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Emmanuelle Vila

THE FAUNA OF EARLY BRONZE AGE SIDON

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Early Bronze Age, Institut Français d'Archéologie du Proche-Orient, Bibliothèque Archéologique et Historique, Beyrouth (in press); the full article will include detailed technical information on the bones, as well as tables and illustrations.

INTRODUCTION

The analysis of the skeletal remains of the fauna from the Early Bronze Age levels at Sidon was undertaken in Lebanon in April 2003. Very little is known about the fauna of ancient Lebanon¹ or that of most of the eastern Mediterranean littoral²; in the southern Levant there have been more archaeozoological studies than elsewhere in the area, although these are sometimes based on very small samples³. The work on the fauna at Sidon thus paves the way for a greater understanding of the ways in which animals were used in ancient times on the coastal plain of Lebanon.

Moreover, the long and relatively continuous occupation on this site throughout the Bronze and Iron Ages⁴ provides enough evidence for valid internal comparisons and makes it possible to

trace the development of the place of animals in the local cultures through these periods.

This article is concerned with the fauna from the Early Bronze Age levels, which have provided over 2600 animal bones and bone fragments, over 2300 of these mammalian. A statistically significant sample of more than 700 of the mammalian bones or fragments was identified as to both bone and species. The analysis of the remains of the fish and the turtles is still in progress.

The skeletal remains are reasonably well preserved. Some bear cutmarks that are clear indications of butchering and consumption; other marks seem to indicate the debris of raw materials used in manufacture.

The occupation layers of the beginning of the Early Bronze Age – levels 1 and 2 – yielded few animal bones, and Levels 3 and 4 (EB IIA and EB IIB) yielded small samples; level 5 (EB IIIA), however, and above all level 6 (EB IIIB) produced a far larger number of skeletal remains.

Wild animals are very well represented, although the domesticated species – sheep, goat and cattle – account for over fifty per cent of the remains. Pigs were also domesticated. Remains of dogs and

1 The main available sources are Ksar 'Akil: D. A. Hooijer, 1961 for the Palaeolithic; Tell Labweh: S. Bökönyi, 1978 and Sukas: P. J. Riis and H. Thrane, 1974 for the Neolithic; Kamid-el Loz: S. Bökönyi, 1990 for the Middle and Late Bronze Ages and the Iron Age.

2 Ras Shamra: T. Poulain-Josien, 1978 and E. Vila, in preparation; Ras al Bassit: P.Y. Gagnier, 1986. Both sites are in Syria.

3 Cf. B. Hesse and P. Wapnish, 2002.

4 C. Doumet-Serhal, 2003.

equids are very infrequent. Mesopotamian fallow deer, wild boar, aurochs and hippopotamus were all hunted, as were large carnivores such as lion and bear. A fragment of antler may come from a roe deer and a horn-core represents a gazelle. Turtles and fish were caught and eaten, but there are few remains of shellfish or birds.

DOMESTIC ANIMALS

Caprines: Sheep (*Ovis aries*) and Goats (*Capra hircus*)

Sheep and goats account for 25% of the total number of mammalian remains, equal to the number of cattle and deer; the sheep and goat remains are equal to one another in number. Taking only the domestic animals into consideration, there are fewer sheep and goats than cattle, which is uncommon in Early Bronze Age Levantine sites.

No definite conclusions could be reached about the size or the sturdiness of either the sheep or the goats: the number of measurements it was possible to take of their skeletal remains was insufficient. However, an estimate of the size of the sheep, based on measurements of four bones of the lower hind leg (hind extremity) suggests that these Early Bronze Age sheep were larger than the sheep at Chalcolithic Bir es Safadi. Early Bronze Age sheep from several Levantine sites are similar in size, according to available measurements, to those from Sidon. The dimensions of some of the bones of the forelegs of sheep from Sidon are smaller than the equivalent bones of sheep from Early Bronze Age Arad. The skeletal remains of the Sidon sheep thus appear to suggest small animals. Because of the very small number of data, it is unclear whether they represent ewes or a small variety of sheep. Such a variety is already known

from the Early Bronze Age in northern Mesopotamia, in what is now northern Syria, northern Iraq and southeastern Turkey⁵.

