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THE FAUNAL REMAINS FROM DUR-KATLIMMU— INSIGHTS INTO THE DIET OF THE ASSYRIANS

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Abstract

Despite all that Near Eastern archaeologists and experts on cuneiform tablets can tell us about the Assyrians and their many achievements, we still have only a limited understanding of particular aspects of their everyday life, for example their meat diet. This is due to the silence of the texts with reference to such mundane matters and an overall scarcity of representative faunal materials from Assyrian sites. However, archaeological research at Tell Sheikh Hamad, whose Assyrian name was Dur-Katlimmu, has not only provided a considerable quantity of tablets but also a large number of animal bones. It is the aim of this paper to compare both sources in order to find what they may tell us about consumption and economy. In addition, the results of analyses further our understanding of the exploitation of natural resources and the extent to which human activities had already shaped the environment during the 2nd and 1st millennium BC in north-eastern Syria.

Keywords: Assyria, Dur-Katlimmu, 1st and 2nd millennium BC, cuneiform tablets, meat consumption, intra-site comparison.

Résumé

En dépit de tout ce que les spécialistes de l'archéologie proche-orientale et les experts des tablettes cunéiformes peuvent révéler sur les Assyriens et leurs activités, nous ne disposons que d'une connaissance limitée de nombreux aspects de leur vie quotidienne, en particulier en ce qui concerne l'alimentation carnée. Cela résulte du silence des textes concernant ces sujets triviaux et surtout de la rareté des assemblages représentatifs de restes animaux issus de sites assyriens. Cependant, les recherches archéologiques à Tell Sheikh Hamad, dont le nom assyrien était Dur-Katlimmu, ont livré non seulement d'importantes quantités de tablettes, mais aussi un grand nombre d'ossements animaux. Cet article cherche à comparer ces deux types de sources, en tenant compte de leur fiabilité respective quant aux questions d'alimentation et d'économie. De plus, les résultats de ces analyses apportent des éléments de compréhension concernant l'exploitation des ressources naturelles et la part qu'avaient déjà les activités humaines dans le modelage de l'environnement, aux II^e^ et I^er^ millénaire av. J.-C., dans le nord-est de la Syrie.

Mots-clés : *Assyrie, Dur-Katlimmu, I^er^ et II^e^ millénaires av. J.-C., tablettes cunéiformes, alimentation carnée, comparaison intra-site.*

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INTRODUCTION

Tell Sheikh Hamad (hereafter "TSH") is a huge artificial mound located on the left bank of the river Khabur in north-eastern Syria (*fig. 1*). This site is unusual in a number of respects. In 1977, the tell achieved fame when by accident thirty cuneiform tablets were washed out of the soil. This discovery enhanced the results of extensive archaeological research carried out since that time under the guidance of Hartmut Kühne (Institute for Near Eastern Archaeology, Free University Berlin, Germany). Campaigns of excavation were begun in 1978 and continue today. Further tablets both from the Middle and the Neo-Assyrian period were discovered, now amounting to several hundred specimens. They contain a wealth of information, mostly administrative and bureaucratic in nature, but also touch on socio-political and even private issues (Röllig 1983, 1999, in press; Cancik-Kirschbaum 1996; Röllig, Tsukimoto 1999; Radner 2003). Also the Assyrian name of the site, Dur-Katlimmu, has been recognised from these texts. The Middle Assyrian tablets, an example of which is presented in figure 2, mainly refer to agricultural products and livestock management. Among many other things, they list names of shepherds and cowherds employed by the government as well as the numbers and kinds of animals in their care. This contrasts with the Neo-Assyrian texts, which generally constitute private law documents from high dignitaries: only a few texts of this period concern administrative matters, such as the sale of estates and slaves.

Meanwhile the history of Dur-Katlimmu has been revealed (Kühne 1991, 1993/1994, 1997, 2006). It was inhabited from the 4th millennium BC until the 3rd century AD. More than 30,000 square metres have been excavated and hundreds of thousands of archaeological finds registered. The number of papers published on the site exceeds 160. They discuss a variety of themes (see bibliography in Kreppner 2006). The number of animal remains recovered to date amounts to more than 100,000. This refuse, leftovers from slaughtering and consumption, is indicative for the meat diet of the inhabitants, for the use of specific raw materials, and for the exploitation of natural resources.

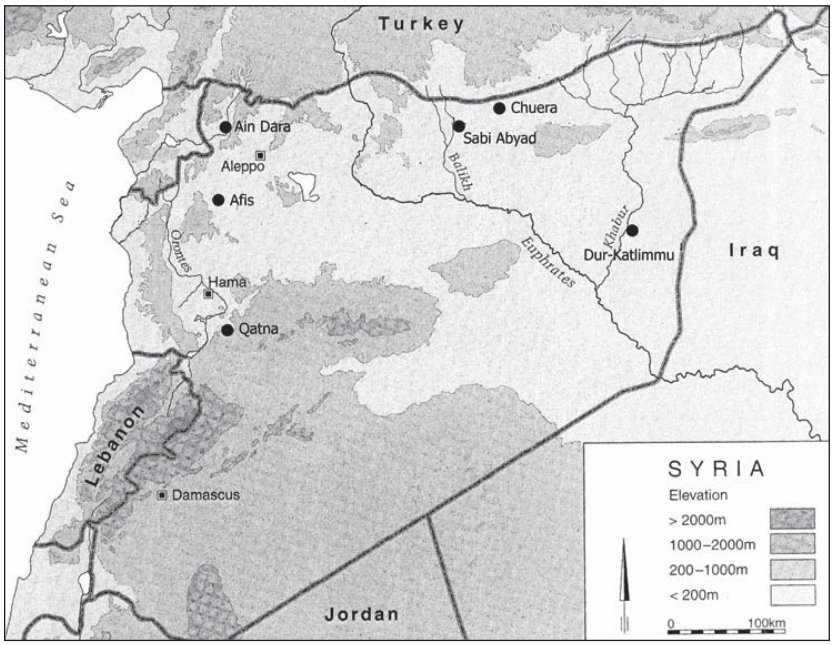

Fig. 1—Map of the study area with location of Syrian sites mentioned in the text (modified map from Akkermans, Schwartz 2003, p. 328, 362).

The discovery of administrative texts and bone refuse from the same period and from the same location opens the possibility of bringing face-to-face two different archaeological sources with approximately the same focus: economy and supply. Such an idea was already translated into action by Chiara Cavallo (2002) during the 5th ASWA conference at the Yarmouk University in Irbid/Jordan: for the Late Bronze Age

occupation at Tell Sabi Abyad (cf. *fig. 1*), she presented one of the rare attempts to relate osteological data (5,600 animal bones) with information from cuneiform texts (*ca* 300) in order to detect more clearly economic patterns in the Balikh valley. Melinda Zeder (1991) made another, no less ambitious attempt. She analysed large amounts of animal bones from Iranian sites and placed them into context with the aid of administrative texts found at Drehem (*ibid.* 31f.). In these records, transactions involving different kinds of animals in the Sumerian Kingdom of Ur III were noticed. Other more recently excavated Near Eastern sites such as Tell Chuera and Qatna (cf. *fig. 1*) would present comparably favourable situations for such analysis.

a b

Fig. 2—TSH/Dur-Katlimmu. Cuneiform tablet of Middle Assyrian date (SH81/1527I/391, breadth 4.5 cm); a: front view, b: back view (from: Kühne 1995, Taf. 1, 1-2).

