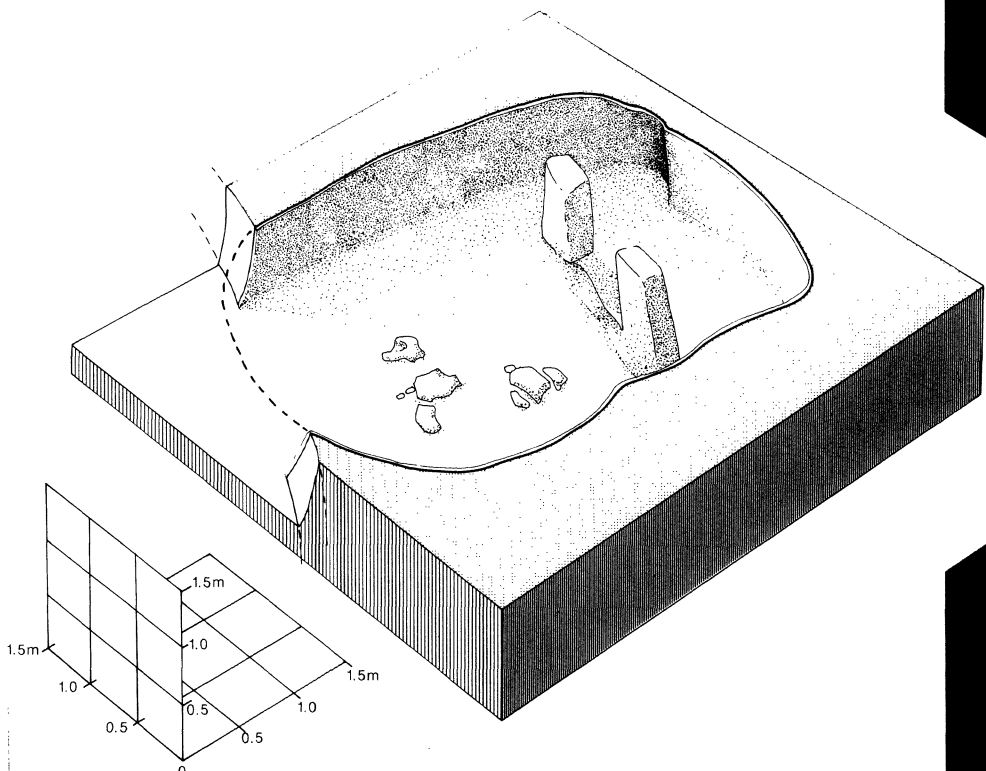
QERMEZ DERE, TELL AFAR:

Interim Report No. 3

Edited by Trevor Watkins
with contributions by
Alison Betts, Keith Dobney, Mark Nesbitt and Trevor Watkins.



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Qermez Dere, Tel Afar, North Iraq: Third Interim Report.

Trevor Watkins, Alison Betts, Keith Dobney & Mark Nesbitt

1.General

1.1 Introductory

The third and final season of excavation at the early aceramic neolithic settlement site of Qermez Dere, Tel Afar, in North Iraq, took place between April 8th and May 17th 1990. The programme of excavation and research was directed by Dr Trevor Watkins of the Department of Archaeology, University of Edinburgh, with the collaboration of Dr Alison Betts (lithics), Keith Dobney (archaeozoology), Mark Nesbitt (archaeo-botany), and Dr Theya Molleson (physical anthropology). The team in the field for the third season was Dr Trevor Watkins, Dr Alison Betts, David Connolly (excavation supervisor), Miss Debbie King (excavation assistant), Mark Nesbitt (flotation and wet-sieving programme), Francis Thornton (excavation assistant), Francis Watkins (excavation supervisor), and Mrs Antoinette Watkins (excavation assistant). Eight local workmen were hired to assist with the heavy digging, taking bulk samples and shifting soil.

The work was massively aided by the constant assistance and great efforts of the representative of the Directorate of Antiquities and Heritage, Moslem Mohammed Ahmed; indeed, without his persistence and determination, work would have come to a sudden end, never to restart, after only a few days. We are also indebted to the Director of Antiquities and Heritage, Dr Mu'ayyad Sa'id Damerji, and his Director in the North, Sd. Menhel Jabbar Ismail; when the excavation programme was threatened with closure the decisive role adopted by the Director of the Nineveh office enabled us to return to work after an interruption of only three days. It is, as always, a pleasure to record our gratitude to our friends and colleagues of the British Archaeological Expedition in Iraq for the unstinting generosity of their support. The work benefited especially from the visits of Mr Tony Wilkinson, Assistant Director of the British Archaeological Expedition in Iraq, who examined the soils in the site's stratigraphy and gave much useful comment on their nature.

This report, which summarises the results of the 1990 field season and the associated research up to the time or writing, is of composite authorship. Unless sections are specifically attributed to one of the other authors, they have been written by TW, who has also been responsible for pulling the whole report together (and introducing any errors).

1.2 Objectives

The intended programme of the season had two fundamental objectives, of which the first was to complete the excavation of the site of Qermez Dere itself. The second objective was to commence a survey along the southern flanks of the Jebel Sinjar hills in order to locate sites of palaeolithic, epi-palaeolithic and aceramic neolithic date. It was also planned to join up with the Polish team excavating at M'lefaat in a short exercise in controlled and quantified sampling by flotation and wet sieving of the kind used systematically at Qermez Dere. We were therefore very disappointed to learn, shortly after our arrival, of a blanket ban on all kinds of field survey throughout the country. As is its wont, excavation proved able to expand to fill all available time and resources. Our disappointment at our inability to conduct survey work fell into insignificance as military events rolled on to war. In fact information emerged which brought several further early prehistoric sites to our attention, and we can say with confidence that other early settlement sites exist on perennial water-courses in situations similar to that of Qermez Dere or Tell Maghzaliyeh between Tel Afar and Sinjar.

The concluding season of excavation at Qermez Dere had four aims. First, it was necessary to search widely in the surviving parts of the southern area of the site for more houses. Second, although the 1989 season had provided ample samples of chipped stone and animal bone, we still very much needed to supplement the sample of plant remains. Third, in view of the rarity of the chipped stone industry and its apparent date at and just after the boundary between the epi-palaeolithic and aceramic neolithic periods, it was highly desirable to maximise the quality of the statistical samples of chipped stone, especially from the site's earliest levels. Finally, having only scratched the surface of the central or northern area of the site in 1987, it was important to conduct more work in that very distinctly different zone of the settlement.

1.3 Changes of tactics

Excavations were carried out in the same manner as previously (see Watkins *et al.* 1991), but the sampling regime was modified in the light of the particular needs. Since samples of chipped stone and animal bone were already sufficient, the sampling effort was concentrated on supplementing the chipped stone from early levels and on obtaining plant remains. Dry sieving on site was used on a much reduced scale, and most effort was put into the recovery of plant remains by flotation. Heavy residues from the wet sieving were sorted to provide check figures on the amounts of chipped stone and animal bone (which was not kept) and, where appropriate, the chipped stone was extracted for study.

At the beginning of the season the Siraf-type flotation machine, which was once again borrowed from the British Archaeological Expedition in Iraq, was substantially modified to enhance its efficiency both in terms of its rate of through-put and in terms of its effectiveness at extracting carbonised plant remains. The outlet was reconstructed with a weir to speed the out-flow of carbonised fragments, and to reduce the amounts of silt which flowed into the fine meshes which caught them. The water inlet was raised in order to increase the effect of agitation on the sample; this modification also reduced the frequency with which the machine required de-sludging. The old box with a 1 mm mesh base, into which the sample was tipped, was abandoned; instead samples were tipped into a large, flexible nylon 1 mm mesh, which was pegged around the rim of the drum and supported on a grid above the water inlets. As in previous years the main constraint on the performance of the machine was the water supply, which was gravity-fed from storage tanks by means of narrow diameter hose. The improvements to the machine enhanced its performance by about 100% to an average hourly through-put of sixty to seventy litres of sample. When the machine was operated at M'lefaat, where the water-supply was pumped from a large and fast-flowing river, the through-put was boosted 100% again to about one hundred and twenty litres per hour. It was simply observed that more carbonised material was recovered in the 1990 season than in 1989, but its quality remains to be seen; the total for the season, however, will be measured in tens of grams, whereas the two days of flotation work at M'lefaat produced more than three hundred grams from the rich house fills sampled.

When survey work was forbidden, Dr Betts, who was to be in charge of the survey, returned to Jordan where she could work more productively. The lithic assemblages recovered during most of the season were put into storage for her to attend to - as we naively assumed - on a brief study visit to be made later in 1990. In consequence, most of the lithic material from the 1990 season remains undocumented. Considerable quantities of lithics from the earliest strata in the southern area were recovered. In the northern area significant samples of lithics were recovered from the new stratigraphic sequence; in general terms, through the presence of a small but significant number of microliths, it is possible to say that the earliest strata in the northern area closely resemble those of the southern area, but no specialist analysis of these important new samples is available.

2. The houses

2.1 The search for houses

In the light of the 1989 discoveries (see Watkins *et al* 1991; Watkins 1990), it was important to find and excavate more houses in order to see whether the houses, begun in 1987 and dug more fully in 1989, were typical of the settlement or were some special kind of structure. The three houses known until this latest season (houses RAA, RAB and RAD) were successive structures replacing one another on the same stance. Each was a subterranean chamber with plastered walls and floor. Doubts as to their domestic nature were raised on the one hand by the absence of domestic debris on their floors and on the other by the presence in each structure of plastered clay pillars which were free-standing stelae rather than structural roof supports.

A large area east and north of these three structures (see Fig 2.2) was opened up and cleaned. Parts of it were found to be damaged by heavy machinery, presumably associated with the placing of water-pipelines or communications cables which run through the middle of the site; in other parts the archaeological deposits were overlaid by redeposited archaeological deposits, presumably associated with the cutting of the road through the site's eastern side some years before. The increasing depth of redeposited material as we worked eastwards reduced our ability to clear as wide an area

2.2 House RAE

Two more structures were found, one (RAE) only a few metres north of the trio of previously excavated structures, the other (RAF) a few metres north again from RAE. Unfortunately, structure RAE, which had lain close to the edge of the trenches for the water pipe-line and the communications cable, had been severely truncated by heavy machines. Perhaps half of its floor area survived, though mostly in a damaged state. Along the NE side the white plaster of the floor survived on the foundation layer of yellow-green clay, and the beginning of the upturn of plaster at the base of the wall could be detected. Little more can be said of RAE than that it confirmed the former presence of a structure generally similar to the group RAA, RAB, RAD; it was another (semi-)subterranean structure, its wall and floor formed in the same way as them. However, the floor was so poorly preserved that it is impossible to say whether there were internal fixtures or not, or even what the overall size and shape of the structure were.