Most of the sheep and goats were between one and two years of age when they were slaughtered, judging by the wear on the teeth. A large part were slaughtered between the ages of two months and a year. This is a fairly typical range of ages for animals slaughtered for meat. Very young individuals – less than two months old – were not evident, nor were mature animals from two to four years old, and most especially not those over four years old. There is no clear difference in the ages at which sheep and goats were slaughtered. The estimates of the ages based on the long bones confirm the scarcity of fully adult animals over the ages of three or four years. This in turn confirms that the skeletal remains of sheep and goats from Sidon essentially represent animals selected for their meat. Forequarters and hindquarters are represented in equal numbers. The bones of the lower legs (extremities) are less well represented, as is the axial skeleton. The high proportion of bones of the fore- and hindquarters, which bear a large amount of meat, is a surely related to their use as food. The smaller number of bones of the lower legs (extremities) no doubt relates to the methods of butchering. As they were of little use as food, they may well have been left behind. The poor representation of the bones of the vertebral column and the ribs could also be a sign of quartering with excision of the vertebral column and the ribs, the meat of the latter having been eaten somewhere beyond the site of the excavation. The unequal representation of the parts of the skeleton suggests that the sheep and goats were not slaughtered and butchered in a private setting such as the household, and that the selection therefore took place elsewhere. Otherwise many more bones of the lower legs, and above all ribs and vertebrae, would have been found. The distribution this implies could be the result of specialized butchering in a larger setting, the ‘butchers’ then distributing the meat to the consumers.

Cattle (*Bos taurus*) and
Aurochs (*Bos primigenius*)

Cattle are the most numerous domesticated animals at Sidon, even more numerous than sheep and goats. The Mediterranean littoral is fairly well suited to the rearing of cattle.

They were reared throughout the Levant in the Early Bronze Age. The skeletal remains of the cattle are of medium size. Far larger bones were also found, quite distinct from the bones of the cattle.

There is little comparative measured material for the bones of cattle, thus the comparisons were made with data from Neolithic to Late Bronze Age sites in the southern Levant and Syria, as the case may be. The bones of the large bovines at Sidon are particularly robust in comparison with the other available data on *Bos*. They are indeed so large that a question arises as to whether they represent wild aurochs, or large domestic bulls castrated before they reached sexual maturity. This practice promotes rapid growth and, more importantly, is very profitable for the production of draught animals. However, the bones present none of the visible pathologies that would be expected as a result of mechanical stress in a working animal. Moreover, the great thickness of these bones is a good argument for attributing them to aurochs. Most of the exceptionally large fragments are attributable to male aurochs. The examples of one of the lower hind leg bones (talus) of aurochs found on the Early Bronze Age site of Tel Yarmouth are as substantial ⁶.

The presence of aurochs is attested on other Early Bronze Age Levantine sites ⁷. It has also been found in northern Syria, Iraq and Turkey in this period ⁸, and has been identified in Lebanon in the Bronze Age and in the Iron Age at Kamid el-Loz in Lebanon ⁹. The aurochs developed the ability to live in a range of environments, including forests, foothills, river valleys and arid areas.

Although the remains of aurochs at Sidon and Tel Yarmouth are unfortunately very few, it should be emphasized that they are all remarkable for their size. It might be thought that the aurochs of the Bronze Age were larger than those of the beginning of the Holocene – that is as sturdy as, if not sturdier than, the aurochs of the Natufian. This seems most unlikely, in view of studies of the Holocene in the Near East that examine the effects of climate and temperature on the size of animals¹⁰. Is it not perhaps possible that the aurochs living in the foothills and Mediterranean coastal plain were larger than those from arid areas such as those from Mureybet or from the Natufian sites of the southern Levant.

Were the aurochs whose bones were found in Sidon hunted selectively for size and/or gender? This would imply that enormous specimens, which were perhaps extremely uncommon, were sought out by the hunters.

To get back to cattle (*Bos taurus*), these were of medium size. At Tell Te'o, the cattle of the Early Bronze Age were found to be smaller than those of the Neolithic ¹¹. However, the number of measurements of bovine skeletal remains now avail-

6 S. J. M. Davis, in preparation.

7 Tel Yarmouth: S. J. M. Davis, in preparation; Jericho: J. Clutton-Brock, 1979; Tel Nagila: P. Ducos, 1968, although this is possibly an example of *Bos taurus*, as the bones in question are not particularly large.

