as they should have been. One explanation may be that the technique used in the roofing construction—and the masses of roof tiles recovered in A1 are clear indication that there was a roof—did not require nails. It is possible, for instance, that LH A1 used a trussed roof, one made up of a series of rigid triangular frames that had been joined together exclusively by means of mortices and other techniques. This suggestion can be argued on the basis of the lack of interior supports for A1's relatively large span, as described in the chapter on architecture (J. W. Shaw, Chap. 1). A1 stands in contrast, for instance, with Temple C, a narrower building, where the columns indicate that the post-and-lintel system was adopted, rather than the truss method that was introduced later.

9. Stone Implements

Joseph W. Shaw

In Minoan contexts at Kommos stone tools, especially cobbles, are ubiquitous, being found on house floors, outside houses, and in dumps and fills, as demonstrated by Harriet Blitzer (1995) and by others in their descriptions of the Minoan houses (M. C. Shaw and Nixon 1996; Wright and McEnroe 1996). It is not always clear, however, to what extent stone tools continued in use during the post–LM III period, from the beginning of Temple A through ER times, the period represented by the Greek Sanctuary. There, downhill from the Minoan town, it is often difficult to separate out Minoan from possible post–Bronze Age stone tools. Some of these may have been brought down along with fill by the builders and users of the sanctuary; some may simply have been carried by erosion down the slope. Unfortunately some, especially cobbles picked up locally, simply look the same no matter their date since they, generally, have not been modified by humans. We are fortunate that artifacts such as pottery are different enough to be distinguished, so that, unlike the stone tools, the Minoan sherds can usually be separated out from Greek contexts without any trouble.

One way to approach the question of the use of stone implements after the Minoan period at Kommos is to examine some of the Greek contexts within which stone tools were recovered (see Table 5.8). The interiors of buildings, which had floors of earth or slabs, are particularly pertinent for any investigation, since stone tools might have been abandoned on their floors when the buildings were deserted or rebuilding took place, as often happened in the Minoan levels. If we begin with Temple A, for instance, we can note that the only possible stone tool found in its interior was an obsidian flake (S 754; Blitzer 1995: CS 63), the only one from post–BA contexts at the site. It was probably brought into the temple fortuitously during the building's construction or use. If we next consider the period of Temple B, there is a differentially weathered pebble (S 1396; Blitzer 1995: GS 622) and a severed cobble (S 746; Blitzer 1995: GS 500) from the temple floor area. Both may have been in the earth used for the floor,

Table 5.8. Stone implements found in room interiors and dumps in the Greek Sanctuary. Some tools are catalogued here, and some in Blitzer 1995.

Findspot	Trench/Pail	Kommos Number	Blitzer 1995 Reference	Catalogue Number	Description
Time of Temple A					
Temple A, floor	33C/86	S 754	CS 63; pl. 8.100		Obsidian flake
Time of Temple B					
Temple B, floor	29A1/85	S 1396	GS 622		Differentially weathered pebble
Temple B, floor	33C/83	S 746	GS 500; pls. 8.36, 8.37		Cobble
Temple B, upper fill	33C/48	S 723			Cobble
Temple B, upper fill	33C/48	S 1502			Pebble
Temple B, upper fill	33C/66	S 747			Sphere
Temple B, upper fill	33C/66	S 748			Sphere
Temple B, built within exterior Altar U	42A, no pail	S 1064	GS 522; pl. 8.42		Perforated cobble
Temple B, dump on east	42A/15	S 890		**1**	Saddle quern
Temple B, dump on east	42A/38	S 904	CS 83; pl. 8.74		Chunk, percussion flaked
Temple B, dump on east	42A/15	S 1371			Pebble
Temple B, dump on east	42A/15	S 1435			Pebble
Temple B, dump on east	42A/15	S 1508			Cobble
Temple B, dump on east	42A/68	S 1525	GS 698		Cobble or anvil(?), ninth century
Temple B, dump on east	53A/5	S 1539			Celt
Temple B, dump on east	47A/14	S 2003			Whetstone
Temple B, dump on east	42A western scarp	S 2126		**2**	Saddle quern
Temple B, dump on south	34A2/33	S 722	GS 271		Whetstone
Temple B, dump on south	63A/47	S 1979			Ten weights

Table 5.8. *(Continued)*

Findspot	Trench/Pail	Kommos Number	Blitzer 1995 Reference	Catalogue Number	Description
Temple B, level to northeast	47A/16	S 1570			Rounded phyllite disk
Temple B, level to northeast	47A/16	S 1573			Rounded phyllite disk
Temple B, level to northeast	47A/16	S 1581	GS 598		Rounded phyllite disk
Building Q, Room 31, floor	60B/76	S 1748			Whetstone
Building Q, Room 31, floor	60B/77	S 1749			Cobble
Building Q, Room 31, floor	60B/77	S 1750			Whetstone
Building Q, Room 37, floor	64A/59	S 1740			Cobble
Building Q, Room 37, floor	64A/47	S 1792			Cobble
Building Q, Room 37, floor	64A/54	S 1793			Cobble
Building Q, Room 37, floor	64A/42	S 1794			Cobble
Building Q, Room 37, floor	64A/50	S 1795			Cobble
Building Q, Room 37, floor	64A/54	S 1796			Cobble
Building Q, Room 37, floor	64A/51	S 1797			Cobble
Building Q, Room 37, floor	64A/60	S 1799			Cobble
Building Z	36B/20	S 768	GS 574; pl. 8.45		Cobble, reused Minoan?
Building Z	65A2/22	S 1803			Schist whetstone
Building Z	82A/26	S 2181		**3**	Ten differentially weathered pebbles (weights?)
Building Z	82B/48	S 2193			Pestle
Building Z	82A/26	S 2203			Mortar
Building Z	82A/17	S 2215			Pierced weight
Hiatus Period					
Temple dump area	63A/17	S 1762			Saddle quern

Time of Temple C

Temple C, interior, on slab floor	29A1/25	S 1440		Pebble
Temple C, interior, on slab floor	29A1/32	S 1476	GS 626; pl. 8.49	Differentially weathered pebble
Temple C, interior, on slab floor	29A1/40	S 1517		Cobble
Temple C, interior, above latest earth floor	29A1/14	S 1367	GS 130; pl. 8.3	Pebble
Temple C, dump to south	34A/10	S 667	CS 49; pl. 8.74	Chert flake
Temple C, dump to south	34A/7	S 682		Whetstone
Temple C, dump to south	34A/7	S 683		Cobble
Temple C, dump to south	34A/17	S 689		Cobble
Building B, interior of western room, near floor	10A/10	S 269	GS 152; pl. 8.6	Cobble
Building B, interior of western room, in tile fall	10A/3	S 270	GS 487; pls. 8.34, 8.35	Cobble
At the base of Altar C (earlier)	10A1/32	S 1408		Cobble
Building E, interior	67A/10	S 1995		Cobble, worn

an explanation made more believable when we consider that four possible stone tools (S 723, S 1502, S 747, and S 748) were found in the fill some distance above the floors, perhaps the result of wall collapse and leveling before later Temple C was constructed.

East of Temple B, a perforated cobble (S 1064; Blitzer 1995: GS 522) was built into Archaic Altar U, and cobbles and pebbles occur sporadically within the early dumps in that area. Of some interest is that in the same dump there were a whetstone (S 2003), a celt (S 1539), and two large saddle querns (**1** and **2;** Pls. 5.43–5.46). South of Temple B there was another whetstone (S 722; Blitzer 1995: GS 271). Northeast of the temple and near one another were three rounded phyllite disks (S 1570, S 1573, and S 1581 [Blitzer 1995: GS 598]), which likely were used during the Archaic period and are similar to Minoan disks used as counters or markers (Blitzer 1995: 474–75). Eight cobbles (S 1740, S 1792–S 1797, and S 1799) were found near the floor of Room 37 in Archaic Building Q, south of Temple B. The concentration in this area suggests that some type of work, perhaps food preparation, occurred here during the seventh century B.C. A cobble (S 1749) and two whetstones (S 1748 and S 1750) were found in nearby Room 31. From Geometric Building Z's floors, south of Q, were ten differentially eroded stone weights (**3;** Pl. 5.47), perhaps for fishing,[33] and a mortar (S 2203). There were also a broken pestle (S 2193), a pierced cobble or weight (S 2215), a cobble (S 768; Blitzer 1995: GS 574), and a schist whetstone (S 1803). No stone tools were found within Building V on the northeast of Z.

East of Temple B, from the hiatus period between the abandonment of that temple and the building of Temple C, was a small saddle quern (S 1762).

From the period of Temple C, there are three possible stone tools from above the primary slab floor: a pebble (S 1440), a differentially weathered pebble (S 1476; Blitzer 1995: GS 626), and a cobble (S 1517). There is a pebble (S 1367; Blitzer 1995: GS 130) from above the latest floor. Again, these could be from wall debris. From the Temple C dump, there is a chert flake (S 667; Blitzer 1995: CS 49), obviously Minoan; a whetstone (S 682); and two cobbles (S 683 and S 689). None were found within Room A1 to the north of the temple, nor were any found in Round Building D or Building W. Within the western room of Building B two cobbles were found, one (S 270; Blitzer 1995: GS 487) in the tile fall and another (S 269; Blitzer 1995: GS 152) from not far above the floor. Both could be from collapsed wall debris. One cobble (S 1995) was found on the slab pavement of Building E's southern room, where it may have been used.

The general lack of stone tools within these Kommos buildings suggests that these tools were not in common use, especially during the period of Temple C. Cobbles might have been used occasionally, whetstones would still be needed to sharpen metal weapons and instruments, and stone querns would be used to grind grain,[34] as they are still used occasionally in Pitsidia today.

The following catalogue describes two saddle querns and a group of differentially weathered

pebbles. Table 5.8 lists the stone tools found in the room interiors and dumps in the Greek Sanctuary and includes references for those tools catalogued in Blitzer 1995.

1 (S 890). Saddle quern. Pls. 5.43, 5.45, 1.57. Length 55.0, w 26.0, th 10.0. Hard blue limestone with quartzitic veins. Broken on all sides, both saddle margins preserved. Oblong working surface, which is smooth from use, as shown by the veins of harder stone, which are slightly raised.

42A/15. Found in large pottery deposit south of Altar U (Callaghan and Johnston, Chap. 4, Section 1, Deposit 26). Eighth–seventh-century-B.C. context.

