

Zooarchaeology of the Pleistocene/Holocene Boundary

Proceedings of a Symposium Held at the 8th
Congress of the International Council for
Archaeozoology (ICAZ)
Victoria, British Columbia, Canada
August 1998

Edited by

Jonathan C. Driver

BAR International Series 800
1999

British Archaeological Reports are published by John and Erica Hedges and by Archaeopress.

This volume has been published by:

John and Erica Hedges

British Archaeological Reports

7 Longworth Road

Oxford OX2 6RA

England

Tel/Fax +44 (0)1865 511560

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BAR S800

Zooarchaeology of the Pleistocene/Holocene Boundary: Proceedings of a Symposium Held at the 8th Congress of the International Council for Archaeozoology (ICAZ), Victoria, British Columbia, Canada, August 1998

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Volume Editor: John Hedges BSc(Hons), MA, MPhil, FSA, FSAScot, FRAI, MIFA

Printed in England by Biddles Ltd

ISBN 1 84171 109 8

All BAR titles available from:

Hadrian Books

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HUNTING THE BROAD SPECTRUM REVOLUTION: THE CHARACTERISATION OF EARLY NEOLITHIC ANIMAL EXPLOITATION AT QERMEZ DERE, NORTHERN MESOPOTAMIA

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Introduction

The site of Qermez Dere lies on the N.W. outskirts of the town of Tell Afar, on the southern side of the Jebel Sinjar range, approximately 50 km W. of Mosul in northern Iraq (Figure 6.1). It is located immediately by the main road which by-passes Tell Afar en-route from Mosul to the town of Sinjar and lies just above the huge, flat expanse of the North Jezirah plain in the foothills of the eastern extension of the Jebel Sinjar range.

The site's importance can be understood in terms of its location and date. It is the earliest permanent settlement site (along with Nemrik, excavated at the same time by Professor Stefan Kozlowski) in Northern Iraq outside the mountain and piedmont zone of NE Iraq. Since settlement sites of such a date are extremely rare in the Near East, Qermez Dere is a significant site in unravelling the story of the beginnings of sedentary village life and the origins of farming.

The strange architecture of the settlement bears on the cultural and social development of early sedentary communities, and their exploitation of local resources by hunting and gathering gives a very important date after which cultivation and herding began. A detailed analysis of the vertebrate remains from Qermez Dere was undertaken in order to closely define the economic basis of this sedentary

early neolithic hunter-gatherer community and illuminate subsistence patterns of pre/proto-domestication communities in Northern Mesopotamia.

The analysis aimed to:

- characterise the deposits over the site and attempt to identify patterns of activity and refuse disposal;
- determine and quantify the taxa represented;
- test for seasonal variation of exploitation;
- provide clues as to the immediate environs of the site and the range of exploitation;
- establish how this assemblage fits into the wider picture of late Epipalaeolithic/early neolithic animal exploitation in the Near East particularly in regard to the 'broad-spectrum' concept; and
- provide the basis for a model of proto-domestication resource exploitation in northern Mesopotamia.

The excavation

The excavation was undertaken at the suggestion of the Department of Antiquities and Heritage as the site was seriously threatened by road-building, by pipeline and communication cable trenches and by the mechanised digging of soil for making gardens around new houses of the expanding town. Early in 1986 the Directorate-General of

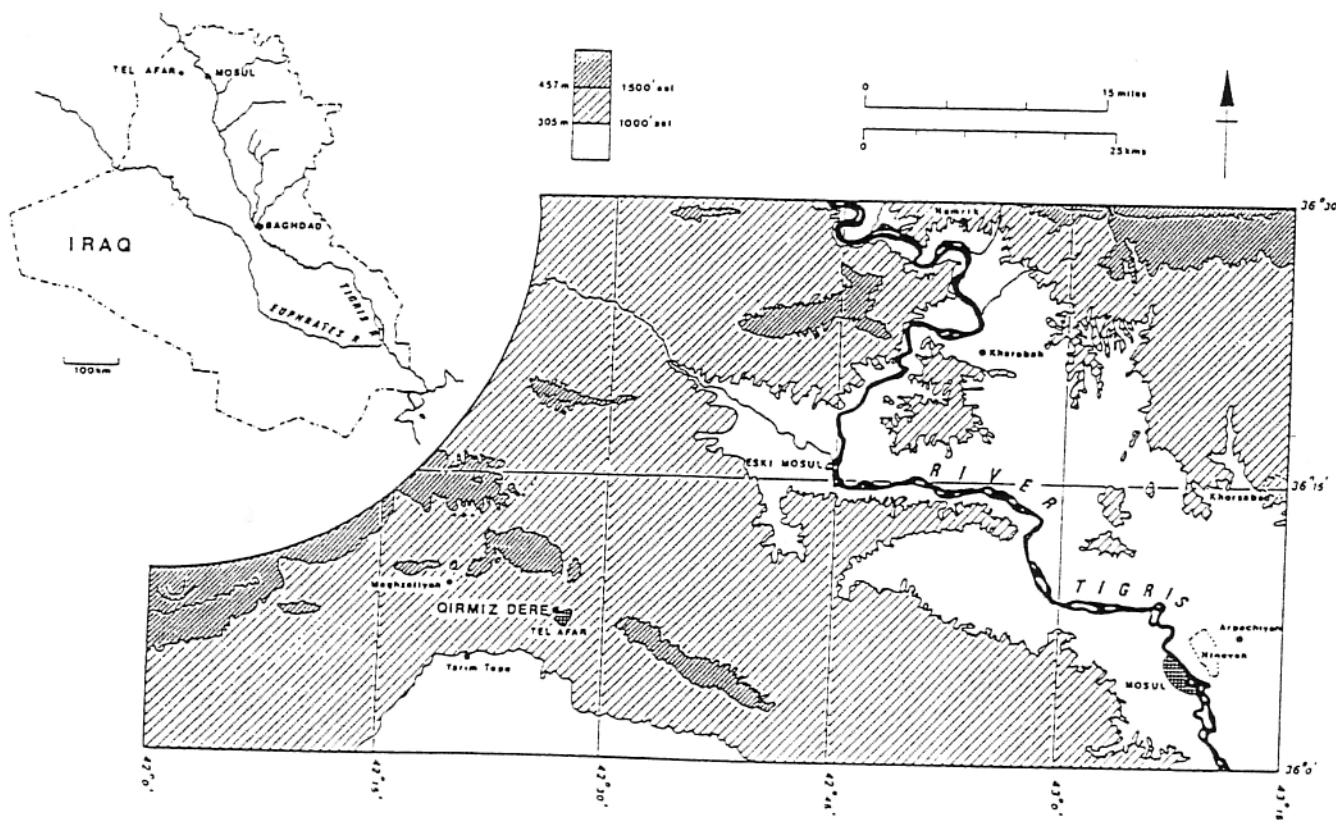


Figure 6.1. Position of Qermez Dere

Antiquities approached the British Archaeological Expedition in Iraq to see if they were interested in mounting an emergency rescue excavation. That October, a small trial excavation was carried out under the supervision of Dr. Ellen McAdam, and a first season of excavation led by Dr Trevor Watkins of Edinburgh University followed from mid-April to mid-May 1987 (Watkins and Baird 1987; Watkins, Baird and Betts 1989). A second season of excavation took place at Qermez Dere from early-April to mid-May 1989 (Watkins et al. 1991). The third and final season of excavation took place between early-April to mid-May 1990 (Watkins et al. 1995).