2.3 House RAF

The other structure found in 1990 (RAF) was much better preserved. Unlike the structures dug in 1987 and 1989, it had not been truncated by machines. It consisted of a single, sub-rectangular chamber dug into the earlier archaeological deposit (see Figs. 2.3 & 2.4). The walls and floor of the chamber had been formed of a thin skin of reddish clay (like house RAB), which was then surfaced with a thin coat of fine white plaster. At the end of its life the chamber had suffered some erosion of its plaster surfaces and it had then been filled with a large amount of deposit thrown into the chamber from one particular direction. The original height of the subterranean wall, or the depth of the floor below the surface of the surrounding deposit remains unclear; thus it is not at all clear whether the structure was semi-subterranean or completely subterranean. The surviving depth of the structure was about 80 cm. Between its abandonment and its filling in there appeared to have been some erosion of the surrounding ground surface, and the most exposed parts of the structure itself, the tops of its two pillars, also showed signs of exposure and erosion through weathering.

As with the other structures already excavated, there was no surviving occupation deposit associated with domestic use. Near the centre of the floor there were several flat stones set into the plaster. One isolated stone set into the floor was a quern stone; unlike the other stones its surface was not set flush with the plaster of the floor. In the eastern half of the structure stood two plastered clay pillars constructed around tall stone cores, very similar in scale and form to those found in the houses RAA, RAB and RAD. The pillars were set symmetrically on either side of the chamber's east-west axis. Each was built around a tall, narrow stone with a rectangular cross-section, presumably set in a foundation below floor level (see below for details of the pillars in the other houses). Around the stone the shape of the pillar was formed in red clay, which was then finished with a coat of white plaster. At its base each pillar was modelled into the floor. A slight rise in the plaster floor of the chamber was modelled across the bases of the two pillars on their western sides.

After the abandonment of the structure the two pillars were allowed to suffer erosion. The tops of the pillars was gone, leaving exposed the tops of the stone cores. The plaster facing had been eroded completely from the upper parts of the pillars, but was moderately well preserved lower down. The southern of the two pillars showed clearly that it had been remodelled and replastered once. The erosion implies that the structure was left unroofed until it was filled. The initial fill presumably accumulated quite quickly - hence the differential erosion between the top and the base of the pillars. However, the initial fill was not particularly rich in debris of any kind, and it would therefore be incorrect to describe the process as one of using the abandoned chamber for the disposal of domestic debris. The secondary fill seems to have been dumped into the chamber from the south in very large quantities. It consisted of stones of various sizes and large gobbets of very varied soil and clay.

2.4 Houses RAA, RAB and RAD

At the end of the 1989 season the three houses excavated were partly filled with fine, light soil. This was removed and the three houses were subjected to further detailed study below the level of their plaster floors. At the end of the 1989 season work had just begun on taking to pieces the base of one of the clay pillars in RAD, and it was intended as part of the 1990 season to continue the process of de-construction in parallel with the investigation of a number of holes in the plaster floor of house RAB.

One of the last pieces of work carried out in 1989 was the dismantling of one of the two clay pillars in house RAD in order to see how it had been constructed below the level of the floor. The central stone was found to be deeply bedded below the level of the floor and set in a mass of rough stones. At the beginning of the 1990 season the surviving clay pillar in RAD, the easterly example, was more carefully de-constructed. Once again, the stone at the core of the pillar was found to be deeply set below the floor level of RAD. It had been set in a small circular pit by means of stones and packed soil. The unexpected feature of the construction was that the original clay pillar began well below floor level, the yellow-green clay reaching well down into the pit in which the stone was set. Armed with this information we could set about the examination of other floors and the features below them with some hope of being able to recognise whether features were or were not associated with the former presence of similar clay pillars.

2.5 The pillars in house RAB

In addition the small area left unexcavated at the north side of RAB was dug. In the last portion of the fill of RAB was found the top of another clay pillar, formed in plaster-faced red clay around a roughly spherical stone (see Figs. 2.5 & 2.7). Like the large pillar found in 1989 in the same chamber, this pillar had flat sides and semi-circular ends. The top of the pillar was flat, and the junction of the top and the sides was marked by a carefully modelled ridge. It is thought that there were probably two excrescences modelled in clay on the top of the pillar, but the evidence was very tenuous, the pillar having been smashed against the wall of the chamber. It would seem that this new pillar in the NW corner of the chamber RAB was quite a low construction; at least there was no long flat slab as in the case of the large pillar of 1989.

Close to where the smashed pillar top was found there was a roughly circular gap in the plaster floor. Investigation of this showed that a roughly rectangular section stone (or post) had been set, its base packed with stones, to project above floor level. Proximity cannot be a substitute for proven association, but it is very tempting to link the pillar top and the sub-floor foundation, and to restore a pillar of unknown height above the hole in the floor. In the mirror image position, in the chamber's NW corner, there was another feature, consisting of a football-sized stone set below floor level, but projecting well above the floor. In this case the evidence was much more tenuous than in the opposing corner, since the floor of RAB had been seriously damaged or indeed removed when the later structures, RAA and RAD, were dug into it. Thus there was no surviving floor around the feature in question, and it is impossible to tell whether there was a gap in the plaster suggestive of another clay pillar. However, the carefully set stone, placed in a position to mirror the other clay pillar, looks perfectly situated to have been the main stone core of a low pillar.

In the southern half of the chamber RAB there were additional features, not seen in 1989, which were mostly below the floor surface. Close to the southern edge of the chamber, and on its north-south axis, was a disc of different clay about 70 cm in diameter. How far this different underbody to the floor was reflected in the floor's plaster surface is unclear in view of the poor preservation of the plaster floor in this area. Immediately north of this disc was a feature formed in the yellow-green clay which was in this area the base on which the plaster surface of the floor had been laid. The feature was a circular gap in the clay floor-base, carefully made around part of its perimeter. The fill of the cavity was fine, dusty charcoal grey soil, but it produced no particularly noticeable amounts of carbonised material on flotation, and the clay sides of the cavity were not burned or fire-hardened. The feature was shallow, but had no appreciable base.

Further north again was a third feature, consisting of an irregular oval cavity in the surface of the floor. The sides were made of a thick layer of yellow-green clay, reinforced at one point by a couple of stones set on edge. The fill of the cavity was a fine, charcoal grey soil, but flotation produced practically no carbon fragments. The clay sides were neither hardened nor discoloured by fire. This feature lay immediately south of the ridge in the plaster floor which ran across the axis of the chamber, eastwards from the tall clay pillar recovered in 1989.

Opposite the socket of the large clay pillar found in the western half of RAB in 1989 was found the red clay base of its mirror image, of equally imposing dimensions. Thus we now know that chamber RAB possessed two pairs of pillars, a large pair in the centre of the room and a small pair close to its northern wall. In addition there were other features in the southern half of the floor whose form and function remain quite indistinct.

Approximately halfway between the small pillar in the NE corner of the chamber and the easterly red clay pillar just described a small circular aperture was found in the clay under-body of the floor. The aperture, about 16 cm in diameter, was carefully formed in the clay, which, while horizontal on its upper surface, became thicker around the rim of the feature. The cylindrical form framed in the clay was filled with fine, silty soil. At its base, which was only about 8 cm below the surface of the floor, the feature possessed a flat slab of stone, considerably larger than the circle itself. Had there been other such features elsewhere in the floor, it would have been simple to describe them as post-sockets with stone post-pads to house posts supporting the structure's roof. Unfortunately, only this one cylindrical socket was found, and it seems odd to have only one roof support post, and that set very eccentrically.

2.6 The pillars in house RAA

Further information was also recovered relating to house RAA, which was mostly excavated in 1987 (Watkins and Baird 1987). Its floor was removed in 1989, but there was no opportunity at the end of that season to pursue investigations below floor level. In the 1990 season, therefore, the area was cleaned and re-examined (see Figs. 2.6 & 2.9-2.12). By deliberate decision, none of the plans, photographs or notes relating to the earlier seasons was made available, and excavation was carried out by people who had not previously been present; in this way none of the information recovered can be considered to have been conditioned by previous knowledge or recorded information.

Some plaster and a group of stones had been found in 1989 adjacent to the E wall of house RAB, and it had been assumed that it was some ill understood part of that structure. Once the plaster and clay of the wall of RAB were removed, it became clear that this particular feature was unconnected with them, but had been truncated by the construction of RAB. The feature consisted of a central cavity, filled with soft, fine loam, surrounded by a series of quite large stones set in lumps of plaster. Around the upper edge of the feature as it survived, the plaster and stones described a rough circle. In the light of the dismantling of the pillars in house RAD, the feature seemed to be another candidate for the base of an upright stone and a clay pillar. When the 1990 excavation plans were overlaid onto those of 1987, it immediately became clear that the new feature was in the mirror image position to the damaged clay pillar found in RAA. The two pillars had stood one on either side of the slight hearth and symmetrically disposed about the north-south axis of the chamber.

One further sub-floor feature was found within the area of the chamber RAB, which can be restored as being a sub-floor part of the later chamber RAA. The feature, which had first been noted in 1989, remained ambiguous on excavation and was for a long time incorrectly associated with RAB; on reflection, having put together all the plans, photographs and records, it can be associated more meaningfully with RAA. The ambiguity arose, once again, because of the absence of so much of the floor of RAB throughout its central and eastern parts. In the middle of RAB, just to the W of the place where the second red clay pillar base was found, two modest slabs of stone set on edge parallel to one another were found in 1989. In this season's excavations an east-west section was dug just south of these stones. Its purpose was to test for sub-floor evidence of a second pillar to partner the fallen, large, red clay pillar found in the chamber's western half. With a little adjustment the section cut through the soils associated with the two slabs of stone. The two stones had been set in the centre of an approximately cylindrical pillar of grey-white clay whose base reached well below the floor of RAB. At the time it was speculated that this was an earlier pillar belonging to RAB and ante-dating the pair of red clay pillars. Once the evidence of the 1989 season was put together with that of 1990, it became clear that this strange feature was one of a pair which belonged to an early phase of house RAA.

The partner to this clay pillar can be located to the east, where a socket for the stone core and a good deal of the packing and base of the pillar were recovered below the floor level of RAA. The sub-floor traces will appear in the final report, but none of the detailed plans are reproduced here. There was no possibility that this last pillar had belonged to chamber RAB, for it lay beyond its eastern edge. Its position exactly opposite its partner on the other side of the axis of the chamber strongly suggest that these two were a pair. When the first excavations were carried out in house RAA in 1987 there were no traces of standing pillars in this part of the floor of the chamber. Superimposing the excavation plan of that floor on the plan of the sub-floor details, it became clear that the flat stones set in the floor of the final version of house RAA exactly mark the positions of the former pillars.