8 H. P. Uerpmann, 1987; E. Vila, 1993.

9 S. Bökönyi, 1990.

10 S. J. M. Davis, 1981; Ducos and L. K. Horwitz, 1997; L. K. Horwitz *et al.*, 1999.

11 L. K. Horwitz, 2001.

12 E. Vila, 1998.

13 S. Bökönyi, 1990.

14 E. Vila and A.-S. Dalix, in preparation.

15 S. Payne and G. Bull, 1988.

lable is still insufficient to warrant a deeper study of regional differences in size in various parts of the Near East in the Early Bronze Age.

The cattle were slaughtered young, according to estimates based on stage of development of and wear on the teeth. More than half of the cattle were sacrificed before they were six and a half years old. A third were slaughtered between the ages of six and a half and nine years. There are no remains of very old animals. However, there is evidence of some calves, eaten when they were between one and two years old, some young adults that would have just attained their full size and weight and some adults, probably used as draught animals and slaughtered around the age of nine. According to estimates of age based on the development of the ends of the long bones, few of the adult animals were more than four years old.

The remains of cattle fall into two groups, representing two methods of rearing: animals reared for food, and those reared and used for work.

The entire skeleton of the cattle is represented. The presence of the bones of the lower legs (extremities) of aurochs suggests that the animals were quartered where they were slain, and their remains brought home without selection for the meaty parts. The quartering of such large game at the scene of the hunt is plausible, as it would surely have been difficult to transport the complete carcass.

Pigs and Boar (*Sus scrofa*)

The numbers of pigs and boar represented by Early Bronze Age remains found at Sidon are relatively great compared with those known from other sites in this period in the Levant. After cattle and caprines, pigs are in third place as the most numerous domesticated animal.

Most of the skeletal remains are small in size and represent domestic pigs, but some large bones

stand out from the rest. As there are hardly any specific morphological differences between pigs and boar, the only way to distinguish them is by the size of their bones; this criterion is only valid if there is a difference in the size of pigs and boar in a region, as appears to have been the case in the Near East where, even if the remains are scattered, domestic pigs seem to have been moderately big¹².

At Sidon, there can be no doubt that the few more robust teeth and bones that stand out from the group represent the remains of boar; some individuals may have been particularly large, judging by their bones.

Boar

From the evidence of the skeletal remains attributable to boar, one sub-adult individual, one individual four to five years old and one individual older than eight to ten years of age could be identified. At least three individuals were thus present. Two fragments of very substantial lower canine teeth represent males, probably old ones. One ankle bone displays cutmarks.

As very few Bronze Age boar bones have been found in the Near East, no measurements are available for comparison. The hunting of boar at Bronze Age sites is purely anecdotal. However, some measurements of remains from Bronze and Iron Age sites in Turkey, Syria and Lebanon are proof of the existence of other very large individuals, as evidence from Kamid el-Loz¹³ and Ras Shamra¹⁴ shows. The boar in ancient times were even larger than certain present day populations in Turkey¹⁵.

Pigs

Pigs were never bred on a large scale in the Near East, and in certain periods, such as the Early Bronze Age, they were bred only sporadically. As a result, the morphology and the size of pigs in ancient times are unknown for lack of sufficient data. This is also true at Sidon, where the remains provide little information on morphology.

The estimates of age based on teeth indicate that most of the pigs were slaughtered before reaching their full size, between the ages of one and two years; the large number of bones whose state of development also indicates that they represent juvenile or sub-adult

individuals confirms that these animals were slaughtered for their meat. Since all parts of the skeletons are represented, it would seem that the animals were probably eaten in the place where they were slaughtered.

Dogs (Canis familiaris)

Only two bones – both vertebrae – attributable to dogs were identified among the bones of the Early Bronze Age. The dog does not appear to have been among the domesticated animals at Sidon in this period. The absence of dog bones in the contexts in which the bones were found – deposits containing the waste from butchering and consumption – could be explained in part by the assumption that dogs were not eaten. On the other hand, it should be noted that few of the other bones bear the marks of having been bitten or gnawed, or of erosion from contact with gastric juices which would provide indirect proof of the presence of dogs. Only seven bones display such marks: erosion from digestive acids on a sheep or goat bone, and toothmarks on bones of deer, pig, boar and cattle.

WILD ANIMALS

Equids (Equus sp.)

One bone and two teeth attributable to equids were identified, but it was not possible to determine the species, or whether these remains were from wild or domesticated animals.

Gazelle (Gazelle sp.)