Dating

In 1992 a short series of six radiocarbon dates was undertaken on samples from Qermez Dere at the Oxford

Accelerator Mass Spectrometer Laboratory (Watkins et al 1995). These revealed that the occupation of the site began some time before 8000 BC, continuing into the first half of the eighth millennium BC. With the exception of a single early date, the remaining five dates form a cohesive group, whose pooled mean lies between 8000 and 7900 BC. This series of dates accords with those radiocarbon dates from the culturally contemporary site of Tell Mureybit (N.Syria) in its late Phase 1 and Phase 2 stages. This small village settlement at Qermez Dere dates therefore to the proto-neolithic or very early aceramic neolithic, a period which witnessed the beginnings of the transition from hunter-gathering to the domestication of selected plants and animals.

Table 6.1 Total number of identified fragments

		Phase							
Taxon	Common name	2	2.5	3	4	5	6	7	Total
cf. <i>Pernis apivorus</i>	?honey buzzard	0	0	1	0	0	0	0	1
<i>Neophron percnopterus</i>	egyptian vulture	0	0	0	0	0	5	1	6
<i>Buteo</i> spp	buzzard	0	0	0	0	0	0	1	1
<i>Buteo buteo</i>	common buzzard	0	1	1	1	0	1	1	5
cf. <i>Buteo rufinus</i>	?long-legged buzzard	0	1	1	0	1	8	1	12
<i>Aquila rapax</i>	steppe eagle	0	0	0	0	1	0	8	9
cf. <i>Alectoris chukar</i>	?rock partridge	0	0	0	0	0	1	0	1
<i>Alectoris chukar</i>	chukar partridge	0	0	3	0	0	0	0	3
cf. <i>Ammoperdix griseogularis</i>	?see-see partridge	0	0	0	1	0	3	1	5
cf. <i>Francolinus francolinus</i>	?black francolin	0	0	0	0	0	1	0	1
<i>Francolinus francolinus</i>	black francolin	0	0	0	0	1	0	0	1
cf. <i>Anthropoides virgo</i>	?demoiselle crane	0	0	0	0	0	1	0	1
<i>Chlamydotis undulata</i>	houbara bustard	0	0	2	0	2	16	6	26
<i>Ovis tarda</i>	great bustard	0	0	0	0	0	1	1	2
<i>Pterocles</i> sp	sand grouse	1	1	5	3	5	37	5	57
cf. <i>Pterocles alchata</i>	?pin-tailed sand grouse	3	5	24	41	18	95	39	225
cf. <i>Pterocles orientalis</i>	?black-bellied sand grouse	1	0	2	8	6	7	0	24
<i>Bubo bubo</i>	eagle owl	0	0	0	2	0	0	0	2
<i>Corvus corone/fragilegus</i>	carion crow/rook	0	0	1	0	0	2	0	3
Alaudidae	lark	4	1	4	0	0	2	0	11
	Total Bird	9	9	44	56	34	180	64	396
<i>Hemiechinus auritus</i>	long-eared hedgehog	*	*	*	*		*		
<i>Meriones</i> sp	jird			*			*		
<i>Tatera indica</i>	Indian gerbil		*		*				
<i>Lepus capensis</i>	cape hare	19	16	111	97	76	152	81	552
<i>Vulpes vulpes</i>	red fox	18	20	162	913	67	372	125	1677
<i>Meles meles</i>	badger	0	0	0	0	1	3	2	6
<i>Felis silvestris</i>	wild cat	1	3	2	11	3	12	11	43
<i>Equus hemionus</i>	onager	0	0	0	0	1	1	1	3
cf. <i>Equus hemionus</i>	?onager	0	0	0	0	0	0	1	1
<i>Bos primigenius</i>	wild cattle	0	0	3	1	2	3	3	12
<i>Gazella</i> cf. <i>subgutturosa</i>	?goitred gazelle	53	33	205	72	174	462	175	1174
<i>Ovis orientalis</i>	wild sheep	4	3	13	2	1	11	8	42
Caprovid	sheep/goat	2	0	9	9	10	4	4	38
<i>Ovis/Capra/Gazella</i>	sheep/goat/gazelle	12	10	58	20	78	323	138	639
	Total Mammal	109	85	563	1125	413	1343	549	4187

Recovery and phasing

The vertebrate assemblage from this small site was carefully controlled for context, and care was taken with quantifying the sampling process. Dry-sieving of all sediment matrix was undertaken through screens with 4mm apertures, whilst standard wet-sieve samples (60 litres maximum where context size allowed) were processed on-site through 1mm mesh. Washovers or flots from these samples were kept for analysis of palaeobotanical remains, whilst residues were further wet-sieved to 3mm (residues from 10 litre voucher samples sieved to 1mm were also retained). The combination of tight stratigraphic and contextual control, rigorous collection and quantified sampling make the recovered material unique for the region.

The stratigraphic phases of the site are as follows: Phases 0 and 1 represent superficial and disturbed topsoil deposits, whilst phases 2, 2.5 and 3 are deposits from subsequent phases of house construction (houses RAA, RAD and RAB respectively). Phases 4-6 represent the 'southern midden deposits' and phase 7 'basal soil' deposits.

Evaluation of site formation processes

A range of semi quantitative data was recorded for the bone assemblages from each context. Preservation and colour of the entire vertebrate assemblage was remarkably consistent throughout, with preservation being recorded as 'fair' and colour recorded as 'fawn' for almost all contexts. The vast majority of the Qermez Dere animal bones are homogeneous in terms of fragmentation, with most contexts containing bone fragments of between 0-2 cm. The only outliers from the dry-sieved fraction included contexts 104, RDN and RDO where more than 50% of the fragments were between 2-5 cm in length. Burning was evident on much of the material,

with low frequencies in the earliest and latest phases of the midden. This may indicate a shift in the disposal practices of the inhabitants of the site during phase 5, where higher proportions of burnt bone were noted. Later house fills also appear to contain more burnt bone, and may be explained by the utilisation of abandoned dwellings as convenient dumping areas for cooked domestic waste.

