

FAUNAL REMAINS FROM THE ALTAR OF APHRODITE OURANIA, ATHENS

(PLATES 15, 16)

IN 1981 a rectangular monumental altar with a limestone base and marble orthostates and crowning course was found on the north side of the Agora Excavations, to the north of the Panathenaic Way and present-day Adrianou Street. It was excavated and attributed to Aphrodite Ourania (Heavenly Aphrodite). It dates to around 500 B.C. and was repaired in the third quarter of the 5th century. The complete altar interior would have been just under four meters long; just under two meters of its length were preserved and contained a large quantity of burnt animal bones.¹ The fill within the altar was carefully processed by flotation.

A preliminary report on the bones from this altar was published in 1984.² During the summer of 1987 it was possible to undertake further analysis of this faunal collection,³ and the present study supersedes the previously published report.

The faunal remains comprise five lots (BE 276, 278, 280–282). After final sorting and removal of stones, potsherds, and dried mud, the faunal sample weighed 12 kg., with 43% from BE 278, 28% from BE 282, and 22% from BE 276. Since there is no stratigraphic or contextual reason to keep these lots separate, the material is discussed here as one unit.

The burnt and unburnt faunal remains should be seen as part of a secondary-fill deposit. The material did not enter the altar directly from sacrifice on the altar itself. The bones and shells are part of the earth filling, no doubt shoveled into the base of the altar from a neighboring dump at the time the altar was reconstructed. For this reason there is also some unburnt faunal material present.

¹ T. L. Shear, Jr., "The Athenian Agora: Excavations of 1980–1982," *Hesperia* 53, 1984 (pp. 1–57), pp. 24–33, fig. 13.

² G. V. Foster, "The Bones from the Altar West of the Painted Stoa," *Hesperia* 53, 1984, pp. 73–82 (= Foster). This preliminary report has been cited in C. Williams and H. Williams, "Excavations on the Acropolis of Mytilene, 1985," *Classical Views* 30, n.s. 5, fasc. 2, 1985 (pp. 141–154), p. 144; J. M. Camp, *The Athenian Agora, Excavations in the Heart of Classical Athens*, London 1986, p. 57, fig. 37, where it is noted that the altar produced "mostly pigs, sheep and goats, with an occasional bird"; M. Kanowski, *Old Bones: Unlocking Archaeological Secrets*, Melbourne 1987, pp. 92–93; M. H. Jameson, "Sacrifice and Animal Husbandry in Classical Greece," in *Pastoral Economies of Ancient Greece and Rome* (Cambridge Philological Society, Suppl. Vol. 14), C. R. Whittaker, ed., Cambridge 1988, pp. 87–119.

³ I thank Professor T. Leslie Shear, Jr. for permission to study the fauna and publish this article, and Craig Mauzy for the excellent photographs of difficult material. Figures 1 and 2 were drawn by Zbigniew Jastrzebski, Field Museum of Natural History. In 1984 Sebastian Payne had a brief look at this bone collection, and I thank him for sharing his unpublished notes with me. I am grateful to Professor Joseph Shaw and Professor Hector Williams for permission to study and publish the faunal material from Kommos and Mytilene, respectively.

Unburnt Bones and Shells

The unburnt bone and shell material is considered to be intrusive and not related to the burning on the altar. It will not be dealt with here at any length except to note that it includes a small number of sheep or goat and pig remains (a few rodent gnawed), 157 mouse (*Mus* sp.) bones from at least 13 individuals, 4 bird bones (2 definitely chicken), eggshell fragments (probably chicken), 3 fish bones, 1 frog/toad bone, 11 recent marine shells (Pl. 16:d, left and e, left), and 2 fossil shells.

Of the 18 astragalus (knucklebone) fragments found, both sheep and goat are definitely present. At least 7 are unburnt and 4 only slightly charred. Most are well ossified and unlikely to be from very young individuals. At least 9 have butchering marks on them and 2 have been cut in half across the proximo-distal axis. Four astragali have been modified: one drilled off center through the dorso-plantar axis (BI 966),⁴ one ground down on the dorsal side (BI 964), one ground down on the lateral, medial, and dorsal sides (BI 965), and one ground down on the lateral and medial sides with an epsilon engraved on the medial side (BI 963).⁵

These astragali probably have little to do with the bones burnt on the altar. It is most likely that they are all gaming pieces used in astragalomancy (divination by casting knucklebones), which was probably performed in the area around the altar.⁶ During reconstruction of the altar they were thrown into the deposit with the other fill.

