QERMEZ DERE, TEL AFAR:
Interim Report No 2, 1989

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rubber; and neither process removes the outer, siliceous husk of the grain. Unless the 'meal' is sieved this abrasive material is incorporated into the flour. The resulting product, if eaten dry as 'muesli' or baked biscuit, would have to be well masticated in order to moisten it sufficiently for swallowing. During this process it is impossible to avoid grinding on the extraneous particles, and thereby inducing severe abrasion on the teeth.

The modest development of the biting muscle, temporalis, in the Qermez Dere skulls implies that preparation of the food in the mouth was chiefly by grinding. Unfortunately, the pterygoid plates, the attachment areas for the pterygoid muscles, the action of which achieves a grinding motion, are not preserved. The implication is that the people of Qermez Dere had incorporated grains in their diet, but that they had not yet learned how to deal with their highly abrasive nature.

The condition of the deciduous teeth of the juvenile 108.505 indicates that the child had also been exposed to highly abrasive food. Furthermore the teeth are chipped and grooved, implying that the child bit on very hard objects such as stone inclusions. The grooving of the canine is puzzling. It is hoped to explore the possibility that this was caused by pulling against a fibrous material such as 'jerky', made from something such as dried gazelle meat. Wear on the first permanent molar is minimal, but this tooth had only just come into occlusion. The indications are that the children of Qermez Dere, once weaned, had the same food as the adults. The chipping of the teeth is a token that the child had not yet learned to avoid biting on the grains of grit.

The thin skull bones, lack of cribra orbitalia, cribra parietalis, periodontal disease or palatal pitting are signs that this particular group of individuals were not exposed to nutritional stress. The presence of hypoplasia on the incisors of 108.505 and 108.507 signifies the presence of metabolic disturbance in childhood. Present evidence shows that enamel hypoplasia is more likely to be induced by systemic stress related to fever associated with infection rather than with nutritional stress. In childhood such fevers are frequently a response to gastric infection transmitted through contaminated food, water or from the immediate environment. These infections are less common among the unweaned infants than in toddlers and the recently weaned. Their presence in a population implies the existence of the infective organism, the vulnerability of the host population, and the effective density of that population to maintain and transmit the organisms. The lack of evidence for dental caries or abscesses despite the high dental attrition and carbohydrates in the cereals suggests that the infecting organisms of these pathologies, lactobacillus and streptococcus, were not prevalent.

8. Economic and environmental remains

8.1. The botanical material

As work has only recently begun on the 1989 material, this report relates only to the 1987. The information is summarised in Table 6.

Flotation produced a small but very interesting sample of carbonised seed remains. Some 1,700 litres of soil was processed, yielding only 6 grams of carbonised plant remains. A Siraf-type flotation machine (Williams 1973) was loaned by the British Archaeological Expedition in Iraq. The charred flot flowed first into a 1 mm mesh and then into an approximately 0.25 mm mesh. The heavy residues were caught on a 1 mm mesh. As Table 6 shows, flotation was concentrated on certain contexts which showed some initial promise.

The provisional identifications are presented in Table 6. Identifications have been made using the reference collection of the British Institute of Archaeology at Ankara. More detailed identifications will be provided in the final report, which will take account

both scanning electron microscope studies and the larger quantities of material obtained (but still being studied) form the 1989 season of excavations.

Most of the plant remains were in small fragments, often with a maximum dimension of little more than 1 to 2 mm, very similar in this respect to the Natufian plant remains from Wadi Hammeh (Edwards and Colledge 1985: 189). A substantial proportion, perhaps 50% by weight, consists of material so distorted and amorphous as to be unidentifiable, although the texture is often somewhat reminiscent of grass grains.

Cereal remains

The main question that it was hoped that the seeds would answer is whether domesticated crops were being cultivated at the site. Unfortunately, the evidence is currently ambiguous. Virtually all of the fragments of grass caryopses are clearly from small-seeded wild grasses. Some fragments are larger, and have the characteristic angular cross-section and deep, wide groove of barley *(Hordeum).* Most of these fragments are too large to be from the smaller grained wild barleys, and derive therefore either from the wild *H. spontaneum* or the domesticated *H. distichum.*

Other caryopsis fragments have the laterally compressed transverse section and flattened ventral face reminiscent of 2-grained wild einkorn wheat, *Triticum boeoticum.* These fragments have not been scored separately as further work is needed in order to rule out other species with similar grains such as wild rye. All of these grains are far too small to be from a domesticated wheat. Some larger fragments of grain have been found, but these are poorly preserved and could derive from large-seeded wild grasses such as wild barley or the goat-grasses (*Aegilops spp.*).