Going back to the 1987 season's plans and notes, we found a large, roughly circular hole in the floor of RAA, E of the hearth area and symmetrically opposed to the damaged plastered clay pillar. Now that we know that in all the three houses there were a several pairs of clay pillars, it seems likely that this cavity marks the position of a partner pillar for the original pillar found in 1987. Having seen the pillars in RAD in 1989, we now know that the bull-dozing of this part of the site had severely truncated those pillars which stood vertical. In house RAA the pillar found in 1987 had survived to a height of only about 8 cm, its stone core snapped off at floor level (hence our difficulty in understanding what we had found). It would seem that its partner pillar, in the even worse damaged eastern half of the chamber had been bulldozed out completely, leaving only a gap in the floor. The hole was rather similar to that in house RAB, from which the 1989 red clay pillar had been deliberately broken off in antiquity. Thus we may restore the last phase of house RAA as having a symmetrical pair of pillars, as house RAD and house RAB had had in their turn.

The pair of deliberately removed pillars whose foundations were found under the floor in the northern part of house RAA could theoretically have belonged originally in house RAD as a second pair south of the surviving pair of pillars. There is no way in which this possibility could be tested and any relationship between these pillars and the RAD had existed, since the construction of RAA had entirely removed all the floor of RAD. What is clear is that the pair of removed pillars had existed in the earlier stages of house RAA, since their foundations were sealed below its latest plaster floor. It is not possible to be exact in the reconstruction of the sequence of pillars made and remade in relation to the sequence of constructions and reconstructions of the chambers to which they belonged. One sequence would read as follows: house RAD had a pair of pillars, and house RAA also had a pair when it replaced RAD; later, when RAA was reconstructed, the first pair of pillars was removed and a new pair was constructed further south in the new chamber. An alternative reading might be as follows: house RAD had two pairs of pillars, the southern of which were incorporated into the new house RAA when it replaced RAD; later, when RAA was reconstructed, the original pillars were removed and replaced.

2.7 Construction, reconstruction and replacement

House RAF shows similar evidence of repair, remodelling of the pillars and re-plastering, but the three-house sequence RAB-RAD-RAA is particularly graphic in its evidence for the care and effort which were expended on the construction, maintenance, reshaping, abandonment and replacement of houses. All three houses in the sequence show evidence of remodelling of the pillars and substantial resurfacing of the plaster walls and floors. The sequence can be described briefly (leaving out the *caveats* and areas of ambiguity) as follows. House RAB was constructed with two pairs of pillars (Fig. 2.7). At the end of its life the house was destroyed; the pillars were knocked down and fell into the accumulating fill of the chamber. House RAD was excavated to replace House RAB; part of its chamber lay within the area of the former RAB. House RAD had at least one pair of pillars, which flanked a rough slab of stone set on edge (Fig. 2.8). It was destroyed by being filled with debris and a new chamber, RAA, was dug to replace it. In its earliest form House RAA had the plaster surfaces of the pillars of the former house (almost?) showing in its north wall, and it retained the rough stone slab exposed in a niche which was stained with red ochre (Fig. 2.9). It had a pair of pillars of its own. The chamber of RAA was remodelled; a curving north wall was constructed and the view of the central parts of the former RAD were lost. In the NE corner of the chamber a small, egg-shaped niche was modelled (Fig.2.10). RAA was remodelled again, and the pair of pillars was removed (their former place was marked in the plaster floor by flat stones) and new pillars were constructed nearer the centre of the chamber (Fig. 2.11). Finally, when the house was abandoned, it was filled with occupation debris which sealed a series of eroded human skulls on the floor (Fig. 2.12). At that time a small, rough slab of stone was set upright in the southern part of the chamber and also buried in the fill.

2.8 Painted plaster in house RAD

As noted above in the introduction to this section, the first task in 1990 was to follow up the final piece of work of the 1989 season by taking to pieces the surviving clay pillar in the chamber RAD. The necessary preliminary was to remove the thin cover of temporary backfilling and clean the area. The cleaning produced a surprise, for, on the plaster floor which had been excavated, cleaned and examined last season two small areas of red colouring were noted. One patch was found close to the edge of the floor in the NW part of the chamber; the other was in the centre of the floor, immediately N of the place where the edge-set slab had stood between the two plastered clay pillars.

The floor of RAD was a thicker, harder plaster than had survived in either RAA or RAB. Nevertheless the surface of the floor was preserved differentially, and was not entirely smooth and even. Once the fragments of red colouring were noted the whole floor was very carefully examined and a fine water-spray was used to enhance any colours. Despite the careful search, only two very small patches of fugitive red colouring were found. No sense could be made of the surviving traces;

it does not seem likely that the floor was treated with either a figurative or a geometric design, but rather that the paint was applied to cover areas of plaster, or possibly the whole floor.

It was somewhat puzzling that features which were excavated in 1989 were not seen when freshly revealed, but were found a year later when the old excavations were re-emptied. The same phenomenon applied to structure RAB, where much of what was seen on and immediately below the floor level could have been observed in 1989 but was not. The difference between 1989 and 1990 was that in 1989 RAD was excavated under very dry conditions, while in 1990 the 1989 back-fill was removed at the very beginning of the season after a cool, wet spring. When seen in 1990 the surfaces excavated in 1989 were damp and vivid with colour by contrast with the hotter, drier, dustier conditions of the previous year.

In 1989 it was noted that the two clay pillars on the floor of RAD had each been rebuilt and enlarged in a second phase of construction. In the 1990 season, as the floor of RAD was being dismantled, the same observation was made in relation to the plaster surface of the floor. Two distinct layers of hard white plaster were found, the second directly superimposed upon the first. Incidentally, in the small area where the two plaster layers were disentangled, the lower layer showed no sign of colouring on its surface.

3. The northern (or central) area

A slightly larger area was laid out around the small 1987 square excavated in the central area (Watkins and Baird 1987). When excavation showed that the new five metre square almost contained a circular stone structure, it was extended a little on its E side and by 1.5 metres on its S side. The enlarged area neatly enclosed the structure, but gave us very little space beyond it. However, the site was so damaged or destroyed in this vicinity that further extension of the excavation area would not have produced a significantly enhanced context within which to view the stone structure.

No further traces were recovered of the structure of which an arc of stone edging was found in 1987, formed for the most part of three large boulder mortars. When they were removed in the 1990 season, the two larger examples of boulder mortars were found to have been used upside-down in the construction of the latest, fragmentary structure (now labelled CAA; see Fig. 3.1). Both boulders had deep, conical or funnel-like, cylindrical depressions worn into what had been their upper surfaces. These mortars had been worn through, and what we had been looking at in 1987 were their broken under-sides.

Immediately below the eroded and fragmentary CAA were the remains of a large and better preserved circular structure, made of rough stones (CAB; see Fig. 3.2). The structure consisted of a shallow circular depression, whose concave and uneven floor was roughly paved with flat stones, and whose sides were formed of stones of all sizes set in mud to form a steeply raked wall. There was no trace of a doorway, nor any sign of any internal fittings or fixtures forming part of or set on the floor. One of the largest stones in the wall of CAB was another worn out boulder mortar, like those in CAA turned upside-down. The fill of the structure was very stony, and included a very large number of broken ground stone implements of every kind.

To the south of the structure the trench was expanded by a further metre in order to allow a sounding to be dug into the levels below structure CAB. This sounding soon reached virgin subsoil, here a stiff red clay overlying the white limestone. In the SW corner of the trench a sharply cut and curving edge was found. In the time available at the very end of the excavation season only a small sounding could be made into what proved to be an extensive feature cut into the subsoil to a depth of almost one metre. The feature had a vertical side and at its bottom was a flat floor. The side and the floor were coated with a fine mud plaster, and the side appeared to be a small arc on the perimeter of quite a large circle. Extrapolating the arc of the side by eye, it appeared that the floor of the structure CAB had subsided a little into the fill of a cylindrical feature, and that its edge could be appreciated as a curving break of slope in the rough stone floor. On the last day of excavation a key-hole was opened in the floor of CAB, and the sharply cut edge of the cylindrical feature was found exactly as predicted. It would therefore appear that the earliest structure on this part of the site was a large (approximately 7 metre diameter) cylindrical hole cut almost one metre deep into the subsoil, which was then faced with mud plaster. In view of its plastered surfaces and size it seems reasonable to think of it as a domestic structure, similar to the houses of the southern area. It is worth emphasising that, in the light of the comparative stratigraphy referred to in the next paragraph, this structure is the earliest known on the site.

The chipped stone assemblage from the central area is the key to the relative chronology of this part of the site. The chipped stone was collected and retained for specialist examination, but the Gulf War of 1990-91 supervened and the examination of the samples has not taken place. Only an impressionistic and inexpert view can be given, based on what was noted when the samples were being sorted, collected and packed for (temporary) storage at Tel Afar. It has already been documented in an earlier report that the latest surviving levels in this part of the site were of the same general date as the latest (house-fill) deposits in the southern area of the site. The lowest levels in the sounding beside structure CAB were lacking in the Nemrik points that marked the later phases at Qermez Dere, and the earliest deposits of all, those in the fill of the plastered cylindrical structure, possessed one or two microlithic elements, types which were only found in the southern area in the deepest and earliest midden deposits. It would therefore appear that the stratigraphy in the northern area covered the same range of time as that in the southern area, and that the site was occupied in both areas throughout its life-time.

4. The search for plant remains

Mark Nesbitt

In view of the relatively poor amounts of carbonised seed remains recovered in earlier seasons, efforts were redoubled to obtain a better sample in the 1990 season. The Siraf-type flotation and wet-sieving machine was modified so as to take larger samples and to expose a greater surface area of the sample (see page 2 for details). The improvements enhanced the machine's performance, increasing its through-put considerably. It also appears that the extraction and capture of carbonised remains was improved, since there were generally somewhat better quantities of seed fragments in 1990 samples than in the same quantities of samples from comparable contexts in 1989. In addition, the machine was kept working more intensively, often for ten hours per day. Even so, the total amount obtained was scarcely overwhelming in quantity.

The preliminary analysis of the 1990 material has been completed, and the score-sheets for both the 1989 and the 1990 seasons are included in the tables appended to this report to complement the score-sheet of the 1987 material published in the second interim report. The significant results of the 1990 season are that the new and larger sample consists of the same kinds of material as those from the previous seasons. The incidence of very small quantities of wood charcoal was also repeated in the 1990 samples, and once again the size of the fragments is microscopic.