The only evidence attributable to gazelle is one nearly complete horn-core. It is large and represents a male – the females of the various gazelles that lived in the southern Levant and in northern Mesopotamia had smaller horn-cores than the males. Unlike the horns of sheep or goats, the horns of gazelles are lyre-shaped, and after preparation the material of the horn itself is a lustrous black in colour. The presence of this horn-core is thus of especial interest: it would have been collected either for the material of the horn that covered the bone, or for its shape. Medicinal and or magical properties could perhaps have been attributed to it, or it might have been kept as a souvenir of a species that was rare on this coast and possibly little-known¹⁶.

- 16 E. Vila, 2002 a.
- 17 *C. elaphus maral*, in H. P. Uerpmann, 1987.
- 18 D. A. Hooijer, 1961.
- 19 S. Bökönyi, 1978.
- 20 S. Bökönyi, 1990.
- 21 L. K. Horwitz, 2000.
- 22 H. P. Uerpmann, 1987.
- 23 D. L. Harrison, 1968.

Deer: Mesopotamian Fallow Deer (*Dama mesopotamica*), Red Deer (*Cervus elaphus*), Roe Deer (*Capreolus capreolus*)

Most of the skeletal remains of deer at Sidon represent Mesopotamian fallow deer. A small fragment of antler perhaps belongs to roe deer, although no other bone of this species was identified among the animal remains. The other fragments of antler were reasonably large, with palmated beams, and seem typical of fallow deer. It is difficult to distinguish between the Mesopotamian fallow deer and the red deer by the bones of the post-cranial skeleton, as the morphological differences are small. The Mesopotamian fallow deer is larger than its European equivalent, nearly as large as the red deer; this results in an overlap in size between the bones of the male fallow deer and those of the female red deer. The confusion is partly mitigated by the fact that the Near Eastern red deer is also larger than its European equivalent¹⁷. The Levant, in common with the Mesopotamian river valleys, was an area *par excellence* in which Mesopotamian fallow deer were found. The simultaneous existence of the red deer, however, is well attested by skeletal remains on Levantine sites. In Lebanon, remains of Mesopotamian fallow deer together with those of red deer have been found in Palaeolithic levels at the sites of Ksar 'Akil¹⁸, Tell Labweh¹⁹ and Kamid el-Loz²⁰ among others. The two species still co-existed in more recent times: their remains were found in the Iron Age and Hellenistic levels of Tell Nov in the Golan²¹. The red deer is not generally as well represented as the fallow deer among archaeological skeletal animal remains. There is no precise date for its disappearance from this area, although it probably vanished in the medieval period²², well before the fallow deer, which was mentioned as late as the twentieth century in Syria²³. The uncertainty is complicated by the problem of distinguishing the bones of the two species, since the sizes of both fluctuated over time.

From a detailed examination of the skeletal

remains of the deer, it would seem that most of the remains represent large, robust Mesopotamian fallow deer; probably most were male, to which the large number of antler fragments also attests. Estimates of age based on the state of development of the bones indicate that it was adult animals that were hunted; only two bones can be attributed to sub-adults. Although all parts of the skeleton are represented, the skull is represented mainly by fragments of antlers; other parts of the skull are under-represented compared with their occurrence among the remains of the domestic species. As many of the fragile bones of the skull may not survive underground, it is difficult to draw conclusions from their absence. The absence of teeth, however, which are not so perishable and which attest to the presence of the jaws, is more surprising. One may therefore wonder why the skulls are under-represented, and whether they received special treatment after the animals were butchered – could they perhaps have been kept as trophies?

Hippopotamus (*Hippopotamus cf. amphibius*)

Most of the remains of hippopotamus were found in level 6. Thirteen of the bones were identified morphologically and specifically, whereas in level 3 only a fragment of pelvis could be identified as hippopotamus. In addition, a number of very thick and very compact fragments from levels 3, 4, 5 and 6 could definitely be attributed to hippopotamus, as it is the only very large mammal that has as yet been recognized in Sidon.

The morphologically determined remains from level 6 come from various parts of the skeleton; the skull, however is not represented, except for a fragment of a lower jawbone that apparently belongs to a hippopotamus. Five bones are from a juvenile and four are from an adult. At least three individuals are represented in the assemblage of level 6 (EB IIIB): two adults, one fairly robust (perhaps a male), one more lightly built (perhaps a female) and one juvenile.