J. W. Shaw 1982a: 191, pl. 56e.

2 (S 2126). Saddle quern. Pls. 5.44, 5.46. Length 51.0, w 40.0, th 24.5. Hard blue-black stone. Probably complete. Saddle margins preserved on both sides. Surface smooth.

42A/scarp. Found in Temple B fill. Probable Geometric context.

3 (S 2181). Pl. 5.47. Ten differentially weathered objects. Max dim ca. 5.0–7.0. Soft limestone. All pierced at least once by a hole at least partially natural.

82A/26. Found as a group near the floor of Geometric Building Z. These objects are possibly fishing weights. They are similar to, but more worn than, the naturally perforated stones in Blitzer 1995: pl. 8.42 (Type 12A).

J. W. Shaw and M. C. Shaw 1993: 177, pl. 39C.

10. Bronze, Lead, and Bone Implements

Katherine A. Schwab

Many of the bronze and lead implements listed below were found as dedications in the earliest to the latest levels of Temples A–C.[35] One bronze net mender (**1;** Pls. 5.48, 5.49) was found in a Hellenistic context associated with Temple C; numerous examples have been found throughout the Aegean region, from Chios and Delos to Corinth, Olympia, and Messenia, in Archaic through Byzantine contexts.[36]

The lead implements from the sanctuary consist primarily of line weights or plummets (**20–27;** Pl. 5.50). They date, in context, from as early as the ninth century B.C. (**20;** Temple A) in the Protogeometric period to the early second century after Christ (**24;** Temple C) in the Roman period. The majority of these line weights (**21–23**) were found in levels belonging to Temple B. Other published examples have been excavated at Emporio in the seventh-century-B.C. Harbour Sanctuary, at Cape Zoster, and at Olynthus.[37]

The line weights at Kommos are pieces of folded-over lead and are generally similar in size. Originally these weights would have been used possibly for a casting net on a circular rim used for catching surface fish; the longer the lead piece, however, the less likely it would be used for this kind of net. Another use would be as a weight for a draw net that allowed for a variety of shapes. This net was used mostly for catching fish along the shore.[38] The extant line weights may have been attached to a net that has not survived and was perhaps dedicated by a fisherman to the unidentified deity worshipped in the temple. Christopher Simon (1986) has observed that, in general, fishing equipment during the Archaic period was dedicated to the following divinities: Pan, the Nymphs, and Hermes (see Rose, Chap. 6, Section 4). The

gender of the deity seems to be less important for the kind of dedication than the fact that Kommos was a harbor sanctuary where fishing equipment would have been appropriate as a votive offering.[39]

Also worthy of note is the unique find at the site of a lead bar (**27;** Pl. 5.50) from a Hellenistic context in Temple C on which the letters lambda epsilon have been lightly incised. It may have served as a weight or as an ingot.[40]

Seven bone needles (Pl. 5.51), nearly all fragmentary, were recovered from Temple C. Only one of these (**33**) belongs to the beginning of the temple during the Classical period. The remaining six examples are of Roman context (**34–39**) from the final use of Temple C. Among the small number of undetermined bone fragments, is one (**40**) that dates to as early as the late ninth–early eighth century B.C. and belongs to the Temple B foundation (Callaghan and Johnston, Chap. 4, Section 1, Deposit 14).

Bronze

1 (B 103). Rod with curved forked ends. Pls. 5.48, 5.49. Length 15.3, d. 0.3. Bronze. Intact, possibly a weaving shuttle or netting needle for making and repairing nets.

Found in Temple C in a second-century-B.C. context (34A/15). See also Bass and Van Doornick 1972: 261 (Fe 94, Fe 95), 262 n. 40; Stillwell 1948: 117, pl. 47, no. 12 (KM 69); for examples of netting needles from Naukratis, see Gardner 1888: 86, pl. XVI.17; and from Delos, cf. Deonna 1938: 202, no. 550.

J. W. Shaw 1981a: 229, n. 64, pl. 59b.

2 (B 302). Awl or needle, in three fragments. Pl. 5.49. Length 7.4, d 0.2. Bronze.

Found west of Altar H in a seventh-century-B.C. level (62D/43).

3 (B 261). Fishhook or hook pin, fragment. Pl. 5.49. Max dim. 1.6. Bronze. Fragment preserving tip. Square in section with pointed tip.

Found in a seventh-century-B.C. level south of Building V (54A2/52). Cf. Boardman 1967: 226, no. 395; 1961: 34, no. 147, pl. XIII; Branigan 1992: 364, no. 5, pl. 303 (M9).

4 (B 259). Fishhook or wire, fragment. Max dim 1.6. Bronze. Fragment preserving tip. Square in section with pointed tip.

Found in a late-eighth-century-B.C. context southwest of Building V (54A1/37).

5 (B 316). Needle, fragment. Pl. 5.49. Length 1.3, d 0.2. Bronze. Two joining fragments, circular-sectioned shaft, one end flattened and perforated.

Found on the floor of seventh-century-B.C. Building Q (64A/57). Cf. Popham 1979: pl. 250, no. 1 (S28,7); Boardman 1961: nos. 152–55.

6 (B 240). Needle, fragment. Bronze. Nearly complete, two joining pieces, missing most of eye. Cylindrical in section, tapering to point, beginning of eye at one end.

Found in a fourth-century-B.C. level just east of Temple C (47A/14 and 16).

J. W. Shaw 1984a: 282.

7 (B 91). Tweezers, fragments, preserved in three pieces. Length 5.25, w 0.4–0.8, th 0.35. Bronze. More than half preserved, broad toward end, hammered strip.

Found with Geometric pottery in Temple C, below the slab floor (29A1/49). Cf. Boardman 1967: 226, nos. 397–98; Coldstream et al. 1981: 157, no. 124.

8 (B 251). Chisel, fragment. Length 1.2, w at tip 0.45, d of shaft 0.25. Bronze. Tip with part of shaft preserved, badly corroded. Tip flattened to a wider thin edge.

Found in a ninth–eighth-century-B.C. context southeast of Temples A and B (52A/19, annex).

J. W. Shaw 1984a: 282.

9 (B 258). Chisel, fragment. Length 1.1, max w 0.5. Bronze. Fragment of tip. Bent at wide flat working edge, tapering to pointed end.

Found in a Late Geometric/Early Orientalizing dump southwest of Temple B (50A/30).

10 (B 239). Nail or rod, fragment. Length 5.4, th 0.3–0.15. Bronze. Nail or rod, shaft fragment preserved. Shaft square in section, tapering to flattened end.

Found with late-fifth- and early-fourth-century-B.C. survivals in later-first-century context northeast of Temple C (47A/9). See J. W. Shaw, Section 8.

11 (B 237). Rivet, fragment. Length 2.3; d of head 0.4, of shaft 0.2. Bronze. Half of one head missing. Capped at both ends by flat disk head; shaft circular in section.

Found in a seventh-century-B.C. (latest) context northeast of Temple B (47A/23).

12 (B 232). Rod, fragment. Pres length 3.2, th 0.45–0.2. Bronze. Fragment preserving shaft, square in section, hammered tip.

Found in a second-century-B.C. context northeast of Temple C (47A/6).

13 (B 231). Rod, complete. Length 10.0; th at circular end 0.45, at tip 0.45 and 0.2. Bronze. Bent rod, one end circular in section, the other square in section, tapering to flattened tip.

Found in a later-first-century-B.C. context northeast of Temple C (47A/9).

14 (B 247). Wire, fragments. Pres length of longest piece 7.6, w 0.6. Bronze. Flat wire, two pieces with finished end, forming a circle, one piece with iron rivet for attachment. Cf. bronze disk **18** with two iron rivets for attachments.

Found in a fourth-century-B.C. context southeast of Temple C (52A/5).

15 (B 256). Wire, fragment. Pres length 2.6, th 0.4. Bronze. Fragment, broken at both ends of curved piece, possibly part of a ring.

Found in a seventh-century-B.C. context south of Temple B (51A/20).

16 (B 255). Strip, fragment. Max pres length 10.9, max w 0.8, th 0.1. Bronze. Fragment, flat in section, broken at both ends, one end possibly broken across middle of pierced hole.

Found in a PG–Orientalizing context southeast of Temples A and B (52A/21). For discussion of technique in the manufacture of bronze or iron strips, see Hemingway forthcoming. There are additional, uncatalogued bronze strips from Kommos: B 187, B 203, B 222, B 274, B 276, B 282, B 285, B 297, B 298, B 304, B 305, and B 311.

17 (B 248). Disk, fragment, with iron rivets. Max d 2.6. Bronze. Flat disk with two round iron rivets, one in the center, one near the edge; each rivet broken off. Cf. **14** for iron rivets for attachment.

Found in a fourth-century-B.C. context southeast of Temple C (52A/5).

18 (B 4). Miniature shield, phiale, or cymbal. Pl. 5.48. D 4.1, th 0.1. Bronze. Complete, restored from five fragments, surface corrosion and perforations. Disk with small central boss, concentric raised bands flanked by grooves at outer edge, near edge, and around boss.

Found in Building B, eastern room, in a tile layer between upper and lower floors, in a third–second-century-B.C. context (10A/54). Cf. Coldstream 1973a: 143–45; Hoffman 1972: pl. 41:4 (Gortyn). See Dabney, Section 3, **14–17.**

J. W. Shaw et al. 1978: 139.

Plummets or Line Weights

19 (L 20). Plummet or line weight, intact. Pl. 5.50. Length 4.9, w 1.5, th 0.7, wt 130 g. Lead. Strip folded lengthwise.

Found in a late-ninth-century-B.C. context, associated with Temple A (63A/51). For net weights in a seventh-century harbor sanctuary context, cf. Boardman 1967: 202–4, nos. 160–61.

20 (L 8). Plummet or line weight, intact. Pl. 5.50. Length 6.0, th 0.5–1.5, wt 110 g. Lead. Strip folded lengthwise, one end cut diagonally, with two shallow cuts and one deep cut near end.

Found in an eighth-century-B.C. context, during the earliest years of Temple B (36B/21).

21 (L 7). Plummet or line weight, intact. Pl. 5.50. Length 6.4, w 1.0, th 0.65, wt 120 g. Lead. Strip folded lengthwise.

Found in a seventh-century-B.C. context, associated with Temple B, Level 3 (33C/53; Callaghan and Johnston, Chap. 4, Section 1, Deposit 18).