THE HISTORY OF DUR-KATLIMMU DURING THE 2nd AND 1st MILLENNIUM BC

The first important phase of blossoming at Dur-Katlimmu can be ascertained for the Middle Assyrian period. During the reigns of Shalmaneser I (1273-1244 BC) and his son Tukulti-Ninurta I (1243-1207 BC), Dur-Katlimmu became a well-known provincial centre on the western flank of the Assyrian empire, connected to the ancient city of Ashur via an east-west route. Its political importance undoubtedly reached far beyond local borders. The extension of Dur-Katlimmu during this particular period has been investigated by archaeological surveys. The city, characterised by the excavators as "Lower City I" (*Unterstadt I*; *fig. 3*), encompassed 20 ha. The palace of the governor dominated the urban features. Since 1978 this "citadel" has been the focus of extensive archaeological excavations. The most spectacular discovery was an archive of some 550 administrative texts, found in Room A of the citadel. These texts turned out to be the main sources of information relevant to the topic raised here. The archive can be connected to Aššur-iddin, a member of the royal court entrusted with the administration of the western Assyrian empire. It was he who had chosen Dur-Katlimmu as his temporary residence. At the same time, a governor lived at Dur-Katlimmu who had responsibility over local administrative matters. This demonstrates that the Middle Assyrian administrative apparatus was double-tracked—quite an unusual arrangement (Kühne 2006, p. 13).

After a phase of prosperity, the political landscape in north-eastern Syria changed as it experienced a period of socio-political disintegration, military conflict and a crisis in the well-organised economic structure (Ward, Joukowsky 1992). It was only in the 10th and 9th centuries BC that the Assyrian kings were able to re-establish their power. Military and administrative centres were created at strategically important points.

The former status of Dur-Katlimmu was revived at this time. Although it is not yet evidenced archaeologically, we may conjecture that a city of such size remained in a position of power even during a "dark age" and that there continued to be an adequate infrastructure for the establishment of a "new" local centre.

During the powerful era of the Neo-Assyrian kingdom (911-612 BC), Dur-Katlimmu expanded to an impressive total of about 110 hectares of urban space of which 65 were enclosed by a wall. The number of residents can be estimated at several thousand, including a military elite as well as many charioteers. This was discovered in 1984 when archaeological activities were expanded to the so-called Lower Town II (*Unterstadt II*; *fig. 3*), namely the north-eastern corner (*Nordost-Ecke*) and the Neo-Assyrian residences (*neuassyrische Residenzen*). The buildings in the north-eastern corner are characterised by a palace-like architecture, *e.g.* with a huge reception hall (20 x 6 m), vaulted storerooms and a *bit hilani*—a spacious building with a broad entrance decorated with columns (Kühne 2006, p. 15). The Neo-Assyrian residences also comprise complexes, belonging to a higher social order, with a representative architecture, that nonetheless differs in structure and ornamentation. Between 1993 and 1998 another area was investigated, bringing to light a spectacular complex—the "Red House" (*Rotes Haus*; *fig. 3*), no less striking for its construction than for its decoration. The most exciting discovery from the Red House, however, was the archive of Šulmu-šarri, the grand vizier of Ashurbanipal, the last Assyrian king (669-629 BC). These cuneiform tablets constitute one of the largest private archives ever found anywhere in the world. After they had been deciphered, it could be demonstrated that Dur-Katlimmu maintained its importance as an

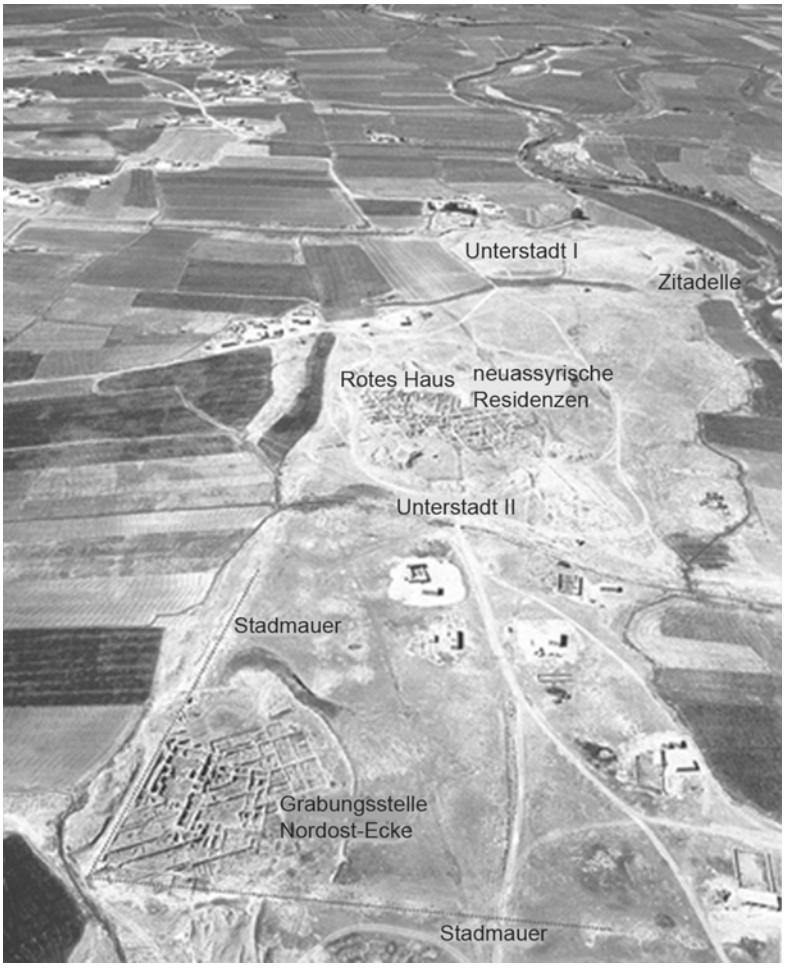

Fig. 3—TSH/Dur-Katlimmu. Aerial view with excavated areas (from: Kühne 2006, p. 13; photo: Georg Gerster).

administrative centre after the collapse of the Assyrian Empire in 612 BC. Dur-Katlimmu then got a second Aramaic name—Magdalu. The city was inhabited until the 3rd century AD.

THE BONE MATERIAL—GENERAL CONSIDERATIONS

Returning to the focus of this paper, which is essentially connected to the political fate of the city, it may be asked in what ways the subsistence of so many people could have been assured. Considering the large number of consumers, the demand for foodstuff must have reached extraordinary dimensions, requiring a sophisticated logistical framework. According to the demands, specific tastes and social rank of the inhabitants, hundreds of animals and tons of agricultural products as well as all kinds of raw materials must have been provided.

Some of these activities are mirrored in the bone material, of which about 56,000 specimens have been analysed and interpreted to date (Becker 1991, 1994, 2005/2006, 2008). It forms a selected sample of a much greater assemblage that was unearthed during the decades of excavation at TSH. The material derives entirely from hand recovery, with no specific finer sampling strategy. It was excavated from three different contexts: the citadel (Middle Assyrian period, *ca* 13th century BC), the Neo-Assyrian residences and the north-eastern corner (Neo-Assyrian period, *ca* 900-600 BC; cf. *fig. 3*). The dating of the bone material is based on close connections with time-specific pottery, small finds, architectural features and cuneiform tablets. The latter are dated quite precisely to a specific year within the reign of one of the many Assyrian kings. All the archaeozoological data, be it measurements, kill-off patterns or anthropic traces, are documented in Becker (2008).