The variations in the concentrations of seed material between one sample and another are often found to exist within a single context, especially among the midden layers in the southern area. The procedure in 1990 was to take a bulk sample of 20 or 30 litres for flotation as soon as a context was identified. A second bulk sample of similar size was then taken later the same day. Where large contexts were excavated over several days, further bulk samples would be taken each morning, especially if a context was shown to be producing seed material. Thus, different samples from the one context would be taken arbitrarily from different parts of the context. The implication of the variations in quantity of seed material per 10 litres of sample is that the seed material was reaching the deposits in small but discrete quantities, and that the midden layers were accreting sufficiently rapidly for the seed material to be buried before it could be mixed homogeneously through the deposit through blowing on the surface.

Table 4.1 is a simplified score-sheet for all those samples that contained any seeds, from all three seasons of excavation. Charcoal has not yet been fully quantified, and some sub-categories (e.g. different grass types) have been amalgamated. Summary statistics for each season are placed at the end of the table. Although the quality of preliminary sorting and identification are not fully comparable between material from each season, some interesting points emerge. Although five times more soil was floated in the last season than the total up to that time, just under twice as many identifiable seeds were recovered. This is probably because of different strategies of sample selection in each season. In 1987 only twelve productive contexts were sampled, of which two (101 and 102) were very rich and contained particularly large numbers of identifiable seeds. The seasons of 1989 and 1990 are more comparable, since a broadly similar, wide-ranging sampling strategy was followed in both years. With a wider range of samples being taken, some rich contexts may be encountered and many poorer ones containing small quantities of abraded material. The proportion of unidentifiable fragments is therefore much higher in these latter seasons (69% and 80%, compared to only 24% in 1987). Experience at other sites has confirmed that, unsurprisingly, sampling a wide range of contexts rather than concentrating on obviously richer deposits will result in an overall lower density of material. The decline in seed density (as distinct from the totals recovered) between 1989 and 1990 is probably part of the same pattern, rather than reflecting any difference in the efficiency of the machine or its operation. Nonetheless, the massive programme of flotation in 1990 achieved the desired result of doubling the number of identifiable seeds, as well as providing a great deal more charcoal and unidentifiable material for analysis. Full interpretation of the varying densities of charred material awaits its final identification and quantification, and context by context comparison.

Brief scanning of the 1990 samples confirms the absence of domesticated wheat grains. In the absence of any morphological criteria differentiating wild and early domesticated barley grains and pulse seeds, the question of cultivation remains open. However, the high proportion of wild grasses and non-standard pulses (i.e. excluding lentil and bitter vetch) is in line with the wide diversity expected in gathered harvests. The ecological approach to this question, pioneered at Abu Hureyra by Gordon Hillman (Hillman, College and Harris 1989) relies on the analysis of much larger numbers of seeds. However, an encouraging route for further work is opened by the recovery of large amounts of contemporary seed remains from M'lefaat (see next section) and, in south-east Turkey, from Hallan Çemi. The much better preserved, broadly similar assemblages from these sites well ease identification and interpretation of the Qermez Dere material. Further possibilities lie in the comparison of these assemblages with slightly later material from sites that are thought to be agricultural, such as Jarmo. Subtle differences in lentil diameter or barley grain size may then become apparent.

At present, efforts directed towards the preparation of the final publication are concentrated on identifying the wild grain fragments that form a major part (ca. 38%) of all the identifiable seeds at Qermez Dere, and which are equally abundant at M'lefaat and Hallan Çemi. Infra-red spectroscopy has proved a useful tool for chemical 'finger-printing' of cereals, and so far two Qermez Dere grains, both identified on the basis of morphological criteria as wild einkorn/wild rye, have been analysed. Both have IR spectra closely matching wild annual rye (McLaren, Evans and Hillman 1991: 802-3). The second approach being applied is the use of gross morphology and histological criteria, and a major study of these criteria for the full range of Near Eastern grasses is in progress.

While further careful examination of the cereals is necessary, it seems probable that the subsistence strategy of the inhabitants of Qermez Dere as far as plant food was concerned was focused on the harvesting of wild cereals, lentils and vetches. There are distinct variations between contexts in the amounts of seed material per 10 litres of deposit, but there seems to be no variation in the proportions of the different genera through time (though the amounts of seed material recovered per context are probably too small to demonstrate slow changes from one phase to the next, even if they did exist).

5. Collaboration at M'lefaat

Mark Nesbitt and Trevor Watkins

Through the help of Tony Wilkinson (Assistant Director of the British Archaeological Expedition in Iraq, who brought the pump from Abu Salabikh to Baghdad) and the kindness of Nicholas Postgate (Director of the Abu Salabikh excavations), we were able to borrow a small petrol-driven pump. The pump was overhauled and reconditioned by Francis Thornton, a member of the Qermez Dere team, with a view to the flotation machine being set up for a short but intensive spell of operation beside the Khazir Su alongside the excavations at M'lefaat. This exercise was planned in collaboration between the Qermez Dere team and the Polish team, led by Professor Stefan Kozlowski, excavating the final epi-palaeolithic or earliest aceramic neolithic settlement site of M'lefaat where Professor Braidwood's team had undertaken soundings many years ago (Dittemore 1983).

The purpose of the collaboration was to enable members of the Qermez Dere to extract bone, chipped stone and carbonised seed material from the M'lefaat deposit in exactly the same manner as that used at Qermez Dere. Thus it was intended to produce directly and precisely comparable data from the two sites. The timing of the collaborative work was carefully co-ordinated so that M'lefaat would be able to produce relatively large samples of well stratified deposits. The flotation machine was transferred to M'lefaat and tested with the pump to lift river water through the system. Mark Nesbitt and Francis Thornton then spent two days processing almost 1.5 cubic metres of deposit from the fills of two houses. The floated samples and the unsorted heavy residues were then brought back with the flotation machine, and members of the Qermez Dere team sorted the heavy residues using exactly the same standards as they applied to their own material.

The quantified chipped stone sample was returned to Professor Kozlowski. The bone and carbonised plant materials were exported together with the Qermez Dere material, thanks to the generous co-operation of the Iraq Museum. The faunal material is being studied by Keith Dobney, and Mark Nesbitt has sorted the plant remains. Even at this very preliminary stage there are some interesting comparisons and contrasts between M'lefaat and Qermez Dere.

Amounts of chipped stone per 10 litres of deposit were relatively low at M'lefaat. Amounts of animal bone were broadly comparable to those in the Qermez Dere deposits, but plant remains were much more abundant in the M'lefaat deposits. More than 300 grams of plant remains (mostly carbonised seed rather than wood charcoal) were recovered from the more than 1400 litres of M'lefaat deposit, which is much, much more than has been flushed from all the more than seven cubic metres floated at Qermez Dere in 1990. First reports (from Dr Keith Dobney) indicate that the species in the faunal samples from Qermez Dere and M'lefaat are rather similar, except that M'lefaat produced relatively large amounts of large fish bones (not surprisingly). M'lefaat produced relatively high proportions of gazelle and caprine bones, backed up by significant quantities of hare, fox and a variety of bird species. The bird bones at M'lefaat are more common than at Qermez Dere, and are more in line with the numbers from other sites in the Middle East.

In terms of the plant remains, contents of the four samples, one each from the upper and lower fills of each house are similar:-

Grasses

Goat-grass (*Aegilops* sp.) grains	+++
Goat-grass (*Aegilops* sp.) chaff	++

	Wild barley (*Hordeum spontaneum*)	++
Pulses		
	Lentils (*Lens* sp.)	+++
	Bitter vetch (*Vicia ervilia*)	++
	Other vetch-types	+
Weed seeds		+
Pistacia nutshell		+

The seed assemblage is similar to that of Qermez Dere, notably in the abundance of goat-grass and wild barley grains, lentils, bitter vetch and other vetch seeds. Although Pistacia nutshell is less common, it is present. It is curious that goat-grass spikelet bases are so common, but we have no barley chaff at all. The goat-grass spikelet bases have spelt-type rachises, and straight, heavily veined glumes. They best match *Aegilops squarrosa* and *Aegilops crassa*. A range of modern and ancient material is being subjected to infra-red spectrometry in the hope that these two species can be separated.

The similarity between the Qermez Dere and M'lefaat seeds suggests that the occupants of both sites were in broadly similar environments and followed the same foraging practices. As at Qermez Dere, we have the problem of the similarity in morphologies of wild and early examples of domesticated lentil, bitter vetch and barley. The absence of barley chaff is particularly frustrating for diagnostic purposes. However, the absence of domesticated wheat, present at all early farming sites found so far, does suggest that we are dealing with a foraging economy.

6. Sample results of faunal analysis

Keith Dobney and Trevor Watkins

Since the last interim report was put together, further work has been carried out on the vertebrate assemblage collected during the first two seasons. Apart from some material from the early deposits in the northern sector, no additional material was collected in the 1990 season. Rory McDonald carried out work on some of the partially sorted animal bone samples and presented the results in the summer of 1992 in an MA dissertation in the Department of Archaeology at the University of Edinburgh. The tables of bone counts and weights in the appendix here are taken from that dissertation.

The purposes of this particular phase in the study of the faunal assemblage were:

- to obtain a first, general picture of the proportions of the various species which were being exploited
- to assess the potential of the faunal assemblage for further study, beyond mere species identification.
- to be able to quantify the resources necessary for that further study.

For the purposes of this study, bones from a selection of contexts were chosen and included those from both wet- and dry-sieving procedures. The contexts were chosen as being representative of the different parts of the site, of varying context type, as well as providing a range dates in the site's short history. For the chosen contexts, preliminary sorting was carried out and the animal bone was sorted into species, genera or even broader groups, with fragments from each group then being counted and weighed. The values included in tables 6.1- 6.6 are presented context by context, except in the case of table 6.2 which represent the pooled data from contexts, RCA, RCD, RCK and RCP, the fill of house RAB. These are among the later deposits represented at the site, and are thought to be of a tertiary rather than secondary nature. From the 1990 season a single context has been sorted, that from CBR, part of the fill of the subterranean house-structure at the base of the stratigraphy in the north part of the site. Equally early, but from the south midden deposits, are contexts RDM, RDN, RDO and RDP.

After primary sorting, the 'small mammal' and 'bird' categories remain to be examined in further detail. Hare and red fox have been identified, as well as wild cat, polecat and badger. The middle-size range of animals, comprising at Qermez Dere sheep, goat and gazelle, were first sorted from the larger and smaller genera; then those bones which could readily be identified as either gazelle or caprine were separated. To date, the caprine remains have not been examined in detail to determine the relative proportions of sheep and goat, and the identification of gazelle species also remains to be determined. The remains of larger mammals have, to some extent, been separated into simply equid or bovid, but a number of fragments remain indistinguishable.

The large numbers of bones of middle-sized species (caprine and gazelle) are obviously a most important group, and must have represented the major source of meat for the inhabitants of Qermez Dere. Most of the bone material, although well-preserved, is heavily fragmented, and much therefore lacks diagnostic zones. Whatever the exact ratios, it is clear that gazelle remains are the most frequent by some considerable margin, whilst the significance of caprines (relative to the other groups) should, at present, be considered much more tentatively.