22 (L 6). Plummet or line weight, intact. Pl. 5.50. Length 6.6, w 1.0, th 0.65, wt 120 g. Lead. Strip folded lengthwise, fold split toward one end.

Found in Temple B, in a seventh-century-B.C. context (33C/56).

23 (L 3). Plummet or line weight, intact. Pl. 5.50. Max pres length 8.7, w 0.9, th 0.4, wt 75 g. Lead. Strip folded lengthwise.

Found in a late-first–early-second-century-B.C. Roman context, associated with Temple C (29A1/30). Possibly used as a fish line sinker (David Jordan, personal communication).

24 (L 22). Plummet or line weight, intact. Pl. 5.50. Length 5.1, w 1.2, th 0.3, wt 60 g. Lead. Strip folded lengthwise.

Found within Building F, in a fifth-century-B.C. context (72C/26).

25 (L 27). Plummet or line weight, intact. Pl. 5.50. Length 5.2, th 0.2. Lead. Strip folded lengthwise.

Found in the seventh-century-B.C. level west of Building F (81C/27a).

26 (L 28). Plummet or line weight, intact. Pl. 5.50. Length 5.2. Lead. Strip folded lengthwise.

Found in the seventh-century-B.C. level above the southern part of the Late Minoan I central court (91B/26).

Lead Bar

27 (L 18). Bar with graffito, fragmentary. Pl. 5.50. Max pres length 10.6, max pres w 1.3, th 0.6, wt 150 g. Lead. Fragment with the letters lambda epsilon incised on one side (Csapo et al. Chap. 2, **86**).

Found above Archaic Building Q in a Late Hellenistic level (60B/43). Possibly a handle fragment or an ingot. For examples of lead ingots, see Miller 1982: pl. 9.

Lead Strips and Fragments

28 (L 21). Wire fragment. Length 6.3, w 2.0. Lead. Wire broken at both ends, square-sectioned, twisted with lead strip wrapped around one end. Probably modern.

Found in a seventh-century-B.C. context south of Building Q (65A3/95).

29 (L 15). Flat fragment. Pres length 4.5, w 3.75, th 1.1, wt 70 g. Lead. Flat fragment, covered with white encrustation, original shape undetermined.

Found in a seventh-century-B.C. context southeast of Temple B (52A/15).

30 (L 16). Flat fragment. Max dim 3.3×1.7, th 0.45, wt 20 g. Lead. One fragment with smooth flat surfaces, slightly curving contour. Two broken projections at one end, with possible perforation; other end broken.

Found in a Hellenistic context, first half of the second century B.C, associated with the sounding in Room A1 (44B/1; Callaghan and Johnston, Chap. 4, Section 1, Deposit 40). A possible weight?

31 (L 17). Two flat fragments (A and B). Max dim of A 3.1×2.3, of B 2.7×1.3; th of A 0.4, of B 0.25; wt 100 g. Lead. Two flat fragments, original shape undetermined.

Found in a Hellenistic–Roman context, first century B.C.–first century after Christ (47A/3).

32 (L 4). Two folded strips (A and B). Length of A 5.3, of B 2.6; w of A 3.7, of B 2.1; th of A 0.1, of B 0.1; wt of A 65 g, of B 45 g. Lead. Two fragments of sheets, ridges caused by having been folded.

Found in Temple C, in the upper levels, in a Roman context, late first–early second century after Christ (29A1/30).

Bone Needles

33 (Bo 52). Needle fragment(?). Pl. 5.51. Pres length 3.4, d 0.2–0.5. Bone. One fragment of needle broken at both ends, circular in section.

Found in a Classical, fifth–fourth century B.C., context, contemporary with the beginning of Temple C, south of the temple (63A/5). For similar examples at Knossos cf. Sackett 1992a: pl. 315.

34 (Bo 23). Needle fragment. Pl. 5.51. Length 8.15, d 0.15, w 0.3–0.5. Bone. Two joining fragments of needle, broken at both ends; top broken where eye starts. Flat in section at top, tapering and becoming circular toward point, pitted and worn surface.

Found within Temple C, in a Roman context, first–second century after Christ (29A1/19).

J. W. Shaw 1980a: 223, pl. 60b.

35 (Bo 25). Needle fragment. Pl. 5.51. Length 6.5, d 1.4. Bone. Two joining fragments of needle preserving middle section, broken at both ends, pitted and worn surface.

Found within Temple C, in a Roman context, first–second century after Christ (29A1/30).

J. W. Shaw 1980a: 223, pl. 60b.

36 (Bo 26). Needle fragments. Pl. 5.51. Length 7.0, d 0.2–0.8. Bone. Five fragments of worn needle, one fragment preserving the eye.

Found within Temple C, in a Roman context, first–second century after Christ (29A1/32).

J. W. Shaw 1980a: 223, pl. 60b.

37 (Bo 27). Needle fragments. Pl. 5.51. Length 9.0, d 0.4–1.1. Bone. Three worn fragments of needle, preserving middle portion.

Found within Temple C, in a Roman context, first–second century after Christ (29A1/30).

J. W. Shaw 1980a: 223, pl. 60b.

38 (Bo 28). Needle fragment. Pl. 5.51. Length 5.7, d 0.3–1.0. Bone. One worn fragment of needle, preserving middle portion, oval in section where broken at top, tapering toward point, where it is circular in section.

Found within Temple C, in a Roman context, first–second century after Christ (29A1/30).

J. W. Shaw 1980a: 223, pl. 60b.

39 (Bo 22). Needle fragment. Pl. 5.51. Pres length 7.2, d 0.9, w 0.4–0.1. Bone. One worn and smooth fragment of needle, preserving middle portion, flat in section at top, tapering and becoming circular toward point.

Found within Temple C, in a Roman context, early second century after Christ (29A1/21).

J. W. Shaw 1980a: 223, pl. 60b.

Undetermined Bone Fragments

40 (Bo 34). Worked fragment. Pl. 5.51. Length 1.45, d 0.4. Bone. One fragment, broken at narrow end, chipped at wider end, possibly a needle, eye near point preserved.

Found in a late-ninth–early-eighth-century-B.C. context, associated with the Temple B foundation (33C/80; Callaghan and Johnston, Chap. 4, Section 1, Deposit 14).

41 (Bo 36). Worked fragment. Pl. 5.51. Length 2.4, d 0.5. Bone. One fragment, broken at both ends, possibly a midsection fragment from a needle.

Found in a Classical/Hellenistic context, fourth–second century B.C., associated with Temple C (42A/2).

42 (Bo 29). Worked bone shaft fragment. Pl. 5.51. Length 6.1, d 0.6. Bone. One worn fragment of thin shaft, broken at both ends, circular in section, original length undetermined.

Found within Temple C, in a Roman context, late first–early second century after Christ (29A1/26).

J. W. Shaw 1980a: 223, pl. 60b.

43 (Bo 30). Worked shaft fragment. Pl. 5.51. Length 3.0, d 0.9. Bone. One fragment of worked shaft, preserving one point, broken at other end. Worn surface, circular in section.

Found within Temple C, in Roman context, late first–early second century after Christ (29A1/26).

J. W. Shaw 1980a: 223, pl. 60b.

11. Bronze, Lead, and Faience Vessels

Katherine A. Schwab

A small number of bronze handles and vessel fragments as well as faience vessel fragments and one lead handle were found among the dedications in the Greek Sanctuary. These fragmentary vessels reflect the use of all three phases of the temple. Five handles, some in good condition, represent types suitable for different vessel shapes.[41] Two examples, circular in section and horizontally placed (**1** and **2**), may have been attached to the same vase, a fragment of which survives and was found with them (**6**). The other well-preserved handle (**4**) is a handle attachment for large bronze vessels such as cauldrons and dinoi, often found as dedications in sanctuaries. A lead circular handle (**10**) is the only other metal example found besides bronze in the sanctuary. With the exception of the fragmentary bronze vessel **6,** it is difficult to identify specific vase shapes or to associate the excavated handles with them. Four fragmentary vessels have been recovered, and they date from as early as the eighth–seventh century

B.C. (**6**) to a late Hellenistic example (**8**). The latter example is the best preserved of the bronze vessels at Kommos, providing a nearly complete profile of flaring rim and convex body.

Fragments of eight faience vessels have been identified (**11–18**), seven examples of which were found in later-ninth–seventh-century-B.C. contexts in Temples A and B.[42] The shapes, when more fragments survive, appear to be shallow bowls with relatively thick walls. The two earliest examples (**11** and **12**) were found on the later-ninth–eighth-century Floor 2 of Temple A. One vessel fragment (**13**) was found in a context associated with the foundation of Temple B (Callaghan and Johnston, Chap. 4, Section 1, Deposit 14). Examples **14–16** belong to the eighth century and are part of a Protogeometric dump. The faience fragments of example **17** date to the latest use of Temple B in the seventh century. Unlike the previous examples, which are clearly associated with the early use of the Greek Sanctuary, only one faience fragmentary bowl dates to Temple C, during the Hellenistic period (**18**).

Faience usually indicates the strong possibility of contemporary foreign trade, for the main production centers of this material in the Geometric period were Egypt and the Near East. In the Archaic period another center developed in Rhodes.[43] At Kommos the majority of faience bowl fragments were found along with fragments of Phoenician pottery, further emphasizing that during the period of use of Temple B, foreign trade and contact were strongly represented at the harbor sanctuary of Kommos (Shaw 1981a: 241, n. 96).

Bronze Handles

1 (B 312). Handle. Pls. 5.52, 5.54. Max pres length 8.3, th of handle 0.6. Bronze. Intact handle, circular in section, riveted through round flattened ends to body of bowl or cauldron, fragments of which remain attached. May belong to same vessel as **2** and vessel fragment **6.**

Found within Temple B in a PG–LPG context (63A/66), eighth–seventh century B.C.

J. W. Shaw 1986: 224, pl. 47d.

2 (B 252). Handle. Pls. 5.52, 5.54. Max pres length 8.9, th of handle 0.7. Bronze. Intact handle, circular in section, placed at a 45° angle and riveted to body of bronze vessel, small pieces of which remain attached to flattened ends of handle. One joining fragment possibly preserving smooth edge of rim, with handle rising above rim level. Possibly from same vessel as handle **1** and vessel fragment **6.**

Found in a Geometric–Orientalizing dump south of Temple B (52A/17). For parallels on skyphoi from Perachora, see Payne 1940: pl. 59, no. 5.