One pivotal aspect requiring further explanation is that concerned with the relationship between faunal refuse and building structures. It has to be stressed that according to the archaeologists, no domestic or commercially related architecture has been excavated in Dur-Katlimmu, but only complexes built for purposes of representation, administration and government (Kühne 2006, p. 15). The discovery of large quantities of bone waste in this particular context might seem surprising and clearly they do not relate to each other. It seems obvious that only those bones that were lying in well-stratified layers directly on the floors (which constitute the smallest part of the material) can reasonably be connected to activities which took place in these buildings. The overwhelming majority of the bones, however, may be suspected to have been deposited later when one part of the building or another had collapsed and/or had gone out of use. It is most fortunate that from the close mixture of the bones with the specific archaeological materials mentioned above, it can be deduced that they belong to a contemporaneous time frame.

There are two possible sources from which the bones could originate, either from neighbouring rooms or from an overlying floor. An example for such a situation has already been observed in Room A at the citadel: in the second floor above a granary, a storeroom was installed, which was originally used for the safekeeping of cuneiform tablets. Some time later the room also served as a dumping area for bone refuse and other waste and, when the building ultimately collapsed, everything became mixed up (Becker 1991, p. 126).

For the Neo-Assyrian residences and in the north-eastern corner, a comparable situation can be imagined. Next to the excavated complexes, facilities must have existed where butchering, food preparation, grilling or the like were all practised. We must also envisage the existence of rooms where people enjoyed their meals, as well as areas where leftovers from cooking and consumption were dumped. The faunal refuse conveys a clear message: because it is (relatively) well dated, it provides sufficient information to reveal a picture of everyday life in this most remarkable city, although the related domestic architecture has not been uncovered. Moreover, the fact remains that the high-ranking people who used these representative buildings did not exist in isolation: a huge number of persons must have occupied positions of different kinds. They supplied the governor, higher civil servants, dignitaries or military officers with meals and other conveniences, and their efforts are reflected in the bone material recovered. To conclude: the leftovers from carcasses and consumption mirror activities that took place in the Middle Assyrian palace or in the Neo-Assyrian residences, and not only at the spot from which they were excavated.

NON-MAMMALIAN REMAINS

In terms of the number of finds, non-mammalian remains are rather scarce (*table 1*). They comprise bird bones (n = 93: *Gallus domesticus, Ardea cinerea, Casmerodis albus, Anas platyrhynchos, Haliaeetus albicilla, Buteo buteo, Gyps fulvus, Falco tinnunculus, Coturnix coturnix, Francolinus francolinus, Fulica atra, Columba livia, Streptopelia senegalensis, Streptopelia turtur, Athena noctua, Tyto alba, Merops apiaster, Turdus philomelos, Carpodacus erythrinus, Corvus corone*), egg-shells from *Struthio camelus* (n = 20), some remains from fish (n = 27: *Barbus esocinus, Barbus* spec.), terrapins (n = 123: *Trionyx euphraticus*), crabs (n = 7: *Potamon mesopotamicum*) and molluscs (n = 33: *Unio tigridis, Cypraea annulus, Conus mediterranaeus, Arcularia gibbulosa*; for further details see Reese 1991; Becker 1991, 2008).

From the number of non-mammalian species found at TSH, one may presume that waterfowl, fish, crabs, terrapins and molluscs contributed in only a minor way to the diet (cf. *table 1*). This impression may be false. It could be that the number of finds from these categories was severely reduced by taphonomic factors, of which only two shall be mentioned here: no screening or fine sieving was done during the excavation, thus reducing the chance of small elements being found. Because of their brittle and delicate structure, fish and bird remains in particular suffer extremely from (modern and old) breakage and might have been destroyed to an extent that makes identification complicated if not impossible—again leading to an artificial reduction in quantity and quality.

If we consider the proximity of the Khabur river and the richness of the freshwater resources available, it seems probable that such resources would have been used much more often than is seen in the osteological record. This view is supported by the fact that in the Middle Assyrian texts mention is made of bird catchers, who supplied the inhabitants with a tasty diet of waterfowl (Radner 2003, p. 8). As to fish, it must be noted that on cylinder seals and reliefs, which portray royal banquets, numerous examples of fish are depicted (Ellison 1987). This demonstrates that fish formed a significant part of the diet, at least on special occasions.

MAMMAL REMAINS

With more than 90% of the total, mammal remains dominate the sample. Among these finds the frequency of unidentifiable specimens rises to 62%, a fact that limits the number of diagnostically important pieces to n = 20,840. The identified mammal bones are distributed as follows: n = 5,777 are attributable to the citadel, n = 1,745 to the Neo-Assyrian residences and n = 13,318 to the north-eastern corner. Although sample size is somewhat divergent, these data sets seem to provide an appropriate basis for intra-site comparison.

A broad range of mammal species appears to have been exploited. Species living in the wild far outnumber domesticates (17 *versus* 9, plus crossbreeds). However, for the wild mammals the number of finds per species is rather low. As far as the bone count is concerned, domesticated species prevail (*fig. 4*). Sheep and goats are the most common, cattle and pigs come next, followed by dogs, camels and Equidae (cf. *table 1*). The latter two categories did present certain problems during identification, which will be briefly dealt with here.

The morphological and metrical analyses of the Equidae bones from TSH indicate that horses, donkeys and onagers, as well as crossbreeds, are present. As usual, identification is based on skeletons from comparative collections and on metrical investigations with Equidae data given in the literature. The analysis—though complicated and frustrating as anyone knows who has carried out in-depth investigation into Equidae identification—was facilitated by the fact that finds included some almost completely preserved autopodia from hind and front legs, in addition to well preserved lower and upper jaws from mature and subadult onagers (*Equus hemionus*). Such remains are highly valuable in that they allow an impression to be formed of intra-specific age-related variability. This helps enormously with the identification of bones from onagers on the one hand (n = 444) and closely related but differently shaped bones from donkeys (n = 136) or cross-breeds (n = 4) on the other. The latter comprise an upper molar from a mule, as well as

three completely preserved bones thought to be from a donkey-onager hybrid.[2] It has to be stressed that conflicting opinions have been expressed in relation to the existence of such hybrids, although some new investigations on 3rd millennium BC Equidae burials from Umm el-Marra add considerable weight in

Species/categories	Citadel	Neo-Assyrian residences	Northeastern corner	Total
Ovis aries + *Capra hircus*	4281	1184	10262	15727
Bos taurus	264	179	1685	2128
Sus domesticus	429	140	561	1130
Equus caballus	-	-	2	2
Equus asinus	6	41	89	136
Equus caballus x *E. asinus*	-	-	1	1
E. asinus x *E. hemionus?*	*2*	-	*1*	*3*
Camelus dromedarius	-	96	150	246
Camelus bactrianus	9	1	4	14
Canis familiaris	96	30	126	252
Domesticated mammals, total	5087	1671	12881	19639
Bos primigenius	-	2	14	16
Gazella subgutturosa	117	19	121	257
Cervus elaphus	7	-	8	15
Dama mesopotamica	228	3	82	313
Capreolus capreolus	-	-	2	2
Equus hemionus	249	27	168	444
Sus scrofa	11	1	7	19
Canis lupus	-	-	2	2
Vulpes vulpes/V. rueppelli	6	3	4	13
Ursus arctos	-	-	2	2
Vormela peregusna	1	-	-	1
Felis silvestris	-	1	3	4
Panthera leo	-	-	1	1
Elephas maximus	1	4	-	5
Castor fiber	1	-	4	5
Lepus capensis	69	14	13	96
Erinaceus europaeus concolor	-	-	6	6
Wild mammals, total	690	74	437	1201
Aves	15	10	68	93
Egg-shells *Struthio camelus*	1	3	16	20
Barbus esocinus/spec.	12	7	8	27
Trionyx euphraticus	119	5	29	153
Potamon mesopotamicum	2	1	4	7
Molluscs	10	8	15	33
Non-mammalian remains, total	159	34	140	333
Unidentified mammal remains, total	9687	2730	22539	34956
Total	15623	4509	35997	56129

Table 1—TSH/Dur-Katlimmu. Faunal remains. Frequencies of species (basis: number of finds).