The signs of butchering on these remains of hip-

popotamus are very numerous. They include cutmarks made by knives and marks made by chopping with axes. There can be no doubt at all that the hippopotami were quartered, chopped and cut into pieces, skinned and eaten at Sidon. In addition, it is probable that the

bones were systematically broken in order to recover the marrow. The skeletal remains represent the detritus of butchering and the remains from meals. The absence of the skulls suggests that they were removed and processed elsewhere, perhaps in an industrial area. It is known that the ivory from hippopotamus teeth was a highly prized raw material, especially in the Late Bronze Age.

The hippopotamus is one of the very large mammals dependent on the presence of water. It is a swimming, diving herbivore that lives in rivers and streams, using the grassy banks for pasture. It can swim up to thirty kilometres out to sea²⁴. The territory it occupies is not very extensive and it sometimes lives in large concentrations. Since it eats large quantities of grasses – 200 kg a day – its impact on the landscape is considerable²⁵. Being extremely large, it has no fear of predators; it attains 4.2 to 4.9 m in length including the tail, and weighs between 2 and 3 tonnes²⁶.

The documentation of the remains of hippopotami in the Near East is uneven. The hippopotamus is

one of the few mammalian species from this region that can be traced back to the Middle Pleistocene²⁷ without it being known precisely whether or not its presence in the southern Levant was discontinued as a result of climatic variations, although this species is very adaptable because of its efficient thermal regulation²⁸. The hippopotamus had already been recorded in a Pleistocene level at Sidon²⁹. Occasional finds indicate that it lived along the Levantine coast until at least the first millennium BC³⁰. It seems to have become extinct in the Levant in about the third to the second centuries BC³¹.

Although the hippopotamus disappeared from Upper Egypt at about the same time, it survived longer in Middle Egypt and in the marshes and lakes of the Delta. The Classical writers mention its presence in the Delta, as do the great travellers until the nineteenth century AD.

Elsewhere, along the Levantine coast to the north of Sidon, the presence of the hippopotamus in the immediate environment of a site is attested by three bones of the lower hind leg (hind extremity), found in late Bronze Age levels at Ras Shamra in Syria³². Bones and teeth of hippopotamus were identified at sites of the historic periods in the southern Levant: Tel Miqne Ekron³³, Tel Nagila, Tel Dor, Nahal Hataninim, Yarkon River, Tel Aphek, Tel Qasile, Tel Gerisa, Tel Erani and Qatif Y2³⁴. All these sites are situated on the coastal plain. At Tel Qasile, cutmarks on a bone of the lower foreleg indicate that the hippopotamus was

24 M. Faure, 1985.

25 *Ibid.*

26 V. Hanak and V. Mazak, 1986.

27 M. Faure, 1985.

28 H. Bytinski-Salz, 1965; M. Faure, 1985; L. K. Horwitz and E. Tchernov 1990.

29 M. Faure, 1986.

30 In Tell Qasile in the Iron Age: Haas, 1953; S. J. M. Davis, 1985.

31 H. Bytinski-Salz, 1965; H. P. Uerpmann, 1987.

32 M. Faure, 1986.

33 E. F. Maher, 2002.

34 L. K. Horwitz and E. Tchernov 1990, Fig. 4.

butchered, either for meat or for leather ³⁵. At Maadi, an Egyptian site, several hippopotamus bones were used as anvils or as bases: they were placed on the ground upright, wedged in place by a packing of stones ³⁶. Marks of wear and of working were observed on the surfaces of some of these bones.

The teeth, whether or not worked for their ivory, could attest to trade or to imports of raw material or finished objects via the coast, and are not necessarily proof of the local existence of the hippopotamus and of its having been hunted near the site of their discovery. Examples are the ivories of Kamid el-Loz in Lebanon and the tusks from Arad ³⁷, as well as the teeth from Tell el Hesi, Aï, Tel Dan and Gezer ³⁸, all in the southern Levant.

The amount of meat that the hunting and butchering of at least three hippopotami found in level 6 at Sidon represents is thus exceptional. Given the presence of all parts of the skeletons and the weight of these animals, they were no doubt hunted close to the site. The fairly wide coastal plain between Sidon and Tyre, with its marshy estuaries and its seasonal watercourses arising in Mount Lebanon – such as the Nahr Saïnig to the south of Sidon and the Nahr el Awali to the north – provided environments favourable to the life of hippopotami. They were probably harpooned, as attested in Egyptian iconography ³⁹. And they

were most likely cut up where they were slain, in order to make it possible to transport the meat.