Burnt Sheep and Goat Bones

Over 95% of the sample is burnt gray, blue-gray, or gray-white, suggesting that the temperature of the fire was 645–940° C, the temperature at which bone becomes calcined or completely incinerated. At such temperatures bones may shrink as much as 15–25%, depending on bone density and the temperature and duration of the fire. It is quite clear that the bone was burnt “green”, or flesh covered. Burning bone in this condition (as opposed to dry or defleshed bone) creates transverse fracture lines, cracking, checking, irregular longitudinal splitting, and marked warping or twisting.⁷ Such evidence is commonly seen on the bones from this altar.

⁴ Foster, pl. 20:e.

⁵ Foster, pl. 20:f.

⁶ For definition of astragali terms, further information, and references see D. S. Reese, “The Kition Astragali,” Appendix VIII(C) in V. Karageorghis, *Excavations at Kition*, V, ii, Nicosia 1985, pp. 382–391 and P. Amandry, “Os et coquilles,” chap. IX in *L’antre corycien II* (BCH Suppl. Vol. IX), Paris 1984, pp. 347–380.

Astragali are known from many Greek sanctuary sites: the Sanctuary of Eros and Aphrodite on the North Slope of the Athenian Acropolis, Isthmia, the Temple of Apollo at Corinth, the Sanctuary of Demeter and Kore on Acrocorinth, the Sanctuary of Apollo Maleatas at Epidauros, the Sanctuary of Hera Limenia at Perachora, the Temple of Apollo at Halieis, the Kabeirion at Thebes, the Corycian cave near Delphi, the Sanctuary of Artemis Orthia at Sparta, the Temple of Pamisos at Ayios Florios in Messenia, the Altar Court at Samothrace, the Sanctuary of Asklepios at Lissos on Crete, etc.

⁷ For recent work on burnt bone, with references, see P. Shipman, G. Foster, and M. Schoeninger, “Burnt Bones and Teeth: an Experimental Study of Color, Morphology, Crystal Structure, and Shrinkage,” *JAS* 11, 1984, pp. 307–325.

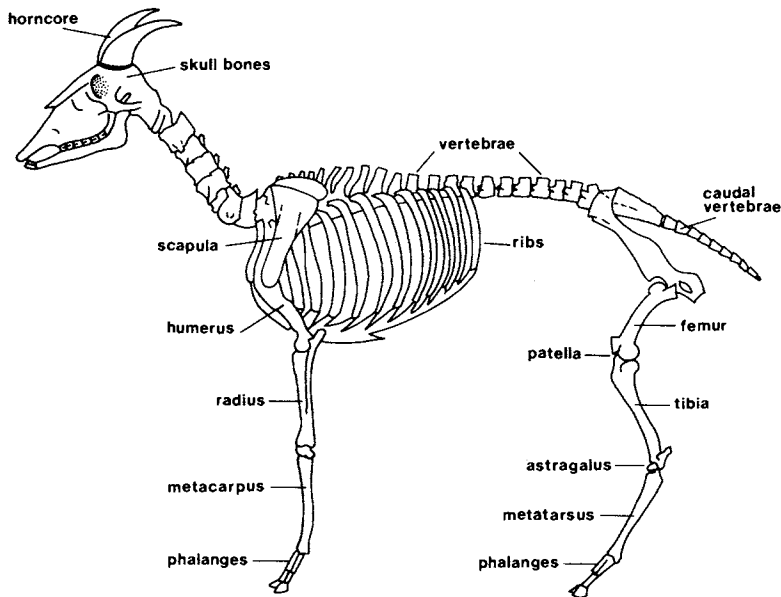


FIG. 1. Location of anatomical elements mentioned in the text

Almost 3200 burnt bone fragments were identifiable with respect to element and species. Sheep (*Ovis aries*) and goat (*Capra hircus*) are by far the most frequent burnt animals in the sample. Numerically the most common identifiable sheep or goat bone fragments present are vertebrae (1909, 59.8%; Pl. 15:a, caudal vertebrae), femur (532, 16.7%; Pls. 15:b, c), ribs (510, 16.0%; Pl. 15:d), patella (kneecap; 105, 3.3%; Pl. 16:a) and horncore (84, 2.6%, some definitely goat; Pl. 16:b). (See Figure 1 for the location of these and other body parts mentioned in the text, and Figure 2 for the parts of the femur.)