2. They comprise a metatarsus found in the material from the north-eastern corner, a phalanx I and a phalanx II, both found in the citadel. The bones appear to be rather compressed in their total length. Morphologically they yield a mixture of elements from both onagers and donkeys, but not from *E. caballus*.

favour of this possibility (Jill Weber, this volume). However, the interpretation of such remains is still a highly controversial issue. The recognition of horse bones (n = 2) turned out to be less difficult. The larger part of the Equidae remains, however, could not be identified to species (n = 857 out of n = 1,443). Most of them are assumed to belong to *E. hemionus*.

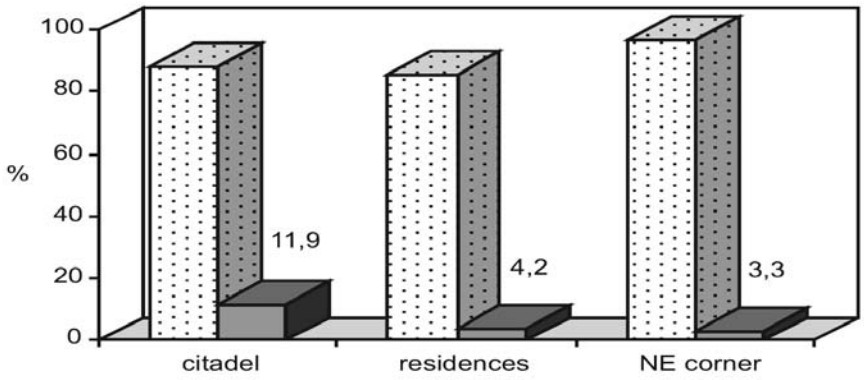

Fig. 4—TSH/Dur-Katlimmu. Relative frequencies of domestic (pale bars) versus wild living mammals (dark bars)—bone count of identified specimens (cf. table 1*).*

Camel bones total n = 260. Their occurrence in the bone refuse of a provincial centre in the Syrian steppe comes as no surprise. Dur-Katlimmu was also an important junction for traffic—commerce and military transports—and thus, beasts of burden and in particular camels must have been used. Nevertheless, the recovery of nine camel bones from a Middle Assyrian context was unexpected since it is only in the second half of the 2nd millennium BC that the beginning of the domestication of the dromedary can be recognized. This is believed to have taken place in the south and southeast of the Arabian Peninsula (Uerpmann, Uerpmann 2002), so that the appearance of camels north of the Euphrates already as early as *ca* 1300 BC would be astonishing. However, detailed metrical and morphological investigations provide convincing evidence that the Dur-Katlimmu finds do not belong to dromedaries but to Bactrian camels. This conclusion is based on the enormous size and massiveness of the bones in question, and on their different morphology (Steiger 1990). *Camelus bactrianus* was domesticated at the turn of the 4th to the 3rd millennium BC somewhere in Central Asia (Peters, von den Driesch 1997). Soon after that date, domesticates found their way to southern regions and helped to establish caravan routes, so that such camels must have been well known in Assyria even in the 2nd millennium BC.

MEAT CONSUMPTION IN COMPARISON WITH TEXTUAL EVIDENCE

Venison

Using the bone weight as an equivalent for the pounds of meat consumed by the residents of Dur-Katlimmu, some interesting results could be achieved. In the sample taken from the citadel, venison makes up 44.1% (*fig. 5*). If we focus more closely on the array of species it becomes evident that onagers and deer (mainly fallow deer) contributed significantly to the diet (*table 2; fig. 6*).[3] The meat of gazelles was also

3. The deer and most of the onagers were all mature at the time of death.

eaten, although in much lower quantities, while other species such as boar, beaver or hare contributed only occasionally to the diet in the palace. As suggested by some rib fragments and long bones (one with a cut mark), elephants must be added to our list of game exploited for meat.

Considering the results gained for the Lower City II, we are confronted with completely different consumption habits. According to the bone weight, the amount of venison does not exceed 15% (*fig. 5, 6b, c*). The diversity of wild mammal species, however, is comparably high. This similarity also applies to the species ranking. Only in the Neo-Assyrian residences was meat from gazelles consumed slightly more frequently than that of deer (*table 2*).

As far as wild mammals are concerned, the textual sources from Dur-Katlimmu are completely silent. Not even products such as hides, sinews, antler or ivory are mentioned (Röllig pers. com.). In this case, the bone material offers a good deal of additional information according to the number and kind of deer, boar and other game brought into town. Through indirect evidence such as body-part representation, the kind of butchering or frequency of cut-marks, we may presume that hides of ungulates and furs of foxes, marbled polecats and beavers were highly esteemed, in addition to specific raw material such as claws and teeth. However, sources exist that highlight aspects of hunting and wild life in Mesopotamia, although relating to the Neo-Assyrian period (among others Salonen 1976; Collon 1983; Anderson 1985;

Species/categories	Citadel	Neo-Assyrian residences	Northeastern corner	Total
Sheep/goat	11827	2346	24045	38218
Cattle	5016	2380	17301	24697
Pig	3761	1270	6335	11366
Dom. equids	232	1189	2907	4328
Dromedary	-	2376	5436	7812
Bactrian Camel	879	81	285	1245
Dog	480	175	746	1401
Domestic livestock, total	22195	9817	57055	89067
Aurochs	-	129	364	493
Goitred gazelle	1141	161	726	2028
Red deer	419	-	232	651
Fallow deer	4788	62	1148	5998
Roe deer	-	-	11	11
Onager	10617	746	5620	16983
Boar	175	23	154	352
Wolf	-	-	10	10
Fox/Sandfox	8	3	6	17
Bear	-	-	70	70
Marbled polecat	2	-	-	2
Wild cat (?)	-	1	9	10
Lion	-	-	39	39
Elephant	169	562	-	731
Beaver	6	-	18	24
Hare	151	18	19	188
Hedgehog	-	-	8	8
Wild mammals, total	17476	1705	8434	27615
Non-mammalian remains	380	68	350	798
Unidentified remains	23305	6011	56196	85502
Total	63356	17601	122025	202982

Table 2—TSH/Dur-Katlimmu. Faunal remains. Frequencies of species (basis: bone weight).