J. W. Shaw 1984a: 281; 1986: 224, n. 13.

3 (B 323). Handle attachment fragment. Pl. 5.52. Length 3.4, d 1.9, w 0.1. Bronze. Fragment preserving flat area where handle was riveted to body of vessel; part of handle loop preserved, point of contact at each corner.

Found within Temple B in a seventh-century-B.C. context (68A/18).

4 (B 102). Handle attachment. Pls. 5.52, 5.55. H 1.8, length 9.0, w 2.3–3.3. Bronze. Intact handle attachment with small damage to palmette end, small pieces of wood adhering to inside central band. Attached with two nails, belonging to either a cauldron or dinos. Wood fragments remaining from the core for the hollow handle attachment. Handle missing.

Found in a Hellenistic context, second century B.C., associated with Temple C (34A/15). The best parallel for its use on a cauldron from the Sala Consilina (Paris, Petit Palais, cf. Photo Archive, Department of Greek and Roman Art, Metropolitan Museum of Art, New York). Dinoi with the same handle attachments were found at Pera-

chora (Payne 1940: 162, pl. 67, no. 15.), the Argive Heraeum (Waldstein 1905: 292, pl. cxxii, no. 2177, which preserves the handle for such an attachment), and at Olympia (Adolf Furtwängler 1890: pl. 50, no. 827). According to Paul Jacobsthal, these bronze handle attachments form a class that belong to the first Orientalizing style (1956: 46, fig. 204).

5 (B 287). Handle fragment. Pl. 5.52. Length 5.4, d 0.7. Bronze. Curving handle fragment, circular in section, broken at one end, flattened at other end, for vertical placement.

Found in a Hellenistic context, associated with Temple C (57A2/62).

Bronze Vessels

6 (B 313). Vessel fragment. Length 6.5, d 5.2, th 0.2. Bronze. One flat fragment of hammered sheet for vessel with straight sides. Possibly associated with handles **1** (from the same pail) and **2.**

Found in a PG–LPG context, eighth–seventh century B.C., south of Temple B (63A/66).

7 (B 88). Vessel fragment. Max dim 3.3, th 0.1. Bronze. Ten nonjoining vessel fragments, possibly from rim. Convex profile, from hammered sheet.

Found in a Late Classical context, first half of the fourth century B.C., associated with Temple C (29A1/16).

8 (B 96). Cup or bowl fragments. Pls. 5.52, 5.55. Max dim 9.0, est d of rim 12.0. Bronze. Numerous fragments, mostly small body fragments with two large body fragments and one rim fragment showing flaring rim with convex body profile. Might be compared with the mastoid shape.

Found in a Late Hellenistic context, into the first century B.C., associated with Temple C (34A/7).

9 (B 235). Rim fragment. Pl. 5.52. Max h 3.0, w 3.2, d of rim 14.0, th 0.3. Bronze. Fragment from two joining pieces, flattened, one edge preserved; the straight rim of a vessel with a straight profile.

Found during water-sieving on Central Hillside, Iron Age context (48A/stray find). For possible parallel, see an undecorated hemispherical bronze bowl, sub-PG III, from Lefkandi (Popham et al. 1980: 189, Tomb 33, no. 16, pls. 227, 243).

Lead Handle

10 (L 2). Circular handle. Pl. 5.56. Length 7.5, w 7.1, th 0.4, wt 110 g. Lead. Complete circular handle, slight ridges near edges on one side. Tabular extension with two rivet holes.

Found in robbers' trench between Room A1 and Temple C, Hellenistic–Roman context (23A/2). For a parallel from Cape Zoster, see Stavropoullos 1938: 21, fig. 215.

Faience Bowls

11 (F 17). Shallow bowl fragments. Pl. 5.53. Pres length 3.0, w 2.7, th 0.9. Two nonjoining rim fragments to shallow bowl, pitted surface, preserving majority of profile.

Found in a later-ninth-century-B.C. context, associated with Temple A, Floor 2, Stage 3 (34A2/37; Callaghan and Johnston, Chap. 4, Section 1, Deposit 6).

J. W. Shaw 1981a: 241, n. 96.

12 (F 14, F 20, F 34, F 35, and F 37). Bowl fragments. Pls. 5.52, 5.56. Max dim 3.1 × 3.3, d of rim 15.0, th 0.3–0.5. Egyptian blue faience. Bowl fragments, mostly nonjoining, preserving straight rim and shallow convex profile of body.

Found in a ninth–eighth-century-B.C. context, associated with Temple A, Floor 2 (37A/15 and 38, 51A/14 and 27, and 63A/23 and 26).

J. W. Shaw 1981a: 241, n. 96.

13 (F 26). Bowl base fragment. Pls. 5.52, 5.56. Pres h 1.6, d of base 3.7, th 1.8. Faience. Base fragment, worn and pitted surface, preserving base with short solid pedestal.

Found in a late-ninth–early-eighth-century-B.C. context, associated with the Temple B foundation (33C/80; Callaghan and Johnston, Chap. 4, Section 1, Deposit 14).

14 (F 33). Bowl fragment. Pl. 5.53. Max dim 3.2, th 0.8. Faience, with traces of green-blue glaze preserved. One body fragment of bowl, convex profile.

Found in a later-eighth-century-B.C. context, associated with the PG dump northeast of Temple A (47A/61; Callaghan and Johnston, Chap. 4, Section 1, Deposit 8).

15 (F 36). Bowl fragments. Pl. 5.53. Max dim 2.5 × 1.8. Whitish faience. Two nonjoining fragments,

probably from a vessel; one surface with round bumps possibly from a mold; slightly convex profile.

Found in a later-eighth-century-B.C. context, associated with the PG dump northeast of Temple A (47A/36–41, 45, 48, 56, 58, and 61; Callaghan and Johnston, Chap. 4, Section 1, Deposit 8).

16 (F 22). Two bowl fragments. Pl. 5.53. Max dim 2.9. White faience. Two fragments from wall of bowl, with burnt bands on exterior of eroded surface; convex profile.

Found in an eighth-century-B.C. context, associated with Temple A (34A2/53).

17 (F 23). Bowl fragments. Pl. 5.53. H 1.6, d of base 3.7, th 1.8. Faience. Worn bowl fragments, over 25 nonjoining, slightly convex wall fragments; traces of burning on interior of wall fragments.

Found within the cella of Temple B, in a seventh-century-B.C. context (33C/79).

J. W. Shaw 1981a: 233, n. 96.

18 (F 27). Bowl fragments. Max dim 1.2×1.0. White faience. Three small badly eroded fragments, probably from a vessel.

Found in a Hellenistic context, first century B.C., associated with Temple C (34A3/68).

12. Worked Astragali

David S. Reese

Mammal astragali (knucklebones or tali) are common at many Mediterranean and Near Eastern archaeological sites. They may simply be food debris, but they have often been used by humans, frequently as gaming pieces. They are particularly common in graves and at sanctuary sites. In the latter case they may have been used for divination (astragalomancy) in which the fall of the bones is thought to indicate divine will.

Much of the evidence for astragali utilization has been brought together by P. Amandry (1984), when discussing the remains from the Corycien Cave near Delphi, by W. Deonna (1938: 332–34), when discussing the material from Delos, and by G. H. Gilmour (1997). I have previously summarized the evidence from prehistoric and historic Cypriot sites (Reese 1985b; 1992c), including material from other sanctuaries and graves. Here I survey the Cretan evidence and review the examples found in Aegean sanctuaries.

Neolithic Phaistos produced *Ovis/Capra* (sheep/goat) and *Bos* (cattle) astragali, with 11 apparently found together (Mosso 1908: 148–49; 1910: 67, fig. 30). Early Neolithic IB Knossos produced 16 *Bos* astragali found together (J. D. Evans 1964: 236, pl. 59:2). An astragalus from Minoan Katsamba near Knossos is ground down on all but the plantar side and has four lateromedial holes and two dorsoplantar holes (on display in the Herakleion Museum, Room VI, case 81; for astragali terminology, see Pl. 5.57).

Kommos (Table 5.9) produced 2 *Ovis/Capra* astragali (1 holed) from the lower floor of Building Q, Room 30 (Bo 49) and a collection of 10 (5 holed) from below that floor (Bo 48; Pl. 5.58), all of the late seventh century B.C. (J. W. Shaw 1984a: 281). There is also a holed fourth-century example from southeast of the temples (Bo 53).

Kommos is not the only Cretan sanctuary with worked astragali. A *Sus* (pig) astragalus holed dorsoplantarly off-center is known from the 1960 excavation of the Sanctuary at Demeter

Table 5.9. Worked *Ovis/Capra* astragali from Iron Age Kommos.

Period and Location	Trench/ Pail	Excavation Number	Number of Astragali	Side	Length (mm)	Width (mm)	Comments
Temple B, Phases 2 and 3							
Building Q, Room 30, lower floor	52B/67	Bo 49	2				
		A		Left	28.0	18.5	Unmodified
		B		Left	22.0	17.0	Man-made hole at proximal center, d 3 mm
Building Q, Room 30, below floor	52B/69	Bo 48	10				(Pl. 5.58)
		A		Right	30.0	20.5	Unmodified
		B		Right	27.0	18.0	Unmodified
		C		Right	27.0	17.75	Unmodified
		D		Right	29.0	16.0	Hole at proximal right, d 3 mm; carefully ground down on medial and lateral sides
		E		Right	28.0	18.0	Hole at proximal center, d 3 mm
		F		Right	27.0	17.75	Hole at proximal right, d ca. 3 mm, worn
		G		Left	31.5	20.5	Various cut marks
		H		Left	31.25	19.25	Hole at proximal right, d 4 mm, ground down on medial and lateral sides, now worn
		I		Left	25.0	16.75	Broken at one end, hole in proximal center, various cut marks
		J		Left	23.5+	16.75	Butchered through one end
Period of Temple C							
Southeast of temple	63A/8	Bo 53	1	—	31.5	21.0	Holed dorsoplantarly, hole d 5 mm

at Knossos (FF <13A>, KN 20790; personal analysis). They are also known from the Sanctuary of Asklepios at Lissos on the south coast, east of Chora Sfakion (Platon 1958: 466). And there are several astragali from the Idean Cave, including 1 with a covering of silver (Sakellarakis 1988: 188–89, figs. 25–28).