Analysis of the 193 proximal femur (thigh) fragments (Table 1), mainly the capita femoris (head; Pl. 15:b, upper row and lower left) with a few trochanter majus (Pl. 15:b, lower right), indicates that there are at least 158 limbs from at least 79 sheep or goat individuals present. Of those whose age can be determined, over 98% are unfused and therefore under 2.5–3 years old.⁸ None are older. Some femur heads are very small, with non-compact articular surfaces, and are likely to be from individuals in their first year. There are 61 small, fragmentary shafts which are likely to be femurs.

For the 239 distal femur remains (Table 1), 99% are unfused and come from individuals under 3–3.5 years old, with none over this age. For the distal end there are 158 lateral

⁸ The epiphyses (ends) of bones fuse to the shaft (diaphysis) according to a set age sequence for each species and can be used, therefore, to determine the age of animals at death. For the dates of fusion of sheep and goat bones I have followed I. A. Silver, "The Ageing of Domestic Mammals," in *Science in Archaeology*, D. Brothwell and E. S. Higgs, edd., London 1969, pp. 250–268.

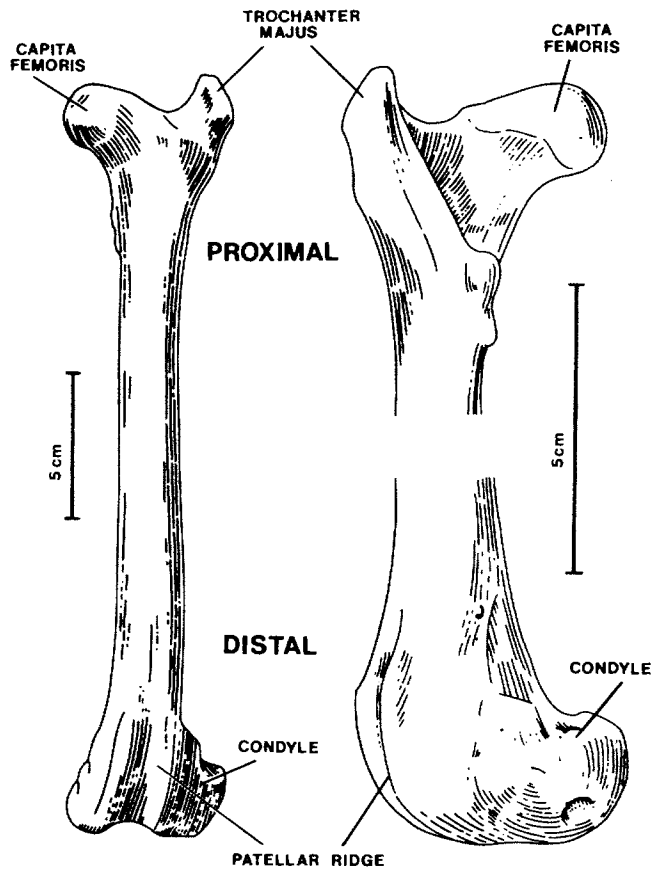


FIG. 2. Terminology of the femur

and medial condyle fragments (87 unfused, 1 just fused; Pl. 15:c) and 32 patellar ridge (or femoral trochlea) fragments (5 unfused; Pl. 15:c).

There are 105 patellae (Pl. 16:a) from at least 53 individuals. There are no identifiable proximal tibia remains, but there are 2 unfused distal tibia shafts from individuals under 3–3.5 years old.

A sheep or goat has 5 cervical vertebrae (not including the atlas and axis), 13 thoracic, and 7 lumbar vertebrae, for a total of 25 vertebrae. The burnt sample includes 992 vertebrae of these types, largely lumbar vertebrae, from over 40 individuals. Of those whose age can be determined (Table 2), 99% are unfused and come from individuals under 3–6 months old.

Each sheep or goat has 7 caudal (tail) vertebrae (Pl. 15:a). The burnt sample includes 551 of these, from at least 78 individuals. Of those ageable (Table 2), 80% are under 3–6 months (unfused), 5% are 3–6 months (just fused), and 15% are over 3–6 months old (fused).