Grayson 1970). They mention royal hunts, the numbers of animals slain, and even particular biological features they might exhibit. For this particular period, B. Lion and C. Michel (2006) present a most interesting study in which data from the iconography in the royal palaces and cuneiform texts are compared. According to their results, the Neo-Assyrian kings preferentially hunted lions, elephants and wild cattle along with tigers and bears. The authors conjecture that during banquets, which must have been rather splendid occasions, neither the meat of elephants nor that of wild cattle was consumed, but preferentially that from hinds and gazelles (*ibid*., p. 224). Additional information, although modest in quantity, can be gathered from cylinder seals, plaques and reliefs, dating from Early Dynastic times to the Neo-Assyrian period. Customary table manners and even elements of the food can be recognised from depictions of feasts and meals. They illustrate the consumption of mutton, birds, fish, hares, locusts on sticks and many other delicacies (Ellison 1987).

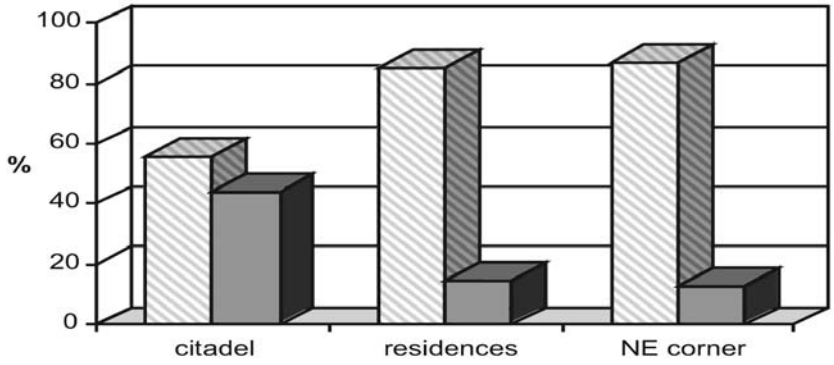

Fig. 5—TSH/Dur-Katlimmu. Relative frequencies of domestic (pale bars) versus *wild living mammals (dark bars)—bone weight of identified specimens (cf.* table 2*).*

Meat from domesticates

As far as consumption of meat from domestic animals is concerned, major differences in the diet of the Dur-Katlimmu people do also occur. In the citadel, people favoured the meat of small ruminants (29.8%; *fig. 6*). Mutton predominates over meat from goats (75% *versus* 25%). Based on to metrical data, the sheep supplied for the citadel appear to have more robust bones and were presumably larger in size than those delivered during the 1st millennium BC to the Lower City II (*table 3*). A degree of selection of particularly large animals seems to have taken place. It would be interesting to know if these examples were conspicuous not only for their size, but also for other features, *e.g.* the shape of their horn cores. Unfortunately this cannot be verified because of a lack of cranial elements. For the Middle Assyrian occupation at Tell Sabi Abyad, sheep of large size are again indicated (Cavallo 2002, p. 233). As Cavallo suggests (*ibid.)* "the large size... might be related to the breeding of larger woolly sheep".

Elements/Measurements		n	Mean value	Min-max
Humerus Bd	LC	14	32.7	29.3-36.9
	Citadel	8	35.5	29.5-39.6
Metacarpus Bd	LC	12	26.6	24.2-29.7
	Citadel	7	28.7	26.9-31.7
Tibia Bd	LC	17	28.3	24.0-31.2
	Citadel	8	29.7	27.2-32.2
Talus LI	LC	16	30.3	27.0-34.3
	Citadel	9	30.3	27.0-34.3

Table 3—TSH/Dur-Katlimmu. Ovis aries*. Size distribution of long bone measurements. Comparison Lower City II (LC)* versus *citadel.*

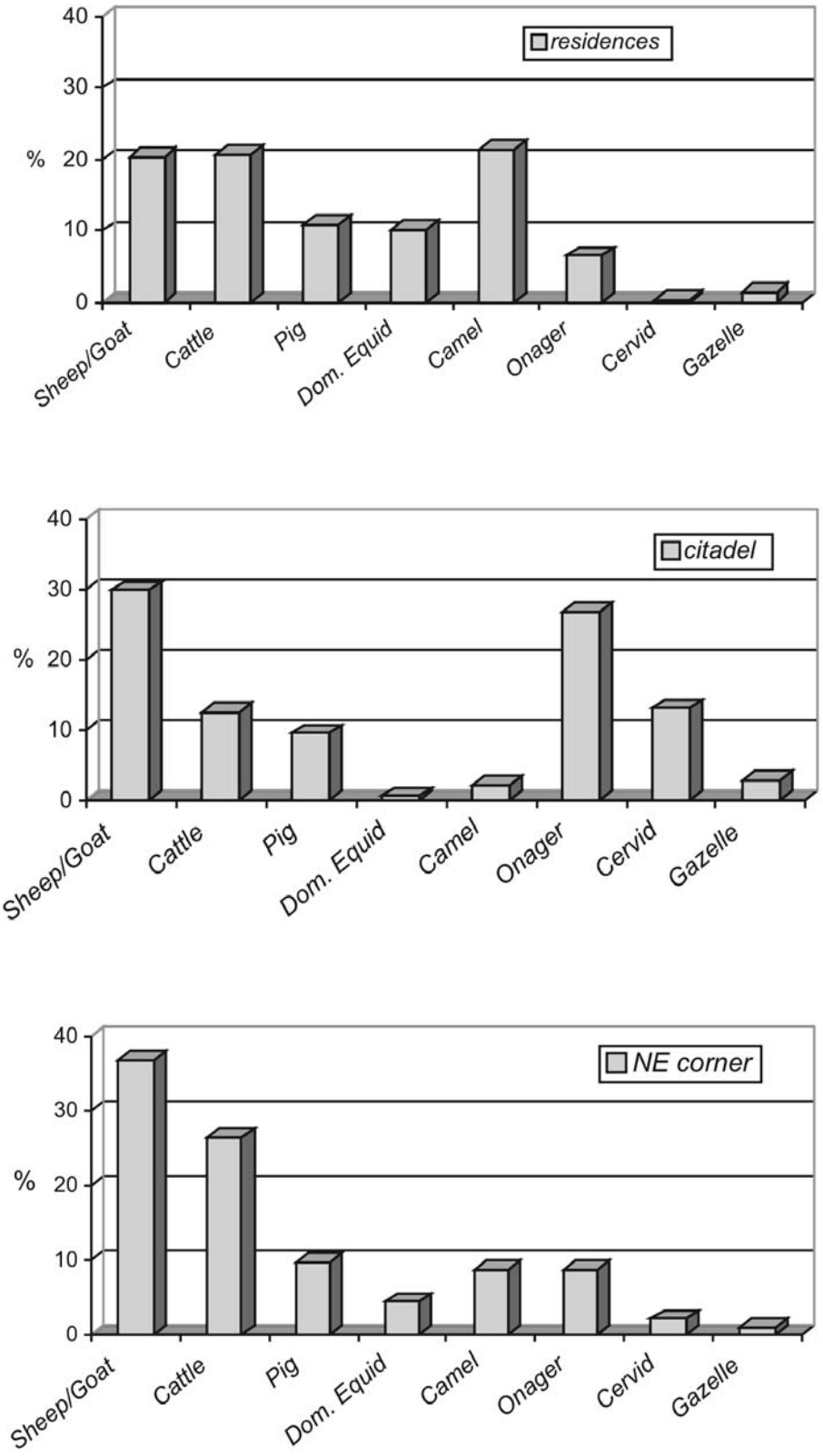

Fig. 6—TSH/Dur-Katlimmu. Meat consumption in the citadel, in the Neo-Assyrian residences and in the northeastern corner (NE corner). Relative frequencies of the most important mammalian taxa—bone weight of identified specimens (cf. table 2*).*

If we consider the age of the animals chosen for slaughter in Dur-Katlimmu, non-adult sheep and non-adult goats predominate (*fig. 7a, b*). In the citadel, the ratio of lambs and kids is even higher than in the Lower City II—further proof of the higher quality of meat supplied to the occupants of the governor's palace. The kill-off patterns quite clearly demonstrate that we are dealing with bones from animals which were explicitly chosen for slaughter: they clearly represent only part of the livestock available, a fact that becomes even more obvious when we study the records contained in the Dur-Katlimmu texts.