The Aphrodite Ourania altar in Athens produced 15 *Ovis/Capra* astragali with 7 burnt, 6 probably burnt, 2 unburnt, and 9 with butchery marks. Of these, 4 unbutchered astragali were modified, with 1 holed through the dorsoplantar side (Foster 1984: 78–79, pl. 20a), 1 ground down on the lateral and medial sides and with an E engraved on the lateral side (Foster 1984: pl. 20f, BI 963), 1 ground down on the lateral, medial, and dorsal sides, and 1 ground down on the dorsal side (Reese 1989a: 64). Groups of astragali were found at the Sanctuary of Eros and Aphrodite on the north slope of the Athenian Acropolis (Broneer 1933: 335), and there is an inscription noting that deer/gazelle astragali were dedicated to Asklepios in Athens (Rouse 1902: 397, *CIA* II (766); *IG* II 2: 1533, 1.23–24).

The temenos of the Sanctuary of Hera Limenia at Perachora produced a bronze astragalus (H. Payne 1940: 182, pl. 80:2). There were also 2 bone astragali, probably *Ovis/Capra,* with 1 holed through the dorsoplantar side (T. J. Dunbabin 1962: 447, pl. 189, A 376, A 378).

There are over 120 astragali from the Sanctuary of Demeter and Kore on Acrocorinth, with 114 *Ovis/Capra,* 4 *Bos,* and 3 *Sus*. Large concentrations include 25, 21, 7 (two samples), and 5 bones. A total of 16 are ground down on one or more sides, 12 have one or more holes, 3 are burnt, and 3 are butchered. They range in date from the sixth century B.C. to the fourth century after Christ. A *Bos* astragalus is ground down on the dorsal and plantar sides and the openings in the bone filled with lead. There are also astragali skeuomorphs: 2 terra-cotta (1 holed) and 3 bronze examples. A ground-down *Ovis/Capra* astragalus is also known from the Temple of Apollo at Corinth (Reese in press b).

At Isthmia the 1954 excavation in the Archaic Temple of Poseidon produced an *Ovis/Capra* astragalus holed dorsoplantarly and burnt gray-white (Gebhard 1999: IM 589; personal analysis). The 1958 excavation of the fifth-century-B.C. East Terraces 5A+6 produced 2 *Ovis/Capra* astragali with 1 holed in the center of the dorsal side and off-center on the plantar side (Bone lot 105, personal analysis).

The Sanctuary of Apollo Maleatas at Epidauros produced an astragalus with a ground-down plantar side and an engraved A (Lambrinoudakis 1978: 209, pl. 148b). A bronze astragalus was found outside of the temple area at Halae (Goldman 1940: 418, 502, fig. 61:10). The Sanctuary of Apollo at Halieis produced 78 astragali (74 *Ovis/Capra* and 4 *Bos*) with many ground down and/or holed. Some have lead plugs, while others are burnt. The cella was the location of 86%, with most dated to the sixth–fifth century B.C. (personal analysis).

The Kabeirion at Thebes produced 1,047 astragali, 27% of all *Ovis/Capra, Bos,* and deer bones found, with 993 *Ovis/Capra,* 12 *Bos,* 20 *Capreolus* (roe deer), 11 *Cervus* (red deer), and 11 *Dama* (fallow deer). There are 118 Classical (11.3%), 301 Hellenistic (28.7%), and 474 Roman (45.3%). Many are ground down and holed in various ways (Boessneck 1973: 8–10, pls. I–II). There are also astragali of stone (25, with 2 marble [1 holed]), glass (4), amber (2), and bronze (1), and 3 *Ovis* astragali filled with lead (Braun and Haevernick 1980: 113–14, pl. 34:27–31).

The sixth–third-century-B.C. Corycien Cave produced 23,000 astragali, with about 4,000 modified. Most are *Ovis/Capra,* but *Bos* and deer are also present. The bones are holed, ground

down, incised, butchered, and lead filled, and there are skeuomorphs in bronze, stone, and glass (Amandry 1984; Poplin 1984).

An "immense number" of sheep astragali are reported from the Sanctuary of Artemis Orthia at Sparta (Dawkins 1929: 237, pl. CLXII:11) with most of the seventh and sixth centuries B.C. The Temple of Pamisos at Ayios Florios in Messenia produced a bronze astragalus (Valmin 1938: 448, pl. XXXV:1) and 18 bone astragali, with 2 burnt, most of which were found in groups of two or three (Valmin 1938: 463, pl. XXXVIB). The Altar Court at Samothrace produced a sixth-century collection of 8 *Ovis/Capra* astragali, said to be "foundation offerings" (Lehman and Spittle 1964: 112–13, fig. 110).

Many astragali were found in the early excavations at the Archaic Artemision at Ephesos, 1 with a gold stud through the center of the plantar side (Hogarth 1908: 192, pl. XXXVI:42), 1 with a dorsoplantar hole and ground down at least on the dorsal side (Hogarth 1908: no. 43), 1 ground down at least on the plantar side (Hogarth 1908: no. 44), and 1 with two dorsoplantar holes (Hogarth 1908: no. 41). There are 2 astragali of blue glass (Hogarth 1908: 209, pl. XIV:31–32). Later excavations of Archaic and Classical levels produced 53 astragali, with 46 *Ovis/Capra*, 6 *Bos,* and 1 imported *Gazella subgutturosa* (gazelle; Wolff 1978: 114–15). Of these, 3 astragali are holed through the dorsoplantar, and some are ground down on the dorsal and plantar sides. Forstenpointer et al. (1999) report many finds here.

The Temple of Apollo at Didyma produced an incised *Dama* astragalus (Boessneck and von den Driesch 1983: 646). The Sanctuary of Santa Venera at Paestum produced 6 sixth-century-B.C. *Ovis/Capra* astragali ground down on various sides; 3 are from Room C, and 2 from Room D (Hoffman and Morden 1993: 291–92, pl. 68f). A sanctuary at Morgantina in central Sicily produced a deer astragalus holed dorsoplantarly (personal analysis).

13. Ostrich Eggshell

David S. Reese

In 1985 a deposit southeast of the temples with ceramics of the seventh to fourth century B.C. (63A/11) produced fragments of one ostrich eggshell (Sh 8; *Struthio camelus* Linnaeus, 1758; *S. c. camelus* in Africa and the extinct Levantine *S. c. syriacus*). There are five fragments, with two joining. Three have fugitive red paint, one band on the two joining fragments and one with a zigzag line (J. W. Shaw 1986: 225).

I have elsewhere (Reese 1985c: 371–82; 1990) discussed ostrich eggshells from Bronze Age and later Mediterranean and Near Eastern sites. A number of Minoan ostrich eggshells are known from Crete, with examples coming from Knossos, Zakro, and Palaikastro. The Kommos example is not the first post–BA find from the island, but it is the only painted Cretan example.

Ostrich eggshells are found in several Iron Age graves. The Protogeometric to Early Orientalizing chamber of tholos Tomb 2 at Khaniale Tekke near Knossos produced "fragments of

ostrich egg, perhaps from a rhyton" (Boardman 1954: 216; 1967a: 70, 57). One grave in the Jalisso necropolis on Rhodes produced an ostrich eggshell (Jacopi 1929: fig. 253).

Here I note comparanda from post–BA circum-Mediterranean sanctuary sites. They were all probably used as ritual vessels. Four eggshell fragments from one or more eggs were found in nearby votive fills at Temple Hill, Corinth, with one stratified fragment of the late seventh/early sixth century B.C. (R. Robinson, personal communication, 1 October 1984; Corinth Museum MF 72-136, 72-174–76). The Argive Heraeum produced a "bit of shell of bird's egg—probably ostrich" (Waldstein 1905: 353). The fifth-century Treasury of the Apollo sanctuary at Halieis in the Argolid produced fragments of ostrich eggshell (Jameson 1974: 117; personal analysis). Delphi and the Artemision on Thasos also have fragments (Poplin 1995: 130–31, fig. 3).

The Artemision at Ephesos produced single eggshell fragments from the 1986 and 1987 seasons (Forstenpointner 1993: 11). The Athena Temple cella and Terrace of ca. 690 B.C. at Emporio on Chios produced eggshell fragments, with 1 having a painted broad band in black paint. Other fragments are known from the Harbour Sanctuary of ca. 600 B.C. (Boardman 1967b: 243, pl. 97: 604). Eggshell fragments are known from the Heraion on Samos (Boessneck and von den Driesch 1983a: 21). The Athena Lindia sanctuary at Lindos on Rhodes produced 69 fragments from a large votive deposit and 20 fragments from an Archaic deposit (Blinkenberg 1931: 175, 182).

At the Kition sanctuary in southern Cyprus there are 4 fragments from Temenos A of the PG to Cypro-Geometric I date (ca. 1150–1000 B.C.). The Cypro-Geometric I (ca. 1075/50–1000 B.C.) Bothros 2 in Room 16 produced fragments of one eggshell (Reese 1985c: 371, pls. CLXIII: 3226, CLXXIV:1788). The Sanctuary of Apollo Hylates at Kourion in southern Cyprus produced fragments of eggshells, including 1 carved fragment (Reese 1990: 146).

The Philistine sanctuary at Tell Qasile on the Israeli coast produced fragmentary eggshells from at least two shells (Mazar 1980; personal analysis). Fragments of an eggshell were found in the votive *favissae* in the courtyard of the Hellenistic temple at Beersheba in Israel (Aharoni 1975: 165). Two fragmentary eggshells were also found among contemporary cult objects at the site (Aharoni 1973: 16, pl. 25:1–2).

The second Greek Temple of Apollo at Naukratis (sixth century B.C.) in the Egyptian Delta produced an eggshell fragment with a design etched in the shell interior and with the upper part stained red (Petrie 1886: 14, pl. XX:15). In Libya, deposits at the Temple of Apollo at Cyrene produced ostrich eggshells (Pernier 1935: 97), and the Sanctuary of Demeter and Persephone there produced 31 eggshell fragments, all Archaic in date (Warden 1990: 60). The Demeter sanctuary at Tocra produced fragments, some probably used as cups, of Roman date. Some fragments have striations along the line of the chipped edge (Boardman and Hayes 1973: 122, pl. 53).

The Sanctuary of Santa Venera at Paestum in southern Italy produced a fragment of the second century B.C. (Hoffman and Morden 1993: 292; personal analysis). The eighth–seventh century Sanctuary of Athena at Syracuse in eastern Sicily produced eggshells (Blinkenberg 1931: 183).