Skeletal element representation

Analysis of the representation of different skeletal elements showed that gazelle heads were poorly represented in most phases, whilst the major long bones and feet were all present. This is not the case for fox and hare remains and may reflect the fact that gazelle heads were removed elsewhere and not brought back to the site, or that the removal of horncores from the heads was carried out on a different part of the site and the heads disposed of separately to the consumption waste. It is also clear that there are striking similarities in the pattern of element representation in material from phases 4-7, representing the basal level and southern midden deposits. This evidence appears to indicate that little difference in the utilisation and disposal of gazelle remains occurred at the site throughout the sequence of occupation represented by the midden. This conclusion is corroborated by both fox, and (to some degree) by the hare remains where the pattern for phases 4-7 remains remarkably similar. For all species, major meat bearing elements, as well as distal limb bones, are represented, and it would appear that both primary butchery waste and domestic refuse were equally well represented. Although skinning marks on some of the fox, hare, and even cat bones were recorded (see below), no bias towards feet and head elements exist to suggest the primary importance of pelts over meat.

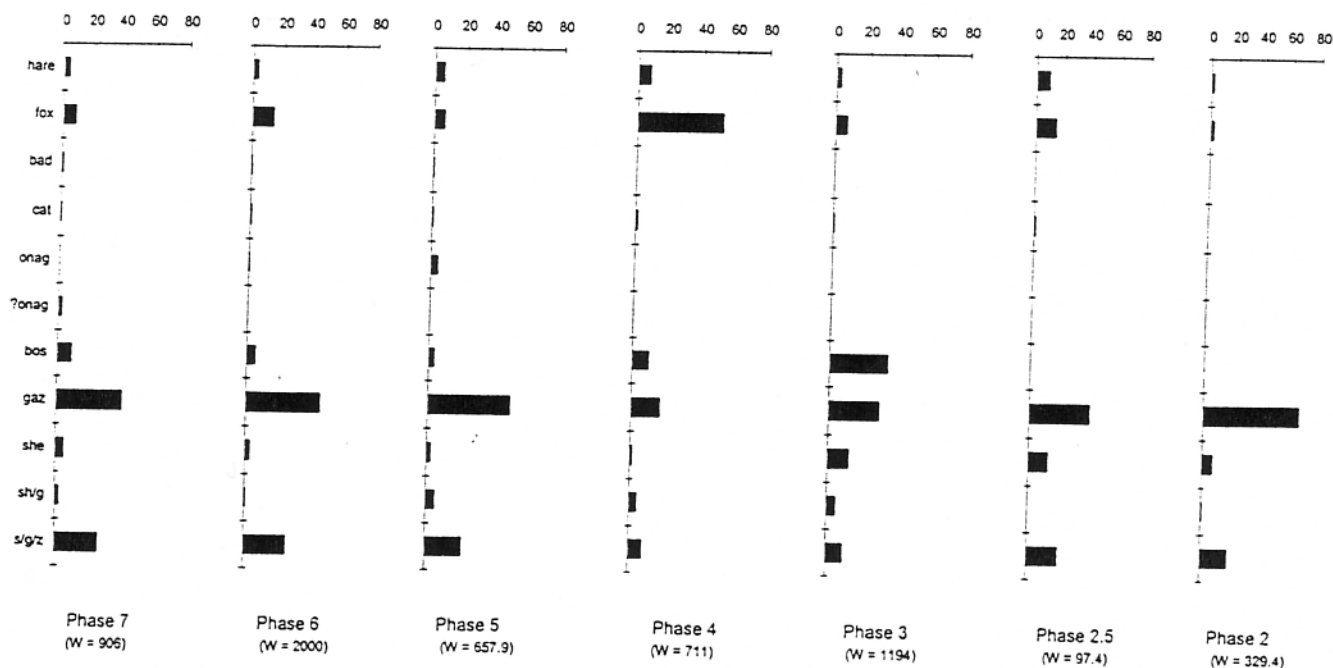


Figure 6.2. Percentage frequency of combined weight (gm) of major mammal species from wet and dry-sieved samples. (bad = badger, onag = onager, bos = *Bos primigenius*, gaz = gazelle, she = sheep, sh/g = caprovid, s/g/z = caprovid/gazelle, w=weight gm).

Occurrence and relative importance of taxa

The vertebrate assemblage recovered from excavations at Qermez Dere totalled 4,583 identified fragments. A wide range of both mammal and bird species have been identified, by far the most numerous being those of *Gazella*, *Vulpes* and *Lepus* for mammals, and *Pterocles* for birds (Table 1). When considering the varying frequencies of individual mammal species by total weight, the overall pattern is decidedly similar throughout all phases (Figure 6.2). However, a distinct peak of fox is represented in phase 4 deposits (most marked in the dry sieved assemblage), whilst gazelle appear most frequent in phase 2 deposits (again from the dry sieved material). The remains of wild caprovids also appear most frequent in later deposits (i.e. phases 2-3). Calculations of the minimum number of individuals (MNI) corroborate the pattern of frequency shown by the use of total identified fragment and total weight data and indicate that the patterns observed are certainly not artefacts of the different methods of calculating species frequency or a result of different recovery procedures. The overall patterns demonstrated for the vertebrate assemblage from Qermez Dere appear broadly similar throughout all phases.

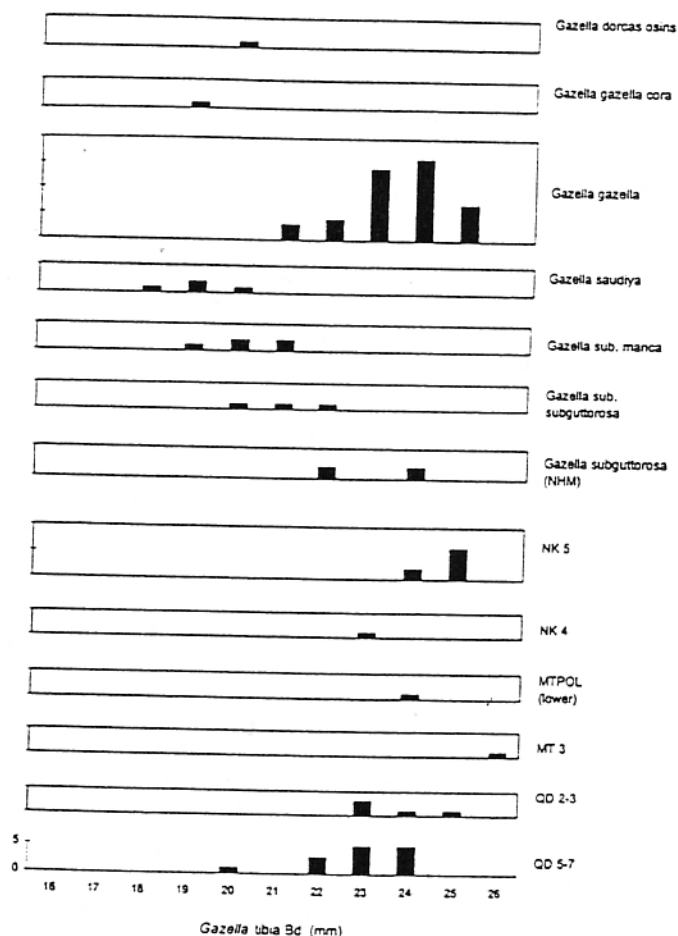


Figure 6.3. Distal breadth (Bd) of archaeological and modern gazelle tibiae. (QD = Qermez Dere; MT and MTPOL = M'lefaat; NK = Nemrik; NHM = Natural History Museum. All other data from Environmental Archaeology Unit comparative specimens).