One rachis node of barley with two lateral pedicels was found in context 201, but with the rest of the rachis segment unfortunately ripped away. Lateral pedicels are present on both wild and early domesticated barleys (van Zeist and Bakker-Heeres 1982: 201; Kislev *et al.* 1986: figs 1-3). The breaking off of most of the rachis segment is perhaps more likely in the domesticated barleys with their tough rachis, but could be due to post-depositional damage or, as Kislev has suggested, to processing of immature wild barley in a mortar. One large spikelet fork with a spelt-type rachis and very obtusely angled glumes is probably from *Aegilops.*

Pulse seeds

The other common category of plant remains is seeds of the Viciaea tribe. Both the bitter vetch (*Vicia ervilia*) and lentil (*Lens*) seeds are rather small (maximum diameter of the lentils at 2.1-2.6 mm), but within the range recorded from early agricultural sites. There are, unfortunately, as yet no morphological characteristics which can clearly separate wild from early forms of domesticated species of vetch and lentil. The indeterminate *Vicia/Lathyrus* (vetch/vetchling) are very poorly preserved, usually lacking hilum and testa. Some resemble *Vicia sativa*, but a definite identification is not possible at this stage. Two very battered seeds are large enough to be a species of pea (*Pisum*), but could be a vetch. No seeds resembling chickpea (*Cicer*) were found.

Nut shell

The wild pistachio (*Pistacia*) nutlet fragments have been identified on the basis of their wall thickness (about 0.5 mm) and curvature. The other nutshell-like fragments are much less curved and rather thinner.

Other seeds

Of the weed seeds virtually all of the Boraginaceous seeds are probably of recent origin, preserved by their high silica content.

Charcoal

Initial work on identification of the charcoal fragments was concentrated on the three richest samples, 101, 201 and 203. The largest fragments (none more than 3 mm in maximum dimension) from each sample were selected, and where possible pressure fractured to reveal clean, flat surfaces in the transverse plane and tangential and radial planes. These were examined with an epi-illuminating microscope at magnification up to x400. The anatomical structure was compared with and matched to authenticated reference material.

The results reported by Ms Rowena Gale were as follows:

QD87.201.502

The condition of these samples was generally rather poor and friable. Nineteen fragments were examined:

5 - *Tamarix* sp., tamarisk.

3 - *Pistacia* sp., pistachio.

2 - Woody members of the family Chenopodiaceae. Thirteen woody genera are named by Rechinger (1964), and are listed below. Very limited reference material is available but detailed anatomical descriptions of ten of these appear in Fahn, Werker and Baas 1986. By comparison these charred samples seem closest to *Noaea* sp., but this identification is not conclusive.

1 - Woody fragment, possibly family Leguminosae, but minimal size and condition make it impossible to confirm.

2 - Fragments of bark from a woody shrub or tree, but with insufficient diagnostic features to permit identification.

4 - Unidentified fragments from young, woody dicotyledonous stems of angiosperms with insufficient characters present; each probably represents a different species.

1 - Fragment of woody material in such poor condition that no further comment can be made.

1 - Fragment, rather glossy in appearance with many small irregular cavities with pitted walls; this does not appear to be of plant origin.

QD82.101.503

Fragments from this samples were rather knotty and in poor condition. Three fragments were examined:

2 - *Pistacia* sp., pistachio.

1 - Unidentified fragment of young, woody stem from a dicotyledonous angiosperm.

QD87.203.502

Four fragments were examined:

1 - Family Chenopodiaceae, similar to fragments described above.

2 - Probably family Chenopodiaceae, but the structure of both fragments was compressed and in poor condition.

1 - Unidentified fragment from a woody, dicotyledonous stem of an angiosperm.