The general profile of animal exploitation at Qermez Dere can be seen from Tables 6.1 to 6.6 In terms of weight of bone, gazelle is the most important species, with caprines being generally less prominent. The frequency counts of bones of small mammals and of birds vary widely between contexts, from low figures (< 10%) up to as much as 20%. In terms of their weight the percentage figures are of course much lower, ranging from less than 1% up to 5%. Remains of hare and fox are represented in every context examined. Hare remains range between <1% and almost 9% in terms of their frequency and contribute between <1% to just over 3% in terms of weight. Fox bones are more common than those of hare, and, in terms of weight, they contribute between 5% and almost 18% of the species represented in each context or context group. The bones of larger species (i.e. equids and bovids), occur in low frequencies, with counts ranging between 0% and almost 10%. In terms of weight, these large species contribute between 0% and almost 30% in different contexts.

Comparisons between contexts show that considerable variation exists and it is of interest to explore the possible source of this variation. There are three dimensions within which the variation may occur, space (in the sense of intra-site variation), context (in the sense of different uses of different types of context) and time. The group of small contexts from the fill of House RAB is similar to context CBR, also the fill of a house. The fill of House RAB was very varied and generally consisted of materials from different sources. Prominent in that fill was the occurrence of dark soils with amounts of chipped stone and bone, which have been interpreted as redeposited general midden. The chipped stone assemblage in the fill of House RAB appears to be later than the assemblages in any of the other deposits from the site (except for fills of the two houses which succeeded RAB). This may imply that the original midden deposits from which this material was derived were not represented in our excavations. The sample of the interior of the house in the northern area from which context CBR was excavated was not sufficient to allow us to form a firm view as to the nature of the fill of the house. The lack of observable 'lenses' may suggest that the fill was artificial and deliberate rather than natural and cumulative, but the matrix of the deposit was distinctly unlike the contemporary midden deposits in the southern part of the site and the midden component in the fill of House RAB. The four contexts RDM-RDP appear to be superimposed midden deposits accumulated on the natural soil in the southern part of the site. Chronologically they belong to the earliest stages of the site's occupation, in broad terms contemporary with the northern house and its fill CBR.

The directions of comparisons which can be made are between CBR and RDM-RDP (which are contemporary deposits of different kinds in different parts of the site), between RAB and RDM-RDP (which are of similar origin but of different date) and within the group of midden deposits RDM-

RDP (which are of similar early date, but of different composition in terms of matrix and lithic characteristics). We may note in passing that the profile of the house-fill CBR differs markedly from the fill of house RAB, but it does not make a great deal of sense to compare them (although they represent different periods in the site's occupation), because we cannot tell whether the differences are a consequence of time, intra-site differences of area, or particular differences between the origins of the derived deposits.

The comparison of CBR with the contemporary group RDM-RDP is tantalising. The conspicuous factor is the part played by the large animal bones. CBR contained more than twice as much bone from large animals (in terms of weight) as any of the group RDM-RDP and 6.75 times the average amount in those contexts. Amounts of bird, hare and fox bone in CBR are somewhat less than those in RDM-RDP. Since these deposits are contemporary, but of different origin and deposited in different parts of the site, the differences in bone composition suggest only that deposition practices varied around the site. The lesson to be learned is that it would be dangerous to characterise a site in terms of only one kind of deposit.

This point is amplified by the internal comparison of the group of samples from RDM-RDP. The overall characteristics appear in the final column of Table 7, and it is quite clear that the weights or frequency counts of the different groups vary considerably in this stratified sequence of midden deposits. This internal variability conforms with the variability in the matrix, the density of chipped stone, the density of animal bones and of charred plant remains in the sequence of deposits. While there is certainly a time factor involved in the accumulation of these deposits, there are no coherent trends observable in the animal bone statistics. Variation in deposition practice appears to be the significant factor controlling the amounts of bone and the proportions of different species.

Finally we may compare RAB with RDM-RDP. In terms of frequency counts the differences are very small. In terms of weight the differences are somewhat greater but still appear to be arbitrary rather than related to a change in subsistence economy. In the light of the variability observed in the previous paragraphs it would seem likely that differences in disposal practice are as likely to be the cause of these differences in composition of the bone assemblage.

Some general observations, however, are worthy of note. The near absence of equids and pigs, and the very low and variable amounts of cattle, may suggest that these species were simply scarce or that cultural factors played a part in regulating the dietary spectrum. All three species should have been present in the general catchment area of the settlement (onagers on the plain, wild cattle in the pistachio woodland and wild pigs in the lush and overgrown wadis). The absence of bones cannot of course provide any clues as to whether these hypothetical cultural factors may have been positive (i.e. a preference for certain kinds of meat and a choice not to eat others) or negative (i.e. a cultural environment in which the inhabitants of Qermez Dere were denied access to certain resources).

Of particular interest is the relative significance of fox as a food species at Qermez Dere. Clutton-Brock (1979:141) noted that at early aceramic neolithic Jericho, where frequency counts of fox were as high as those at Qermez Dere, 'fox was a major item of food, lying second only to gazelle'. Köhler-Rollefson et al. (1988: 424) found that 'cut-marks and traces of burning . . . can also be observed in the bones from some smaller species (e.g. foxes and hares)' at 'Ain Ghazal. In the PPNB phase at that site, many centuries later than the occupation of Qermez Dere, fox still represents 4.3% of the large identified sample of bone. Fox was also 'the commonest "small mammal" eaten by the prehistoric villagers' in the early phases of occupation at Ali Kosh in SW Iran (Hole et al. 1969: Table 57 & page 314). Stampfli (1983: 431) reports 3.5% fox bones in the sample collected from Karim Shahir in NE Iraq; in the same volume Turnbull (1983: 493-4) identifies 6 fox bones (4.25%) in the small sample from the soundings at M'lefaat at the edge of the piedmont in N Iraq. Amounts of fox bone reported are very variable, however. Legge (1975: 74-6) noted very small quantities of fox bone in the samples from Tell Abu Hureyra (none in the epi-palaeolithic and ceramic neolithic samples and 0.3% and 0.7% in the two groups of aceramic neolithic samples). The excavations at Nahal Oren (Noy, Legge and Higgs 1973), which employed careful recovery techniques of wet- and dry-sieving, apparently found no fox bones in the stratigraphy there, which runs from the Kebaran through the later epi-palaeolithic and on through the aceramic neolithic periods. Tchernov (in Valla 1986) found only 7 fox bones in all the samples from the recent soundings of the Natufian occupation at nearby El Wad.

Finally, using the index of diversity which Edwards (1989: 236-7) employed in his review of the concept of the 'broad spectrum economy', Qermez Dere emerges with a figure of 0.77, based on the seven categories of animals. Edwards' point is that faunal assemblages of the epi-palaeolithic do not in fact exhibit greater faunal diversity than assemblages of earlier palaeolithic date, and the assemblage from Qermez Dere (based on the figures presently available) appears to fall well within the range of those relatively low-diversity assemblages of epi-palaeolithic and aceramic date. However, despite extensive sieving, the Qermez Dere material, unlike other so-called 'broad-spectrum' vertebrate assemblages, appears to contain very low numbers of bird remains.

This preliminary work on the vertebrate assemblage from Qermez Dere has provided a chance to evaluate the potential of this material and enabled us to identify the particular research questions which it might address. However, it is only the first step. Further more detailed work is needed:-

- to determine the actual range of taxa represented and their relative importance
- to identify possible seasonal variation in exploitation
- to provide basic clues regarding the nature of the immediate environs of the site and the range of exploitation
- to establish the character of the deposits over the site
- to establish how this assemblage fits into the wider picture of late epipalaeolithic/early neolithic animal exploitation in the middle east
- to provide the basis for a synthesis (with other assemblages such as M'Lefaat, Nemrik and Ginnig) of pre and proto-domestication resource exploitation for northern Mesopotamia.

7. Further work in the early strata

Following on the small soundings in the early strata in the southern area in 1989, larger samples were excavated in 1990. It was observed in 1989 that densities of flint and bone varied very considerably over quite short distances. The samples dug in 1989 were disposed on a north-south line, and the sounding nearer the edge of the site was found to be generally poorer in material than the northern sounding.

In 1990 the experiment was extended. Work started immediately east of the northern sounding of 1989, and a trench one and a half metres wide was dug across the site for fifteen metres. Bulk samples for flotation and wet-sieving were taken at arbitrary intervals from the strata in this sounding trench. There were two purposes for the exercise. On the one hand it was hoped that the bulk samples would produce useful archaeo-botanical material; and on the other hand the samples were used to assess the variability of the strata in terms of the density of flint and bone per wet-sieved litre.

The strata observed in the northern sounding in 1989 could easily be followed eastwards, but it was quite obvious that the matrix of the strata changed rapidly. There was also considerable variability in the amounts of carbonised plant remains, animal bone and flint, which would seem to indicate that the strata were accumulated from many small and varied deposits of waste materials. The general trend in the concentrations of material in the midden strata was to decrease as the trench led away from the 1989 northern sounding. Thus the 1989 and 1990 soundings between them point to a focus to the NW of the northern end of the 1989 sounding. Unfortunately, no excavation could be undertaken in that direction because of the presence of service trenches, which had destroyed the ancient strata. Beyond the service trenches there was very little deposit surviving at all, the archaeological deposit having been dug away by heavy machines to the level of the underlying bedrock.

In an effort to obtain more bulk samples for flotation, at the end of the excavation the remains of the structure RAD were removed and the underlying deposit was crudely removed in large quantities. In the course of this work an isolated human cranium was found in the lowest stratum. The cranium had been badly crushed by compression of the matrix in which it was embedded, and it was removed in a large block of that matrix. The cranium was packed without examination and put in store for future study after professional recovery and conservation can be arranged. The context of the detached cranium in the earliest deposit at the base of the midden levels in the southern area indicates that secondary removal of skeletal material was already practised at the beginning of the site's occupation. But the ambiguous context and the uniqueness of the find prevents any sensible inferences being drawn concerning the nature of the activities responsible for the disposition of the cranium.

8. Chipped stone

Alison Betts and Trevor Watkins

General characteristics of the industry

Since the first, general description of the industry, which was included in an article submitted to the journal *Sumer*, has not yet been published, it is extracted and repeated here more or less verbatim but revised and up-dated as far as possible. Although this version repeats some of what has already been published in the previous interim report, there are a number of details which were not included there.

