
					Gezer	“Second Semitic Period.” By Dever: MB IIB–C and LB IA (Dever 1974: 4–5)	Tomb 28 II	Macalister 1912a: 247–51 Macalister 1912b: pls. XXXIV, CXCV
					Jerusalem (Ophel)	MB II		Naeh 2015: 581
					Jerusalem (Rephaim Valley)	MB IIB	Tombs 35B, 71	Milevski, Greenhut, and Agha 2010: 415, fig. 8.6
Jerusalem (Dominus Flevit)	MB II	Tomb	Saller 1964: 178–83, fig. 63, pl. 37					
1C	1/49	MB II Stratum P-4 (Area P)	Palace rooms	Sass 2004: 1506, fig. 23.23:3	Dan	MB II	Tomb 8096	Ilan 1996: 231–32, fig. 4.102:1
					Megiddo	MB II	Tomb 2009	Loud 1948: pl. 195:18
					Beth Shean (Area R)	Late MB IIB LB IA	Residential Temple	Yahalom-Mack and Mazar 2007: 682–83, fig. 13.6:2, 7 Yahalom-Mack and Mazar 2007: 682–83, fig. 13.6:7

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					Jericho	MB II	Tombs H6, J1, J7 Tomb B51	Kenyon 1960: 416, 468 Kenyon 1965: 355
					Tell Fara (South)	15th (Hyksos) Dynasty		Macdonald, Starkey, and Harding 1932: pl. XLIV:46
1D	5/49				Jericho	MB II	Tomb H18	Kenyon 1960: 468
					Gibeon	MB II	Tomb 15	Pritchard 1963: 30–31, fig. 25
1E	8/49	MB II Stratum P-4 (Area P)	Palace rooms	Sass 2004:1506, fig. 23.23.1	Tell es-Salihiye	MB II		Henning von der Osten 1956: pl. 28
					Dan	MB II	Tomb 8096	Ilan 1996: 231–32, fig. 4.101:5
					Kabri	MB II	Tombs	R. Oren 2002: 376–77, fig. 10.18:17
					Megiddo	MB II	Tombs 2135, 3039, 3070, 3085, 3095, 3175, 4055, 5013 B, 5133, 5259, 4056	Loud 1948: pls. 192:1–2; 192:4–5; 193:6–10; 194:11, 14; 195:15
					Beth Shean (Northern Cemetery)	LB I	Tomb 42	E. Oren 1973: 6–8, fig. 34:1
					Jericho	MB II	Tombs G37, H6, H22, J1	Kenyon 1960: 367, 416, 468, 510
							Tombs A136, G73, G82, J14, J39, J45, P19, P21	Kenyon 1965: 321, 387, 419, 437
					Gibeon	MB II	Tombs 15, 18	Pritchard 1963: 30–31, figs. 25, 26.15
					Gezer	“Second Semitic Period”	Tomb 28 II	Macalister 1912a: 247–51 Macalister 1912b: pls. XXXIV; CXCXV
					Jerusalem (City of David)	MB IIB	Residential (?)	Shiloh 1985: 66, pl. 12b Ariel 1990: 120–24, figs. 9a, 9b
					Jerusalem (Ophel)	MB II		Naeh 2015: 581
					Jerusalem (Dominus Flevit)	MB II	Tomb	Saller 1964: 178–83, fig. 63, pl. 37
					Tell Beit Mirsim	MB IIB–C		Albright 1938: 49–50, pls. 35–36
					Tell Beit Mirsim	MB II	Tomb 510	Ben-Arieh 2004: 7, 96, fig. 2.66:58
					Tell Fara (South)	15th (Hyksos) Dynasty		Petrie 1930: pl. VI:4

Appendix. (Continued)

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<i>Inlays from Fortress</i>		<i>Occurrence in Other Contexts at Lachish</i>				<i>Parallels at Other Sites</i>			