Descriptions of the genera named.
Chenopodiaceae

This is a large family with many herbaceous and some woody genera. The woody genera are mainly shrubby, although some form small trees. Those occurring in Iraq include *Aellenia* sp., *Anabasis* sp., *Arthrocnemum* sp., *Atriplex* sp., *Cornulaca* sp., *Halocnemum* sp., *Halogeton* sp., *Haloxylon* sp., *Noaea* sp., *Seidlitzia* sp., *Salsola* sp., *Suaeda* sp., *Traganum* sp.

Pistacia sp., pistachio. Anacardiaceae.

P. atlantica Desf. is a deciduous tree usually associated with steppe regions. *P. Khinjuk* Stooks is a somewhat smaller tree preferring a shrubbier habitat, often in the forest.

Tamarix sp., tamarisk. Tamaricaceae.

These are fast growing shrubs or trees which tolerate drought and saline conditions. Most of the eleven species found in Iraq grow on low ground on damp or boggy sites. These include *T. androssowii* Litw., *T. asphylla* (L.) Karsten, *T. aralensis* Bge., *T. arceuthoides* Bge.; *T. aucherana* (Desche. ex Walp.) Baum., *T. brachystachys* Bge., *T. Kotschyi* Bge., *T. macrocarp* (Ehrenb.) Bge., *T. pycnocarpa* DC.

There are two species, both shrubby trees, which grow at higher altitudes. *T. ramosissima* Ledeb. flourishes beside streams and is common in the steppe and desert regions up to 1100 m; *T. smyrnensis* Bge. is more commonly found by streams in forest regions up to 1700 m.

Evidence for plant-economy

At present it is not possible to say whether the plant remains are derived solely from the gathering of wild plants, or from a mixture of farming and gathering. However, the lentils, bitter vetch, wild pistachio nuts and indeterminate vetch/vetchlings were clearly being used for food, parallelling the relatively large numbers of lentils and bitter vetch found at the slightly later site of Nemrik (Nesbitt 1990). The two rachis nodes, three culm nodes and the weed seeds suggest that plant-food processing was being carried out on site.

Evidence for the early Holocene environment

The presence of *Pistacia* nut and charcoal fragments is of considerable interest. At present Qermez Dere lies in the 'moist steppe zone' of Iraq (Guest 1966: 72), which is heavily grazed and thus has virtually no natural woodland. Even in early May almost the only vegetation visible around the site is a rather sparse cover of goat-grasses and wall-barley. The nearest woodland (aside from that in the extensive spring-watered area at the southern side of the town of Tel Afar) is 50 km west, in the Sinjar hills, and 60 km north, in the foothills of the Zagros ranges.

However, there are phytogeographical reasons for believing the present-day climax vegetation (that is, assuming no human impact) to be an open savannah dominated by *Pistacia atlantica* var. *kurdica*, with other shrubs such as *Ficus carica* and

Prunus spp. (Guest 1966: 82). The abundance of Pistacia and woody Chenopodiaceae in the charcoal, taken in conjunction with the absence of oak, strongly suggest a similar vegetation in the early Holocene period.

The minimal size and poor condition of the charcoal reduced the number of species identified, but the fact remains that all the samples (of plant origin) were from woody plants. Some of the fragments were from young stem material of very small diameter and remain unidentified; the structure of these suggested that several genera were present, but it was not possible to establish if these were trees, shrubs of sub-shrubs.

Many of the Chenopodiaceae are cited by Guest (1966) as occurring in plant communities associated with the desert regions of the present day. However, *Noaea mucronata* (Chenopodiaceae) is characteristic of a plant association dominated by *Pistacia atlantica*, remnants of which have been noted on the northern foothills of the Jebel Sinjar. Other bushes of this association are *Prunus microcarpa*, *Artemisia herba-alba* and *Haloxylon articulatum*, the last also in the Chenopodiaceae.

The pollen record for vegetation in this area is ambiguous, as no cores have been studied from north Iraq (or from similar regions in adjoining countries). The most recent synthesis (van Zeist and Bottema 1982) suggests that, with the warming in climate at the end of the Pleistocene, woodland spread eastwards from glacial refugia in the Levant. Given the lack of evidence from Iraq, van Zeist and Bottema limit their reconstruction of this eastwards movement to the Taurus mountains of SE Turkey and the NE of Syria. Although these mountainous areas with their higher rainfall were no doubt the first to be forested, the evidence from Qermez Dere clearly shows that open forest certainly extended much further south. Then, as now, the dominant species in the mountain forests would be oak, while in the drier steppe to the south of the Taurus-Zagros foothills it would be pistachio.