Major mammal species

Gazelle (*Gazella* cf. *subgutturosa*)

Identifications of gazelle material from other sites has too often been based on assumptions related to modern day distribution patterns (Uerpman 1987: 98) which may have been radically different in the past. Using biometrical data to separate species is also problematic since there is often an overlap in size between species. Figure 6.3 shows comparisons of tibia measurements between modern comparative gazelle species and those from northern Mesopotamian Neolithic sites of Qermez Dere, Nemrik and M'lefaat. It is clear that values for both modern *Gazella gazella* and *Gazella subgutturosa* overlap to a considerable degree and values for all the early Neolithic specimens from the three sites discussed fall within the range of both species. Figures 6.4 and 6.5 show bivariate plots for distal humerus measurements which compare both the modern and archaeological data. Again, a major overlap occurs between values for *G. gazella* and *G. subgutturosa*, with values for the archaeological material falling towards the upper end of their distribution.

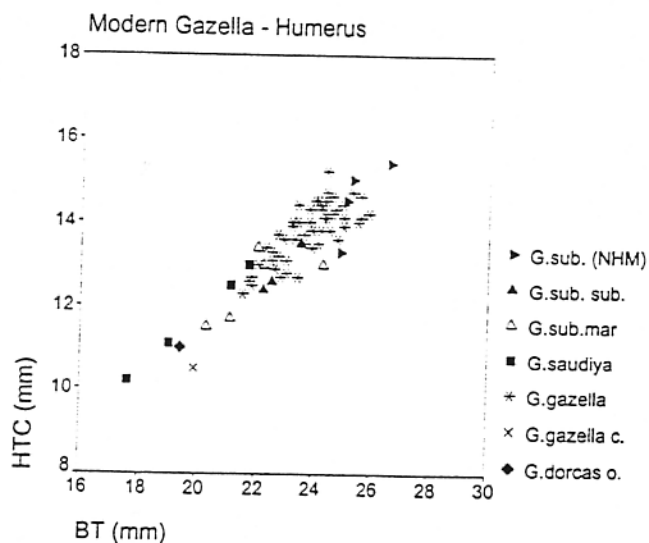


Figure 6.4. Bivariate plot of modern gazelle humeri. See Figure 6.3 for key to species.

On the basis of their modern day distribution, the goitred gazelle (*G. subgutturosa*) is the only species to occur in the lowlands and foothills north and east of the river Tigris and probably all of Mesopotamia (Uerpman 1987: 98). *Gazella gazella* appears to be confined to east of the Euphrates, in the hills and coastal area of the southern Levant (Uerpman 1987: 100) and there is no firm archaeological evidence of an eastern distribution beyond the site of Ksar 'Akil in central Lebanon (Hooijer 1961). The geographical location of Qermez Dere (and that of Nemrik) falls within the modern range of *Gazella subgutturosa*, and at the centre of the northern distribution of other proto and late Neolithic sites where goitred gazelle remains have been definitely identified (Uerpman, 1982, Bibikova 1981, Turnbull and Reed 1974). On the basis of general size and distribution therefore, the gazelle remains from Qermez Dere, Nemrik and M'lefaat are

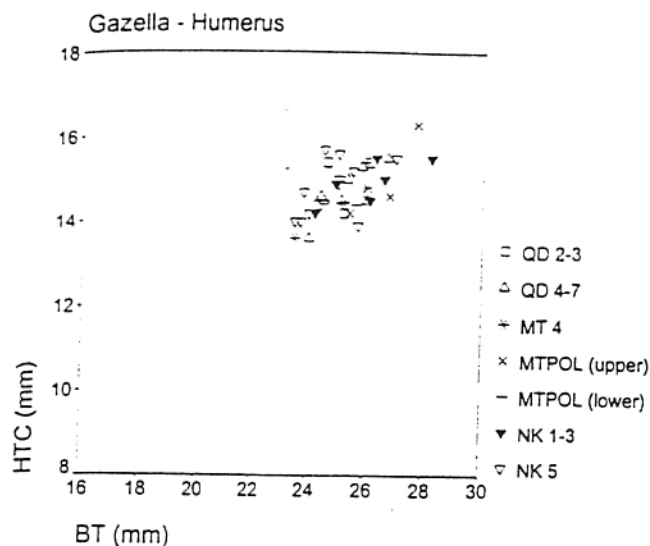


Figure 6.5. Bivariate plots of archaeological gazelle humeri. See Figure 6.3 for key to sites.

most likely that of *Gazella subgutturosa*. The few poorly preserved horncore fragments seem to support this

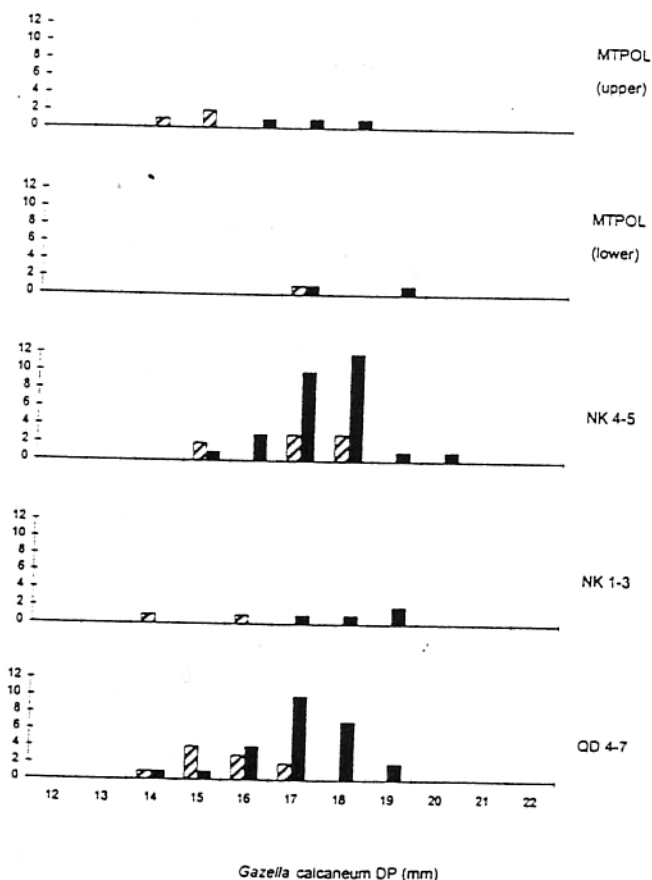


Figure 6.6. Anterior-posterior depth of archaeological gazelle calcanei (DP). Solid bars = fused proximal epiphysis. Open bars = unfused proximal epiphysis.

conclusion, although the presence of two female horncores (similar to those recovered from Douara cave [Payne 1983]) may also indicate the occurrence of the *marica* subspecies (Uerpmann 1987:101). It is certainly the case that several small tibia breadth and calcaneum length measurements, from Qermez Dere, fall within the range of those presented for modern *G. s. marica* comparative specimens.