On average, the herds of small ruminants that were kept under state control amount to about 600 head with a maximum of 1065 and a minimum of 58 (Röllig in press 2006, pers. com.). They obviously constitute breeding flocks. Sheep and goats were kept together in the same herds, with sheep outnumbering goats by far (2:1 up to 5 or 6:1). Five categories are distinguished: ewes, rams, wethers, female and male lambs. For the goats, too, an age-related differentiation may be detected, and the contribution of each category to a herd might vary. The problem is that sex and age distinction often are not considered important to record, so that fertility rates become hard to establish. A few details can be pinpointed here: ewes and female lambs are counted 4:1; among the male sheep the proportions of adults *versus* juveniles change without any clear tendency; among the goats the number of adults is twice that of juveniles. In sum, it seems that not all animals living under state control were registered, and hence our knowledge of the complete yearly stock must remain uncertain. Particularly deserving of notice are the rarely-listed "white sheep" and "sheep with a fat tail". Wool and the hair of goats were also delivered to the city for processing by weavers or felt-makers.

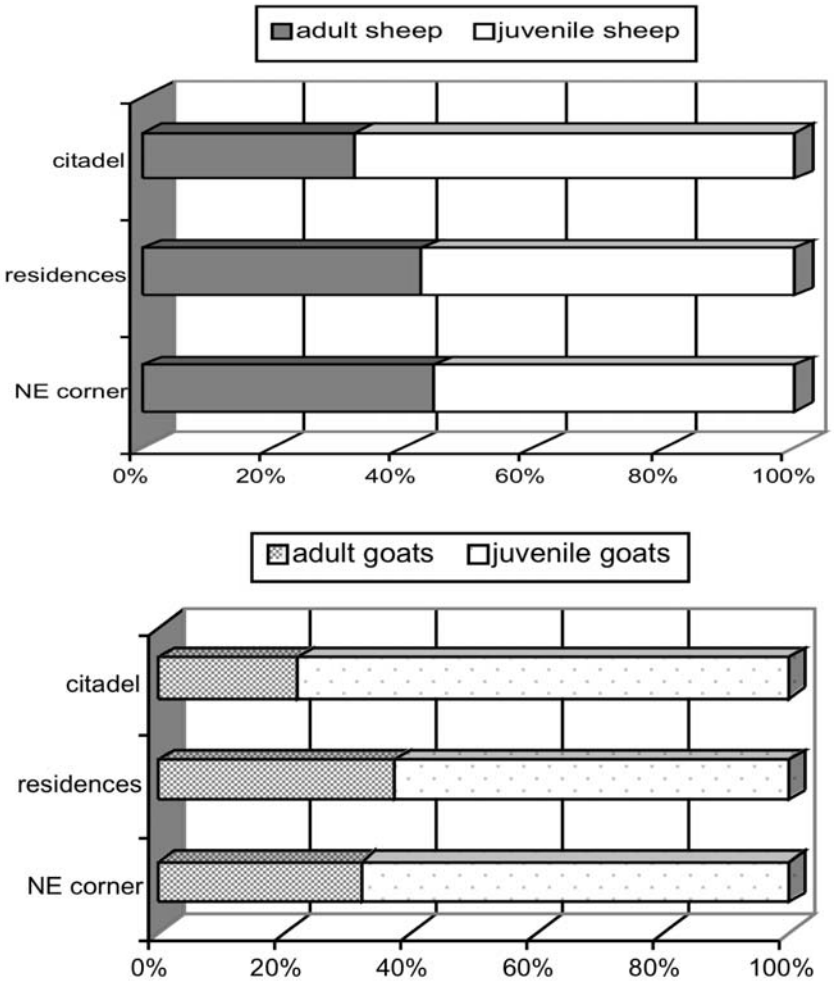

Fig. 7—TSH/Dur-Katlimmu. Ovis aries *and* Capra hircus*. Kill-off patterns: frequency of adult (dark bars) and young (pale bars) individuals (examined elements: sheep = 980, goat = 288).*

If we combine all these pieces of information, it becomes evident that large herds both of sheep and goats existed and that a certain proportion of them—particularly younger animals—was marked out for culling. Under these prerequisites, herders could regularly discard larger numbers of male lambs or young wethers, and occasionally, perhaps, elderly ewes no longer required for breeding. Additionally, from such a large stock it was even possible to choose some of the largest, most impressive animals to supply the palace. It may be that these animals were presented in procession, prior to slaughter.[4]

In the citadel, beef occupied a position of lesser importance than mutton (12.6%; *fig. 6*). The cattle bones reflect kill-off patterns with high frequencies of adult individuals. The latter were of comparably large size. Some pathological indicators point to the use of cattle as beasts of burden and labour. It seems obvious that the main goal of cattle management related to their capacity for work, while the production of beef and veal seems to be secondary in priority.

The osteological results coincide broadly with the textual evidence. Cattle, of course, are mentioned in the Dur-Katlimmu texts. The animals were led by official cowherds for grazing along the Khabur river or on the stubble-fields. The herds may have included between 14 and 182 animals. Cows, bulls and calves are listed separately. The herd's composition comprises a frequency of cows *versus* bulls as 2:1, sometimes even 1:1. Pairs of cattle for ploughing and the supply of cattle hides are mentioned. In one text, particular large individuals, perhaps from a special breed, are referred to. These animals were given a specific fodder and were used only for threshing and transport (Röllig in press, pers. com.; Radner 2003).

According to the bone record, pork was also of limited importance (9.5%; *fig. 6*). The pigs were mostly juvenile and subadult at the time of slaughter, typically in their first and second or early third year. In the Dur-Katlimmu texts, no mention of pigs can be found, perhaps not too surprising in view of their modest value as a source of meat. Furthermore, it should be remembered that generally in cuneiform texts some features are ignored or considered to be of insufficient importance to merit recording. Pork or pigs could have fallen into this category. In other contemporary sources, too, *Sus domesticus* is rarely mentioned. For example, in the Middle Assyrian texts from Tell Sabi Abyad, pork is included only once in the list of foodstuffs (Cavallo 2002, p. 234). In this context, attention may be drawn to a paper by B. Englund (1995) who offers information about boar hunting and the management of pigs in ancient Mesopotamia from the late 4th millennium BC onwards, based on depictions from cylinder seals and notes on (proto-) cuneiform tablets. In addition to numerical notations, the animals are qualified according to their status (wild/domestic) and the habitat in which they were kept, as well as their age.

