

Bonn. zool. Beitr.	Bd. 50	H. 3	S. 183–198	Bonn, Dezember 2002
--------------------	--------	------	------------	---------------------

On the incised cattle scapulae from the East Mediterranean and Near East

David S. Reese

Abstract. This paper is concerned with a type of worked bone object described from Late Bronze Age and Iron Age Kition in southern Cyprus by Günter Nobis over 15 years ago. The present paper puts these bone objects (sometimes thought to be musical instruments, tallies for record keeping, instruments of prophecy, or simply tools) in their wider chronological and geographic context, and includes a catalogue of those known to date.

Key words. Cyprus, East Mediterranean, Near East, worked bone, scapulae.

Among the many zooarchaeological papers published by Günter Nobis are reports on the fauna from the sanctuaries at Kition and Tamassos on Cyprus (Nobis 1976–77, 1985, 2000; Nobis & von Lehmann 1979; von Lehmann & Nobis 1979). While most of the faunal material from these two sites are the normal domestic animals, there are several rarer or exotic forms and man-made items from Kition that are of particular interest. These include a *Cervus elaphus* antler (Nobis & von Lehmann 1979, Nobis 1985: 426; most Cypriot deer remains are *Dama mesopotamica*), ostrich eggshells (Nobis 1985: 427; Reese 1985: 371–82), two hippopotamus teeth (Nobis 1985: 427; Reese 1985: 391–98, 1998), two elephant molars (Reese 1985: 398–404; Karageorghis 2001: 15), an imported tortoise carapace holed in the center of the shell (Nobis 1985: 428; Reese 1985: 409–13), imported Red Sea shells (Reese 2001), and about 15 *Bos taurus* scapulae with cut incisions (Nobis 1985: 423; 2000: 124–25). It is these incised bones that will be addressed in this paper (Fig. 1).

Nobis only notes a small portion of the presently known corpus of incised scapulae: 9 of 15 from Kition, only Enkomi examples from the Sanctuary of the Ingot God, Myrtou, Byblos in Lebanon, and Norşuntepe in Turkey. Here I provide a complete catalogue of all examples known to me to date. It should be noted that continued excavations at Polis and Athienou, as well as at other sites, will certainly produce additional examples. Also, sometimes older excavations have yielded these items which only recently have been recognized as part of this corpus (Çayönü and al-Judaïdah in Turkey, Tell Tuneinir in Syria, Tell Abu Hawwam in Israel, Jericho in the West Bank, Haji Firuz Tepe in Iran).

While most of the incised bones discussed here are scapulae there are also some other elements which are incised. The earliest of the incised bones in the Near East come from various caves on Mount Carmel in Israel: Mousterian levels in Kebara cave yielded an incised *Gazella/Dama* shaft fragment (Davis 1974: 181, fig. 1) and Lower Natufian levels here produced an “elongated piece of polished bone decorated with incisions along the edge” (Turville-Petre 1932: 272). The Upper Mousterian to Natufian Abu Usba cave produced two bone fragments with 4+ and 12+ incisions

(Steklis & Haas 1952: 28, figs. 15:4, 6). The Upper Paleolithic or Epipaleolithic at Ksar 'Akil in Lebanon produced a gazelle or ovicaprid metapodial fragment with about 35 incisions along its length (Tixier 1974).

Most of the incised scapulae come from Cyprus and the Levant but there are also examples from as far away as Neolithic Iraq and Iran and from Iron Age Spain. Their geographic distribution by major period includes: Upper Paleolithic (Israel), Epipaleolithic (Turkey), Neolithic (Turkey, Lebanon, Iraq, Iran), Chalcolithic or Early Bronze Age (Turkey, Israel), Early or Middle Bronze Age (Syria), Middle Bronze Age (Turkey), Late Bronze Age (Cyprus, Syria, Iraq), Iron Age (Cyprus, Turkey, Syria, Israel, Spain).

While there are so far no incised scapulae known from Egypt, there is an incised *Bos* proximal metacarpus with 26+ incisions from Tell el-Dab'a (Avaris) in the Delta (Bietak 1985: 6 [3187], fig. 4: 4, pl. III: 3187).

A significant number of incised scapulae come from Late Bronze Age and Iron Age sanctuary sites (Kition, Myrtou, Enkomi, Limassol, Polis, and Athienou on Cyprus and Tell Migne in Israel).

It is worth noting that sometimes incised scapulae are found in association with unincised scapulae, as at Kition (1), Myrtou Pigadhes (*c*9) and Enkomi (6+) on Cyprus and at the Tell Migne sanctuary (1) in Israel. Maybe these bones were cached to be incised at a later date.

Sometimes the sites with incised scapula also have another type of incised bone: Neolithic Girikihaciyan (7 scapulae, 1 other), Neolithic Çayönü (1 scapula, 1 other), Neolithic Byblos (2–3 scapula, *c*2 other), EB Tell al-Judaiah (1 scapula, 1 other), LB Ras Shamra (1 scapula, 2 others), LB to Iron Age Kition (15 scapulae, 1 rib), and LB II to Iron Age Tell Migne (13 scapulae, 6 others). This suggests that in some cases the bone element utilized was not particularly important.

From Palaepaphos on Cyprus comes a Cypro-Archaic bone (said to be a rib) with *c*18 incisions and also a broken engraved decoration including the wing of a ?sphinx (Erdmann 1977: 87, pl. XII: 739). The decoration on this piece is very similar to that found on a contemporary *Bos* scapula from Tell Dor in Israel. This bone (in addition to the 4 incised scapulae from Dor) is not incised but has an engraved maritime decoration on it, an inscription with of 15 characters in the Cypro-Syllabic script, and a hole made in the distal portion of the *spina scapulae* (Stern 1994b). The engraving on the Palaepaphos and Dor bones recalls that found on other Near Eastern Iron Age objects: ivories (Barnett 1957; Bunnens 1997), engraved *Tridacna* shells (Stucky 1974; Reese 1988, Reese & Sease 1993), some stone cosmetic palettes (Sease & Reese 1994), and metal bowls (Markoe 1984; Falsone 1992). It should also be noted that an incised scapula from the Polis-Peristeries sanctuary on Cyprus has 4 characters in the Cypro-Syllabic script.

Some authors feel that the incised scapulae are musical instruments (where a *plectrum* of bone, wood, or other material is scraped along the incised area; Dunand 1973: 75; Courtois in Webb 1977: 78; von den Driesch & Boessneck 1981: pl. 3, 1985; Otte et al. 1982; Nobis 1985: 424, 2000: 125; Becker 1988: 381-83; Caubet 1987: 735, 1996: 12, 26; Karageorghis 1990a: 67, 1990b; Dunham 1994; Dothan 1998: 155; Stager 2000), tallies for record keeping (du Plat Taylor 1957: 78), counting bones or musical instrument (Redman 1973: 258), tools or musical instruments (Watson & LeBlanc 1990: 93), tools (Starr 1939: 488), or possibly items

used in divination or prophecy (scapulomancy or omoplatoscopy; Webb 1977: 79–80, 1985: 325–27; Stern 1994: 6).

At Kition the association of one LC IIIA incised scapulae (no. 5036) with a unique *Bos* astragalus drilled through the center dorso-plantarly and latero-medially and filled with lead (Reese 1985: 382, pls. B: 5, CXXXV: 5474) may suggest that scapulae and astragali were used together in divination. The small bronze kidney or liver model (Karageorghis 1971, Karageorghis & Demas 1985: pls. CVI: 2409, CLXXXVI: 2409) and the worked *Conus* shells may suggest that various types of divination were practiced at Kition, including scapulomancy, astragalomancy, and cleromancy (divination by casting lots) (Reese 1985: 389).

Only Karageorghis is positive of the use of the incised scapulae: “We accept without hesitation the proposal made by others that scapulae were used to produce music by rubbing the notched edge with a piece of wood or bone” (1990a: 67) and “The sound is very clear and acute, and when played rhythmically it produces the sort of ‘music’ one might expect to accompany a religious dance” (1990b).