<i>Type</i>	<i>Frequency</i>	<i>Date</i>	<i>Context</i>	<i>Reference</i>	<i>Site</i> ⁴	<i>Date</i> ⁵	<i>Context</i>	<i>Reference</i>	
1F	2/49	LB I Late MB II Stratum P-3 (Area P)	Tomb 555 Reused room and reused courtyard of the destroyed palace	Tufnell 1958: 86–87, pl. 28.4 Sass 2004: 1506, fig. 23.23:6	Dan	MB II	Tomb 8096	Ilan 1996: 231–32, figs. 4.1015, 4.1021	
					Ginosar	MB IIB	Tomb 2/3	Epstein 1974: 20–39, figs. 11:19, 22; 13:21	
					Megiddo	MB II	Tombs 3048, 3085, 3175, 4055	Loud 1948: pls. 193:8–10, 194:13	
					Jericho	MB II	Tombs H18, H22, J1	Kenyon 1960: 416, 496, 512	
					Gibeon	MB II	Tomb G73 Tomb 15	Kenyon 1965: 463 Pritchard 1963: 30–31, fig. 25	
					Gezer	“Second Semitic Period”	Tomb 28 II	Macalister 1912a: 247–51 Macalister 1912b: pl. CXCXV	
					Jerusalem (Ophel)	MB II		Naeh 2015: 581	
					Beth Zur Tell Beit Mirsim	MB MB IIB–C		Sellers 1933: 56, fig. 47 Albright 1938: 49–50, pl. 35	
1G	1/49				Kabri	MB II	Tombs	R. Oren 2002: 376–77, fig. 10.18:13	
					Ginosar	MB IIB	Tomb 2/3	Epstein 1974: 20–39, fig. 11:17	
					Megiddo	MB II	Tombs 2117, 3039, 3070, 3085, 3095, 3175, 4055	Loud 1948: pls. 192:2; 193:8–10; 194:11, 14; 195:17	
					Beth Shean (Northern Cemetery)	LB I	Tomb 42	E. Oren 1973: 6–8, fig. 34.1	
					Gibeon	MB II	Tomb 15	Pritchard 1963: 30–31, fig. 25	
1H	4/49	MB IIB–C	Tomb 6028	Tufnell 1958: 86–87, pl. 28:1	Tell es-Salihiye	MB II		Henning von der Osten 1956: pl. 28	
					Sidon	MB IIB	Tomb 100	Doumet-Serhal 2011: 94	
					Dan	MB II	Tomb 8096	Ilan 1996: 231–32, figs. 4.101:5, 4.102:1	
					Ginosar	MB IIB	Tomb 2/3	Epstein 1974: 20–39, fig. 11:20–21	

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					Megiddo	MB II	Tombs 2009, 3039, 3048, 3070, 3085, 3095, 3175, 4056, 5133	Loud 1948: pls. 192:2; 193: 6–8, 10; 194:11, 13–14; 195:18
					Beth Shean (Area R)	Late MB IIB	Residential	Yahalom-Mack and Mazar 2007: 682–83, fig. 13.6:5
					Beth Shean (Northern Cemetery)	LB I	Tomb 42	E. Oren 1973: 6–8, fig. 34:1
					Jericho	MB II	Tombs H6, H18, H22, J1, J9	Kenyon 1960: 416, 468, 496, 510
					Gibeon	MB II	Tombs B51, G73, G82, J14, J45, P19, P21	Kenyon 1965: 355, 387, 419, 437, 463
					Gezer	“Second Semitic Period”	Tomb 28 II	Macalister 1912a: 247–51 Macalister 1912b: pls. XXXIV; CXCV
					Jerusalem (City of David)	MB IIB	Residential (?)	Shiloh 1985: 66, pl. 12 Ariel 1990: 120–24, figs. 9a, 9b
					Jerusalem (Ophel)	MB II		Naeh 2015: 581
					Jerusalem (Dominus Flevit)	MB II	Tomb	Saller 1964: 178–83, fig. 63, pl. 37
					Tell Beit Mirsim	MB IIB–C		Albright 1938: 49–50, pls. 35–36
2A	5/49	MB IIB–C	Tomb 119	Tufnell 1958: 86–87, pl. 28:2	Ebla	MB II	Western Fort	Peyronel 2016: 191, fig. 7