TABLE 1: Burnt Sheep or Goat Femur Fragments

	<i>Total</i>	<i>Unfused</i>	<i>Just Fused</i>	<i>Fused</i>	<i>% Unfused of Total</i>
Proximal					
capita femoris	158	156	2	0	98.6%
trochanter majus	8	8	0	0	100.0%
shafts	27	19*	0	0	100.0%
Distal					
shafts	49	47	0	0	100.0%
epiphysis	190	92	1	0	98.9%

*There are 19 proximal shaft fragments with unfused capita femoris and also one fragment with an unfused trochanter majus, possibly from one of the same 19 limbs.

TABLE 2: Burnt Sheep or Goat Vertebra Fragments

	<i>Total</i>	<i>Unfused</i>	<i>Just Fused</i>	<i>Fused</i>	<i>% Unfused of Total</i>
cervical,* thoracic, lumbar	992	180	1	1	98.9%
caudal	551	367	23	71	79.6%

*Does not include the atlas or axis.

On the basis of all the above evidence then, there are 53 sheep or goat individuals under 3–6 months, 4 at 3–6 months, and 11 over 3–6 months with 2 as old as 2.5–3 years. This makes a total of 68 individuals that can be aged. If we assign the same proportions of age to the 79 individuals known to be present, this makes 61 (77.2%) under 3–6 months, 5 (6.3%) at 3–6 months, and 13 (16.5%) over 3–6 months, with 2 or 3 (2.5–3.8%) as old as 2.5–3 years.

Other Burnt Remains

Reanalysis of the burnt bones from the Athenian altar yielded no burnt cattle bones but does indicate the presence of burnt pig (*Sus scrofa*). It is difficult to be certain that some of the bones identified above as sheep or goat are not pig; it is particularly difficult to differentiate the vertebra, rib, and shaft fragments. Sheep or goat are by far the most significant genera present. Definite burnt pig bones include an unfused distal radius (under 3.5 years), possibly as many as 6 patellae, and a third phalanx.

While burnt bird bones were noted from the altar in the preliminary report, no burnt bird bones are actually present. The altar has produced one burnt fish vertebra, 5 × 4 mm. (Pl. 16:c). While impossible to be certain, it may be from a small sparid (sea-bream).

The sample yielded a number of burnt shells. There are one or more fragmentary cockles (*Cerastoderma edule glaucum*), one murex fragment (*Murex* sp.), one water-worn dog-cockle (*Glycymeris* sp.; Pl. 16:d, upper right), one charred nassa or basket shell (*Arcularia gibbosulus*), one slightly burnt money cowrie (*Cypraea annulus*) 16.75 mm. long, with an open dorsum 7 × 5 mm. (Pl. 16:d, lower right and e, right),⁹ and one burnt fossil oyster fragment.

The altar also produced one burnt olive pit (*Olea europea*; Pl. 16:f).

Discussion

The burnt bones from the Athenian altar which are of particular interest are the large number of sheep and goat femur and caudal vertebra remains. Homer mentions burning the thighs of cattle and rams.¹⁰ The Old Testament also notes the burning of the right thigh, generally of rams.¹¹ It is very likely that the upper part would be burnt on the altar and the lower part otherwise disposed of. The faunal remains from a few other Greek altars have been analyzed, and the relevant comparanda are presented in this section.

We have evidence for the burning of similarly selected bones on various structures at the superimposed temples at Kommos in southern Crete. The Temple B2 (ca. 700 B.C.) hearth/altar produced mainly sheep or goat vertebrae and ribs. Altar U of Temple B2-3 (ca. 700-600 B.C.) produced mainly cattle bones, including 52 vertebrae (35 caudal), as well as many burnt sheep or goat femur, patella, vertebra, and rib fragments.

The third hearth/altar of Temple B3 (ca. 600 B.C.) produced only burnt sheep or goat femur, patella, vertebra, and rib fragments, and the ritual deposit mainly these same sheep or goat bones. The fourth hearth/altar of Temple B3 produced various sheep or goat bones but mainly the femur. Altar C of Temple C (ca. 400 B.C. to A.D. 150) produced mainly sheep or goat and cattle femora, patellae, vertebrae, and ribs.

One large burnt sample from the 1987 excavation of altar I on Mytilene, attributed to Demeter and dated early or mid-4th to late 1st century B.C., produced 307 bones, mainly sheep or goat femur fragments (40) and vertebrae (228 fragments, over 40 of them caudal).