Catalogue

CYPRUS

Kition (all Area II)

no. 5383; Between Floors IIIA and III, Courtyard C, south of Temple I; LC IIIA

Bos scapula fragment, L 155, 7 surviving incisions, av. L 7, av. W 1, regularly spaced 5–6 mm apart, along posterior border of ventral face, incised area polished (Webb 1985: 317, pl. A: 1; Karageorghis & Demas 1985: pls. CXXI, CXCVI).

no. 5036; Floor III, Courtyard C, immediately to the south of the westernmost block of the south wall of Temple I; LC IIIA

Bos scapula, right, rather complete, F glenoid, L 220, 14 surviving incisions, av. L 12, av. W 1, regularly spaced 3–4 mm apart, along posterior border of ventral face, incised area polished (Webb 1985: 317, pl. A: 2; Karageorghis & Demas 1985: pls. CXXXV, CCIV; Nobis 1985: 423 [as LC IIIA], 2000: 124 [as Iron Age]) (Fig. 1b).

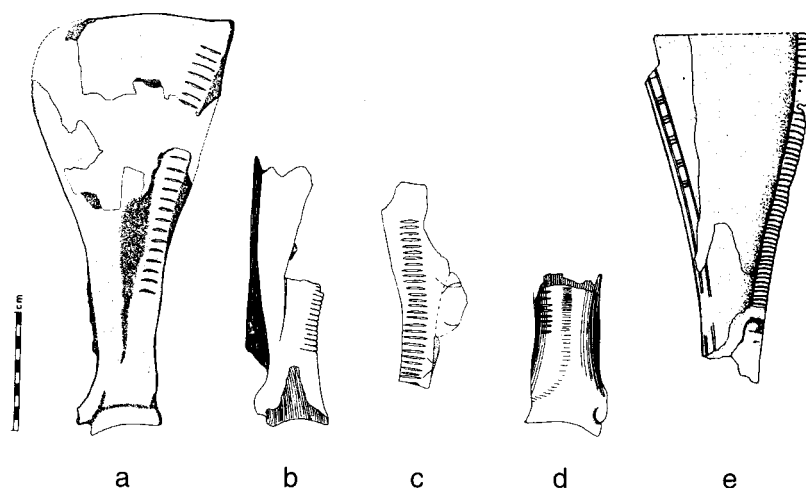


Fig. 1. Examples of incised scapulae from Cyprus, reduced approximately to the same scale. a) Kition 3816, CG IA (after Karageorghis & Demas 1985: pl. CCXXVII); b) Kition 5036, LC IIIA (after Karageorghis & Demas 1985: pl. CCIV); c) Kition 3773, CG III (after Webb 1985: fig. 1); d) Kition 4184, CG I (after Karageorghis & Demas 1985: pl. CCXXIX); e) Limassol Komissariato; CA II (after Webb 1985: fig. 2).

no. 3691A (different scapula from 3691B and C); Well 7 in paved courtyard immediately to the east of Temple 4; LC IIIA

Bos scapula, right, F glenoid, L 135, 6 surviving incisions, av. L 15–20, av. W 1.5, regularly spaced 4–6 mm apart, along posterior border of ventral face, incised area polished (Webb 1985: 317, pl. A: 3 left; Nobis 1985: 423; Karageorghis 1999: pl. CXCII [as unstratified]).

no. 3691B (different scapula from 3691A and C); as 3691A

Bos scapula fragment, L 59, 7 surviving incisions, L 8–10, av. W 2, regularly spaced 5–6 mm apart, on ventral face; Webb says polished while Karageorghis calls it wear (Webb 1985: 317, pl. A: 3 right; Karageorghis 1990).

no. 3691C (different scapula from 3691A and B); as 3691A

Bos scapula fragment of posterior border, L 33, 3 surviving incisions and traces of a fourth, L 20, av. W 2, regularly spaced 6–7 mm apart, on ventral face; Webb says polished while Karageorghis calls it wear (Webb 1985: 317–18, pl. A: 3 center; Karageorghis 1990).

no. 3816; Floor I, Temple 5, Room 58; CG IA

Bos scapula, right, F glenoid, rather complete, L 350, 21 surviving incisions, L 15–25, av. W 1.5, regularly spaced 8–13 mm apart, along posterior border of ventral face, incised area polished (Webb 1977: 75 [as from a bothros], pl. XXVII: 1, 1985: 318, pl. A: 4; Karageorghis & Demas 1985: pls. CLXVII, CCXXVII; Snodgrass 1994: pl. 5: 1 [as from a bothros]; Nobis 1985: 423, 2000: pl. 34: 1 [but not noted in text]) (Fig. 1a).

no. 4184; Bothros 20 (material from Floor I, Temple 5); CG I

Bos scapula fragment, right, F glenoid, L 138, 8 surviving incisions, av. L 10, av. W 1, regularly spaced 3–4 mm apart along posterior border of ventral face, incised area polished (Webb 1977: 75, 1985: 318, pl. A: 5; Karageorghis & Demas 1985: pls. CLXXV, CCXXIX; Nobis 1985: 423) (Fig. 1d).

no. 3773; Floor 3, Room 45; CG II (9th c.)

Bos scapula fragment, left, posterior border and central area, L 160, 27 surviving incisions, L 15–18, av. W 1.75, regularly spaced 3–5 mm apart, along posterior border of ventral face, incised area polished. Above the incisions in the center of the ventral face, two compass-drawn overlapping arcs are lightly incised. A third curving incision appears to the right and the lower parts of two more immediately above the incisions to the extreme right. All appear to have originally extended toward the anterior border (Webb 1985: 318, fig. 1, pl. A: 6, 1977: 75 [as Temple 4 early floor]; Karageorghis 1999: pl. CXXXVIII, 2001: 60; Nobis 2000: 124) (Fig. 1c).

no. 4650; Floor 3, Courtyard B – Street; CG III–CA I

Bos scapula fragment of posterior border, L 45, 6 surviving incisions, L 11, av. W 1, regularly spaced 4–6 mm apart, along posterior border of ventral face, incised area polished (Webb 1985: 318, pl. B: 2; Karageorghis 1999: pl. CXXXVIII, 2001: 85; Nobis 2000: 125).

no. 4673; Bothros 23+13, east of Temenos B, material of Floor 3; CG III to CA I

Bos scapula, left, reconstructed L 160, 15 surviving incisions, L 16–19, av. W 1.7, regularly spaced 3–5 mm apart, along posterior border of ventral face, incised area polished (Webb 1985: 318, pl. B: 3; Nobis 2000: 124; Karageorghis 2001: 68).

no. 4371, Between Floors 3 and 2A, Room 45A; CG III to CA I–II

Bos scapula fragment, pres. L 50, has 4 incisions (Karageorghis 1999: pls. XXIX, CXL, 2001: 15).

no. 3696; Floor 2A, Bothros 17; CA I–II

Bos scapula, right, fragment of posterior border, central region, and part of anterior border. Reconstructed L 88, 10 surviving incisions, L 10–12, av. W 1, irregularly spaced 2–6 mm apart, along posterior border of ventral face. Between the major incisions are a number of small, very lightly engraved grooves. At least 9 barely visible, short, parallel incisions appear also on the surviving region of the anterior border; Webb says polished while Karageorghis (1990) calls it wear (Webb 1985: 318, pl. B: 4; Karageorghis 1990, 1999: pls. XXXVII, CXLIX, 2001: 70; Nobis 2000: 125).

no. 532; Floor 2, Courtyard C, Square H8; CC I–II

Bos scapula, right, posterior border of ventral face has 40 regularly spaced incisions with traces of at least another 5. Reconstructed L 230, av. L 10, av. W 1, incised area polished

(Webb 1977: 76, 1985: 319 [as Temple I], pl. B: 5, 1977: pl. XXVII: 2; Snodgrass 1994: fig. 5: 2; Nobis 2000: 125; Karageorghis 2001: 2).

no. 2201, Floor 2, Bothros 9; CC I–II

Bos scapula fragment, both ends broken off, L 104, at least 36 incisions survive plus a few shallower incisions (Karageorghis 2001: 63).

no. 1789; Between Floors 2 and 1, Temple 1, Room VIII; ?CC

Bos scapula fragment, broken at either end, L 70, 12 deep incisions, rounded area between incisions, considerable wear along the edge (Karageorghis 1990b: fig. 3, 1999: pl. LXXXII; 2001: 2).