The Kommos ostrich eggshell could have come from Libya (300 km away), Egypt, or the Levantine coast. The red paint on these fragments is unique, the only other painted example being the black-painted fragment from Chios.

14. Fossils

David S. Reese

There are 170 marine invertebrate remains from 48 deposits at Kommos: 150 oysters (*Gryphaea, Crassostrea,* and *Ostrea*; see Pl. 5.59) from 46 deposits, 11 scallop fragments (*Pecten* and *Chlamys*) from 7 deposits, 5 gastropods from 3 deposits, 2 echinoids (sea urchins) from 2 deposits, and 2 other bivalves from 2 deposits (Table 5.10). Of the 120 oysters, there are 15 from the period of Temple B, Phases 1–3; 14 from the period of Temple B, Phases 2 and 3; 40 from Temple C, and 52 from the period of Temple C (with 28 from the dump to the south). An unburnt echinoid fragment comes from Altar U, from the period of Temple B, Phases 2 and 3, and another fragment (80 × 63.5 mm; restored 90 × 90 mm) comes from the robbers' trench from the period of Temple C (29A/9; S 343). All gastropods come from Temple B, Phase 3, or Temple C, with 4 very small and probably chance specimens. The last is a *Strombus* (true conch or stromb) internal cast from the fill above the walls of Building D.

Minoan Kommos produced 470 marine invertebrate fossils: 423 oysters, 32 scallops, 9 bivalve internal molds, 3 coral, 2 gastropods, and 1 echinoid (Reese 1995c: 87–88). The Minoan report describes the local outcrops of these fossils and notes fossils from Aegean and Cypriot Neolithic and Bronze Age sites. Here I limit the comparanda to fossils from circum-Mediterranean votive deposits, generally sanctuaries and graves.

The Minoan Juktas peak sanctuary inland from Knossos produced 8 bivalve internal molds, 2 oysters, 2 scallops, 1 gastropod, and 1 echinoid. The Idean Cave yielded 1 scallop fragment. The Malia palace produced a *Glossus humanus* (L.) (=*Isocardia cor* [L.]), a heart cockle, suggested to be an amulet (van Effenterre and Tzedakis 1977: 180:3, pl. 74d). Fossil deer antlers are reported from a Minoan shrine at Knossos (Bate 1918: 221). The Iron Age Tomb 285 in the North Cemetery at Knossos produced a pendant made from a fossil bivalve (Evely 1996: 636, pl. 311:285.f18).

There are a burnt and an unburnt fossil oyster fragment from the fifth-century-B.C. Aphrodite altar at Athens (Reese 1989a: 64, 68). A Hellenistic grave at Patras in western Greece produced a bivalve (Papapostolou 1972: 326–27, pl. 113, bottom). There is a fossil elephant molar from the Asklepeion on Cos (Brown 1926). An Early Archaic deposit in the southeastern area of the Heraion on Samos produced the distal end of a fossil hippopotamus femur (Kyrieleis 1988: 230, fig. 9).

At the Sanctuary of Demeter and Persephone at Cyrene in Libya there are 3 holed fossil bivalves (Warden 1990: 26–27, pls. 20:138, 140). The Temple of Isis at Sabratha in Libya produced fossil shells and bones as votive offerings (Pesce 1953: 60).

Table 5.10. Fossils from Iron Age Kommos.

Period and Location	Trench/Pail	Number	Type	Comments
Temple A				
Floors 1 and 2		4	Oysters	
		1	Scallop	Small
Period of Temple A–Temple B, Phase 1				
Deposit in south		1	Oyster	
Temple B, Phase 1				
Dump to south		1	Oyster	
Temple B, Phases 1 and 2				
Floor 2	33C/59	1	Oyster	
Double hearth in court		1	Oyster fragment	
Period of Temple B, Phase 2				
South sounding		2	Oysters	
Period of Temple B, Phases 1–3				
Dump to south		5	Oyster fragments	
Levels to northeast		1	Oyster	
Levels to west #1		1	Oyster	
Levels to southwest		8	Oysters	7 fragmentary
		1	Bivalve internal cast	Waterworn
Temple B, Phases 2 and 3				
Ritual deposit around Tripillar Shrine	29A1/74	6	Oysters	1 very large: S 657 from 29A1/74, 165+ mm long, 70 mm wide; J. W. Shaw 1980a: 231 (Pl. 5.59)
Altar U, contents		1	Echinoid fragment	80 × 63.5 mm
Building Q, Room 30, lower floor		1	Oyster	
Building Q, Room 31, dump on upper floor		2	Oyster fragments	
Building Q, Room 37, upper floor		1	Oyster	
Period of Temple B, Phases 2 and 3				
Marine meal #2		2	Oysters	
Marine meal #3		2	Oysters	
		1	Scallop	
Marine meal #8		1	Oyster fragment	

Table 5.10. (*Continued*)

Period and Location	Trench/Pail	Number	Type	Comments
Marine meal #13		1	Oyster	
East of later altars		3	Oysters	
South of temple		3	Oysters	
		1	Cockle	
Southeast of temple		2	Oysters	1 small
Temple B, Phase 3				
General upper interior pails	33C/48	1	Oyster	
	33C/48	1	Scallop	
		3	Small gastropods	Water-sieved
Period of Temple B, Phase 3				
Archaic court levels east of the later altars		1	Oyster fragment	
Period of Temple B, Phase 2–Temple C				
Sounding on the east		3	Oysters	1 large and unworn
Period of Temple B, Phase 3–Temple C				
Altar H, just east of		4	Oysters	
Temple C				
Temple C, above and on slab floor		9	Oysters	1 large, 3 worn
		3	Scallop fragments	
Building F, floor		2	Oysters	
Building D, below floor		1	Oyster fragment	Waterworn
		1	Scallop fragment	
Building D, fill above walls		3	Oysters	
	14A/4	1	*Strombus* internal cast	
Building D, above floor		7	Oyster fragments	
Room A1, central hearth		5	Oyster fragments	
		3	Scallop fragments	

Table 5.10. (*Continued*)

Period and Location	Trench/Pail	Number	Type	Comments
		1	Small gastropod	
Building B, western room, level of roof tile collapse		8	Oyster fragments	
		1	Scallop fragment	
Building B, eastern room, on lower floor		2	Oysters	
Building B, eastern room, lower floor		2	Oysters	
Building E, north room		1	Oyster fragment	
Period of Temple C				
Altar C, inside and on		1	Oyster	
Altar C, east of		1	Oyster	
Dump to south		28	Oysters	1 waterworn
General pails above founding level outside entrance to Temple C		5	Oysters	1 worn and pitted
Upper levels next to Building D		2	Oysters	
Levels to southwest	34A/22	4	Oysters	1 burnt and large
South of temple		5	Oysters	
Southeast of temple		5	Oysters	3 complete and 2 fragments
East of altars		1	Oyster	
Above founding level outside on northeast		1	Oyster	
To southeast		1	Oyster	
Robbers' trench	29A/9	1	Echinoid fragment	S 343 from 29A/9

Greeks of the third century B.C., according to the poet writing as Orpheus, considered fossil ammonites (extinct coiled cephalopods) to be oracles. Before consulting the oracle

> the seer kept a fast, bathed it in running water, wrapped it like an infant, set it in a shrine, inspired it with life by chanting spells. (King 1860)

These fossils were alleged to provide protection from snakes and to be a cure for blindness, impotence, and barrenness (Oakley 1965a: 13).

Gastropods are known from the Neolithic temples of Malta (Oakley 1965b: 118) and at least

2 echinoids were found in the 2800–1900 B.C. Tarxien temple on that island (Zammit 1930: 29). On Cyprus the Late Cypriot IA2–B2 (ca. 1600–1475 B.C.) Tomb 20 at Ayia Irini–*Paleokastro* in the northwest produced beads of fossil *Dentalium rectum* (Durante 1977: 289–90, fig. 308).

The temple at Tamassos produced 1 *Ostrea,* 2 *Gryphaea* cf. *vesicularis* (all oysters), 1 *Cerastoderma/Cardium* cf. *echinatum,* and 1 *Strombus bubonius*. The *Ostrea* and 1 *Gryphaea* come from inside the temple in the southwestern section of "TA III" (Nobis 1976–77: 296). The Cypro-Archaic II sanctuary at Meniko-*Litharkes* produced a 150-mm *Ostrea* (Demetropoulos 1977: 81, pl. XXVIII:2). The Floor 3 (ca. 800–600 B.C.) Bothros 16 at Kition produced a fossil *Venus* shell.

The Sanctuary of Apollo Hylates at Kourion produced 3 *Ostrea,* 1 *Cerastoderma/Cardium,* and 1 *Glycymeris*. One oyster dates to the early first century after Christ, and the cockle and dog-cockle come from a deposit dated to A.D. 370 (Reese 1987c).

The Hathor temple at Timna in southern Israel produced numerous gastropods, bivalves, and echinoids (D. Price 1988: 266–67, pl. 154:2, 4–10; Rothenberg 1972: pl. 108, top left). The Egyptian Tomb 361 at Tell el-Ajjūl (Gaza) produced a holed echinoid (Petrie 1933: 6, pl. XVII, right center). The 800–720-B.C. Grave C IX 148 at Hama on the Orontes in Syria produced a fossil snail (Riis 1948: 149). Molluscs and echinoids are known from a seventh-century sanctuary at Buseirah in Jordan.

It seems likely that many of the Kommos fossils were placed in the sanctuary as offerings, like those from contemporary sanctuaries and tombs elsewhere in Greece, Cyprus, and the Levant. It is also possible that some of the fossils, like the 4 small gastropods, have simply eroded from building stone or are in the archaeological deposits by chance.

Appendix 5.1

A Human Skull from Kommos, Crete

Paul J. Anderson, M.D.

During the excavation of the northern facade of Building T in August 1982, a portion of a human cranium (Bo 45) was uncovered in a layer of nearly pure sand (47A/54; Pl. 5.60; Table 5.11), with a scattering of Late Minoan III sherds and a terra-cotta bull's leg (M. C. Shaw, Chap. 3, **AB40;** J. W. Shaw 1984a: 257, pl. 53.b; see Addendum following).