⁹ It should be noted that the charred cowrie and a similar unburnt specimen (19 mm. long, open dorsum with a hole 11 × 6.75 mm.; Pl. 16:e, left) are not a Mediterranean species but must originate in the Red Sea. The Isthmia sanctuary produced one similarly worked and charred *C. annulus* (Isthmia Museum no. 590).

¹⁰ *Iliad* 1.460-464; *Odyssey* III.273, IX.551-555.

¹¹ Exodus 29:22; Leviticus 7:32-33, 8:25.

The most commonly burnt bones in the circular rubble altar in the Archaic precinct (built in the late 7th century) at the Sanctuary of Apollo Hylates at Kourion in southern Cyprus are the right hind limbs of young sheep and goats.¹²

The burning of the tail, both of rams¹³ and of lambs,¹⁴ is also noted in the Old Testament. In the Greek world, omens were taken from the tail as it burned in the fire. In burning, the tail turned up and formed a curve. This curling is pictured on at least 28 Attic vases¹⁵ and described in various ancient texts.¹⁶ It has also been experimentally reproduced.¹⁷

Some of the animal parts not burned on the altar would be eaten roasted or stewed by the celebrants. Other sections, including the skin, might be given to the priest as his payment. The unused sections would be discarded, ritually buried, or otherwise dealt with, as described in various ancient texts.¹⁸

Burnt bird bones are very rarely found on altars or in sanctuaries. A note on the faunal remains from the Archaic Temple of Poseidon at Isthmia refers to burnt "fowl" bones,¹⁹ but none have been found in recent re-examination of this faunal collection. A recently excavated (1980) burnt sample from the Isthmia sanctuary has produced a burnt chicken (*Galus*) distal tarsometatarsus.²⁰ Burnt bones of two birds have been incorrectly reported from altar I at Mytilene.²¹ At Kommos the fourth hearth/altar of Temple B3 produced a burnt left coracoid humeral head of a female Chukar partridge (*Alectoris chukar*).²²

The only other sanctuary structures to produce burnt fish remains are the hearth/altars and altars at Kommos.²³ The Temple B2 hearth/altar produced *Sparus pagrus* (Couch's sea-bream) or *Pagellus erythrinus* (Pandora sea-bream) individuals, often burnt. The

¹² D. Buitron-Oliver, "Hellenic Trends at the Sanctuary of Apollo Hylates, Kourion, in the Archaic Periods," in *Acts of the International Archaeological Symposium "Cyprus Between the Orient and the Occident,"* V. Karageorghis, ed., Nicosia 1986 (pp. 383–392), p. 390; D. Buitron and D. Soren, "Sanctuary of Apollo Hylates," in *An Archaeological Guide to the Ancient Kourion Area and the Akrotiri Peninsula*, H. W. Swiny, ed., Nicosia 1982 (pp. 58–66), p. 63; D. M. Buitron, "The Circular Rubble Altar in the Archaic Precinct at Kourion," *RDAC* 1981 (pp. 157–195), p. 195.

¹³ Exodus 29:22; Leviticus 8:25.

¹⁴ Leviticus 3:9.

¹⁵ M. H. Jameson, "Sophocles, *Antigone* 1005–1022: An Illustration," in *Greek Tragedy and its Legacy. Essays Presented to D. J. Conacher*, M. Cropp, E. Fantham, S. E. Scully, ed., Calgary 1986 (pp. 59–65), pp. 60, 63, notes 5, 6, fig. 2. See also F. van Straten, "Greek Sacrificial Representations: Livestock Prices and Religious Mentality," in *Gifts To The Gods. Proceedings of the Uppsala Symposium 1985 (Boreas 15)*, T. Linders and G. Nordquist, ed., Uppsala 1987 (pp. 159–170), p. 160, fig. 7.

¹⁶ Jameson, *op. cit.*, pp. 60, 63, note 6.

¹⁷ *Ibid.*, p. 60, fig. 3, and *idem*, "The Omen of the Oxtail," *Scientific American* 214, fasc. 2, 1966, p. 54.

¹⁸ See, for example, F. Puttkammer, *Quo modo Graeci victimarum carnes distribuerint*, diss. Königsberg 1912.