Unincised scapula

no. 3773A; Room 45, Floor 3; CG II (9th c.)

Bos scapula, left, F glenoid, reconstructed L 210. Found with no. 3773 (Webb 1985: 318, pl. B: 1; Karageorghis 1999: pl. CXXXVIII, 2001: 60).

Incised rib

Bothros 6A, material from the reuse of Temple 1, CC

Rib, L 75, one side is divided in two by an incision, one of these ends has 10 incisions 4–6 mm apart with a L of 5 mm (Webb 1985: 322).

Myrtou Pigadhes (Area VI) (Period VI, LC III, 12th c. B.C.)

Fragmentary scapulae from a group of rooms to the east of the sanctuary. They are either from a sanctuary storeroom or discarded material from a sanctuary.

Room 16 – *Bos* incised scapula (du Plat Taylor 1957: 21, no. 371; 3 fragments, two attaching, one fragment with 8 incisions and the other with 4, L 55 x 33, W 20, in the Museum of Classical Archaeology, Institute of Archaeology, University College London, no. 53/1409; pers. comm. from Mrs. Naomi Mott, Curator, 5 November 1996).

Room 17 – 2 *Bos* unmodified scapulae (du Plat Taylor 1957: 21, #435–436; both are in the Nicholson Museum, University of Sydney [435 is NM 53.194]).

Room 20A – pile of 7 unmodified scapulae on the floor (du Plat Taylor 1957: 21, #421; she notes that all are in the Otago Museum in Dunedin, New Zealand, but none are present according to Dimitri Anson, Head of Humanities there; pers. comm, 3 April 1997). Another pile of very decayed scapulae was found on a plaster ledge to the south of the room (du Plat Taylor 1957: 21, no number). One fragment (M.51 or no. 2) of a right scapula is L c200 and has 25 incisions (Zeuner 1957: 100, 1958: 134).

Room 20B – 4 incised scapulae on the plaster floor (du Plat Taylor 1957: 21, no numbers).

The Room 20A incised scapula or one of those from Room 20B is in Dunedin (Reg. no. E52.31: “2 fragments of shoulder blades with notches”, probably of the same piece).

The incised scapulae have from 4 to 45 incisions and are 50 to 150 long (Seton-Williams 1957: 78). One example with 23 regular incisions and broken at one end (unclear which one) is illustrated (du Plat Taylor 1957: pl. Vd).

There is also 1 incised rib, not illustrated (Zeuner 1957: 100; Webb 1977: 75, 1985: 322).

(du Plat Taylor 1957: 21; Zeuner 1957:99-100, 1958: 134; Webb 1977: 75, 1985: 320).

Enkomi

Enk 195, Sondage XL VIII

Bos scapula fragment with 16 incisions: one group of 8 spaced close together and another group of 8 which are longer and further apart. Published as sheep. “Morceau d’os animal gravé: fragment d’omoplate de mouton, avec série d’enchâsses incisées sur une face convexe. 7 cm x 2 cm. Enkomi 1958, inv. 195. Sondage XL VIII, point 39 à 0.70 m de profondeur” (Schaeffer excavation, 1958) (Courtois 1984: 59 no. 566, fig. 19: 6).

Enk 1107, Area III, Room 4 (along City Wall), Γ-Δ 22–24 east, between Floors I–II (almost on Floor II), Level IIIB; LC IIIA2

Bos scapula, 10 deep parallel incisions (maybe more), broken at either end, L 58.5, W 48.5 (Dikaïos 1969: 293–94, pls. 135: 69, 168: 60, 1971: 467, 734 [as a fragment of a bone handle]; Webb 1977: 75, 1985: 321; personal analysis).

Sanctuary of the Ingot God (LC IIIB, 11th c.)

On the north bench there were fragments of incised scapulae; on the floor beneath the bench were many more fragments of incised and unworked scapulae (fig. 113); several almost complete examples found in the middle of the floor; another incised group found in a niche in the north bench (figs. 109, 110), for a total of 27+ worked scapulae: Number 1117 (incised scapula, F glenoid); 1211 (incised scapula, F glenoid); 1258 (F glenoid); 1326 (incised, may not be a scapula); 1327 (incised scapula); 1327B (?unmodified); 1327C (?unmodified); 1327D; 1330A; 1330B; 1331; 1333A (fragment); 1333B; 1333C; 1333D; 1334 (under stone); 1335A; 1336B (Courtois 1971: 258, 277–80, figs. 97, 109, 110 right [2 incised scapulae in situ], 11 [8 incised scapulae or fragments and probably 6 unmodified scapulae], 114, 128 [6 incised scapulae; 1963 season]; Webb 1985: 320–21).

Area of the Sanctuary of the Ingot God

“Ainsi, dans la région du sanctuaire du Dieu au lingot, les puits 222 (pt. top. 1673) et 21 (pt. top. 1386) ont-ils livré des bucrânes de taureaux, des bois de cervidés et un omoplate encoches incisées (pl. XV:6) objets caractéristiques du colte pratiqué dans le sanctuaire (Courtois 1986: 56, pl. XV:6).

Has F glenoid, 18+ incisions, some evenly spaced but toward *margo vertebralis* they are wider apart. It looks like three separate phases of incising: from glenoid: 3, 8, and 7 incisions. This scapula, excavated in 1967, Quartier SE, puits 218 (D.E.) was stored in the French excavation storeroom at the site and it is unknown if it is still there.

Limassol *Komissariato*; no. 176(101/54); CA II sanctuary

Scapula broken at either end, L 220, 47 incisions preserved on the anterior border (*margo cervicalis*); posterior border (*margo thoracicus*) has two pairs of parallel incisions made along the length of the bone, divided into sections by groups of three perpendicular incisions (Webb 1977: fig. 17, pl. XXIII, 1985: 321, fig. 2; Snodgrass 1994: 171, fig. 1e (Fig. 1e).

Palaepaphos; from Persian siege mound; CA

Bone (said to be a rib), L 64, max. W 14, with 15 parallel incisions and traces of 3 more are fragmentary engraved decoration including the wing of a ?sphinx (Erdmann 1977: 87 [as comb], pl. XII: 739; Webb 1985: 321–22).

Palaepaphos *Teratsoudhia*

Tomb 104, Chamber P (possibly debris dumped from a sanctuary, with mixed material dating from the Chalcolithic to the CA), 3 fragments from 1 incised *Bos* scapula, traces of scraping wear on transverse incisions on 88A-B; L: 100 (A), 99 (B), and 70 (C) (Karageorghis 1990a: 39 [nos. 88A-C], 67, pls. XXVII, LX).

Stylli village, Famagusta district

CM 1933/III–5/35; 10 very small incised bone fragments and 1 unincised fragment; at least and possibly 10 individual scapulae are represented by the fragments, all probably scapulae incised along either the posterior or anterior border of the ventral face (Webb 1985: 322, pl. I 6).

Polis *Marion* (personal analysis)

Sanctuary A.H9 (CA I–II)

A.H9 V17, Stratum 1, pass 3 (1984)

Bos scapula fragment, incised, eroded.

A.H9 V15, Level 4, pass 1 (9 July 1986)

Bos scapula fragment, incised, eroded.

A.H9 V15, Level 5, pass 2 (13 July 1986)

Bos scapula (3 fragments), incised, eroded.

Sanctuary B.D7 (Polis-Peristeries) (Smith 1997) (CA I–II, 7th–6th c. B.C)

B.D7 r14, Sq. DIV, Lev. 14, Pass 1 (1995), Find 371, NB 1995/1, p. 113, R17793.0, BI3011

Bos scapula fragment, incised, small piece.

B.D7 r14, Sq. CIV, Lev. 14, Pass 2 (16–17 July 1995), Find 469, NB 95/2, p. 84, Find NB 95/1, p. 137

Bos scapula fragment, incised, poorly made.

B.D7 r14, Sq. D4, Lev. 14, Pass 3 (1995), Find 525, NB 1995/3, p. 34

Bos scapula fragment (2 pieces), incised, very fresh incisions.

B.D7 r14, Sq. CVI, Lev. 3, Pass 2 (1996), Find 93, NB p. 52, FNB p. 28, R19766, BI3446

Bos scapula, irregular incisions, worn.