					Tell es-Salihiye	MB II		Henning von der Osten 1956: pl. 28
					Sidon	MB IIB	Tomb 100	Doumet-Serhal 2011: 94
					Dan	MB II	Tombs 368, 8096	Ilan 1996: 231–32, figs. 4.97:3, 4.101:5
					Ginosar	MB IIB	Tomb 2/3	Epstein 1974: 20–39, fig. 13:22
					Megiddo	MB II	Tombs 2009, 2117, 3175, 4055	Loud 1948: pls. 192:1, 193:9–10, 195:17–18
					Beth Shean (Area R)	Late MB IIB	Residential	Yahalom-Mack and Mazar 2007: 682–83, fig. 13.6:4
					Jericho	MB II	Tombs A34, H6, H18, H22, J1, J9	Kenyon 1960: 367, 416, 468, 496, 512
					Gibeon	MB II	Tombs 15, 18	Pritchard 1963: 30–31, figs. 25, 26:15

Appendix. (Continued)

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<i>Inlays from Fortress</i>		<i>Occurrence in Other Contexts at Lachish</i>			<i>Parallels at Other Sites</i>			
<i>Type</i>	<i>Frequency</i>	<i>Date</i>	<i>Context</i>	<i>Reference</i>	<i>Site</i> ⁴	<i>Date</i> ⁵	<i>Context</i>	<i>Reference</i>
					Gezer	"Second Semitic Period"	Tomb 28 II	Macalister 1912a: 247–51 Macalister 1912b: pls. XXXIV, CXCXV
					Jerusalem (City of David)	MB IIB	Residential (?)	Shiloh 1985: 66, pl. 12b Ariel 1990: 120–24, figs. 9a, 9b
					Jerusalem (Ophel)	MB II		Naeh 2015: 581
					Jerusalem (Rephaim Valley)	MB IIB	Tombs 35B, 71	Milevski, Greenhut, and Agha 2010: 415, fig. 8:5–6
					Jerusalem (Dominus Flevit)	MB II	Tomb	Saller 1964: 178–83, fig. 63, pl. 37
					Tel Batash	LB IA	Elite residence (Building 315)	Yahalom-Mack 2006: 262, fig. 127
					Beth Zur	MB		Sellers 1933: 56, fig. 47
					Tell Beit Mirsim	MB IIB–C		Albright 1938: 49–50, pls. 35–36
2B	2/49				Dan	MB II	Tomb 8096	Ilan 1996: 231–32, fig. 4.1015
					Megiddo	MB II	Tomb 3048	Loud 1948: pls. 192.1, 194.13
					Beth Shean (Area R)	Late MB IIB	Residential	Yahalom-Mack and Mazar 2007: 682–83, fig. 13.6:1
					Jericho	MB II	Tombs H18, J1	Kenyon 1960: 416, 496
					Gibeon	MB II	Tombs 36, 57	Pritchard 1963: 30–31, figs. 41:42, 62:49
					Gezer	"Second Semitic Period"		Macalister 1912a: 247–51 Macalister 1912b: pl. CXCXV
					Jerusalem (Dominus Flevit)	MB II	Tomb	Saller 1964: 178–83, fig. 63; pl. 37
3A	6/49	MB IIB–C	Tomb 119	Tufnell 1958: 86–87, pl. 28:2	Tell el-Burak	MB II	Tomb	Sader and Kamlah 2010: 133

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					Dan	MB II	Tomb 8096	Ilan 1996: 231–32, fig. 4.101.5
					Megiddo	MB II	Tombs 2135, 3039, 3059, 3070, 3175, 5013 B, 5259, 4055	Loud 1948: pls. 192:4–5; 193:9–10; 194:11–12, 14; 195:15
					Jericho	MB II	Tombs G37, H6, H18, H22, J1 Tombs G73, J14, J45, P19	Kenyon 1960: 367, 416, 468, 496, 510 Kenyon 1965: 321, 387, 419