The skull was studied and X-rayed during July 1985. It lacked the mandible, the maxilla, most of the zygoma and facial bones, and the inferior portions of the occipital bones. A fossilized crust of hard, grayish brown granular material obscured the details of the basilar portions. Medial, ventral, and lateral portions of the orbits were absent. Suture lines between the frontal, parietal, temporal, and occipital bones were clearly defined. An elliptically shaped Wormian ossicle was present in the midportion of the right lambdoidal suture. This measured 21.0×5.0 mm. The frontotemporal articulation presented a conventional H-shaped pterion.

The frontal bone was intact from the glabella to the bregma (Pl. 5.61). The supraorbital

ridges were prominent, and there were well-defined supraorbital notches. No portion of the maxilla or mandible was present, and only the posterior bases of the zygomata were represented. The posterior roots of the zygomatic processes extended as prominent ridges beyond the level of the external auditory meati. The right mastoid, with its prominent mastoid process, was well preserved. The body and portions of the greater and lesser wings of the sphenoid and the medial and lateral pterygoid plates were present. The sphenosquamosal sutures were clearly defined. Two foramina opened to the surface of the sphenoid bone medial to the sphenosquamosal suture. These corresponded to the foramen ovale and foramen spinosum.

There were two irregular fenestrations in the left cranium: one, approximately rectangular (30.9×30.4 mm), was present in the left parietal bone midway between the frontal and squamous sutures; the second, elliptical fenestration (35.3×18.1 mm) was situated in the squamous portion of the left temporal bone immediately below the left squamous suture (Pl. 5.62).

"Fracture" lines extended from the margins of these defects. There were two such lines associated with the parietal defect. One extended from the posterior margin for a distance of 80.0 mm, crossing the lambdoid suture to involve the left occipital bone. The second extended from the inferior margin for a distance of 44.0 mm to join the superior margin of the defect in the left temporal bone. Two other "fracture" lines were associated with the temporal defect. One extended from the anterior margin for a distance of 37.0 mm. It terminated in the coronal suture. The second extended from the inferior margin for a distance of 32.0 mm, terminating in the superior wall of the left auditory meatus. A number of smaller "fracture" lines radiated from the margins of both defects.

A faint, "hairline" linear defect was present on the outer convex surface of the right parietal bone. It was located about midway between the coronal and lambdoid sutures and extended anteroposteriorly for 68.0 mm.

Four disarticulated bones (Pl. 5.63) were recovered immediately beneath the skull at the time it was excavated. The first and largest was rectangular ($35.2 \times 30.0 \times 15.6$ mm) and contained two smooth, prominent concavities. The second was triangular ($29.9 \times 26.0 \times 9.5$ mm). The third was triangular ($39.6 \times 24.3 \times 10.8$ mm). One surface was smooth, whereas the opposite was highly porous. The fourth was rectangular ($15.2 \times 12.0 \times 5.0$ mm), and one of its surfaces contained a prominent ridge. The anatomic relation of these fragments could not be positively determined, but they were compatible with remnants of the sphenoid, ethmoid, or palatine bones. The surfaces of the largest resembled those of the mandibular region.

Table 5.11 records the direct measurements performed on this skull. Each entry is the average of three measurements. Because the opisthion and basion were absent, the basi-bregmatic height, occipital arc, and basi-nasal length could only be approximated. Measurements involving the maxillary, mandibular, nasal, orbital, palatal, and zygomatic areas could not be performed.

The skull and the four bone fragments were X-rayed at the Venezeliou Hospital in Herakleion

Table 5.11. Metric traits of skull Bo 45.

Trait	Measurement (mm)	
Direct Measurements		
Maximum length (L)	190.8	
Maximum breadth (B)	132.6	
Frontal arc (S_1)	140.0	
Parietal arc (S_2)	143.0	
Maximum horizontal perimeter (U)	542.7	
Frontal chord (S'_1)	119.5	
Parietal chord (S'_2)	120.0	
Estimated Measurements		
Basi-bregmatic height (H')	118.0	(basion est)
Basi-nasal length (LB)	104.8	(basion est)
Occipital arc (S_3)	115.0	(opisthion est)
Other Measurements		
Right mastoid process diameter	21.5	
Cranial index (CI; $B/L \times 100$)	69.5	
Endocranial capacity (C; broca: $L \times B \times H' \div 2.24$)	13,304.0*	

*mm^3

by Dr. John Tsouderos. Right (Pl. 5.64) and left lateral and dorsomedial projections were X-rayed at 40 and 60 KV. Approximately seventy percent of the skull was fossilized, but the inner and outer tables of the calvaria were clearly defined over the cranial vault. The coronal and lambdoidal sutures were fused in the fashion of a mature skull. The sella turcica in the sphenoid bone was of normal configuration and was contiguous with a rostral portion of the clivus. The anterior and posterior clinoid processes could not be identified. The frontal sinuses were aerated but extremely small. The margins of the perforations and their associated fracture lines in the left parietal and temporal bones were sharply defined, but no osteoblastic or other sign of "healing" reaction was evident in these margins. X rays of the four fragments confirmed the skull-like quality of the bone.

Interpretation

The configuration and measurements of this specimen suggest that it is the skull of a young adult male. The prominence of the supraorbital ridges, the right mastoid process, and the zygomatic ridges are compatible with the usual features of a male skull. The radiological

quality of the sutures suggests that the skull was that of a young person of twenty to thirty years of age.

The cranial index is that of a dolichocephalic skull. It is decidedly more "long headed" than the predominantly "broad-headed" skulls reported from other sites of Early, Middle, or Late Minoan origin (Hutchinson 1962: 60–63).

The indices for most skulls from other Cretan sites fall well within the mesocephalic or brachycephalic range (Hawes 1910–11; Duckworth 1902–3a; 1902–3b; Luschan 1913; Angell 1944). The cranial index of the present skull is at the lower limit of the range reported for LM skulls (Charles 1965). The three skulls reported from Aisa Langada, Gournia, and Sphoungaras (McCulley et al. 1983) were also metrically consistent with R. P. Charles's data. One specimen was mesocephalic (cranial index = 76.5), and two were brachycephalic (cranial indices = 81.1 and 81.3).

The significance of the parietal and temporal bone defects in the Kommos skull is uncertain. The absence of osteoblastic "healing" reaction at the margins of the defects and their associated "fracture" lines does not exclude a premortem traumatic origin with rapid fatal consequences. Their irregular margins and the absence of incisional markings suggest that the defects were not the result of therapeutic trepanning (Pl. 5.65). Their locations are, however, compatible with those used for ritualistic postmortem trepanning for the purpose of brain extraction (Zivanović 1982: 187).

Although the metric qualities of the Kommos skull are generally within the ranges of length, breadth, circumference, and cranial index reported by Charles (1965) for Minoan skulls, the site of discovery suggests that the skull dates from the LM III (1400–1200 B.C.) to the Protogeometric/Geometric (1000–800 B.C.) periods. A terra-cotta bull's leg found in the vicinity of the skull, for example, has been interpreted as belonging to the Early Iron Age (M. C. Shaw, Chap. 3, **AB40,** Trench 47A/53). The possibility of an extraneous (Cretan or non-Cretan) origin of the skull must also be considered, since the site of discovery (Kommos town) was an "area that was eschewed for burial, as was Minoan custom" (J. W. Shaw 1984a: 257).

Addendum[44]

The skull studied by the late Paul Anderson was found in a sandy layer (0.40 m thick) overlying a sand accumulation (ca. 0.10–0.15 m) above the Minoan slab road (as in Pl. 5.60).[45] The skull was 1.53 m north of the krepidoma of the Minoan orthostate wall of Building T and ca. 0.98 m south of the retaining wall bordering the Minoan road on the north. The location is northeast of the Greek temples and considerably lower. The skull was the only object inventoried from 47A/54, which otherwise contained only "scrappy sherds down to LM III," a date that cannot be taken as diagnostic of the period, owing to the scantiness of the sherds. The layer immediately above, however (Pail 53), contained three items that were catalogued: a loomweight (Dabney 1996a: **163** [probably Minoan]), a fragment of the base of a PG jug

(C 6183), and a Sub-Minoan terra-cotta bull's leg (M. C. Shaw, Chap. 3, **AB40**). The skull's conservation was carried out by Catherine Sease.

How the skull came to be where it was found is unknown. Maria C. Shaw, the original excavator, suggested that it may have been in the packing behind the northern Minoan retaining wall of the road and, after part of the wall had collapsed, rolled down into the sandy layer that accumulated during the abandonment period. The skull was apparently not part of a nearby burial, since only the jawless cranium was found. No other skulls, much less burials, have appeared to date on the Kommos site. The defects in the skull, apparently made intentionally, as suggested by Anderson, probably do not reflect therapeutic trepanning.[46] He believes they may be the result of a ritual act during which part of the brain was removed, probably after death.[47] This may have occurred when the Minoan site was largely deserted and before the building of Temple A. If the skull was part of a fill in the Minoan retaining wall, there is no way of tracing its origin or exact date.

Notes

1. At Tarrha. For the site, see Weinberg 1960, with glass fragments shown on pl. 31h; for its products, see Buechner 1960. Unguentaria of first-century-after-Christ type and dishes with frills on the rim (cf. **11**) occur there.

2. Because of the inherent ambiguity in the pin/nail identification, seven are double listed, here and in the section on nails (J. W. Shaw, Section 8). For equivalents for the seven double listings, see Table 5.7.

3. Another fragmentary bow fibula with a single bead molding and a long tongue was found in 1993 south of the sanctuary in a context dated at the latest to the eighth century B.C. This example also belongs to Sapouna-Sakellarakis's type IVb (1978: 69–73).

4. Table 5.2 includes loomweights from Greek levels through 1986. During the period 1991–93 another four were found (Table 5.3). The pyramidal form and fine fabric of C 9549 indicate its post-Minoan date. The thin profile and small perforation of the discoid loomweight C 9248 suggest a post-Minoan date. Loomweight C 9502 could be either Minoan or post-Minoan. Loomweight C 9226 is too fragmentary to determine its original form.

5. As calculated graphically, the plane of the edge of the outer, higher part of the top of the stand would have been about 0.4–0.5 cm above a horizontal line drawn between the top edges of the "socket" cut in the base.

6. Text by Amy Raymond.

7. For her advice on the basins, I am indebted to Helga Butzer Felleisen, who attended the American School of Classical Studies when I was on sabbatical during 1989–90.

8. For the use of cult tables elsewhere in Greece, see Gill 1974. See also, for Priene, Wiegand and Schrader 1904: figs. 119, 121–22, where there are two *in situ*; Petracos 1981: 248, for the position of the table at the temple of Nemesis at Rhamnous; Orlandos 1967–68: figs. 111, 117–19, for that in the Temple of Asklepios at Alipheira.