B.D7 r14, Sq. D3 (almost at bottom of *bothros*), Lev. 7, Pass 2 (1996), Find 328+329, NB I, p. 158, Find NB p. 76+77, R20396, BI3670

Bos scapula, F glenoid, fresh incisions, has 4 Cypro-Syllabic signs.

B.D7 r15, Sondage I, Lev. 40, Pass 8 (1991), Find 495, NB III, p. 32, FND I, p. 141, R13248, BI2000

Bos scapula, F glenoid, incised.

B.D7 r17, Lev. 4, Pass 4 (1988), P18, Find 599, Δ.1.38, R16116, BI2481

Bos scapula, 6+ incisions, worn fragment.

Athienou Malloura, sanctuary; CA–CC (mainly 6th–5th c. B.C.) (personal analysis)

EU 4, E 6792, N 6137, SU 427, 7/17/98

Bos scapula – 5 fragments, largest piece is L 66.5 and has 7 incisions, four other pieces have 4, 1, 1, and 1 incisions.

EU 10, E 6797.5, N 6150, SU 1099.155, 7/15/98 (AAP–AM–#1726)

Scapula fragment – broken down center, 6 or 7 incisions, incision L 9.25+ and W 1.25, incisions roughly regularly spaced about 6.0 apart, L 32.0, W 23.0.

EU 10, E 6798, N 6151, SU 1079.158, 7/1/98

Scapula fragment – small piece, 5 incisions, incision W 0.75, c3.25 between incisions, L 14.25, W 5.25.

EU 10, E 6798, N 6151, SU 1099.155, 6/26/98

Scapula fragment – 3 pieces, at least 10 incisions, L 63.25, W c34.0 (badly encrusted).

EU 10, E 6798, N 6151, SU 1099.155, 6/26/98 (AAP–AM–1730; probably joins 1725)

Scapula fragment – worn, broken down center of incisions, 6 or 7 incisions, incision L 9.5+ and W c1.0, L 46.0, W 10.0.

EU 10, E 6799.35, N 6151.355, SU 1099.155, 6/25/98 (AAP–AM–1725; probably joins 1730)

Bos scapula – broken down center of incisions, 10 regularly spaced incisions, incision L 12.75 and W 1.0, 4.5–5.0 between incisions, L 84.25, W 32.25 (encrusted).

EU 10, E 6799.94, N 6150.06, SU 1099.158, 7/15/98 (AAP–AM–1727; joins 1728)

EU 10, E 6798, N 6150, SU 1099.158, 7/15/98 (AAP–AM–1728; joins 1727 and 1731)

EU 10, E 6798, N 6150, SU 1099.158, 6/30/98 (AAP–AM–1731; joins 1728)

Bos scapula – F glenoid, left, 18 incisions on back of *margo thoracicus*, incisions regularly spaced but now worn or broken, incision L 9.25 and W 1.25, L c140, GLP 47.0, LG 40.5, SLC 36.75, BG 31.75.

EU 10, E 6798.75, N 6150.71, SU 1099.155, 6/26/98 (AAP–AM–1724)

Scapula fragment – broken, nicely made, 9 incisions, incisions deep and rather evenly spaced, incision L 8.25 and W 1.5–1.75, L 68.25, W 18.75.

EU 10, E 6799, N 6150, SU 1099.155, 7/15/98 (AAP–AM–1729)

Ovis/Capra-sized scapula – 8+ very light incisions, L 53.25, W 14.0 (encrusted).

EU 10, E 6800.51, N 6151.48, SU 1099.167, 6/11/98 (AAP–AM–1284)

Scapula fragment – broken at both ends and down center of incision, 10 incisions, incision L 8+ and W 0.75, incisions rather nicely made and regularly spaced roughly 5 apart, L 43.75, W 19.25.

EU 10, Clean-up, SU 1099.164, 6/12/99 (AAP–AM–1740)

Bos scapula fragment – broken at either end, 4 incisions, L 32.75, W 22.0, incision L 9.5 x W 1.0, c5.75 between incisions.

EU 18, E 6786.20, N 6141.35, SU 1822, 6/26/98 (AAP-AM-1712, joins 1711)

EU 18, E 6786.36, N 6140.82, SU 1822, 6/23/98 (AAP-AM-1711, joins 1712)

Bos scapula fragment – broken at either end, 44 incisions, incision L 12.25–17.25, incision max. W 1.25, L c140, W c18.25.

EU 18, E 6789.71, N 6141.88, SU 1829, 7/7/98 (AAP-AM-1713)

Scapula fragment – 3 joining pieces, 12 incisions, L 48.25, W c17.0, incisions regularly spaced 4.5–5.0 apart.

EU 24, SU 2428, SMU 6795/6143, 6/25/99

Scapula fragment – 2 pieces, largest L 27.5 with 1 incision and maybe a 2nd, other bone L 12.25, W 11.5 with 2 incisions.

TURKEY

Öküzini cave, southwestern Turkey; Stratum VI, (c. 10,500 B.C.)

One large mammal scapula (F), partly broken, has c20 light incisions along one edge as well as a pattern of linear engraving on the same side (Yalcinkaya et al. 1995: 575, fig. 6: 14).

Girikihiaciyan, southeastern Turkey; Neolithic (Halafian, 5500–5000 B.C.), said to be used as tools or perhaps musical instruments: “The notched surfaces are covered with a great number of light striations running parallel to the notches, which were probably made during manufacture. The surfaces are highly polished, resulting in the rounding of the areas between the notches and thus suggesting that this polishing was performed by a soft material. This situation is confirmed by the lack of transverse striations large enough to be visible through a hand lens. The greatest number of incisions on any one piece is 30, but no specimen is complete” (Watson & LeBlanc 1990: 93).

A8–9 – *Ovis* scapula fragment, minimum of 30 incisions, each about 5 mm long and 1 deep; from Fill (Watson & LeBlanc 1990: 94).

E4N2 6–0 – *Ovis* scapula fragment, slightly polished, 13 incisions, most of them about 3 mm long and 2.5 deep; from Fill (Watson & LeBlanc 1990: 94).

E7N9 15–3 (#1248) – *Bos* scapula fragment, articulation at one end, other end broken at one of the incisions, 11 incisions, each about 20 mm long and 2 or less deep, incisions not as regularly spaced as on other specimens; from Pit (Watson & LeBlanc 1990: 94, fig. 6.6: 2).

E7N9 15–3 (#1249) – *Bos* scapula fragment, broken at both ends (one break is at incision), showing 29 incisions, each about 25 mm long and 1 deep, extremely highly polished; from same pit as #1248 (Watson & LeBlanc 1990: 94, fig. 6.6: 3).

W2S5 24–8 – *Bos* scapula fragment, articulation at one end, other end broken off at incision, 11 incisions, each about 20 mm long and 1 deep; from Living area (Watson & LeBlanc 1990: 94).

W2S5 33–1 (#1561) – *Bos* scapula fragment, 25 incisions, each about 20 mm long and 0.8 deep, polished on much of the incised surface, polish is greater in area where specimen is broken; from Trash or Rubbish area (Watson & LeBlanc 1990: 94, fig. 6.6: 1).

W2S5 33–0 – *Bos* scapula fragment, broken at one incision, 10 incisions, each about 20 mm long and 1 deep, polished only in central area of incisions; from same area as #1561 (Watson & LeBlanc 1990: 94).

There is also a ?*Bos* long bone fragment which has transverse striations similar to that on the scapulae (Watson & LeBlanc 1990: 94).

Çayönü Tepesi, southeastern Turkey (Neolithic; c. 7250–6750 B.C.). Called counting bones or a musical instrument.

SE 7–0 – scapula, small mammal, left, 13 regularly spaced incisions 5–11 mm apart (Redman 1973: 258, fig. 6–4).

R 7–0/1 – incised bone, worked on edges and flattened on both sides, incisions made by a series of scratches and then rubbed, has high polish (Redman 1973: 258, fig. 6–5 [detail]).

Tell al-Judaidah, Amuq/Hatay; First Mixed Range (Neolithic to EB I), scapula with at least 8 incisions on edge, “fragment decorated with series of short incised lines. The incised surface (other surface missing) is polished from use. Whether the object represents a tool or was

merely decorative cannot be said.” Said to be made on a gazelle bone (Braidwood & Braidwood 1960: 133, pl. 76:3, x4108).