					Gibeon	MB II	Tombs 15, 18	Pritchard 1963: 30–31, figs. 25, 26:15
					Gezer Jerusalem (City of David)	“Second Semitic Period” MB IIB	Residential (?)	Macalister 1912a: 248 Shiloh 1985: 66, pl. 12b; Ariel 1990: 120–24, figs. 9a, 9b
					Beth Zur Tell Nagila	MB MB IIB–C	Living quarter (Area A)	Sellers 1933: 56, fig. 47 Amiran and Eitan 1965:116, fig. 6
3B	3/49				Tell es-Salihiye	MB II		Henning von der Osten 1956: pl. 28
					Megiddo	MB II	Tombs 3070, 5259	Loud 1948: pls. 192:4, 194:11
					Jericho	MB II	Tomb G82, J14, J19	Kenyon 1965: 355, 387
3C	8/49	MB IIB–C	Tomb 119	Tufnell 1958: 86–87, pl. 28:2	Megiddo	MB II	Tombs 3070, 3085, 3095, 4056	Loud 1948: pls. 192.2, 193:7–8, 194:11
					Jericho	MB II	Tombs H18, J1 Tombs G73, P19, P23	Kenyon 1960: 416, 496 Kenyon 1965: 223, 387, 463
					Tell Beit Mirsim	MB IIB–C		Albright 1938: 49–50, pl. 35
					Tell Fara (South)	15th (Hyksos) Dynasty		Petrie 1930: pl. VI:3, 10
3D	2/49				Megiddo	MB II	Tomb 5259	Loud 1948: pl. 192:4
					Jericho	MB II	Tomb J14	Kenyon 1965: 321

⁴ The sites are listed from north to south.

⁵ The period of each assemblage is that assigned by the excavator(s) of the site.

References

- Aharoni, Y.
1975 *Investigations at Lachish: The Sanctuary and the Residency (Lachish V)*. Publications of the Institute of Archaeology, Tel Aviv University. Tel Aviv: Gateway Publishers.
- Albright, W. F.
1929 "The American Excavations at Tell Beit Mirsim." *Zeitschrift für die alttestamentliche Wissenschaft* 47: 1–17. <https://doi.org/10.1515/zatw.1929.47.1.1>
1938 *The Excavation of Tell Beit Mirsim, Vol. II: The Bronze Age*. Annual of the American Schools of Oriental Research 17. New Haven, CT: American Schools of Oriental Research.
- Amiran, R., and Eitan, A.
1965 "A Canaanite Hyksos City at Tell Nagila." *Archaeology* 18: 113–23.
- Ariel, D. T.
1990 *Excavations at the City of David 1978–1985, Directed by Yigal Shiloh, Vol. II, Imported Stamped Amphora Handles, Coins, Worked Bone and Ivory, and Glass*. Qedem 30. Jerusalem: The Institute of Archaeology, The Hebrew University of Jerusalem.
- Ayalon, E.
2005 *The Assemblage of Bone and Ivory Artifacts from Caesarea Maritima, Israel 1st–13th Centuries CE*. BAR International Series 1457. Oxford: British Archaeological Reports.
- Ayalon, E., and Sorek, C.
1999 *Bare Bones: Ancient Artifacts from Animal Bones*. Tel Aviv: Eretz Israel Museum (Hebrew).
- Barnett, R. D.
1982 *Ancient Ivories in the Middle East*. Qedem 14. Jerusalem: The Institute of Archaeology, The Hebrew University of Jerusalem.