In terms of vegetation (but not necessarily of subsistence) Qermez Dere is comparable with the earlier, epi-palaeolithic, levels at the site of Abu Hureyra (Moore *et al.* 1975; Hillman *et al.* 1989), 400 km to the west in the Syrian steppe. There *Pistacia* nutlets and the absence of oak charcoal in the charcoal remains also points towards the proximity of a comparable *Pistacia* woodland near the site. The abundant seed remains from the epi-palaeolithic period include wild einkorn, wild rye and lentils. If the plant remains at Qermez Dere are the product of foraging (rather than of farming), then the environmental and plant subsistence basis of the two sites is likely to be similar.

8.2 The zoological material

Quantitative sampling

The weight of bone fragments per litre of material dug from the site can readily be calculated for all the 1989 contexts, whether dry- or wet-sieved. The samples from the wet-sieved portions are more reliable in that the washed bone was recovered more systematically in better working conditions whereas the dry-sieved portion was sorted on site. For all contexts a portion of at least one wet-sieved sample was dried for sorting exactly as it left the wet-sieving machine with its 1 mm mesh, while the greater part of each sample was further wet-sieved in a 3 mm mesh to reduce the bulk of the material to be sorted.

It was found that very little material was lost in the second wet-sieving at 3 mm, amounting to one or two grams of minute bones or bone splinters. General impressions of the comparison of the wet-sieved and dry-sieved samples suggest that frequencies of the larger species were equally well represented. Bird bones also figure highly in the dry-sieved samples, perhaps because larger bird species seem to have been preferred.

Table 6: Carbonised plant remains, 1987 season.

Context number	002	004	101	101
Mesh size	1	1	1	0.2
Litres floated	10	5	297	(58%)
GRAMINEAE				
Wild grasses	.1	.10	1.4	.15
Barley type (cf Hordeum)	.2	.4	.2	
Culm nodes				
Rachis nodes				
LEGUMINOSAE				
Vetches (Vicia/Lathyrus)	.15	4.19	4.67	
Bitter vetch (V. ervilia)		1.		
Lentils (Lens sp.)		3.2	3.3	
NUTS				
Wild pistachio (Pistacia)				
non-Pistachio		.1		
WEED SEEDS				
Adonis		1.		
Astragalus	1.	2.	5.	1.
Boraginaceae		3.	13.	1.
Chenopodium			1.	
Galium (1.1-1.3 mm diam)				
Silene				
Unidentified		2.	6.	10.

Notes: Figures to the left of the points are whole seeds, and figures to the right of the points are fragments of seeds.

The following contexts provided barren samples: 009 (10 litres); 100 (15 l); 106.501 (15 l); 110 (74 l); 104 (10 l).

The following samples contained only a few seeds:

103 (15 litres), 3 wild grass grain fragments, 2 small culm-nodes;

111 (46 litres), 2 wild grass grain fragments, 1 weed seed;

116 (10 litres), 2 wild grass grain fragments;

120 (60 litres), 1 wild grass grain fragment, 4 weed seeds;

202 (15 litres), 1 Viceae fragment.

Table 6: Carbonised plant remains, 1987 season.

Context number	106	108	201	201	203
Mesh size	1	1	1	0.2	1
Litres floated	118	77	586	(59%)	70
GRAMINEAE					
Wild grasses			14.162	.35	.6
Barley type (cf Hordeum)			.26		
Culm nodes			.1		
Rachis nodes			.2		
LEGUMINOSAE					
Vetches (Vicia/Lathyrus)	1.11	.33	13.78		.5
Bitter vetch (V. ervilia)			1.		
Lentils (Lens sp.)	.5	.4	.2		
NUTS					
Wild pistachio (Pistacia)			.11		
non-Pistachio			.2		
WEED SEEDS					
Adonis					
Astragalus			18.		
Boraginaceae	3.	4.	5.		
Chenopodium					
Galium (1.1-1.3 mm diam)			8.		
Silene			1.		
Unidentified			2.	4.44	112.24