Lion (*Panthera leo*)

Two bones recovered from level 6 were attributed to lions. Both are from the paws. They represent two individuals, as one of the bones is from a fairly large animal, perhaps a male, while the other is from a more lightly built individual. No cutmarks were observed on the surface of these bones. The find of bones from the paws of lions does not necessarily indicate that the animals were hunted near the site: they could have arrived together with the skin by way of trade, exchange or as a gift. The bones from paws are in fact encountered quite regularly on Near Eastern sites ⁴⁰.

The lion, a species that occupies a variety of habitats, living in savannahs as well as in wooded areas, disappeared from this region in the beginning of the twentieth century ⁴¹ BC. The lion hunt – when it was not undertaken to protect the flock – was a royal activity in the Mesopotamian world, where the lion was considered to be the king of the animals, and was thus associated with kings and with certain deities. It is one of the favourite motifs in Near Eastern iconography. Signs that lions were eaten are uncommon, but are attested in a few cases, such as at Gindéris in the Afrin region of northwestern Syria in the Iron Age, where a long bone was found which displays cutmarks ⁴². Evidence of the eating of big cats such as lions and leopards was also brought to light at the

- 35 S. J. M. Davis, 1985.
 36 I. Rizkana and J. Seeher, 1989.
 37 S. J. M. Davis, 1976.
 38 A. Caubet and F. Poplin, 1987.
 39 J. Vandier, 1964.
 40 P. Wapnish, 1997; E. Vila, 1998.
 41 D. L. Harrison, 1972, appendix I.
 42 E. Vila, in preparation.

Hittite site of Bogazköy in Anatolia ⁴³.

In the particular context of Sidon, it is probable that lions were hunted by the inhabitants of the site, and in its near vicinity. For the experienced hunters of Sidon in the Early

Bronze Age, it would no doubt have been appreciated for its symbolic value as a trophy of the hunt, and for the symbolic value of its skin and its skull, including the jaws, rather than for its meat. In the Late Bronze Age at Ras Shamra the lower jaws were selected and deliberately removed for reasons unknown ⁴⁴, as appears also to have been the case at Ras Ibn Hani. At Jaffa in the same period the skull and jaws of a lioness were also found on the floor of a temple ⁴⁵.

Brown Bear (*Ursus arctos*)

Several bones from levels 5 and 6 (EB IIIA and EB IIIB) could be attributed to the brown bear. The bones are particularly large. Brown bears are known for the great variability in their size. There are no measurements of brown bears from the Near East available for comparison, either from ancient times or from the recent past, although great differences in the size of their skeletal remains have been reported from various sites in Turkey ⁴⁶. The brown bears of the Syro-Lebanese mountains were very large in ancient times: like the remains from Sidon, a bone from Byblos also

belonged to a large animal ⁴⁷.

One of the long bones bears a bony outgrowth, an indication that the animal it comes from was old. Another bears the marks of chopping with an axe. A third bears cutmarks. The marks on the last two bones attest to the disarticulation of the foreleg at the elbow joint.

At least one large, adult brown bear was hunted and eaten at Sidon, as attested by the marks of removal of the flesh on the bones of the foreleg; a second juvenile bear is possibly also represented among the skeletal remains.

Brown bears lived throughout the Levant, as attested by remains recovered at archaeological sites: in the north they have been recovered at Ras Shamra ⁴⁸, at Byblos ⁴⁹ and at Kamid el-Loz ⁵⁰; in the south at Tell es Sa'idiyeh ⁵¹, at Jericho ⁵² at Tel Dan ⁵³ and at Tel Yarmouth ⁵⁴. Although the brown bear likes the forest cover, it can thrive in other environments, being omniverous. The presence of humans has reduced its habitat to mountainous regions and to other regions difficult of access. It is uncommonly found or entirely absent in arid areas. The bears were hunted for their meat and their skins, and probably also for the protection of flocks, in the seventh to the first millennia BC. Bear was eaten at Arslantepe in Anatolia at the end of the Chalcolithic and in the Early Bronze Age ⁵⁵. The brown bear survived in the southern Levant until the nineteenth century AD and in the Syro-Lebanese mountains (*Ursus arctos syriacus*)

- 43 A. Von den Driesch and J. Boëssneck, 1981.
44 E. Vila, in preparation.
45 J. Kaplan and H. Ritter-Kaplan, 1993; P. Wapnish, 1997.
46 B. De Cupere, 2001.
47 E. Vila, 1998.
48 T. Poulain-Josien, 1978; E. Vila in preparation.
49 E. Vila, 1998.
50 S. Bökönyi, 1990.
51 J. Lepiksaar, 1990.
52 J. Clutton-Brock, 1979.
53 P. Wapnish and B. Hesse, 1991.
54 S. J. M. Davis, in preparation.
55 S. Bökönyi, 1983.
56 D. L. Harrison, 1968.

until the beginning of the twentieth century AD⁵⁶. It is described as light in colour and of medium size.