- Ben-Arieh, S.
2004 *Bronze and Iron Age Tombs at Tell Beit Mirsim*. Israel Antiquities Authority Reports 23. Jerusalem: Israel Antiquities Authority.
- Ben-Tor, A.
2009 "A Decorated Jewellery Box from Hazor." *Tel Aviv* 36.1: 5–67. <https://doi.org/10.1179/204047809x439442>
- Ben-Tor, D.
1994 "The Historical Implications of Middle Kingdom Scarabs Found in Palestine Bearing Private Names and Titles of Officials." *Bulletin of the American Schools of Oriental Research* 294: 7–22. <https://doi.org/10.2307/1357151>
1997 "The Relations Between Egypt and Palestine in the Middle Kingdom as Reflected by Contemporary Canaanite Scarabs." *Israel Exploration Journal* 47.3–4: 162–89.
- Biro, M. T., Choyke, A. M., Vass, L., and Vecsey, Á.
2012 *Bone Objects in Aquincum*. Budapest: Aquincum Museum.
- Burke, A. A.
2008 *Walled Up to Heaven: The Evolution of Middle Bronze Age Fortification Strategies in the Levant*. Winona Lake, IN: Eisenbrauns.
- Clark, R. T. R.
1959 *Myth and Symbol in Ancient Egypt*. London: Thames and Hudson.
- Costin, C. L.
1991 "Craft Specialization: Issues in Defining, Documenting, and Explaining the Organization of Production." *Archaeological Method and Theory* 3: 1–56.
- Dever, W. G.
1974 *Gezer II: Report of the 1967–70 Seasons in Fields I and II*. Annual of the Hebrew Union College/Nelson Glueck School of Biblical Archaeology 2. Jerusalem: Hebrew Union College.
1987 "Archaeological Sources for the History of Palestine: The Middle Bronze Age: The Zenith of the Urban Canaanite Era." *The Biblical Archaeologist* 50.3: 148–77. <https://doi.org/10.2307/3210059>
- Doumet-Serhal, C.
2011 "A Decorated Box from Sidon." *Archaeology and History in the Lebanon* 34–35: 93–103.
- Epstein, C.
1974 "Middle Bronze Age Tombs at Kefar Szold and Ginosar." *Atiqot* 7: 13–39 (Hebrew).
- Gadot, Y., and Yasur-Landau, A.
2012 *Qiryat Shemona (S) Fort and Village in the Hula Valley*. Salvage Excavation Reports 7. Sonia and Marco Nadler Institute of Archaeology, Tel Aviv University. Tel Aviv: Tel Aviv University.
- Garfinkel, Y.
2016 "The Murder of James Leslie Starkey near Lachish." *Palestine Exploration Quarterly* 148.2: 84–109. <https://doi.org/10.1080/00310328.2016.1138217>
- Garfinkel, Y., Hasel, M. G., and Klingbeil, M. G.
2013 "An Ending and a Beginning: Why We're Leaving Qeiyafa and Going to Lachish." *Biblical Archaeology Review* 39.6: 44–51.
- Garfinkel, Y., Hasel, M. G., Klingbeil, M. G., Kang, H. G., Choi, G., Chang, S. Y., Hong, S., Ganor, S., Kreimerman, I., and Bronk Ramsey, C.
2019 "Lachish Fortifications and State Formation in the Biblical Kingdom of Judah in Light of Radiometric Datings." *Radiocarbon* 61.3: 695–712. <https://doi.org/10.1017/RDC.2019.5>
- Garfinkel, Y., Hasel, M. G., Klingbeil, M. G., Kreimerman, I., Pytlik, M., Carroll, J. W., Waybright, J. W. B., Kang, H. G., Choi, G., Chang, S. Y., Hong, S., David, A., Weissbein, I., and Silverberg, N.