The material used for the chipped stone industry is mostly a medium- to fine-grained chert, varying in colour from light grey/brown to dark greyish/black. In its raw state it is nodular, with a thin layer of irregular, buff-coloured cortex. There are a few pieces of quite different raw materials, obsidian, a pinkish, banded flint and a smooth, rich mid-brown flint. The brown flint, which occurred almost exclusively in the last three of the seven phases, appears to represent an import which arrived at the site in the form of prepared blanks, The obsidian, which amounted to only twenty-two small chips (0.07% of the total chipped stone), was also confined to the later phases.

Cores are small; most are relatively poorly worked and heavily reduced. Most are single platform blade/bladelet cores. Some of these are well prepared and regular, but others are less so. Opposed platform blade/bladelet cores occur with moderate frequency, but crossed platform (changed orientation) cores are rare. Flake cores are irregular, and flakes are sometimes struck from exhausted blade cores. Quite a high proportion of the cores are fragmentary or otherwise unclassifiable. Blank removal seems to have been somewhat haphazard in many cases. Removal scars tend to be uneven and hinge fracture is relatively common.

Primary core preparation elements occur in low numbers but in sufficient frequency to show that primary core preparation took place on site in some, if not all, instances. Crested blades also occur in low but significant numbers, giving some idea of methods used to shape the blade cores prior to the removal of blanks. Core tablets and rejuvenation flakes are rare.

Blanks in the form of flakes are more numerous than blade blanks in all phases, but relative proportions vary from context to context. Striking platforms on flakes vary from punctiform through faceted to broad and plain. Blade/bladelet striking platforms are punctiform, and there is evidence that before the blade was struck the core was trimmed to remove protruding scar ridges. Blades are generally less regular than bladelets. They tend to become wider towards the middle while the bladelets are usually parallel-sided. Most blades and bladelets are snapped, but it is not clear whether these are intentional of accidental breaks. Trapezoidal cross-sections occur more frequently than triangular cross-sections on both blades and bladelets.

The very low frequency of burins among the retouched pieces is closely mirrored in the very low frequency of burin spalls. Splintered pieces occur very rarely. A very few micro-burins were recovered, all from the earlier phases. Some pieces in phases 3 and 4 may be accidental by-products of notched point production, but those from phase 5 and earlier appear to be related to the production of microliths. Débitage was divided into two classes regular and irregular. The regular pieces are roughly parallel-sided and represent bladelet segments. They account for about 10% of the total, although precise proportions vary from context to context. Proportions of angular debris vary from less than 1% to at least 10%. High counts of debris and débitage usually occur together, probably indicating an intensification of knapping in those contexts.

Altogether 9494 pieces of chipped stone were recovered in excavation in the 1987 season, of which 786 (about 8%) were retouched pieces. The frequencies of types of retouched tools are given in Tables 8.1a and 8.1b (in the Appendix). For the purposes of this summary report the detailed types are condensed into generalised types, and the contexts are grouped into the main stratigraphic phases. The figures show that the central or northern area (in Table 8.1b) and the southern area (comprising Table 8.1a) share a common assemblage, and that, while there are internal changes in the assemblage through time, as well as functional variations between different contexts, the assemblage remains essentially homogeneous throughout.

Retouched pieces

The most common types of retouched pieces were points of various kinds, and notched and denticulated pieces. Each group accounted for just over 20% of the total tool count. Scrapers and burins occurred only in very low frequencies (2.5% and 1.7% respectively). Backed pieces were only slightly more common (3.1%). The typology followed is a modified version of the type-list proposed by Hours for the epi-palaeolithic of the Levant.

Points

Points have been divided into five groups: two are distinctive types of projectile, a tanged form and a notched form, the latter subdivided into two classes; the other two point forms probably represent perforators or borers rather than projectiles. Notched (Khiam) points are relatively common throughout. Typically, they are made on bladelets with a transverse or concave truncation at the base and a pair of opposed notches a little up the piece. The point is usually formed by limited bilateral inverse retouch, although some have direct retouch or have retained the original tip of the blade without further modification. In short, the Qermez Dere Khiam points conform precisely to the refined definition proposed by Nadel, Bar-Yosef and Gopher (1991).

The tanged (Nemrik) points are made on blades, or occasionally bladelets and are formed by bilateral inverse retouch at base and tip. The tang slopes out to the side of the piece without any break or 'shoulder', and in many cases slopes back immediately towards the tip, forming an approximately lozenge-shaped piece. Only a few pieces are shaped by direct retouch and these have been classed in a separate group. The tanged points occur only in the later phases, namely the last four of the seven.

The perforators are divided into two groups, a simple point formed by inverse retouch and a point on a backed blade.

Notched and denticulated pieces

These fall into four groups, notched blade fragments, strangled blades, denticulated blades and notched flakes. Some of the notched blade fragments may be pieces of broken notched points and others may be true notched pieces. Strangled blades are rare. They have long shallow bilateral concavities formed by direct retouch. Denticulated blades are also rare. They have fine, irregular, semi-continuous denticulation on one or both sides.

Truncated pieces

Truncations are also rare. There are two forms, blades with transverse truncations and blades with oblique truncations. in both cases the truncation is at the distal end of the piece.

Scrapers

Scrapers occur infrequently. Three groups have been distinguished, end-scrapers, side-scrapers and round scrapers. Most are executed on flakes and are fairly roughly shaped by discontinuous semi-abrupt retouch.

Retouched blade fragments

These have been divided into eleven classes according to the location and nature of their retouch. Some must be broken pieces from other tool classes, but some may be tools in their own right. Eight classes include mid-sections of blades; the other three include butts and tips. Of these three, two are blades pointed either by direct or inverse retouch and are probably from broken borers or notched arrowheads. The third class, butt fragments blunted by inverse retouch, mostly represent broken tanged points.

Retouched blades

Since most blade tools were broken, only two complete blade tool classes could be distinguished, bilaterally backed blades and a distinctive tool which was very localised within the stratigraphic sequence, crested blade/bladelets with fine unilateral retouch.

Pieces with sickle gloss

Only one piece with sickle gloss was recovered in a stratified context, and that from a late phase.

Burins

Burins are rare. Three classes were distinguished, dihedral burins, burins on a break, and broken pieces.

Retouched flakes

Retouched flakes occur in moderate numbers. They fall into two groups, pieces with inverse retouch and pieces with normal semi-abrupt retouch. The second group is closely related to the scraper class but working is less regular.

Retouched débitage/debris

Some of the smaller retouched pieces cannot be classified more closely than this class.

Preliminary analysis of the 1990 lithic samples

At the beginning of the field season, while excavation was getting under way, there was time to catch up with finishing the processing of the samples which were produced on the final days of the 1989 season. During the first part of the 1990 season Dr Betts was able to carry out the basic processing of the new samples as they came in. The samples from the latter part of the season were put into store to await a second visit to Tel Afar by Dr Betts at the end of 1990, a visit which has been indefinitely postponed. Sadly, some important material was recovered from the earliest levels of Area C in the last few days, material which has not parallel in that area; that material can be reported only in the most general, unquantified and inexpert terms.

At the time of writing the chipped stone statistics from the 1990 season (together with the supplement to those of the 1989 season), which are produced in the appendices to this paper, remain to be digested and incorporated into the overall figures for earlier seasons. Since work on the final report on the chipped stone is otherwise well advanced, and it is hoped to produce the first of the two final volumes of publication rather soon, it would be pointless to do more than produce here the tables of basic statistics. Thereby, all the basic statistics on the chipped stone industry will be in print, and none of this need be repeated in the final publication, which will concern itself with the typological examination of the retouched pieces, inferences from the corpus of published statistics and more generalised discussion.

Observations given here must necessarily be somewhat impressionistic. The simplest observation is that the 1990 material produced no samples which were different from those from earlier seasons. All the samples excavated, therefore, seem to belong within the range of variability of the industry as already seen. The 1990 samples, however, serve to reinforce greatly the statistics, especially of the earlier phases. The restricted amounts of chocolate-coloured flint continued, as before, confined to the later levels of occupation. The 1990 season also further emphasised the very small contribution, in statistical terms, of imported obsidian to the assemblage.

The novelty of the 1990 season in terms of the chipped stone industry was undoubtedly the sequence of samples from the central area excavation. The uppermost surviving levels of the central area, excavated in 1987, had been dated by means of the lithics to the later stages of the southern area sequence, parallel to the construction and use of the houses RAA, RAB and RAD in general terms (see Watkins *et al.* 1991: 18 and Tables 1 and 2). As a result of the 1990 season the earliest levels in the central area sequence have now been seen to compare with the earliest strata in the southern area in terms of the chipped stone assemblage.

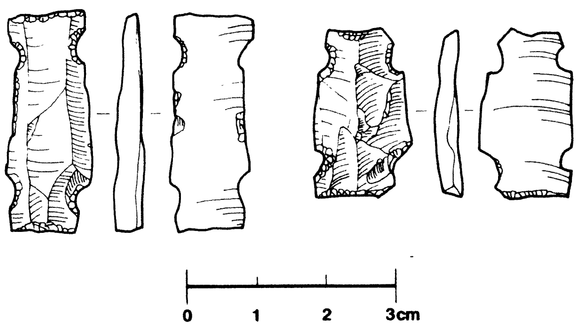


Fig. 8.1: Qermez Dere truncations.

In the 1989 season a very small number of strange and unfamiliar pieces were found in the early strata, and these were compared on the basis of their concave truncations to the recently named Hagdud truncations from the very early aceramic neolithic site of Netiv Hagdud (Bar-Yosef, Gopher & Goring-Morris 1980). Further examples have been recovered from the early phase samples of the 1990 season, although in total these pieces only number five or six. Their form is fairly homogeneous, and now that the excavations at Qermez Dere are complete it is time for a conclusion. It is here proposed to call these pieces Qermez Dere truncations. The type is clearly closely related to the Khiam point, which is relatively common throughout the Qermez Dere stratigraphy, and also has something in common with the Hagdud truncation. But it is very distinctive in form (and not a little puzzling in the contemplation of its possible function). The Qermez Dere truncation consists of a blade segment with a concave truncation at either end. Each of our examples is completed by a two pairs of opposed notches worked on the parallel edges of the blade close to either end. It is the concave truncations at either end of the piece which relates it to the Hagdud truncation, while the opposed notches (allied to a concave truncation) relate the Qermez Dere truncation to the Khiam point.

Now that the excavated assemblage is completely recorded, work is in progress on the definition of variance within it. In particular there are already indications of variation within the assemblage through time (see Watkins et al. 1991: 19). Only a few types are likely to be present in sufficient numbers to allow the examination of the proposition that individual tool types may also vary through time within the relatively short time-span of the settlement's occupation. In particular the Khiam points are being considered. There is certainly a range of variability within the type, both in terms of size and form, but it remains to be seen whether any of this variability is associated with time. The variability in absolute length of the points is very striking, as is the contrast between those points with a long, thin tip and those with a short tip whose two sides meet at an angle of 90° or greater. However, in a number of cases it can be seen that the short, 'fat' points have been reworked after impact fracture. An attempt will be made to find indices of size which are independent of phenomena such as re-working, as well as typological criteria, such as whether the tip of the point is produced by inverse retouch or not.