As a result of the fragmented nature of both teeth and long bones, little information regarding the age at death profile of the gazelle population from Qermez Dere could be gathered. Where post-cranial fragments did allow the assessment of the fusion status of individual elements, the frequency of fused (and thus skeletally mature) specimens, was always high, on average around 83%. Figure 6.6 shows gazelle calcaneum DP (anterior-posterior depth of the proximal articulation at fusion line) measurements. The pattern found at Abu Hureyra, northern Syria, has been interpreted as one which implies seasonal killing of gazelles, with three separate peaks of newborn, yearlings and adults (Legge and Rowley Conway pers comm.). At Qermez Dere, although almost no newborn gazelle bones were recovered, two possible peaks of yearlings and adults could also be tentatively interpreted as evidence of seasonal killing.

Fox (*Vulpes vulpes arabica*)

Definitive identification of the fox species at Qermez Dere is made more problematic by the fact that both the red fox (*Vulpes vulpes arabica*) and Ruppell's sand fox (*Vulpes ruppelli*) are listed by Hatt (1959) as being present within the Assyrian plains and the foothills of Iraq. Identification was exacerbated by the fragmented

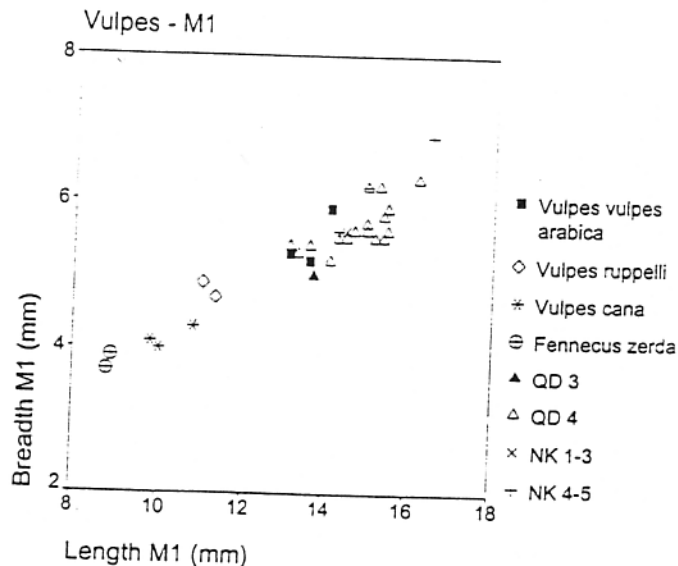


Figure 6.7. Bivariate plot of modern and archaeological fox carnassial (M1).

nature of the material, with the result that only post-cranial elements and isolated teeth were recovered. Although numbers of actual specimens are low, measurement data from isolated mandibular first molars (M1), however, clearly show that the fox remains from Qermez Dere and Nemrik most certainly represent the red fox, rather than the smaller *Vulpes ruppelli*, *Vulpes cana* or *Fennecus zerda* (Figure 6.7).

Almost all the remains represented adult individuals, with only 14 of a total of 401 fragments (where epiphyseal fusion data could be gleaned) being unfused. There is little doubt that the red fox remains from Qermez Dere represent the remains of consumption, since many of fox bones are burnt. In a few cases, evidence of small parallel cut marks attest to the probable removal of the pelt.

Hare (*Lepus capensis*)

The remains of hare were also recovered in large numbers from the Qermez Dere assemblage. As was the case for the fox remains, many of the hare bones were also burnt and several again showed evidence of skinning marks on distal limb elements. Although fragmented, a moderate biometrical archive was collected from all phases at Qermez Dere and compared to those data from several Epipalaeolithic and later Neolithic eastern Jordanian desert sites reported by Martin (1994). At these sites preliminary analysis showed that a

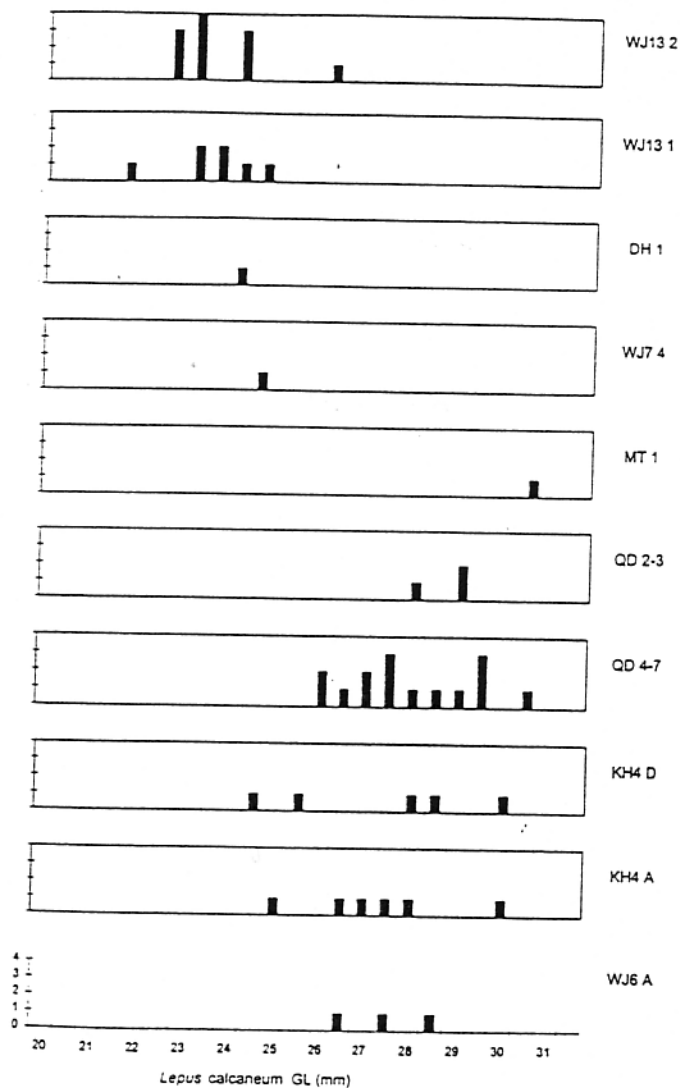


Figure 6.8. Greatest length (GL) of archaeological hare calcanei. All sites below QD4-7 are Epipalaeolithic eastern Jordanian. All sites above QD2-3 are late Neolithic eastern Jordanian.

significant size decrease had occurred in the hares between the Epipalaeolithic and the later Neolithic, although (unfortunately) no data of early Neolithic date was available for the eastern desert region. The data set from Qermez Dere falls within this missing time period, and Figure 6.8 clearly show that the hares from the early Neolithic of Northern Mesopotamia were comparable in size to those from the Epipalaeolithic of the eastern Jordanian desert.