2021 "The Canaanite and Judean Cities of Lachish, Israel: Preliminary Report of the Fourth Expedition, 2013–2017." *American Journal of Archaeology* 125.3: 419–59.

- Garfinkel, Y., Kreimerman, I., Hasel, M. G., and Klingbeil, M. G.
2019 "First Impression on the Urban Layout of the Last Canaanite City of Lachish: A View from the Northeast Corner of the Site." In A. M. Maeir, I. Shai, and C. McKinny (eds.), *The Late Bronze and Early Iron Ages of Southern Canaan*, Vol. 2. Pp. 122–35.
- Ilan, D.
1996 "The Middle Bronze Age Tombs." In A. Biran (ed.), *Dan I: A Chronicle of the Excavations, The Pottery, The Early Bronze Age and the Middle Bronze Age Tombs*, 161–296. Annual of the Nelson Glueck School of Biblical Archaeology. Jerusalem: Hebrew Union College–Jewish Institute of Religion.
- Kenyon, K. M.
1960 *Excavations at Jericho*, Vol. 1: *The Tombs Excavated in 1952–4*. London: The British School of Archaeology in Jerusalem.
1965 *Excavations at Jericho*, Vol. 2: *The Tombs Excavated in 1955–8*. London: The British School of Archaeology in Jerusalem.
- Liebowitz, H. A.
1977 "Bone and Ivory Inlay from Syria and Palestine." *Israel Exploration Journal* 27.2–3: 89–97.
1987 "Late Bronze II Ivory Work in Palestine: Evidence of a Cultural Highpoint." *Bulletin of the American Schools of Oriental Research* 265: 3–24. <https://doi.org/10.2307/1356803>
- Loud, G.
1948 *Megiddo II. Seasons of 1935–39*. Oriental Institute Publications 62. Chicago: The Oriental Institute, The University of Chicago.
- Macalister, R. A. S.
1912a *The Excavations of Gezer 1902–1905 and 1907–1909*, Vol. II. London: Committee of the Palestine Exploration Fund.
1912b *The Excavations of Gezer 1902–1905 and 1907–1909*, Vol. III. London: Committee of the Palestine Exploration Fund.
- Macdonald, E., Starkey, J. L., and Harding, L.
1932 *Beth-Pelet II: Prehistoric Fara, Beth-Pelet Cemetery*. London: British School of Archaeology in Egypt.
- MacGregor, A.
1985 *Bone, Antler, Ivory and Horn: The Technology of Skeletal Materials Since the Roman Period*. London: Barnes and Noble.
- McDonald, J.
1999 "Egyptian Sunshades." *Source: Notes in the History of Art* 18.2: 8–14. <https://doi.org/10.1086/sou.18.2.23204939>
- Milevski, I., Greenhut, Z., and Agha, N.
2010 "Excavations at the Holyland Compound: A Bronze Age Cemetery in the Rephaim Valley, Western Jerusalem." In P. Matthiae, F. Pinnock, L. Nigro, and N. Marchetti (eds.), *Proceedings of the 6th International Congress of the Archaeology of the Ancient Near East, May 5th–10th 2008, "Sapienza" – Università di Roma*, Vol. 2, *Excavations, Surveys and Restorations: Reports on Recent Field Archaeology in the Near East*, 397–415. Weisbaden: Harrassowitz.
- Naeh, L.
2015 "Worked Ivory and Bone Objects from the Ophel." In E. Mazar (ed.), *The Ophel Excavations to the South of the Temple Mount, 2009–2013, Final Reports* Vol. 1, 581–616. Jerusalem: Shoham Academic Research and Publication.
2018 "Local Art in the Southern Levant: Middle Bronze Age Bone-Inlaid Boxes of the Geometric Family." Ph.D. dissertation, Hebrew University of Jerusalem (Hebrew).
- Oren, E. D.
1973 *The Northern Cemetery of Beth Shan*. University of Pennsylvania Museum Monographs. Leiden: Brill.
- Oren, R.