Another incised bone (Phase G, EB I–II) is an ulna (F) decorated with at least 23 short parallel incised lines. One edge is slightly notched in several places (Braidwood & Braidwood 1960: 340, pl. 76: 2).

Tell Kurdu, 'Amuq/Hatay, Trench 4A, Locus 014, Lot 67, MRV 1536, 9/19/98 (Chalcolithic) (personal analysis)

Incised *Bos* scapula – max L 39.25, W 15.5, 8 incisions preserved, not evenly spaced, incision L c9 and W c0.75, polished around incisions.

Gözlü Kule (Tarsus), Middle Iron Age, (c. 850–700 B.C.)

Broken scapula, 7 irregular incisions along the border (Goldman 1963: 386, fig. 178: 37; Webb 1985: 323).

Broken scapula, 6 incisions across the center of the ventral surface (Goldman 1963: 386, fig. 178: 38; Webb 1985: 323).

Norşuntepe, eastern Turkey; Iron Age (c. 600 B.C.)

3 incised *Ovis/Capra* scapulae:

Q17E NH 3 (von den Driesch & Boessneck 1981: figs. 1, 3) – 48 incisions, each 1–3 mm long.

022b 9RB (1981: fig. 2) – 10 incisions.

P 19,15 G7 – 17 incisions (von den Driesch & Boessneck 1981; Webb 1985: 323 n. 10)

SYRIA

Ras Shamra (Ugarit); ?LB

There are 3 incised bones, called “racleurs à musique” (“musical scrapers”) here. There is one *Bos* scapula fragment with 16 preserved incisions from the 1938 excavations near the Royal Palace, pres. L 90 (Trench SWR, locus 1789; Louvre 81 AO 242) (Caubet 1987: 735, fig. 1, 1996: 12, fig. 6). There are also one bovid metapodial with 25 incisions and one *Ovis* metapodial with 39 preserved incisions (Caubet 1987: 735, fig. 2, 1996: 12, fig. 7).

Apamée, on the Orontes; EB

Scapula, F glenoid, with 24 incisions. Said to be a musical instrument (Otte et al. 1982).

Tell al-Raqā'i, on the middle Khabur River, from street of Level 4; Ninevite 5 (c. 2900–2700 B.C.)

Called a rib (but looks like a scapula fragment), broken, 11+ widely spaced incisions 5–7 apart, highly polished, L 83, W 24, T 10, incision L 17, W 1, depth 1 (Dunham 1994: figs 1–3, no. Raq 9229/114–514–I, I–201).

Tell Gudea, on the middle Khabur River; Stratum IIa, Ninevite 5 (c. 3000–2500 B.C.)

Three fragments of one *Bos* scapula (F glenoid) with a total of over 30 incisions, with some regularly spaced. Suggested uses include working fibres or leather, playing music, counting, and divination (Fortin et al. 1994: 53, fig. 3).

Tell Tuneinir, on the Khabur River: Area I, EB–MB

Bone with at least 8 incisions (Loyet 1994: 25, fig. 7; said to be a long bone shaft, seemingly no. 1263, Square 60, locus 14, reg. #974, charred).

Tell Bdēri, on the Khabur River: LB

Bos scapula with F glenoid and at least 12 incisions preserved (Becker 1988: 381, pl. 60a–b, Area 2963, no. Bd85/2963I/85).

Tabara el-Akrad (just east of Atchana, inland from al Mina) (1949 excavation; Trench A). Level I, Early Iron Age (c. 1100–520 B.C.)

Fragmentary scapula from store/granary pit; pres. L 20, broken, 34+ very straight regular incisions, nearly 2 wide (Hood 1951: 146, fig. 12: 9; Webb 1977: 77, 1985: 323; in Antakya Museum).

Fragmentary scapula from store/granary pit; curving bone, pres. L 85, broken, 17+ incisions (Hood 1951: 146, fig. 12: 10; Webb 1977: 77, 1985: 323; in Antakya Museum).

LEBANON

Byblos

Early Neolithic (c. 6000–5000 B.C.), 29 incisions very lightly executed along the posterior border of the ventral face of the scapula (Dunand 1973: 75, pl. XCIX: 24469; Webb 1977: 76, 1985: 322–23; von den Driesch & Boessneck 1985: 47).

Early Neolithic (c. 6000–5000 B.C.), not illustrated (Dunand 1973: 75, no. 22109; Webb 1985: 323).

Late Neolithic (c. 4500–4100 B.C.), 2 fragmentary incised bones (Dunand 1973: 163 no. 31465, pl. CV: 33655).

Early Eneolithic (c. 4100–3600 B.C.), 12 surviving incisions, probably not a scapula (Dunand 1973: 207, pl. CLIV: 30573, 207, fig. 134; Webb 1977: 76, 1985: 323).

Late Eneolithic (c. 3600–2900 B.C.), scapula with 13 incisions along the posterior border (Dunand 1973: pl. CLIX: 25260; Webb 1977: 76, 1985: 323).

Late Eneolithic (c. 3600–2900 B.C.), 2 fragmentary incised bones (Dunand 1973: 310 nos. 23796, 33869).

Post-Neolithic (Levée II), 40 preserved incisions, not clear if a scapula (Dunand 1954: 146, fig. 139 bis, no. 7784; Webb 1985: 323 n.5).

ISRAEL

Hayonim cave, western Galilee; Upper Paleolithic (Levantine Aurignacian, Level D), 5 incised scapula (3 are on display in Israel Museum, Case 7 #6)

Gazella scapula, F glenoid (Davis 1974: 181, fig. 2).

Gazella scapula (Davis 1974: 181, fig. 3).

Gazella scapula, F glenoid (Davis 1974: 181, fig. 4).

Gazella scapula, F glenoid (Davis 1974: 181, fig. 5).

Gazella scapula, F glenoid (Davis 1974: 181, fig. 6).

Tell Turmus, Huleh Valley, eastern bank of the Seon (Bamyas) River; Chalcolithic

2 fragments of an incised scapula, 21 surviving regularly spaced incisions along posterior border of the ventral face (Dayan 1969: fig. 9: 15; Webb 1985: 323).

Tell Miqne-Ekron, Philistia (personal analysis)

Iron I (1st third 12th c. B.C.)

INE 69.71, 69020 (debris, VII) 6/22/95

Ovis/Capra scapula – small fragment, 1 incision, part of a second, L 55.0, W 18.75 (#11307).

Iron I (1st half 11th c.)

INE 3.138, 3025D (fill, post VA, shrine) 5/6/82

Bos scapula – F glenoid, complete, missing part of *tuber scapulae*, has 38 incisions, max L 29.75, incised area 165 long, has *margo vertebralis*, right, L c340, GLP 63.25 (#157) (Dothan & Gitin 1982: 71, 132, 1994: 10 fig.; Gitin & Dothan 1987: 203 fig., 204; Dothan 1989: 9, fig. 1: 8 [insitu]; Dothan & Gitin 1990: 27, 28 fig.; Dothan & Dothan 1992: 242 fig.).

ISW 29.161, 29062 (street surface, VB) 6/22/93

Scapula fragment – 7 incisions present, L 31.25, W 21.0 (#11323).

ISW 4.354, 4105 (fill in street area, VC) 6/15/93

Ovis/Capra scapula – broken, 7 deep incisions present (L 7.25), incisions poorly made and irregularly spaced, L 56.5, W 20.25 (#4632).

ISW 28.348, 28119 (street surface, VC) 6/20/95

Scapula – 5 incisions (#6725).

Iron I (2nd half 11th to early 10th c.)

INE 3.106, 3022 (pit, IV, shrine) 5/5/82

Bos scapula – F glenoid, with *tuber scapulae* sawn off, restored, 6 incisions and incised line along upper glenoid, 23 incisions on glenoid fragment (L c97.0), also 23 incisions on large piece (L c140.0), glenoid W 56.75 (#108) (Dothan & Gitin 1982: 65, 145; ASOR Newsletter 35/6 [July 1984]: 9).

III NE 5.243, 5031 (fill, IVA) 6/9/94

Ovis/Capra scapula – recently broken glenoid area, 7 preserved incisions along edge (more missing toward glenoid), right, L 119.0 (#9669).