MARINE FAUNA

There are a fairly large number of remains of fish and turtles. The remains of the fish are being studied by Wim van Neer of the *Musée Royal d'Afrique Centrale*, Tervuren, those of the turtles by France De Lapparent of the *Museum national d'histoire naturelle*, Paris.

MARKS ON THE BONES

There are several types of marks on the surface of the bones from Sidon. Some, such as traces of bites and gnawing as well as attack by digestive acids, are attributable to animals, more particularly to dogs. Most, however, such as cutmarks, traces of burning, sawmarks, signs of polishing and piercings, are the result of human activity. Some of these, such as the lines left by knives and the marks left by the impact of axes when the animal was being quartered, cut up and its flesh was being removed, are related to the activities of butchering and eating. Others, such as the traces of local burning, could be the result of roasting. Finally, some, mainly the marks of sawing, of polishing and piercing, but possibly also some of the marks left by knives and axes, are related to manufacturing, that is to the making of bone objects and tools and to their use. Traces of sawing on bones of the Early Bronze Age in Sidon have been observed only in connection with manufacturing; this technique was not used in butchering.

Butchering

By far the largest number of marks is attributable to butchering. These marks are found on the bones of all the species recovered. Judging by the number of marks of impact on the bones of the large mammals, a chopping tool such as an axe or a cleaver was much used in quartering cattle and deer. Marks of impact are also found on the hip-

popotamus and bear bones, as mentioned above. Although there are not many marks on the bones of the small animals, such as sheep, goats and pigs, those there are indicate that these were dismembered mainly with knives. The turtle bones also display traces of knife cuts. The cleaver or axe appears to have been used only in butchering large animals.

The Bone Industry

Antlers were removed from the skull and chopped up by blows from axes. The fragments of antler display a fair number of marks, caused by both axes and knives. The antlers were clearly used to make objects or tools; one fragment of a beam of an antler that bears two grooves and four perforations could have served as a handle. Another fragment could have been used as a small pestle, to judge by marks at one end. Several small fragments of sawn antler are clearly failures or wasters. A few bases of antlers with vestiges of the burr more or less preserved were removed from the head of the dead animal and not collected after the annual shedding of the antlers. A single antler fragment with its burr, and which also bears marks of chopping on its beam, is from a shed antler, which signifies that it was collected on the ground as raw material.

Other bones of Mesopotamian fallow deer were also used as raw material for manufacture. The polished surfaces of some long bones from the lower legs (metapodials) are indications of wear resulting from their use as tools. Fragments from some of these could have been used as scrapers and some as awls.

These same bones from bovines were also used as raw material, as attested by sawn fragments that no doubt represent wasters.

Signs of polishing, smoothing or wear on ankle bones of sheep and goats, on the ribs of a small ruminant and a large mammal and on the ends of two long bones, one from a pig and another from a caprine, could be the result of their use as unworked tools (scrapers, smoothers, etc.).

Part of the vertebra of a fish had been used as an awl.

These remains bear witness to the use of the bones and fragments thereof precisely because of their natural shapes; there was, on the other hand, true workmanship in the case of the antlers.

THE EXPLOITATION OF ANIMALS AT SIDON

Breeding

According to the frequency of the occurrence of the various species, calculated from the remains of identified bones, domestic animals were dominant among the fauna of Sidon. However, stockbreeding was not the main source of meat. If the weight of the remains – which can be correlated to the weight of the flesh – is taken into account, stockbreeding provided less than half of the meat eaten: the larger part was acquired by hunting.

The animal husbandry qualifies as diversified, since the various domestic species – sheep, goats, pigs and cattle – are almost of equivalent importance. The absence of intensive breeding, the high proportion of goats (the same number as sheep), the presence of pigs and the evidence of hunting demonstrate that the economy of Sidon was not based on specialized breeding of the kind encountered in the southern Levant or in northern Mesopotamia.