2002 "Bone Objects." In N. Scheftelowitz and R. Oren (eds.), *Tel Kabri: The 1986–1993 Excavation Seasons*, 374–77. Sonia and Marco Nadler Institute of Archaeology Monograph Series 20. Tel Aviv: Emery and Claire Yass Publications in Archaeology, Institute of Archaeology, Tel Aviv University.
- Osten, H. Henning von der
1956 *Svenska Syrienexpeditionen 1952–1953: Die Grabung von Tell eš-Šalihiyeh*, Vol. 1. Skrifter Utgivna Av Svenska Institutet I Athen 4/4. Lund: Gleerup.
- Parkinson, R. B.
2008 *The Painted Tomb-chapel of Nebamun, Masterpieces of Ancient Egyptian Art in the British Museum*. London: British Museum Press.
- Petrie, W. M. F.
1891 *Tell el Hes: Lachish*. London: Committee of the Palestine Exploration Fund.
1930 *Beth Pelet I (Tell Fara)*. London: British School of Archaeology in Egypt.
- Peyronel, L.
2016 "Bone and Ivory Manufacturing at Ebla (Syria) during the Early and Middle Bronze Age (c. 2500–1600 B.C.E.)." *Levant* 48.2: 184–96. <https://doi.org/10.1080/00758914.2016.1194040>
- Pinch, G.
2002 *Handbook of Egyptian Mythology*. Santa Barbara, CA: ABC-CLIO.
- Pinnock, F.
2001 "The Urban Landscape of Old Syrian Ebla." *Journal of Cuneiform Studies* 53: 13–33. <https://doi.org/10.2307/1359976>
- Pritchard, J. B.
1963 *The Bronze Age Cemetery at Gibeon*. University Museum Monograph 4. Philadelphia: University Museum, University of Pennsylvania.
- Remler, P.
2010 *Egyptian Mythology, A to Z*. New York: Chelsea House Publications.
- Rice, P. M.
2015 *Pottery Analysis: A Sourcebook, Second Edition*. Chicago: The University of Chicago.

- Roux, V.
2019 *Ceramics and Society. A Technological Approach to Archaeological Assemblages*. New York: Springer. <https://doi.org/10.1007/978-3-030-03973-8>
- Sader, H., and Kamlah, J.
2010 "Tell el-Burak: A New Middle Bronze Age Site from Lebanon." *Near Eastern Archaeology* 73.2–3: 130–41. <https://doi.org/10.1086/NEA25754042>
- Saller, S. J.
1964 *The Excavations at Dominus Flevit (Mount Olivet, Jerusalem)*, Part II: *The Jebusite Burial Place*. Studium Biblicum Franciscanum Publications 13. Jerusalem: Franciscan Press.
- Sass, B.
2004 "Vessels, Tools, Personal Objects, Figurative Art and Varia." In D. Ussishkin (ed.), *The Renewed Archaeological Excavations at Lachish (1973–1994)*, 1450–524. Tel Aviv: Emery and Claire Yass Publications in Archaeology, Institute of Archaeology, Tel Aviv University.
- Sass, B., Garfinkel, Y., Hasel, M. G., and Klingbeil, M. G.
2015 "The Lachish Jar Sherd: An Early Alphabetic Inscription Discovered in 2014." *Bulletin of the American Schools of Oriental Research* 374: 233–45. <https://doi.org/10.5615/bullamerschoorie.374.0233>
- Sellers, O. R.
1933 *The Citadel of Beth-Zur: A Preliminary Report of the First Excavation Conducted by the Presbyterian Theological Seminary, Chicago, and the American School of Oriental Research, Jerusalem, in 1931 at Khirbat et Tubeiqā*. Philadelphia, PA: Westminster.
- Shahack-Gross, R., Bar-Yosef, O., and Weiner, S.