Dissimilarity in the osteological and textual representation, although pointing in the opposite direction, can also be detected amongst the Equidae. According to the osteological record, meat from donkeys was of almost no importance for consumption (citadel: 0.6%; cf. *fig. 6* and *table 2*). Furthermore, the bone remains yield mostly elements from less meat-bearing parts such as phalanges and astragalus, while sections rich in meat are very few. This phenomenon is often considered to be connected with the recovery of slaughtering waste or hides. In fact, it should be observed that in the texts, hides from donkeys are indeed mentioned as being brought to the leather workers. Such hides also served as substitutes for a dead or lost animal and had to be presented during the official yearly investiture. The question may be asked as to whether such a situation is reflected here. Nonetheless, the remains could have come from regularly slaughtered animals whose meat was distributed elsewhere. It was perhaps only rarely consumed (if at all) by the inhabitants of the citadel, although it could have been appreciated by the inhabitants living in the Lower City I.

The low frequency of donkey remains in the bone waste contrasts with the high number of donkeys available at that time. The herds listed in the texts may number up to 331 head. Female and male individuals occur in a frequency of 2:1 (Röllig in press). It is curious that in the texts a distinction is made between so-called "local" and "Syrian" asses, the meaning of which is not quite clear (Röllig pers. com.). If these "Syrian" donkeys were in fact onagers, the quantitative inconsistency between osteological and literal sources would be cleared up, since onagers contributed plentifully to the meat diet of the citadel people (26%; see "Venison"). The overwhelming majority of the domestic donkeys, however, were used for agricultural purposes and/or to carry burdens, water and people. In the Middle Assyrian texts not only the size and composition of

4. I must thank Angela von den Driesch for contributing this interesting idea.

the herds are mentioned but also the names of herdsmen who had a special responsibility for these animals—thus providing evidence for the importance of such beasts. One may wonder why the texts from Dur-Katlimmu make no mention of crossbreeds and horses, both highly esteemed animals. Only in one text is the fodder for horses listed (Röllig pers. com.). Again, proof of their existence is based solely on the osteological record. The last animal to be considered as a source of meat is the camel. In the citadel, only nine camel bones were recovered, representing 2.2% of the bone weight. As with the donkeys, parts of the lower limb bones predominate. Quite obviously, camel meat was not regularly consumed, if at all (cf. *fig. 6*). This may be because of the primary use of two-humped camels as beasts of burden or their relative scarcity or it may simply reflect matters of taste.

In relation to camels the Dur-Katlimmu texts fall completely silent. We know of two-humped camels and dromedaries from depictions and likewise from texts, but only from the 1st millennium BC (Clutton-Brock 1987, p. 13; Moortgat 1990, table 66).

For meat consumption in the Lower City II during the Neo-Assyrian period, we can rely only on osteological results: textual evidence is missing completely. In the Neo-Assyrian residences, people enjoyed a fairly balanced meat consumption, focusing on mutton and beef in nearly equal quantities (about 20%; *fig. 6*). In the residences and in the north-eastern corner camels (dromedaries!) make up 21% of all meat consumed (*fig. 6*). The presence of many skeletal elements rich in meat and bones with cut marks further supports this view. Altogether 10% of the meat came from donkeys and pigs, respectively. Based on age classes, all domestic Equidae were slaughtered as old individuals, a fact that underlines the use of such animals as beasts of burden and labour, not primarily as a meat source. The pigs were slaughtered around 1 to 2 years, mutton and goat meat mostly came from yearlings (cf. *fig. 7a, b*), and beef from adult cows.

Most interestingly, the inhabitants of the north-eastern corner enjoyed a menu that differed considerably from the previous picture. It was much less balanced (*fig. 6*). Mutton predominated (36.7%), beef was placed second (26.4%) while pork and meat from donkeys and camels was consumed only very occasionally (less than 10%).

DISCUSSION

With the analysis of the meat consumption in Middle- and Neo-Assyrian Dur-Katlimmu, not only general aspects of the diet but also varying consumption habits became visible. Although there is a chronological distance between the samples uncovered from the citadel and those from the Lower City II, it may be asked whether or not a social component is indicated here. It can be argued that the higher the social status of people, the more venison they consumed, and that this also holds true for the case presented here: the frequency of 44% venison in the meat consumption at the citadel is an undisputed fact. This result refutes a statement made by A. Clason and H. Buitenhuis (1998) who suggested that "hunting was economically of no importance in the Bronze Age towns and cities of the Orient" (*ibid.*, p. 207).

But we may ask whether the preceding hypothesis is truly valid, since the inhabitants of the Lower City II are also characterised as members of an "elite" (Kühne 2006) and cannot be associated with the consumption of high amounts of venison. There may, of course, have existed some gradation within the higher echelons of society at Dur-Katlimmu. Such a view is supported by two facts: these people resided in two distinct quarters of the Neo-Assyrian city with dissimilar architecture; their consumption habits differed, as we have seen already. It remains to be investigated whether supplementary differences also existed.

In addition, it remains questionable whether the proportions of venison *versus* meat from domestic mammals or the varying frequencies of mutton *versus* pork *versus* beef can be linked exclusively with social rank or whether they were tied to changing provisioning strategies and/or the availability of wild game in the immediate surroundings of the city during the Middle and Neo-Assyrian period. In the context of this question, another more basic argument has to be considered: one has to distinguish very strictly between consumption processes (reflected in the bone refuse), animal and product distribution (recorded on

the tablets) and animal production in general (an unknown quantity). With reference to the latter, it may be stressed that the results from Dur-Katlimmu provide a very good illustration of the often-neglected fact that slaughter and consumption residue mirror aspects of culinary customs first of all and not *a priori* the entire management of livestock in a larger area.

The aspect of animal and product distribution cannot be answered in full, since for the Neo-Assyrian period detailed information from cuneiform tablets about official herd management is missing. We have to rely exclusively on the picture gained from the bone refuse. The other aspect, the availability of game, can of course be investigated. A short account of the environmental development of this region follows in order to address this important complementary dimension.

ENVIRONMENTAL CONSIDERATIONS

If one travels today through north-eastern Syria, the overall impression is that of a completely devastated environment. Apart from some limited areas with reeds and a handful of fast-growing poplars, the lower Khabur valley is almost devoid of natural vegetation. The steppe, too, is almost bare of natural plant cover, except during the rainy season when a thin carpet of herbs and grass covers the soil. Fields with maize or sesame irrigated by a motor-pump system brighten the monotonous view, while on the hills of the Jebel Abd-al-Aziz and Jebel Sinjar, only miserable remains of a former forest can be found. Nature itself imposes limitations for agricultural activities. This region is located south of the 200 mm isohyets, so that rain-fed agriculture is not possible (Wirth 1971; Van Zeist 1999/2000). Given such circumstances, it is all the more remarkable that Dur-Katlimmu could grow to such a size and could endure over the millennia.

In order to reconstruct the former ecological situation and to determine the kind of human inventiveness that was necessary to cope with the situation, palynological, botanical, zoological and geo-morphological investigations were carried out. This multi-disciplinary approach shed light on four main environmental aspects:

—First, the climate in that part of Syria has not changed dramatically during the last six millennia (Gremmen, Bottema 1991).

—Second, the potential vegetation must have been much more plentiful than today: a gallery forest grew along the Khabur river; in the steppe, to the right and the left of the river terraces, a rich plant cover (*Artemisietea)* grew over a vast area; a steppe-forest with pistachio and other trees could be found further north at the Jebel Abd-al-Aziz and Jebel Sinjar (Frey, Kürschner 1991).