Tentative evidence of a general size decrease has been noted in a range of species (Davis 1977, 1981, 1982, Davis et al. 1994 & Martin 1994) during the early Holocene of the middle east, and attributed to warming of the climate. If the hares at Qermez Dere are following Bergmann's rule, then it can be inferred that the temperature gradient at early neolithic Qermez Dere was still that of the later Pleistocene and the supposed increase in temperature (as reflected through the decrease in size of foxes and hares) had yet to take effect. However, with such limited datasets, care should be taken not to oversimplify what is almost certainly a more complex picture. For example, differences in geography and terrain of the North Jezira plain and the eastern Jordanian desert may just as likely explain the size differences between the assemblages, although it is interesting that the addition of the Qermez Dere data does nothing to change the clear differences in size between the early and later eastern Jordanian datasets.

Other mammal species

Mammal species which appeared to have played a relatively minor role in the economy of the site include wild sheep (*Ovis orientalis*) and the bezoar goat (*Capra aegagrus*), the aurochs (*Bos primigenius*), the onager (*Equus hemionus*), a mustelid (possibly badger [*Meles meles*] or ratel [*Mellivora capensis*]) and the wild cat (*Felis silvestris*). Aurochs was represented at Qermez Dere in extremely small numbers, its apparent high frequencies in certain contexts being exaggerated by the fact that a single *Bos* element weighs perhaps 100 times as much as an equivalent fox bone. This comparison is not entirely without justification, since the amount of meat from a large bovid or equid would far outweigh that collected from a single hare or fox carcass. Thus, their economic importance to the inhabitants of the site should be magnified in order to account for their larger meat yield. The low frequency of cattle remains at Qermez Dere is in contrast to their apparent high frequencies in PPNB deposits at Nemrik (Lasota-Moskalewska 1994). This may be a result of the later date of the Nemrik material and the probable closer proximity of the site to upland forest cover. Although it is generally believed that aurochs in western Europe inhabited heavy forests, it is not known whether they were also forest dwellers in Mesopotamia, or whether they inhabited principally the grassy steppes or the river valleys (Hatt 1959:66). In this context, it is interesting to note that *Bos primigenius* remains were identified at the supposed late Hassuna sites of Ginnig and Khirbit Garsour which are situated well onto the North Jezira plain due south of the Qermez Dere settlement (Dobney and Jaques unpublished manuscript). Other sites in the region where aurochsen remains have been identified include Bouqras (Hooijer 1966, Clason 1977 and 1981), Tell es-Sinn (Clason 1980), Umm Dabagiyah (Bökönyi 1978), Mlefaat

(Turnbull 1983), Jarmo, Matarrah and Karim Shahir (Stampfli 1983), and Palegawra (Turnbull & Reed 1974).

The onager was once abundant on the plains of Iraq, however, over-hunting with the aid of vehicles and rifles has led to its probable extinction in Iraq, probably as recently as the early part of this century. One of the last herds of onager was in fact recorded near to the Jebel Sinjar (30 km North of Qermez Dere) in 1927 (Hatt 1959: 23). Onager have also been identified at Yarim Tepe (Bibikova 1980).

The scarcity of large mammal remains from the Qermez Dere assemblage is not necessarily proof that these species were not heavily exploited. If the kill sites of these animals were some distance from the settlement, it would be expected that primary butchery of the carcass would have occurred elsewhere. Distal limb elements and the head would be left, and perhaps the primary meat-bearing bones would have the meat filleted from them to reduce weight for transportation back to the site. However, in the absence of evidence, it must be assumed that large mammals were not heavily exploited.

The wild sheep (*Ovis orientalis*) must have been once more widespread in the middle east. Today they are extremely rare in the region, existing in isolated regions along the edges of mountain ranges in south-central Turkey, Armenia, Azerbaijan down to the southeastern end of the Zagros mountains (Uerpmann 1987: 127). Sheep are generally small mountain-dwelling ruminants, preferring more open, undulating highlands than the goats.

Both cat and badger/ratel remains were recovered in small quantities from the Qermez Dere assemblage. The wild cat (*Felis silvestris*) is today distributed throughout Arabia and generally prefers rocky areas, but can also occur on flat open plains where there is available refuge, e.g. in fox-holes (Kingdon 1990: 98). The general size and morphology of the large mustelid bones indicate the presence of badger (cf. *Meles meles*) rather than the ratel or honey badger (*Mellivora capensis*), although only two comparative specimens of *Mellivora capensis* were located in the Natural History Museum (one from an un-provenanced location, the other from Uganda). The fact that some of the archaeological remains of these species were burnt (some also showed sign of skinning marks) suggests that, like fox and hare, they were both eaten and utilised for their pelts.

Small mammals

Long-eared hedgehog (*Hemiechinus auritus*)

Perhaps the most numerous small mammal remains recovered from the Qermez Dere assemblage were those of hedgehog. Although particularly fragmentary, a single mandible and two maxillary fragments (with teeth still intact) were identified as *Hemiechinus auritus* (Harrison pers. comm.). The size and morphology of the teeth matched *Hemiechinus auritus* rather than the Ethiopian hedgehog (*Paraechinus aethiopicus*), which is also larger in size, or the black hedgehog (*Paraechinus hypomelas*). As was the case with the fox, hare and other smaller 'medium mammal' (MM2) remains, many of the hedgehog bones were also burnt. This almost certainly indicates that hedgehog was consumed by the Qermez Dere inhabitants.

Other small mammals identified on the basis of dental remains (Harrison and Bates pers. comm.) include the Indian gerbil (*Tatera indica*). It has been found at many localities in Iraq (Harrison 1968), with the site of Qermez Dere being located at northern edge of its present day distribution. It is a heavily built rat-like gerbil which generally inhabits agricultural land not far from water, although it can live in a wide variety of habitats ranging from semi-deserts to forests.

Jird sp. (*Meriones* sp.)