III NE 5.333, 5076 (fill, IVB) 6/28/94

Medium-sized scapula – broken, 8 incisions (some have other faint lines around them), has *margo vertebralis*, L 91.0, W 48.25, T 8.25 (#6492).

III NE 8.354, 8073.1 (fill, IVB) 7/19/92

Rather small scapula – broken, 23 incisions present, some rather long (11.5), left, L 124.0 (#4519).

Iron II (1st half 8th c.)

I NE 3.53, 3011 (construction fill, IIB, shrine) 5/13/81

Bos scapula – F glenoid, broken, at least 17 incisions, right, glenoid and side piece W 58.25, L c225.0 (#7632) (Hesse 1986: 25, fig. 4).

Iron II (early 7th to early 6th c.)

III SE 4.49, 4005 (fill, I) 8/8/84

Ovis/Capra scapula – small fragment, 2 incisions, left, L 44.25, W 25.0 (#11308).

III SE 4.48, 4008.1 (fill, I) 8/2/84

Ovis/Capra scapula – small fragment, 3 incisions, thick, L 41.25, W 25.25 (#11324).

Undated

I NE 3.404, balk trim, 7/8/86

Ovis/Capra scapula – small fragment, 1 incision (L c8.0), part of a second, L 34.25, W 16.25 (#9692).

Other incised bones

Late Bronze II (14th-13th c. B.C.)

I NE 7.172, 7041 (debris, VIII) 7/8/86

Bos rib fragment, has 4 long deep incised lines (entire width of bone) and 4 thinner/finer lines, trimmed on one edge (other broken), L 102.5, W 33.75 (#1359).

Iron I (last 2/3rds 12th c. B.C.)

I SW 4.449, 4108 (street surface, VIA) 7/13/93

Bos metacarpus – proximal end with much of shaft, cut down shaft, polished, slightly burnt, 50+ incisions along side of various lengths, widths, and depths, L 153 (#5077).

Iron II (10th-9th c. B.C.)

I SW 29.286, 29097 (foundation trench, III) 7/21/93

Bos proximal metacarpus with 9 incisions (now eroding) below proximal, L 91.25, proximal W 51.0 (#11433).

Undated

I NE 5.315, North balk trim, 7/3/85

Ovis/Capra tibia shaft with 10 incisions, L 66.0 (#11409).

I NE 36.208, 36083, 6/14/94

Sus tibia – distal F, proximal missing, trimmed on part of distal side, right, L c160.0, proximal W 34.75, 41 incisions along one edge (#5557).

III NE 7.358, 7075 (fill) 6/30/93

Bird tibiotarsus shaft with 11 incisions on all sides of bone, L 50.5 (#11339).

IV SE 13.63, 13001, 7/8/86

Bone fragment with 3 equally spaced incisions, L 48.0, W 18.5 (#11388).

Unmodified scapula

I NE 3.386, 3074 (pit, VI), Iron I, last two thirds 12th c. B.C., 7/1/86

Bos scapula – complete, F glenoid, unmodified, has *margo vertebralis*, right, GLP 53.25, Ld 141.75, SLC 42.25, Hs 286.0 (#9674). Dothan (1989: 12 n. 5) notes this scapula and a *lekane* vessel in a pit in the I NE.3 sanctuary of the 12th c.

Tell Abu Hawwam, Late Bronze Age or Iron Age

Bos scapula with incisions; seen in Israel Antiquities Authority conservation lab at Har Hozvim, Jerusalem.

Tell Dor, Iron Age

Bos scapulae, at least 4 examples with incisions, one with 24, other 27 incisions (Stern 1994a: 96, fig. 49, 1994b: 5-6, fig. 6; personal communication from E. Stern, 4 May 2001).

Ashkelon, Iron Age (1998 season, from 73/98 Grid 38)

At least 1 *Bos* scapula, F glenoid, 40 incisions regularly spaced along one edge (Stager 2000 fig.; Barako 2000: 523 n.80).

Tell es-Safi/Gath, Iron II (late 9th-early 8th c. B.C.) destruction

3 incised scapula with 2 probably *Bos* and 1 possibly *Ovis/Capra* (personal communications from A. M. Maeir, November 2000 and 10 July 2001).

WEST BANK**Jericho**, Pre-Pottery Neolithic A

Incised ?scapula, broken, at least 13 incisions on one side, 2 on other, from Tr. E.x.a (Marshall 1982: 611, fig. 248: 1, pl. IXb: A, #2819). In Amman National Museum (Kenyon & Holland 1983: 827).

IRAQ**Sakce Gözü**, Neolithic (c. 5500–5000 B.C.)

Several fragments, one scapula has 21 incisions, another (possibly a rib), has 13 incisions grouped in the middle of the bone (du Plat Taylor et al. 1950: 119–20, fig. 30: 4–5; Webb 1985: 322).

Tall Arpachiyah, Neolithic (Halaf, c. 5500–5000 B.C.)

Several incised examples; one illustrated fragment of a *Bos* scapula has 15 incisions across the central ridge (Mallowan & Cruickshank Rose 1935: 103, pl. XIIa, no. 716B; Webb 1977: 76).

Nuzi, Late Bronze Age (Hurrian)

Several incised scapulae from private houses (Starr 1939: 488, II: pl. 127 DD, has at least 19 incisions).

Yarim Tepe I, Sinjar valley, NW Iraq; Neolithic (Hassuna, c. 6000–5500 B.C.)

Bone fragment (?scapula) with at least 12 incisions, not all parallel or evenly spaced (Merpert & Munchajev 1971: pl. VI: 6c; Sq. 28, Level V).

Scapula fragment with at least 15 incisions (Munchajev & Merpert 1973:9, pl. VII: 1, Sq. 27, construction Level VI).

Scapula fragment with at least 27 incisions (Ibid, p. 9, pl. VII: 2, Sq. 36, construction Level VII).

Scapula fragment with at least 29 incisions (Ibid, p. 9, pl. VII: 3, Sqs. 36–46, construction Level VI).

Yarim Tepe II, Sinjar valley, NW Iraq; Neolithic (Halaf, c. 5500–5000 B.C.)

One incised scapula fragment (Merpert et al. 1976: pl. XXIX).

IRAN**Haji Firuz Tepe**, Neolithic (Phase A₂₋₃, c. 5900–5000 B.C., F 11, Field no. HF 68–236)

Scapula fragment with 9+ incisions, not all parallel, smoothed, lightly polished, L 71, W 38, T 18; suggested to be musical rasps (Voigt 1983: 212, 216–17, fig. 108e, pl. 31c; Meadow suggests it is a scapula or rib fragment from a large mammal, probably *Bos*).

SPAIN**Morro of Mezquitilla**, Málaga (c. 700 to 7th c. B.C.)

There are 2 Phoenician incised scapulae, one *Capra* (Mo 82-1838; 8th/7th c.; von den Driesch & Boessneck 1985: pl. 6: 2) and one *Sus* (pl. 6: 3; Mo 82-2002).

Abbreviations

AAP	Athienou Archaeological Project
av.	average
c	approximately
c.	century
CA	Cypro-Archaic
CC	Cypro-Classical
CG	Cypro-Geometric
F	fused
FNB	Finds Notebook
GLP	greatest length of the <i>processus articularis</i> (glenoid process)
Hs	height along the spine
L	length
LC	Late Cypriote (Late Bronze Age of Cyprus)
Ld	greatest dorsal length
Lev.	Level
LG	length of the glenoid cavity
m	meter
max.	maximum
mm	millimeter
n.	footnote
NB	Notebook
p.	page
pres.	preserved
SLC	smallest length of the <i>collum scapulae</i> (neck of the scapula)
Sq(s).	Square(s)
T	thickness
W	width (all measurements are in mm)

Zusammenfassung

In der Zeit des Neolithikum bis in die Eisenzeit wurden von Menschen in der östlichen Mittelmeer-Region und im Nahen Osten Knochen (überwiegend Schulterblätter größerer Säugetiere) in spezifischer Weise bearbeitet und mit Kerben versehen. Diese Knochenobjekte, bisweilen als Musikinstrument, Kerbholz, Instrument zur Weissagung oder einfach als Werkzeug interpretiert, werden hier in einen breiteren chronologischen und geographischen Kontext gestellt, und es wird ein Katalog der bis heute bekannten Objekte gegeben.