1997 "Black-Coloured Bones in Hayonim Cave, Israel: Differentiating Between Burning and Oxide Staining." *Journal of Archaeological Science* 24.5: 439–46. <https://doi.org/10.1006/jasc.1996.0128>
- Shatil, A.
2012 "Manufacture of Bone Items from the Early Islamic Period in Givati Parking Lot Excavations." In D. Amit, G. D. Stiebel, O. Peleg-Barkat, and D. Ben-Ami (eds.), *New Studies in the Archaeology of Jerusalem and its Region, Collected Papers*, Vol. 6, 125–35. Jerusalem: Israel Antiquities Authority and The Hebrew University of Jerusalem.
2021 "Production of Bone Objects in the Early Islamic Period." In D. Ben-Ami and Y. Tchekhanovets (eds.), *Jerusalem Excavations in the Tyropoeon Valley (Giv'ati Parking Lot)*, Vol. II: *The Byzantine and Early Islamic Periods, Part 2: Strata IV–I: The Early Islamic Period*, 585–640. Israel Antiquities Authority Reports 66/2. Jerusalem: Israel Antiquities Authority. <https://doi.org/10.2307/j.ctv1fkgc67.7>
- Shiloh, Y.
1985 "Jerusalem, City of David, 1984." *Israel Exploration Journal* 35: 65–67.
- St. Claire, A.
2003 *Carving as Craft: Palatine East and the Greco-Roman Bone and Ivory Carving Tradition*. Baltimore, MD: Johns Hopkins University.
- Stein, G. J.
1996 "Producers, Patrons, and Prestige: Craft Specialists and Emergent Elites in Mesopotamia from 5500–3100 B.C." In B. Wailes (ed.), *Craft Specialization and Social Evolution: In Memory of V. Gordon Childe*, 25–38. Symposium Series 6, University Museum Monograph 93. Philadelphia: University of Pennsylvania Museum.
- Tufnell, O.
1953 *Lachish III (Tell ed-Duweir): The Iron Age*. Oxford: Oxford University.
1958 *Lachish IV (Tell ed-Duweir): The Bronze Age*. Oxford: Oxford University.
- Ussishkin, D.
1978 "Excavations at Tel Lachish – 1973–1977, Preliminary Report." *Tel Aviv* 5.1–2: 1–97. <https://doi.org/10.1179/033443578788497668>
1983 "Excavations at Tel Lachish 1978–1983: Second Preliminary Report." *Tel Aviv* 10.2: 97–175. <https://doi.org/10.1179/tav.1983.1983.2.97>
2004 *The Renewed Archaeological Excavations at Lachish (1973–1994)*. Tel Aviv: Emery and Claire Yass Publications in Archaeology, Institute of Archaeology, Tel Aviv University.
- Wapnish, P.
2008 "The Manufacture of Bone Artifacts." In L. E. Stager, J. D. Schloen, and D. M. Master (eds.), *Ashkelon 1: Introduction and Overview (1985–2006)*, 587–637. Winona Lake, IN: Eisenbrauns.
- Weinstein, J. M.
1975 "Egyptian Relations with Palestine in the Middle Kingdom." *Bulletin of the American Schools of Oriental Research* 217: 1–16. <https://doi.org/10.2307/1356218>
- Yahalom-Mack, N.
2006 "Various Small Finds." In N. Panitz-Cohen and A. Mazar (eds.), *Timnah (Tel Batash) III: The Finds from the Second Millennium B.C.E.*, 255–66. Qedem 45. Jerusalem: The Institute of Archaeology, The Hebrew University of Jerusalem.
- Yahalom-Mack, N., and Mazar, A.
2007 "Various Finds." In A. Mazar and R. A. Mullins (eds.), *Excavations at Tel Beth-Shean 1989–1996*, Vol. 2: *The Middle and Late Bronze Age Strata in Area R*, 672–87. The Beth-Shean Valley Archaeological Project Publication 2. Jerusalem: The Institute of Archaeology, The Hebrew University of Jerusalem.