The teeth of Jirds are generally much smaller than *Tatera indica*, having cusps which are joined by 'small bridges' (Harrison pers. comm.). Identification was only possible to genus, with several species having present day distributions which include Iraq. These include Tristram's jird (*Meriones tristrami* (Thomas, 1892)), the Libyan jird (*Meriones libycus* (Lichtenstein, 1823)) and Sundevall's jird (*Meriones crassus* (Sundevall, 1842)). All are robust, rat-like gerbils with relatively wide habitat preferences which render them of little interpretative value. None showed signs of burning, and are likely in fact to represent intrusive remains not associated with site occupation.

The avian fauna

The bird bones from Qermez Dere were numerous and represented a wide range of species. The recovery of so many fragments was primarily a result of the implementation of systematic wet and dry-sieving, linked with the fact that many of the bones were, although fragmented, particularly well preserved. Table 1 shows the range and numbers of identified fragments recovered from each phase.

The importance of sandgrouse (*Pterocles* sp.)

By far the most numerous remains were those of the sandgrouse (*Pterocles*). Two species are common in the region today; the pintailed sandgrouse (*Pterocles alchata*) and the black-bellied sandgrouse (*Pterocles orientalis*). Differentiating between the various sandgrouse species on the basis of skeletal morphology is extremely difficult and here it has been tentatively undertaken on the basis of the few comparative specimens held in the Natural History Museum bird collection at Tring. It was found that *P. orientalis* was somewhat more robust than *P. alchata* and the definitive identifications in the table are made on this basis alone. Biometrical data also proved somewhat inconclusive as can be seen from Figures 6.9 and 6.10.

The few comparative specimens of the different sandgrouse species (two species of sandgrouse [*P. exustus* and *P. senegallus*] not found in the region today, are also included as controls) separated rather well using bivariate plots of lengths and breadths of the major long bones. However, the archaeological material was mostly too fragmented to allow any length measurements to be taken. Width measurements of articular ends and shaft diameters were more common and these were therefore utilised.

From coracoid (Figure 6.9) and tarsometatarsus (Figure 6.10) measurements it can be seen that the sandgrouse from Qermez Dere do not overlap directly in size with any of the modern comparative sandgrouse specimens. Those individuals represented by coracoids appear to be less robust

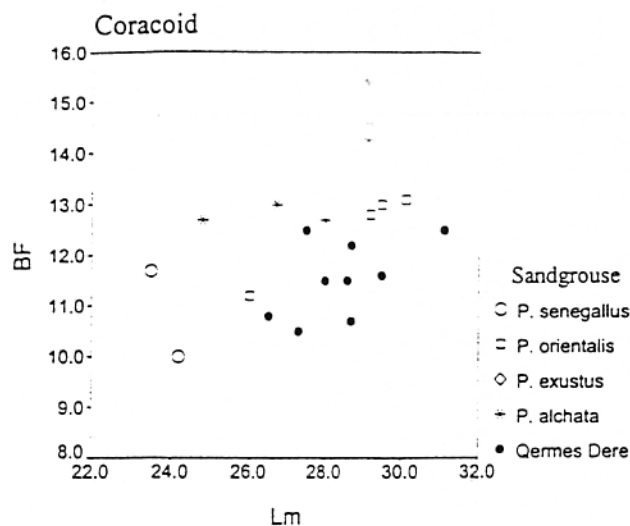


Figure 6.9. Bivariate plot of modern and archaeological sandgrouse coracoids.

than either *P. alchata* or *P. orientalis*, whereas tarsometatarsi values fall above the upper end of the *P. alchata* range. Although by no means certain, it is proposed that the vast majority of sandgrouse remains from Qermez Dere are most probably from *P. alchata*, with fewer numbers of more robust individuals probably representing *P. orientalis*.

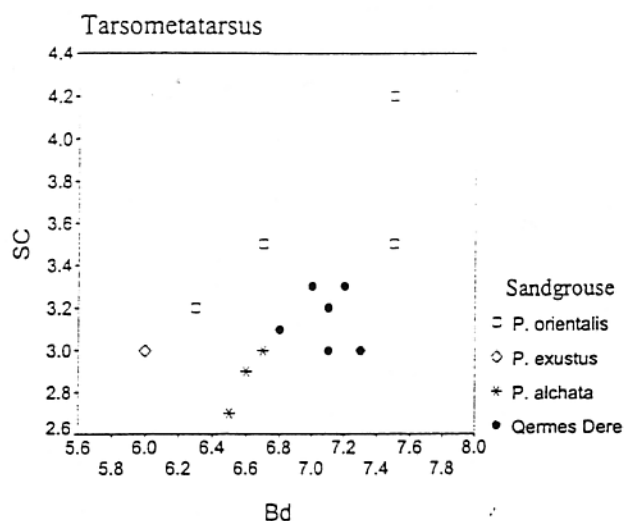


Figure 6.10. Bivariate plot of modern and archaeological sandgrouse tarsometatarsi.

The possible significance of raptors

Of particular interest are the remains of various large raptor species which appear to be represented almost exclusively by leg elements (mainly the tarsometatarsus and phalanges). It is open to debate as to whether this bias in favour of leg bones in raptors is real, since when limited data for the game birds (i.e. *Pterocles*, *Ammoperdix*, *Francolinus* or *Alectoris*) are compared, similar biases are also evident. This may be a result of a combination of factors e.g. simply the ease of

identification of certain elements over others, or more complex taphonomic factors affecting disposal and preservation. However, many sites of later Epipalaeolithic and early Neolithic date from across the region show the same broad pattern for raptor remains. It is therefore probable that the presence of raptors at these sites has a different significance to those species which are thought to be primarily consumption refuse. Their presence has traditionally been interpreted as reflecting either consumption refuse or more symbolic or religious activities (Solecki and McGovern 1980). However, the data could also support another hypothesis which has, as yet, not been fully explored, i.e. the capture, keeping and training of birds of prey, and the possible first faltering steps towards falconry (Dobney forthcoming). The significance of the raptor remains from proto and early Neolithic sites in the middle east does not have to reside in a single explanation. The fact that birds may have been hunted as food, or tamed, managed, and even used for hunting certainly does not preclude their importance as symbolic or totemic icons.

Placed within the cultural and environmental framework of the early Holocene, the broad spectrum sites of the middle east are extremely significant in that they represent recently sedentary human groups who still utilise hunting and gathering as an economic base. The theory of rapidly declining resources, as a result of intensive exploitation within a fixed territory, seems to be a plausible explanation for the apparent shift in focus towards smaller less rewarding species which funnelled many of these groups inextricably down the road towards agriculture. What is perhaps most significant about a falconry hypothesis at these broad-spectrum sites, is their temporal proximity to the beginnings of domestication of sheep and goat. Could experimentation with taming and management of raptors, either as a new hunting strategy and/or for religious purposes, have acted as a prelude to the beginnings of the experimentation with larger mammals? Supporting this hypothesis is the fact that the domestication of the dog took place even earlier, a species that is thought to have been primarily utilised as a hunting aid.