Clearly there was small scale breeding of domestic animals. Possibly the rearing of cattle and pigs was a family occupation. The sheep and goats, on the other hand, could have been bred and reared on a commercial scale. A vital characteristic of the economy was the exploitation of the wildlife of the surroundings – mountains, forests, the coastal plain, river estuaries and the sea.

Hunting

The evidence from Sidon is surprising, as hunting was not a habitual activity among the inhabitants of Early Bronze Age sites in the Levant. Those cities and villages of this period for which evidence of animal husbandry are available, mostly sites in the southern Levant, obtained their meat mainly from the rearing of domestic animals. The first model, and the one most widespread on these sites, is one of mixed breeding, where cattle are second only to sheep and goats in importance to the economy; this model applies in Taur Ikhbeineh, Yaqush, Tell Dan, Megiddo, Dalitand Ai. The second model is one of diversified breeding, with the rearing of pigs added to that of cattle and sheep and goats. There is evidence for this model from Qiryat'Ata, Esh Shuna, En Shadud, Abu en-Ni'aj and Tell Mishrifé. The third model is one of specialized breeding, mainly of sheep and goats, with other domestic animals accounting for less than 10% of the remains, as at Tell Halif and at Arad. The part played by wild animals in the economy is in general non-existent: they account for about 1–2% of the animal remains except on two sites – Tel Dan and Tell Gat – where their remains do not exceed 10–12% of the total. Thus, in view of the available published data, any accounts of hunting on Levantine sites of the Early Bronze Age are purely anecdotal: hunting played no part in supplying food. The cities and villages lived mainly by animal husbandry, which took different forms – probably for cultural and environmental reasons, since the presence and relative importance of cattle and pigs varied greatly from site to site.

The way in which animals were exploited in Sidon in the Early Bronze Age is thus a phenomenon particular to this site. Hunting was not important only for the meat it supplied, as some of its distinctive features demonstrate. Although mostly deer were killed, aurochs, boar, bear, lion and hippopotamus were also hunted. All these species have two things in common: they are large and they are dangerous. Moreover, the individuals were clearly selectively targeted. Judging by the size of the animals, it is generally the males that

were preferentially selected; this holds true for the large carnivores as well as for the deer, boar and aurochs. The excavations at Sidon have not yet proceeded far enough for conclusions to be drawn as to whether Sidon was a city or a village in the Early Bronze Age, or for assessments of way of life of its inhabitants.

The characteristics of the chase, however, give pause for reflection. The game selected is uncharacteristic for hunters looking only for meat. If that had been the object, they would not have attacked the most dangerous animals, such as the males of redoubtable species, but would rather have pursued the females of boar and deer.

One of the reasons for this hunt might therefore be ideological rather than economic. My hypothesis is that the hunters were interested not only in the quantity of the meat, but in the quality of the game itself. This could imply that the hunt was about prestige, that certain persons attacked dangerous animals in order to raise their status and obtain a position, or else that the hunt was a competition to bring back the most prestigious game, the animal at that point serving as the trophy. Hunts of this sort surely reflect the existence of a separate social group, whether defined by privilege, distinction, or something else, or a group of specialist hunters.

The inhabitants of Sidon also fished. This pursuit requires rather different qualities, knowledge and savoir-faire. It would seem probable that the same people did not hunt, fish and rear livestock. And perhaps the people who hunted deer were not the ones who hunted bear. A possible diversity of human economic activity, as well as the potential for social distinctions this might have entailed, is thus discernible

CONCLUSION

The activities of hunting and fishing are not limited to one short period in the lives of the inhabitants of Sidon; they are, of course, very evident in levels 5 and 6 because the quantity of the skeletal remains is large, but they are clearly perceptible as early as levels 3 and 4 despite the small number of remains. I therefore consider that this type of exploitation of animals can be qualified as a cultural tradition peculiar to Sidon, since it survives from the EB IIA to the EB IIIB. The material from the Middle Bronze Age now being analyzed, on the other hand, does not suggest a continuation of this type of exploitation; it appears that animal husbandry was the main source of meat at that time. At present, this phenomenon is unique in the Ancient Bronze Age of the Levant. Of course, only the study of more sites in the northern Levant will reveal whether this model is really unique, or whether there are local traditions of combined animal husbandry and hunting typical of the northern Levant and which are not manifested in the southern Levant.

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