¹⁹ O. Broneer, *Isthmia, I, Temple of Poseidon*, Princeton 1971, p. 56. The term fowl probably refers to chicken but could also mean duck or goose.

²⁰ Identified by Kevin Rielly.

²¹ Williams and Williams (footnote 2 above), p. 144. Reanalysis of this burnt sample by the present author in 1987 yielded no bird bones but rather young pig remains.

²² Identified by Dr. George E. Watson.

²³ Preliminary identifications by Mark J. Rose.

contemporary double hearth in the court and ash next to it produced *S. pagrus/P. erythrinus*, often burnt, and one possibly burnt *Epinephelus* sp. (sea-perch).

A Temple B2–3 hearth also produced burnt sparid remains. The fourth hearth/altar of Temple B3 produced *S. pagrus/P. erythrinus*, with many burnt. Burnt sparids are also known from the Temple C rectangular hearth and upper hearth.

Concerning the sea-bream remains, it should be noted that one deity, Aphrodite, is specifically mentioned as being associated with one species, *Sparus aurata* (Gilthead sea-bream).²⁴

Kommos also produced burnt shells, mainly limpets (*Patella* sp.) and topshells (*Monodonta* sp.) in hearth/altars of Temples B1 (ca. 800 B.C.), B2, B2–3, B3, and C. Three of these structures produced burnt cockles: the Temple B2 hearth/altar (one shell), Temple C rectangular hearth (18 individuals), and upper hearth (35 individuals).²⁵ Mytilene altar I produced 2 burnt scallop fragments, and the contemporary altar II, also of Demeter, 9 shell fragments, mainly cockles.

Burnt olive pits have also been found in the Kommos Temple B2 hearth/altar and Altar H (600–400 B.C.), while olive wood was found in the Temple B2 hearth/altar, Temple B3 lower hearth/floor and ritual deposit, and around Altars H and C.²⁶

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²⁴ “It was sacred to Aphrodite, whether because of its beauty or because it is hermaphrodite I do not know”: A. Davidson, *Mediterranean Seafood*, Harmondsworth 1972, p. 90. See also D’A. W. Thompson, *A Glossary of Greek Fishes*, London 1947, pp. 293–294 and Archippus *ap.* Athenaeus 328 a: it is known as *ἱερός ἰχθύς*, Eratosthenes and Callimachus, *ap.* Ath. 284 c: *Καλλιμάχος δ’ ἐν Γαλατείᾳ τὸν χρύσοφρυν, «ἢ μᾶλλον χρύσειον ἐν ὀφρύσιν, ἱερὸν ἰχθύν».*

²⁵ Some of the burnt cockles are illustrated in D. S. Reese, “Strange and Wonderful: Exotic Fauna from Sanctuary Sites,” *Newsletter of the American School of Classical Studies at Athens*, Fall 1984, p. 13.

²⁶ Identifications by Drs. Jennifer M. Shay and C. Thomas Shay.



a. Burnt sheep or goat caudal vertebrae. Longest: 21 mm. Widest: 11.5 mm. (BE 278)



b. Burnt sheep or goat femur proximal ends. Upper row: unfused heads (largest: 25 x 21 mm.; smallest: 14.5 x 14 mm.). Lower row, left: femur head just fusing to shaft; right: unfused trochanter majus (pointing down). (BE 278)



c. Burnt sheep or goat femur distal ends. Upper row, left: one condyle and part of another; center: one condyle and part of another; right: one condyle, unfused. Lower row, from left: unfused distal shaft (distal end on top); patellar ridge fragment; two condyles. (BE 278)



d. Burnt sheep or goat ribs. (BE 278)

Scale 1:1



a. Burnt sheep or goat patellae. Largest: 30.5 mm. long, 17.5 mm. wide. (BE 278)



b. Burnt sheep or goat horncores. Largest: 61 mm. long, 23 mm. wide. (BE 278)



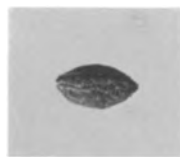
c. Burnt fish vertebra (three views). (BE 278)



d. Marine shells. Left: unburnt *Cerastoderma*. Upper right: burnt and water-worn *Glycymeris* fragment. Lower right: burnt *Cypraea*. (BE 282)



e. Red Sea *Cypraea*. Left: unburnt (BE 278); right: burnt (BE 282)



f. Burnt *Olea* pit, length 11.25 mm. (BE 278)