On the basis of all the available evidence, the significance of raptor bones recovered from numerous late Epipalaeolithic and early Neolithic sites in the middle east remains very much open to debate. Whether they simply represent domestic food refuse, symbolic artefacts or the remains of tamed and managed birds is still far from clear. The falconry hypothesis is therefore presented here merely as a possible alternative explanation, worthy of further, more critical consideration.

Vertebrate remains and palaeo-environmental reconstruction

Both the mammal and bird remains recovered from the site portray a consistent picture of the surrounding environment of the site, one not dissimilar to that which exists today. If present day preferences of the animal species identified in the Qermez Dere assemblage reflect those of 10,500 years ago, then a stony, semi-arid, open environment, possessing little in the way of tree cover, was the dominant habitat exploited. The complete absence of remains of waterfowl perhaps indicates that permanent water was not present near the site

and that the adjacent waddy contained only a seasonal waterflow. Sandgrouse only congregate in numbers once a day to drink from standing water and these may perhaps have been caught in the waddy when water was present.

The absence of wild pig (*Sus scrofa*) from Qermez Dere can perhaps be explained by their need for dense cover, shade and moist habitats, which would exclude them from more arid areas. However, it was reported to one of the authors (KD) by a long-term resident of Tel Afar, that wild boar once occurred locally in the wadi directly adjacent to the site, and that it was occasionally hunted for sport. Similarly, the absence of any cervid remains from the assemblage and large bovid also indicates that open woodland cover no longer existed in the vicinity of the site by 10,500BP. Wild pig, deer and cattle remains have been recovered from the contemporary site of Nemrik (Lasota-Moskalewska n.d.), in addition to other forest species such as beaver (*Castor fiber*) and even leopard (*Panthera pardus*). This is not wholly surprising, since the site was situated in an ecological transition zone between the Tigris floodplain and the foothills of the Taurus mountains, where a range of habitats (such as dense marshy thickets, open park woodland and denser upland forest) could be exploited.

Discussion

The vertebrate assemblage from Qermez Dere represents one of the few systematically recovered collections from Northern Mesopotamia of any date. It contributes vital data to our understanding of the economic basis of the early Neolithic in a geographical and temporal hiatus between the numerous sites of the Levant to the west and Persia to the east. The general characteristics of the Qermez Dere assemblage fits very well with all other sites of a similar period from the middle east, i.e. a reliance on the hunting of gazelles a more intensive exploitation of a range of smaller mammals (particularly fox and hare) and birds, and the absence of domestic sheep and goats. Sites exhibiting these characteristic vertebrate assemblages are supposed to reflect so-called 'broad-spectrum' economies and the phenomenon they represent has been termed the 'broad spectrum revolution' (Flannery 1969). It appears to be a widespread phenomenon across the middle east during the later Pleistocene, and is most closely linked with the emergence of the early pre-agricultural sedentary settlements dating from around 10,000 BP. Sites where broad spectrum economies have been recognised are those characterised by an apparent shift away from larger prey species towards a heavier reliance on smaller mammal species, birds, fish and even reptiles. Edwards (1989), in his re-examination of a number of Levantine Pleistocene vertebrate faunas, showed that many of these species were exploited by humans throughout much of the upper Pleistocene, and that the smaller species (such as fox and hare) were consistently exploited throughout the last 100,000 years. He concluded that no apparent increase in vertebrate diversity was visible through the Pleistocene and that the 'broad-spectrum' concept was an artefact of better recovery methods and the need to explain the beginnings of domestication.

It is certainly true, when considering the diversity of species present at individual sites, that many were indeed exploited by man during the later Pleistocene. However, when the

relative frequencies of the various taxa are considered, there is no doubt that late Epipalaeolithic and early Neolithic human groups focused more intensively on gazelles and smaller taxa. Indeed, rather than a broadening of the available vertebrate prey spectrum, a shift in emphasis, or an intensification towards particular parts of the existing spectrum, occurred. This is certainly the case at Qermez Dere.

An increase in sedentism may have led to a greater degree of land ownership as proto-farming villages became increasingly dependent for their food resources within a fixed catchment area. This may well have led to territorial conflicts (Watkins 1992) of which we have limited evidence. For example, the massive walls around the site of Jericho suggest a defensive role, whilst more direct evidence was recovered from the site of Nemrik in the form of human skeletal remains with projectile points embedded in them. At Qermez Dere, numerous flint projectile points showed characteristic impact fractures to the tips, whilst the human skulls also found at this site (and a number of others) could well be enemy trophies and not revered ancestors as traditionally interpreted.

Whether demographic stress (Binford 1968, Cohen 1977), organisational changes in human society (Bender 1978, Price and Brown 1985), changes in the management of resources (Flannery 1973, Redman 1977) or environmental change (Davis 1977, 1981 & 1982) were major catalysts towards sedentism (and the associated reliance on gazelles and smaller species), it is clear that it was a widespread phenomenon throughout the middle east, and certainly present in Northern Mesopotamia during the early Neolithic. The evidence from Qermez Dere is therefore crucial in linking the different eastern and western flint tool traditions by a remarkably similar economic basis. A reappraisal of the bird of prey remains has also led to the construction of an hypothesis which suggests that early Neolithic man was possibly experimenting with falconry. This perhaps somewhat eccentric idea is presented in the hope of further critical consideration (see Dobney forthcoming).

Acknowledgements

This work was supported by grants from the Natural Environment Research Council and the British School of Archaeology in Iraq. The authors are grateful to Dr Trevor Watkins (University of Edinburgh) for providing much of the initial impetus and support as site director, and who supplied the archaeological information. Also to Simon Parfitt (Department of Palaeontology, Natural History Museum, London) who assisted with access to comparative specimens in the Museum and provided the vital spark for the falconry hypothesis, and to David Harrison and Paul Bates who provided access to the Harrison Zoological Museum comparative collections, and who kindly identified the hedgehog and gerbil bones from the assemblage.

Access to various avian comparative collections (those of the Natural History Museum at Tring, The Royal Africa Museum and the University of Ghent, Belgium) were kindly arranged by Don Smith, Dr Wim Van Neer, Dr Anton Ervynck and Prof. Achille Gautier. We are also extremely grateful to colleagues (Dr Simon Davis of

English Heritage, Dr Tony Legge of Birkbeck College, London, Dr Louise Martin of University College, London, Dr Alicja Lasota-Moskalewska, University of Warsaw who kindly provided unpublished data cited in this report).

Dr Simon Davis assisted greatly with the provision of offprints from his personal collection, whilst Professor

Stefan Kozłowski and Dr Alicja Lasota-Moskalewska of the Institute of Archaeology, University of Warsaw, provided welcome hospitality during a visit to Poland to collect comparative zooarchaeological data from the sites of Nemrik and M'lefaat.

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