9. Luigi Pernier, however, believed that he had found a cult table for slaughtering at Prinias (1914: 42, 92). There is also a large unpublished rectangular table, probably of Early Roman date, dedicated to Asklepios, in the Chania Museum (from Lissos, no. L 261).

10. In the northwest corner of the middle room of Temple B at Prinias were found a stone bowl and the large slab mentioned in n. 9. The slab (1.00×0.65 m) was thought by the excavator to be a slaughtering table, with the bowl used to collect the accumulated blood (Pernier 1914: 42, 92, figs. 7, 16). The bowl (0.45 m in diameter and 0.20 m deep) is deeper than but about as wide as the two examples from Kommos.

11. As in Deonna 1938: 73–78; Raubitschek 1949: 370–407, Groups 1–3; Ginouvès 1962: 77–99). Whereas W. Deonna appears to prefer to distinguish between basins for water and tables for offerings and other purposes, R. Ginouvès (1962) includes even those with very little depth as basins for washing. For instance, Ginouvès's basin in his fig. 59 is the same referred to by Deonna as a table (Ginouvès 1962: 52, pl. XXI.149, no. B 5702).

12. This was first recognized by D. Gill 1974: 135. The excavator believed that the basin was for crushing grain or other dried fruits, since its surface was picked roughly, and a grinding stone was found in the building's interior.

13. The following text was prepared by Joseph W. Shaw, who, however, owes much to Deborah K. Harlan for the primary stages of the preparation of lists, for seeing to the careful preparation of drawings and photography, and, later, for viewing the significance of the material as a whole. The authors are indebted to Rebecca Duclos, who helped with the catalogue listings and also wrote the discussion of the bronze shield (**6**) found in Temple B. Susan Downie also helped with the catalogue. Peter Haarer offered valuable comments on the iron assemblage and the spits in particular.

14. Catalogue entry by Rebecca Duclos.

15. Suggested by Peter J. Callaghan.

16. Of some interest in this connection is that the Sanctuary of Demeter at Knossos, which began to be frequented ca. 700 B.C., did not contain weapons (Coldstream 1973a).

17. Mi 130 (51A/10), uncatalogued, from south of Temple B, may have been either a dagger or a spearpoint.

18. Mi 140 (50A/41; Pl. 5.28), Mi 157 (27B/4), Mi 158 (27B/7; Pl. 5.28), Mi 159 (53A/5; Pl. 5.28), Mi 164a and Mi 164b (60B/66; fill above floor in Building Q, Room 31), Mi 187 (75A/3), Mi 191 (73B/90), Mi 194 (serrated; 54A/22), and Mi 197 (50A/6).

19. Over seventy small and a number of larger iron knives were also found in the Sanctuary of Demeter at Knossos (Coldstream 1973a: 158–60, pl. 94). A set of knives, however, may have been dedicated at a sanctuary at Gela (Orlandini 1966: 28, pl. 25, no. 3).

20. Also probably Mi 158 (27B/7; Pl. 5.28), uncatalogued here.

21. The bronze nails were treated at the Herakleion Museum. Later, the lacquer that had been applied was removed with acetone, then the nails were stabilized in 3% alcoholic benzotriazole and relacquered with Acryloid B72.

22. The Late Hellenistic and Roman bronze nails reported from the Sanctuary of Demeter at Knossos are usually small (2.0–6.0 cm in length) and would fit comfortably in our Type 1. The iron nails from the same site might as well, but dimensions are few, since they were so poorly preserved (Coldstream 1973a: 152–53, 161, pl. 92, nos. 179–85). In the case of the Unexplored Mansion at Knossos (Branigan 1992: 367, M 96–155), the some sixty iron nails reported, from Classical-Hellenistic levels, have been split into three groups based on shaft diameter. Most would fit into our Type 1, but some of the larger ones would probably be classified by us as spikes (Type 2). For epigraphical references to the use of nails in Greek building, see Orlandos 1955: 12, 19.

23. The well-preserved iron spikes from Olynthus, from the cemetery where they may have been used on wooden coffins, are as long as 19.0 cm (D. M. Robinson 1941: nos. 1439–82 on pl. 94).

24. Cylindrical sections in Type 1: **1–4, 12, 14,** and **15;** in Type 2: **21** and **23;** in Type 4: **40–55, 57,** and **58.**

25. These are similar to those from fourth-century-B.C. Olynthus (D. M. Robinson 1941: nos. 1439–82 on pl. 94). See also Davidson 1952: nos. 1033–34 (tacks from Corinth).

26. With its unusual curving-over edge and length (6.0 cm), **56** may belong to an indefinite category, however.

27. Similar markings occur on **60** (from Altar C) and **61** (from the court) and probably indicate that the provenance of these items and their original date (both are from Roman contexts) is the same as for the Hellenistic group of fourteen.

28. Evidence for the use of nails on furniture, however, is not common. Quite often wooden pegs and joins were used, even for doors such as those recovered from the sunken temple at Kenchreai near Corinth, where nails were used only to attach the hinges (Scranton et al. 1978: 179, fig. 44).

29. Nails were used earlier in Crete, however. Their occasional recovery, for instance, on Bronze Age Minoan sites, such as at Gournia and Phaistos, has been reported (J. W. Shaw 1971: 77, appendix A, p. 255), and a few probable nails were found in MM III and LM IIIB contexts at Kommos

itself (B 68 and B 69, respectively, for which see Blitzer 1995: M 100 and M 101). For the later period, the PG and Geometric tombs at Fortetsa near Knossos produced iron nails (Brock 1957: 54 [no. 568] and 59). At the Unexplored Mansion site at Knossos, nails were plentiful, with over two hundred reported (Branigan 1992: 364, 367, 373). Most nail shafts there were circular, as were the heads, although (unlike at Kommos), some of the heads of Hellenistic and Roman iron nails were rectangular, and a few were even triangular. As at Kommos, nails were more common in Classical through Roman contexts than earlier. At both sites bronze nails, more durable but probably more expensive, remained in use. At Knossos bronze nails make up only about 10% of the total, however, whereas at Kommos they are more common (60%) than iron. The difference may be partially attributable to the religious rather than domestic character of the Kommos site, but the major factor is probably that corrosion at seaside Kommos usually left the bronze nails unaffected while those of iron often disintegrated.

30. They were common within the fourth-century-B.C. houses at Olynthus, however, although the excavators do not speculate about their use there (D. M. Robinson 1941: 323, pls. 91–93).

31. Here I am indebted to the original careful cataloguing and drawing by Deborah K. Harlan and others, done before the wood was removed for analysis.

32. We are indebted to Janusz Zwiazek for the identifications in a letter of 7 August 1990. Zwiazek also identified conifer in wood found adhering to a possible grate fragment (Mi 153).

33. A similar group of differentially weathered stone weights (S 1979), also from a Geometric level, was found south of Temples A and B. Curiously, like **3,** this group also consisted of ten items—could each group have been used in some type of game?

34. Peter J. Callaghan and Alan W. Johnston also report a number of terra-cotta mortars for crushing foodstuffs, one from within Building F (Chap. 4, Section 1, **404**) and other, later ones from sanctuary dumps (**699, 700,** and **874**). There was also one from within Temple B (C 11279, uncatalogued here).

35. Dates for the objects listed below are by the pottery context provided by Peter J. Callaghan and Alan W. Johnston in the study of the IA material (Chap. 4, Section 1). The implements lack a specific chronology of their own, and following the format of other excavation reports, I have chosen to provide a context date. For a recent excellent discussion of the wide array of objects and materials dedicated in Greek sanctuaries, see Harris 1991; 1995.

36. Simon 1986: 274, n. 3, where he refers to Kuniholm 1982: 262–63, n. 40, Fe 94–95. The net mender or netting needle is characterized by prongs at either end of a rod, with the prongs perpendicular to one another. For its use during the BA, see Powell 1996: 104–5, fig. 61a.

37. For Emporio, cf. Boardman 1967: 204, cat. no. 161, p. 202, where he notes that "Lead net-weights . . . are undatable except by context." Note 38 provides further references to published examples, e.g., Cape Zoster (Classical to Hellenistic), Stavropoullos 1938: 21, fig. 22; Olynthus (Classical), D. M. Robinson 1941: 475, no. 2504.

38. Branigan 1982: 303, examples LW 27–38, pp. 306–9; Simon 1986: 275, 276 n. 4–5. For earlier examples and discussion, see Powell 1996: 118–20, fig. 78.

39. Cf. Simon 1986: 275. For fishhooks from IA Kommos, see also Blitzer 1995: M 60 (B 7), M 69 (B 28), M 70 (B 29), M 71 (B 30), M 72 (B 31), M 93 (B 56), M 106 (B 82), M 127 (B 157), M 142 (B 156), M 145 (B 196). Also, for discussions of fishhooks, see Powell 1996: 124–28, figs. 88–90, and for Kommos fishhooks therein, nos. 20 (B 7), 21 (B 196), 22 (B 210), 23 (B 186), 24 (B 2, B 7, B 28–B 31, B 36), 25 (B 56).

40. For further discussion on this object see Csapo et al., Chap. 2, **86.**

41. For a discussion of bronze handles, cf. Jacobsthal 1956: 47ff.

42. For a general study on faience in Archaic Greece, cf. Webb 1978; Bissing 1941.

43. Webb 1978: 1, 39, a seventh-century-B.C. faience pyxis was found in Tomb L, Arkades, Crete.

44. Written by J. W. Shaw, 10 October 1998.

45. We are indebted to Dr. Peter K. Lewin, Hospital for Sick Children, Toronto, for helping to select the illustrations. Having studied them, he believes that the two depressed fractures on the left side of the skull were probably related to a rapid fatal head injury brought about by a blunt weapon.

46. Such as in skull Gamma 51 from Grave Circle A at Mycenae, for which see Prag et al. 1995: 112–15, a reference provided by C. D. Cain.

47. For an up-to-date review of trepanning in the BA Aegean, see Arnott 1997: 251–61, where he remarks (p. 254) that there is no evidence as yet that the Minoans did it for therapeutic purposes but, perhaps, for the "postmortem release of evil spirits" (p. 257), citing LM IB examples from the Stratigraphic Museum excavations at Knossos (Wall et al. 1986: 341, 349, 373; Warren 1981: 159).