Preliminary treatment of some chipped stone statistics for 1987 & 1989

In sorting the non-retouched material several categories were used, including blade-form pieces, flakes, regularly shaped debris and irregularly shaped debris. In what follows it is assumed that, within a particular industrial tradition, the ratio between blade-form pieces and flakes, and between regular and irregular debris will be fairly constant, being an unconscious by-product of the reduction process in use.

Appendix 2 Table 8.3 contains base figures, which are presented in terms of ratios in Table 2. The figures in Table 1 are counts of the numbers of blade-form pieces and flakes, irregular and regular debris, total débitage and retouched pieces. The figures are given for the various significant stratigraphic phases of the site, and are correct and up to date to the end of the 1989 season (i.e. they do not contain any 1990 season figures). All except 'phase 8' are situated in the southern area. The 'phases' are:-

Phase	
0 & 1	Superficial and disturbed.
2	House RAA
2.5	House RAD
3	House RAB
4-6	Southern midden deposits
7	Basal soil
8	Northern area

As noted above 'Phase 8' is not a stratigraphic phase below Phase 7, but consists of the uppermost strata in the northern, or central, area of the site. In the light of the 1989 analysis of chipped stone (Watkins *et al.* 1991: 17-8), it is believed that the upper strata of the northern area are of the same date as the fills of the three houses RAA, RAB and RAD (that is, Phases 2, 2.5 (or 2b) and 3). Phases 0 and 1 are now believed to be virtually the same. When they were first identified and labelled it was believed that we could distinguish between superficial, undisturbed, surface levels and essentially damaged or redeposited material. Especially in the light of the 1990 season it is clear that most of the superficial deposits are both damaged and redeposited. To all intents and purposes, material from Phases 0 and 1 is equally suspect and can be ignored. Its analysis in terms of the lithics has been confined to ensuring that there are not traces of later deposits than we have found elsewhere. At the base of the table the various phases are consolidated into groups of similar deposits. For this purpose phases 0 and 1 are omitted; phases 2, 2.5 and 3 are taken together as the fills of houses; phases 4 to 7 as midden deposits; and 'phase 8' comprises the upper layers of the northern area.

In Table 2 the ratios between flakes and blades, and between irregular and regular debris are given for each of the phases and then by the three groups. In the third column the percentage of retouched pieces within the total assemblage for each phase or group is given.

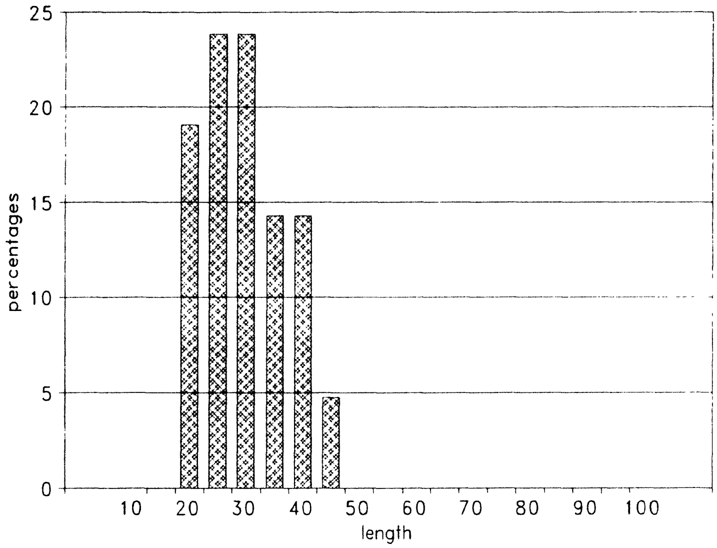
By far the greater part of the results are homogeneous. In particular, the ratios of blade-form pieces to flakes and of irregular to regular debris show that there is no significant difference in these basic characteristics of the reduction process either through time or in different parts of the site or in deposits of different origin. The obvious and striking statistic, however, is the percentage of retouched pieces for the northern area, which is more than twice as high as that from any of the types of deposit in the southern area. Higher percentages of retouched pieces should relate to higher degrees of tool use as opposed to tool manufacture. In this context it should be repeated that the deposits from the three houses in the southern area consist of large quantities of deliberate fill containing quantities of occupation debris, and not of floor deposits associated with the use of the houses.

Goodness of fit tests

The consolidated statistics from Table 1 were extracted by turns in order to compare the proportions of retouched to non-retouched, blades to flakes, and regular to irregular debris in the various groups of deposits, namely the house-fills in the three southern houses, the midden strata into which those houses had been dug, and the upper strata of the northern area. The tests were carried out as chi-squared tests, examining the hypothesis that there was no significant difference between the samples from the different areas.

One may presume that, if the industry was common to the two areas, the north and the south of the site, then the chi-squared tests would produce statistics below the critical level. This was indeed the case when the blade versus flake figures were compared for the midden strata and the northern strata. Similarly, when the three southern house-fills were compared with the northern strata, the chi-squared statistic fell below the critical level. Recalling that the typological comparison of the house-fills and the upper strata in the northern area was very close indeed, the latter test, showing a closer fit than the former, is gratifying in corroborating that inference.

Similar comparisons were examined in terms of the statistics of regular versus irregular debris. None of the comparisons produced a significant chi-squared statistic: the conclusion is that in terms of the various characteristics of the reduction process the three sets of strata are very similar indeed. It is worth digressing briefly at this point, because there are interesting internal results between these samples. The hypothesis that the house-fills are of the same date as the upper strata in the northern area, but both are somewhat later than the midden strata in the southern area, proposed on the basis of the typological comparison of the retouched tools, is supported by ratios of regular to irregular debris. The chi-squared statistic calculated for the comparison of the house-fills and the northern strata was a mere 0.08, while the comparison between the house-fills and the earlier midden strata produced a statistic of 0.45, indicating a greater (though not statistically significant) degree of difference.

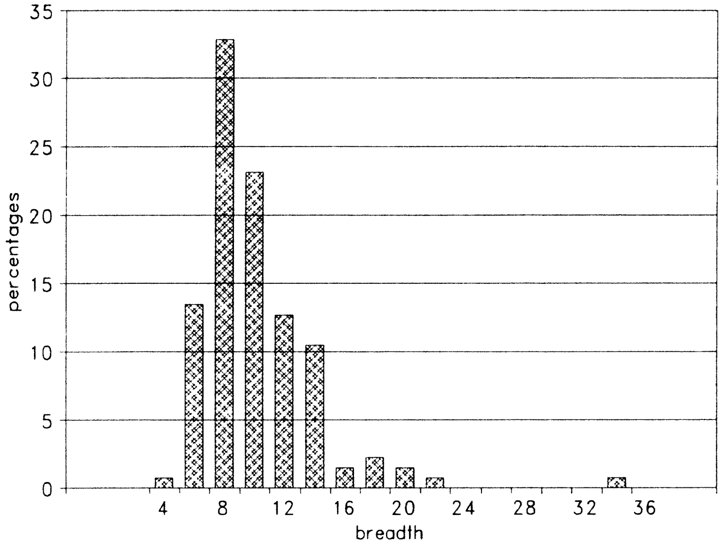


Graph 8.1: frequency distribution of length of complete, unretouched blades.

The comparison of retouched versus non-retouched pieces for the house-fills versus the northern strata was quite different in its results from both of the two previous sets of tests. The calculated chi-squared statistic was well beyond the critical value. In consequence the hypothesis that there is no significant difference between the samples must be rejected: although the samples are industrially similar (in terms of particular characteristics of the reduction process), in terms of the utilisation of retouched pieces (the degree to which the industry was put to use) the two areas were very different. The relatively high proportions of retouched pieces in the northern area would suggest that the area was used more for tasks which involved using flint tools, whereas the southern area received higher proportions of the debris of flint tool manufacture.

An index of this internal industrial homogeneity can be seen in the stable size of the more regular, parallel-sided débitage. An examination of the blades and bladelets from three 1987 contexts with large samples was used in the previous interim report (Watkins *et al.* 1991: 16 and Table 3) to demonstrate this point. A group of students at Edinburgh undertook a further study of the regular (blade-form) débitage from several contexts excavated in the 1987 season. There were blade-form 154 pieces drawn from all the unretouched material from contexts 106, 114, 115 and 116, which had been borrowed from Iraq for this and similar exercises. There were also some 74 retouched pieces from the 1987 excavations, which were in Edinburgh for drawing. Since the previous study had shown no industrial change in the life-time of the site, the sample discussed here can be summarised as a single unit.

The general characteristics of the blade-making industry can be summarised in terms of the mean lengths and breadths of the sample described above. The available complete blade-forms (21 in total) have a mean length of 24.24 $\pm$ 9.43 mm (with a coefficient of variation of 38.90%). The mean breadth of all the unretouched blade-forms (154 in total) was 9.42 $\pm$ 3.68 mm (giving a remarkably similar coefficient of variation of 39.06%). These two frequency distributions are illustrated in Graphs 1 and 2. The conventional distinctions between blades and bladelets are that bladelets are less than 40 mm long and 12 mm broad. The Qermez Dere industry is therefore clearly a bladelet industry, and very similar in the basic dimensions of its blade blanks to the earlier, epi-palaeolithic, Natufian tradition in the Levant (Henry 1989: 192-3 reports the average for the Natufian bladelets as between 25 and 31 mm in length and 9.6 to 11.6 mm in breadth). The two graphs show that there is almost no identifiable group of blades as distinct from the bladelets. Rather, the pieces which are longer than 40 mm are at the long end of the bladelets range, and similarly those which are broader than 12 mm are almost without exception as small tail at the edge of the main distribution of bladelets. For Qermez Dere the characteristics of its bladelets may be summarised as follows: 95% (within approximately two standard deviations) of the blades are less than 43.1 mm in length and less than 16.78 mm in breadth.



Graph 8.2: frequency distribution of breadth on sample of blade-form unretouched débitage.