References

- Barako, T. J. (2000): The Philistine Settlement as Mercantile Phenomenon? – *American Journal of Archaeology* 104/3: 513–530.
- Barnett, R. D. (1957): *A Catalogue of the Nimrud Ivories in the British Museum*. – London: British Museum.
- Becker, C. (1988): Die Tierknochenfunde vom Tell Bdēri 1985. – *Damaszener Mitteilungen* 3: 379–386.
- Bietak, M. (1985): Eine „Rhythmusgruppe“ aus der Zeit des späten Mittleren Reiches: ein Beitrag zur Instrumentenkunde des Alten Ägypten. – *Jahreshefte des Österreichischen Archäologischen Instituts in Wien* LVI/6: 3–18.
- Braidwood, R. J. & L. S. Braidwood (1960): *Excavations in the Plain of Antioch I*. OIP 61. – Chicago: University of Chicago Press.
- Bunnens, G. (1997): Carved Ivories from Til Barsib. – *American Journal of Archaeology* 101/3: 435–450.
- Caubet, A. (1987): La musique à Ougarit. – *Comptes Rendues des séances de l'Académie des Inscriptions et Belles-lettres*: 731–754.
- Caubet, A. (1996): La Musique à Ougarit: nouveaux témoignages matériels. – In: N. Wyatt, W. G. E. Watson & J. B. Lloyd, eds., *Ugarit, religion and culture. Proceedings of the International Colloquium on Ugarit, religion and culture*. Edinburgh, July 1994. Essays

- presented in honour of Professor John C. L. Gobson. *Ugaritosch-Biblische Literatur* 12. Münster: Ugarit-Verlag, 9–31.
- Courtois, J. C. (1971): *Le Sanctuaire du dieu au lngot d'Enkomi. – Alasia I (Mission Archéologique d'Alasia IV)*. Leiden: E. J. Brill, 151–362.
- Courtois, J. C. (1984): *Alasia III. Les Objets des Niveaux Stratifiés d'Enkomi (Fouilles C.F.A. Schaeffer 1947–1970). – Mission Archéologique d'Alasia Vol. VI*. Paris: Éditions Recherche sur les Civilisations, Mémoire no. 33.
- Courtois, J. C. (1986): *Brief Historique des Recherches Archéologiques à Enkomi. – Part I* in: J. C. Courtois & J. & E. Lagarce, *Enkomi et le Bronze Récent à Chypre*. Nicosia: Imprimerie Zavallis, Fondation A. G. Leventis, 1–58.
- Davis, S. (1974): *Incised bones from the Mousterian of Kebara cave (Mount Carmel) and the Aurignacian of Ha-Yonim cave (Western Galilee), Israel. – Paléorient* 2/1: 181–182.
- Dayan, Y. (1969): *Tell Turmus in the Huleh Valley. – Israel Exploration Journal* 19/2: 65–78.
- Driesch, A. von den & J. Boessneck (1981): *Über drei gekerbte Schulterblätter im archäologischen Fundgut von Norşuntepe/Ostanatolien. – Archäologie und Naturwissenschaften* 2: 72–75.
- Driesch, A. von den & J. Boessneck (1985): *Osteologische Besonderheiten vom Morro de Mezquitilla/Málaga. – Madrider Mitteilungen* 26: 45–48.
- Dikaïos, P. (1969): *Enkomi, Excavations 1948–1958 I The Architectural Remains, The Tombs. – Mainz am Rhein: Verlag Philipp von Zabern*.
- Dikaïos, P. (1971): *Enkomi, Excavations 1948–1958 II Chronology, Summary and Conclusions, Catalogue, Appendices. – Mainz am Rhein: Verlag Philipp von Zabern*.
- Dothan, T. & S. Gitin (1989): *The Arrival of the Sea Peoples: Cultural Diversity in Early Iron Age Canaan. – In: S. Gitin & W. G. Dever, eds., Recent Excavations in Israel: Studies in Iron Age Archaeology. AASOR* 49. Winona Lake, 1–14.
- Dothan, T. & S. Gitin (1998): *Initial Philistine Settlement: From Migration to Co-existence. – In: S. Gitin, A. Mazar & E. Stern, eds., Mediterranean Peoples in Transition: Thirteenth to Early Tenth Centuries BCE. Jerusalem: Israel Exploration Society*, 148–161.
- Dothan, T. & S. Gitin (1982): *Tell Miqne (Ekron) Excavation Project. Field Report. Field I NE – Areas 2, 3, 4, 5, 6, 7. – Jerusalem: W.F. Albright Institute of Archaeological Research*.
- Dothan, T. (1990): *Ekron of the Philistines. How They Lived, Worked and Worshipped for Five Hundred Years. – Biblical Archaeology Review* XVI/1: 21–36.
- Dothan, T. (1994): *Tell Miqne (Ekron): The Rise and Fall of a Philistine City. – Qadmoniot* 27/1-2 (105–106): 2-28 (Hebrew).
- Dothan, T. & M. Dothan (1992): *People of the Sea: The Search for the Philistines. – New York: Macmillan Publishing Company*.
- Dunand, M. (1954): *Fouilles de Byblos II. – Paris: Librairie d'Amérique et d'Orient Adrien Maisonneuve*.
- Dunand, M. (1973): *Fouilles de Byblos V. – Paris: Librairie d'Amérique et d'Orient Adrien Maisonneuve*.
- Dunham, S. (1994): *An early percussion instrument from Tell al-Raqā'i, North Syria. – Source Notes in the History of Art* XIII/4: 36–43.
- Erdmann, E. (1977): *Ausgrabungen in Alt-Paphos auf Cypern I Nordosttor und Persische Belagerungsrampe in Alt Paphos I. Waffen und Kleinfunde. – Konstanz: Universitätsverlag Konstanz GmbH*.
- Falsone, G. (1992): *Nuovo Coppe Metalliche de Fattura Orientale. – Vicino Oriente* 8/2: 83–112.
- Fortin, M., B. Routledge & C. Routledge (1994): *Canadian Excavations at Tell Gudeda (Syria) 1992–1993. – The Canadian Society for Mesopotamian Studies Bulletin* 27 (May): 51–63.
- Gitin, S. & T. Dothan (1987): *The Rise and Fall of Ekron of the Philistines: Recent Excavations of an Urban Border Site. – Biblical Archaeologist* 50/1: 197–223.
- Goldman, H. (1963): *Excavations at Gözlü Kule, Tarsus III The Iron Age. – Princeton: Princeton University Press*.
- Hesse, B. (1986): *Animal Use at Tel Miqne-Ekron in the Bronze Age and Iron Age. – Bulletin of the American Schools of Oriental Research* 264: 17–27.