—Third, the repertory of animals in evidence for Dur-katlimmu perfectly matches this reconstructed vegetation cover, as has already been shown in detail elsewhere (Becker 2005/2006). Elephant, beaver, fallow deer, boar, gazelle, onager and hare are some of the most indicative species. In particular, the rich wildlife in the reed jungle along the Khabur river is a rather unexpected feature, considering the aforementioned conditions. It should be stressed that this biotope, rich in plants and animals, is specifically mentioned in the Dur-Katlimmu texts (Radner 2003, p. 8).

—Fourth, the most important measure to cope with the difficult ecological situation was the building of canals that brought water from the Taurus Mountains 200 km through the steppe southwards to the city (Ergenzinger, Kühne 1991, p. 167). Particularly in the hot summer months, when the water level in the Khabur river would have been rather low, this water was necessary for humans and beasts and, above all, for the irrigation of fields and gardens. Most interestingly the texts, too, mention irrigated areas and refer to the existence of wells and fountains (Radner 2003, p. 7). The use of canals, of course, persisted far into the 1st millennium BC, because at that period Dur-Katlimmu reached its greatest extent. Without doubt, the installation and the maintenance of canals was labour- and time-consuming and a tremendous task to manage. One is inclined to ask “Why was the city founded in this spot and not north of the 200 mm isohyets where environmental conditions were more favourable?” The reasons indeed are manifold. As far as I have understood, they are strategic in nature rather than ecologically determined. During the Middle Assyrian period, Dur-Katlimmu served as an outpost at the western flank of the empire. It was an important provincial

centre for administration. From its sheer size and its spacious architecture, the city presented a conspicuous and constant demonstration of governmental power. Undoubtedly, it was also an important junction for traffic and commerce. These routes went through the Syro-Mesopotamian steppes and sometimes crossed rivers at natural fords, one of which was located near Dur-Katlimmu. However, the extent to which the Khabur river and the many canals covering parts of the country and even pre-dating the Assyrian empire (cf. Di Nocera 1998, p. 149) contributed to transport remains subject to debate. It is possible to imagine the transport of heavy goods or of animals on rafts or small boats at least over some distances. How many of these canals and related levees might have existed in prehistoric Mesopotamia as a whole is not known, although their presence has recently been revealed for the region around Sippar through SRTM (Shuttle Radar Topography Mission; see Hritz, Wilkinson 2006). Whether we may presume a comparable situation in the area under discussion here remains to be seen.

During the Neo-Assyrian era, when Assyrian influence in the Near East was culminating, Dur-Katlimmu was maintained as an important junction for traffic and commerce as well as a secure base for a growing army. In addition, during the 1st millennium BC the Lower Khabur valley was a region where large numbers of deportees were resettled—a measure that artificially enlarged the population at that time, making large-scale centralised management in the region essential (Bernbeck 1993; Kühne 1994).

However, during the 1st millennium BC the natural plant cover as well as the wildlife of the Lower Khabur region may have already suffered from massive human impact. This is illustrated by the analysis of more than 10,000 charcoal remains (Frey *et al.* 1991). These investigations demonstrated quite clearly that in contrast to the 2nd millennium BC when only regional trees such as *Populus*, *Tamarix*, *Pyrus*, *Crataegus* and *Ulmus* were exploited, the 1st millennium BC saw a massive import of *Pinus* from regions near the Turkish border (*ibid.*, p. 142). This would only have been necessary when the gallery forest along the Khabur river was already severely depleted. The results: a loss of habitats, a decline in numbers and/or a retreat of plant and animal species from the immediate neighbourhood of Dur-Katlimmu. This need not mean that elephants, beavers or fallow deer disappeared completely from the wider Khabur area or adjacent areas. It is most remarkable that—in contrast to the amount of specimens—the species diversity from the Dur-Katlimmu records remained at a constant level even during the 1st millennium BC. Furthermore, other sources both iconographic and textual in nature also reflect a continuing wealth of wildlife: during royal hunts, elephants, lions, wild cattle, deer, gazelles, ostriches and many other species were captured in large quantities (Lion, Michel 2006, p. 220). An impoverishment of game might be restricted to those regions near the centres of the Assyrian empire and might mainly concern the *density* of the wild mammal populations. If this in fact was the case, it could offer an explanation for the low frequency of venison consumed by the elite from the Lower City II simply because in the nearer environment game was available only in reduced numbers.

CONCLUDING REMARKS

The study described here was intended to highlight aspects of consumption at Dur-Katlimmu as well as to pinpoint some problematic issues connected with livestock management and the exploitation of natural resources in the Lower Khabur valley under the regime of the Assyrian kings. The conjunction of osteological results and records from the cuneiform tablets has considerably widened the view far beyond the potential that one source alone can offer. But although the texts can be astonishingly detailed, like the bone remains, they provide only a partial picture of the exploitation of domestic and wild animals, of the process of livestock management and of the logistical background.

It is difficult to say how much the Dur-Katlimmu results reflect a general picture rather than being linked with the particular status of this city. This is due to the low number of comparable Syrian sites with bone material either from the Iron Age (Tell Afis, Tell ‘Ain Dara) or the Late Bronze Age (Tell Sabi Abyad). The sites mentioned are not only much smaller than Dur-Katlimmu and located in a rather different environment (cf. *fig. 1*)—they also differ in character and function (Wilkens 1998; Frey, Marean 1999; Cavallo 2002). In carrying out an inter-site comparison, we would not only be drawing on data from different geographical areas, but confronting different social phenomena and thus pursuing a rather imbalanced picture. Tell Sabi Abyad, for example, is characterised as a *dunnu*, a small fortified precinct, inhabited for a fairly short period of time. The faunal remains from the *dunnu* reflect a decidedly different picture for the meat diet: the number of bones from pigs, Equidae and gazelles is surprisingly high.[5]

Two last aspects may be emphasised: first, did the rural population in the wider surroundings of Dur-Katlimmu benefit economically from the proximity of this vast city and second, what effect did livestock management under the rules of the government have upon the general management of animals in the entire Khabur valley? We can only assume that sheep/goat pastoralism was the main pillar of subsistence in the countryside, but the question of who in fact kept cattle, pigs or donkeys and in what numbers remains unsolved. In any case, there must have been a production-surplus intended for the supply of the city—a surplus from which the official herdsmen could obtain their animals. A far-reaching economic network must have existed to meet all these demands.

As might be expected, faunal collections such as this one are bound to raise more questions than they answer. The analyses of bone refuse—be it the most unspectacular material ever recorded for the Assyrian period—is indispensable for the exploration of all the complexities of Assyrian society. The animal bones analysed from Dur-Katlimmu present a variety of unexpected details, but draw us even deeper into the search for a greater understanding. Therefore, this paper is also intended to be a stimulus for discussions on the economic dimensions of bone refuse, to be brought to the attention of archaeologists and assyriologists, in order to further the reconstruction of this fascinating period of the Assyrian empire.

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My warmest thanks go to Wolfgang Röllig who provided me with information on many still unpublished details mentioned in the texts of Dur-Katlimmu which are related to the management of livestock and supply, to Janoscha Kreppner who deepened my knowledge about the Assyrian Empire on more than one occasion, to my colleagues for their inspiring remarks on my paper during the ASWA conference at Lyon in June 2006, and—as so often—to Arthur MacGregor for his most helpful comments on my English text.

5. Unfortunately, the bone weight is not given in the publication and neither are the Equidae remains finally analysed. From their sizes, C. Cavallo (2002, p. 235, 239) claims that horses, donkeys, hybrids as well as onagers might be present in Sabi Abyad.

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