- Hood, S. (1951): Excavations at Tabara el Akrad, 1948–49. – *Anatolian Studies* I: 113–147.
- Karageorghis, V. (1971): Un bronze votif incrit (modèle de foi ou de rein?) trouvé à Kition en 1970. – *Studi Cipriotie Rapporti di Scavo*: 237–248.
- Karageorghis, V. (1990a): Tombs at Palaepaphos: 1. Teratsoudhia, 2. Eliomylia. – Nicosia: A. G. Leventis Foundation.
- Karageorghis, V. (1990b): Miscellanea from Late Bronze Age Cyprus II. A Late Bronze Age Musical Instrument? *Levant* XXII: 159.
- Karageorghis, V. (1999): Excavations at Kition VI The Phoenician and Later Levels (Plates). – Nicosia: Department of Antiquities.
- Karageorghis, V. (2001): Excavations at Kition VI/II The Phoenician and Later Levels. (Text). – Nicosia: Department of Antiquities.
- Karageorghis, V. & M. Demas (1985): Excavations at Kition V (Plates). – Nicosia: Department of Antiquities.
- Kenyon, K. M. & T. A. Holland (1983): Excavations at Jericho V. The British School of Archaeology in Jerusalem. – Oxford: University Press.
- Lehmann, E. von & G. Nobis (1979): Subfossile Mauswiesel, *Mustela nivalis* Linné, 1766 aus Enkomia-Alasia auf Zypern. *Bonner zoologische Beiträge* 30: 32–38.
- Loyet, M. A. (1994): Analysis of Faunal Remains from Tell Tuneinir, Syria. – Senior Honors Thesis, Department of Anthropology, Washington University, St. Louis.
- Mallowan, M. E. L. & J. Cruickshank Rose (1935): Excavations at Tall Arpachiyah, 1933. – *Iraq* 2: 1–178.
- Markoe, G. (1984): Phoenician Bronze and Silver Bowls from Cyprus and the Mediterranean. – Berkeley: University of California Press.
- Marshall, D. N. (1982): Jericho Bone Tools and Objects. – Appendix E in: K. M. Kenyon & T. A. Holland, Excavations at Jericho IV. The British School of Archaeology in Jerusalem. Oxford: University Press, 570–622.
- Merpert, N. & R. Munchajev (1971): Excavations at Yarim Tepe 1970. Second Preliminary Report. – *Sumer* XXVII: 9–21.
- Merpert, N., R. Munchajev & N. O. Bader (1976): The Investigations of the Soviet Expedition in Iraq 1993. – *Sumer* XXXII: 25–61.
- Munchajev, R. M. & N. I. Merpert (1973): Excavations at Yarim Tepe 1972. Fourth Preliminary Report. – *Sumer* XXIX: 8–16.
- Nobis, G. (1976–77): Tierreste aus Tamassos auf Zypern. – *Acta Praehistorica et Archaeologica* 7–8: 271–300.
- Nobis, G. (1985): Tierreste aus dem Prähönizischen Kition. – In: V. Karageorghis, Excavations at Kition V/II. Nicosia: Department of Antiquities, 416–433.
- Nobis, G. (2000): Tierreste aus dem phönizischen Kition. – In: P. Åström & D. Sörenhagen, eds., *PERIPLUS: Festschrift für Hans-Günter Buchholz zu seinem achtzigsten Geburtstag* am 24. Dezember 1999. SIMA CXXVII. Jönsered: Paul Åströms Förlag, 121–134.
- Nobis, G. & E. von Lehmann (1979): Ein Geweihstück vom Rothirsch, *Cervus elaphus* Linné, 1758, aus Kition, Zypern. – *Säugetierkundliche Mitteilungen* 27: 158–160.
- Otte, M., A. Gautier & P. Bibuyck (1982): Interprétation d'un ossement encoché de la préhistoire syrienne. – *Paléorient* 8/1: 85–86.
- du Plat Taylor, J. (1957): Myrtou-Pigadhes, A Late Bronze Age Sanctuary in Cyprus. – Oxford: Ashmolean Museum.
- du Plat Taylor, J., M. V. Seton Williams & J. Waechter (1950): Excavations at Sakce Gözü. – *Iraq* 12: 53–138.
- Redman, C. L. (1973): Early Village Technology: A View through the Microscope. – *Paléorient* 1/2: 249–261.
- Reese, D. S. (1985): Shells, Ostrich Eggshells and Other Exotic Fauna from Kition. – Appendix VIII in: V. Karageorghis, Excavations at Kition V/II. Nicosia: Department of Antiquities, 340–415.
- Reese, D. S. (1988): A New Engraved Tridacna Shell from Kish. – *Journal of Near Eastern Studies* 47/1: 35–41.
- Reese, D. S. (1998): A Hippopotamus Tooth from Hala Sultan Tekke, Cyprus. – Appendix III in: P. Åström, The Wells (Hala Sultan Tekke 10). SIMA XLV: 10. Jönsered: Paul Åströms Förlag, 140–146.

- Reese, D. S. (2001): The Shells, Astragali and Fish. – Appendix IX in: V. Karageorghis, *Excavations at Kition VI/II The Phoenician and Later Levels (Text)*. Nicosia: Department of Antiquities.
- Reese, D. S. & C. Sease (1993): Some Previously Unpublished Engraved Tridacna Shells. – *Journal of Near Eastern Studies* 52/2: 109–128.
- Sease, C. & D. S. Reese (1994): An Unpublished Stone Palette. – *Journal of Near Eastern Studies* 53/4: 285–294.
- Seton-Williams, M. V. (1957): The Lamps and Miscellaneous Objects. – In: J. du Plat Taylor, *Myrtou-Pigadhes, A Late Bronze Age Sanctuary in Cyprus*. Oxford: Ashmolean Museum, 75–79.
- Smith, J. S. (1997): Preliminary Comments on a Rural Cypro-Archaic Sanctuary in Polis-Peristeries. – *Bulletin of the American Schools of Oriental Research* 308: 77–98.
- Snodgrass, A. M. (1994): Gains, losses and survivals: what we can infer from the eleventh century B. C. – In: V. Karageorghis, ed., *Proceedings of the International Symposium “Cyprus in the 11th century B.C.”*. Nicosia: A. G. Leventis Foundation, 167–174.
- Stager, L. E. (2000): *Ashkelon Excavations, The Leon Levy Expedition, 2000*. – Brochure about excavation.
- Starr, R. F. S. (1939): *Nuzi, Excavations at Yorgan Tepe near Kirkuk (1927–1931)*. – Cambridge: Harvard University Press.
- Steklis, M. & G. Haas (1952): The Abu Usba Cave (Mount Carmel). – *Israel Exploration Journal* 2/1: 15–47.
- Stern, E. (1994a): Dor, Ruler of the Seas: Twelve Years of Excavation at the Israelite-Phoenician Harbor Town on the Carmel Coast. – Jerusalem: Israel Exploration Society.
- Stern, E. (1994b): A Phoenician-Cypriote Votive Scapula from Tel Dor: A Maritime Scene. – *Israel Exploration Journal* 44/1-2: 1–12.
- Stucky, R. A. (1974): The Engraved Tridacna Shells. – *Dédalo* 19: 1–170.
- Tixier, J. (1974): Poinçon décoré du Paléolithique supérieur à Ksar ‘Aqil (Liban). – *Paléorient* 2/1: 187–192.
- Turville-Petre, F. (1932): Excavations in the Mugharet el-Kebarah. – *Journal of the Royal Anthropological Institute of Great Britain and Ireland* LXII (July–December): 271–276.
- Voigt, M. M. (1983): *Haji Firuz Tepe, Iran: The Neolithic Settlement*. – University Museum Monograph 50. Philadelphia: The University Museum.
- Watson, P. J. & S. A. LeBlanc (1990): *Girikihacian, A Halafian site in Southeastern Turkey*. – Monograph 33. Los Angeles: Institute of Archaeology, University of California at Los Angeles.
- Webb, J. M. (1977): A Scapula from Limassol-“Komissariato” No 176. – Appendix II in: V. Karageorghis, *The Limassol Sanctuary. Part Two in: Two Cypriote Sanctuaries of the end of the Cypro-Archaic Period*. Rome: Consiglio Nazionale delle Ricerche, 74–80.
- Webb, J. M. (1985): The Incised Scapulae. – Appendix VI in: V. Karageorghis, *Excavations at Kition V/II*. Nicosia: Department of Antiquities, 317–328.
- Yalcinkaya, I., J. M. Leotard, M. Kartal, M. Otte, O. Bar-Yosef, I. Carmi, A. Gautier, E. Gilot, P. Goldberg, J. Kozłowski, D. Lieberman, I. Lopez-Bayon, M. Pawlikowski, St. Thiebault, V. Ancion, M. Patou, A. Emery-Barbier & D. Bonjean (1995): Les Occupations Tardiglaciaires du Site d’Öküzini (Sud-Ouest de la Turquie), Résultats Préliminaires. *L’Anthropologie* 99/4: 562–583.
- Zeuner, F. E. (1957): The Persian fallow deer and other animal remains from the Sanctuary. – Chapter Xa in: J. du Plat Taylor, *Myrtou-Pigadhes, A Late Bronze Age Sanctuary in Cyprus*. Oxford: Ashmolean Museum, 97–100.
- Zeuner, F. E. (1958): Animal remains from a Late Bronze Age Sanctuary on Cyprus, and the problem of the domestication of fallow deer. – *Journal of the Palaeontological Society of India* 3: 131–135.

Dr. David S. Reese, Peabody Museum of Natural History, Yale University, P. O. Box 208118, New Haven, CT 06520-8118, U.S.A.