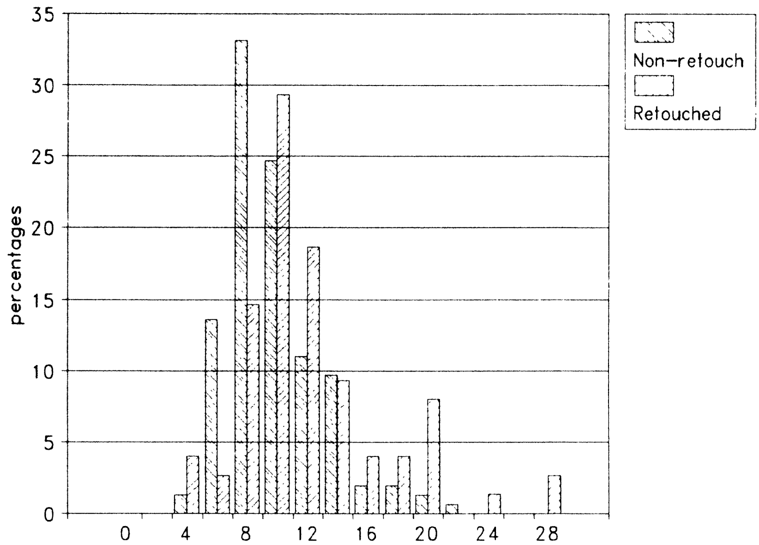
Since a number of retouched tools were available in Edinburgh the students measured the maximum breadth of those, too. The breadths of the unretouched blade-forms and the retouched tools should correspond if the blade-forms were the blanks from which the pieces were selected for retouching. The mean breadth of the retouched pieces is, perhaps surprisingly, greater than that of the unretouched pieces. The variability of breadth of the retouched pieces is also considerably greater than that of the unretouched blanks. A t-test showed that the difference between the two samples is highly significant and there is virtually no probability that the two samples are drawn from the same population. The archaeological implication of this result is that the production of blanks on which retouched tools might be worked did not produce the unretouched blade blanks which constitute our sample. The generally broader blanks used for retouching are very poorly represented among our sample, which is only to be expected if the raw material was being used economically. This leaves unanswered the question of where in the reduction process our unretouched blade blanks fit in.

	n	b	±	CV
Unretouched	154	9.42	3.68	39.07
Retouched	74	11.82	5.57	47.12

Table 8.1: comparison of breadths of unretouched and retouched blades.

	n	%	l	±	CV	b	±	CV
cortical	21	18.6	24.24	9.43	38.90%	11.52	6.39	55.47%
non-cortical	92	81.4	18.60	7.05	37.90%	9.20	2.97	32.28%

Table 8.2: comparison of cortical and non-cortical pieces.



Graph 8.3: comparative frequency distributions of breadth for retouched and unretouched pieces.

In a previous study of the material from a site of aceramic neolithic date in Wadi Jilat in Jordan another student group had found that the comparison of cortical and non-cortical pieces was informative. The ratio of cortical to non-cortical pieces was found to change with time, presumably reflecting a shift to the use of smaller nodules. The relativity of size of cortical and non-cortical pieces also changed through time, in the earlier period the two groups being statistically indistinguishable, and in the later period the non-cortical pieces being smaller than the cortical. The samples from individual contexts at Qermez Dere available in Edinburgh were too small to be used for an examination of the relationship of cortical to non-cortical pieces through time, but the material can be examined and characterised as a unit. The sample used consisted of the broken blade-forms, that is, the 113 pieces which were incomplete blades in that one end or the other had been deliberately or accidentally snapped off. Only one blade segment (that is, a mid-section truncated at both ends) was cortical and none of the intact blades in the sample had any cortex. The so-called broken blades provide a suitable group.

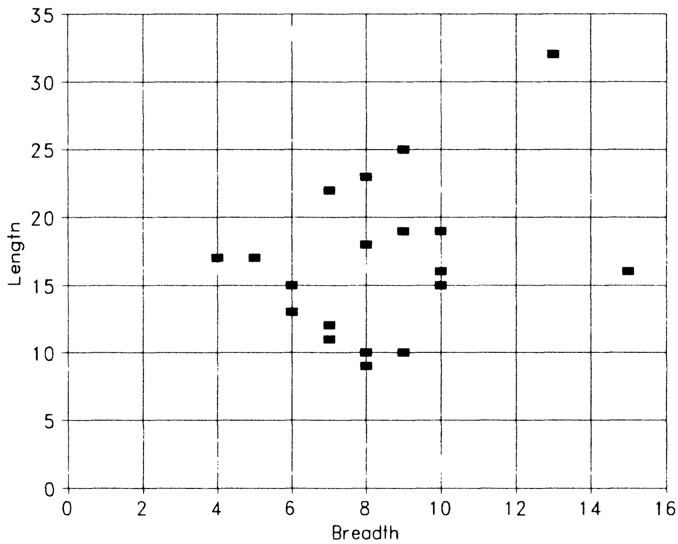
The cortical blades are apparently larger (both in length and breadth) and more variable (measured in terms of the coefficient of variation (CV) of the breadths of the blades). The two variables were subjected to t-tests. The difference in breadth emerges as of ambiguous significance, but the difference in length is statistically highly significant. The results suggest that the cortical blade-forms (struck from nearer the outside of the nodule) are larger than the inner, non-cortical pieces. The ratio of cortical to non-cortical blade-forms and the degree of difference in size between the two sub-groups may serve as further indices in the characterisation of the reduction process, and is recorded here for Qermez Dere to that end.

Finally, the available sample of débitage was used to review a proposal by Kozlowski and Szymczak (Kozlowski 1990: 78 & Fig. 27) that the manufacture at Nemrik of blade segments, deliberately truncated at both ends, was intended to produce pieces to be used as 'unretouched inserts'. Kozlowski and Szymczak indicate that such supposed unretouched inserts are known from various regions of Europe and North Africa in later mesolithic and earliest neolithic times. At Nemrik as many as 85% of the middle sections of blades are defined as unretouched inserts on the evidence of what is interpreted as intentional truncation at either end.

	n	l	±	CV	b	±	CV
segments	20	16.70	5.52	33.08%	8.45	2.50	29.58%

Table 8.3: mean length and breadth characteristics of blade segments.

The sample of blade segments from Qermez Dere consists of 20 non-cortical pieces (see Table 8.3). If one expected deliberately formed segments to exhibit a greater degree of homogeneity than a random selection of other blade-forms, then the coefficients of variation (CV) should be lower than in the other groups. In fact the coefficients of variation are very similar indeed to those calculated for the various other groups (see earlier tables). The segments are as variable in their lengths and breadths as the blade-forms as a whole.



Graph 8.4: scattergram of length versus breadth of segments.

One might argue that the scale of the required inserts was important, and not their particular size; larger inserts might be used towards the proximal end of the implement and smaller towards the distal end, for example. In that case one would expect to find a relativity between length and breadth. In fact there is a very low degree of correlation between length and breadth. Graph 8.4 illustrates the scattered relationship between length and breadth. The correlation coefficient (r^2) is very low indeed at 0.096 (where 0 is zero correlation and 1 is total positive correlation).

9. Soils, archaeological deposits and the settlement history

From the first season of excavations in 1987, we had been puzzled by the striking difference between the deposits in the northern and central part of the site and those in the southern area, where most of the effort has been concentrated. In the 1990 season, however, we returned to the northern part of the site and dug through the deposits to the subsoil, which in this area was a stiff, red clay. We also extended our explorations in the southern area as far as possible to the north, and found, to the north of the house RAF, part of the interface between the two types of deposit.

In the northern area the deposit showed no clear interfaces between deposits, and the whole deposit was more or less the same from top to bottom. On the other hand, the chipped stone recovered from these deposits represents the same time-span as that found in the southern area; that is, the earliest deposits contained residual epi-palaeolithic pieces, the occasional example of what we are proposing to call the Qermez Dere truncation, and the expected Khiam points, while the uppermost deposits, dug in 1987, compare closely in terms of the proportions of Khiam to Nemrik points with the fills of the houses in the southern area. At the interface in the sounding reaching N from House RAF it was observed that the southern deposits tapered to nothing, and were superimposed directly on the natural soil and subsoil: the red-brown clay deposit typical of the central and northern part of the site overlay the northern edge of the southern type of deposits, showing that the northern deposit was continuing to form after the southern deposits had ceased accumulating.

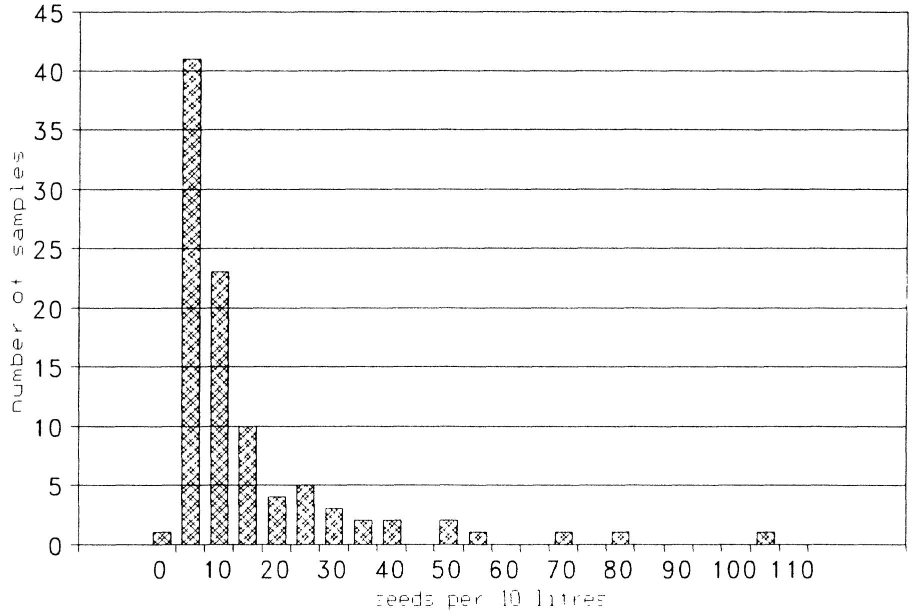
In the course of two short visits Tony Wilkinson looked at the different archaeological deposits, as well as the local soils and the geological strata exposed in the sides of the ravine beside the site. The crucial light which he was able to shed on the nature of the archaeological deposits was that the red-brown clay deposits in the central and northern area should be understood as a slow-growing soil which had been homogenised throughout by normal soil formation processes. The strata in the southern area, by contrast, had been laid down more rapidly, so that natural soil formation processes, which take place in the top 30 cm or so, had not had time to homogenise the deposits and the boundaries between one and another.

Putting together all the available evidence, therefore, it seems that the original settlement lay in the central or northern area, where subterranean domestic structures were dug into the red-brown clay subsoil. At that time the southern part of the site, which had a hard gypsum and limestone subsoil, was used for the deposition of midden and waste. In the northern part of the site there was a slow, largely natural accumulation of red-brown clay. At a certain stage in the history of the settlement, the deposition of waste materials in the southern part of the site ceased; domestic occupation shifted to that southern area, where houses were dug into the accumulated midden deposits. In place of its domestic function, the northern and central area took on a new function, associated with structures of a distinctly different kind and the intensive use of ground stone implements for crushing and grinding seed foods.

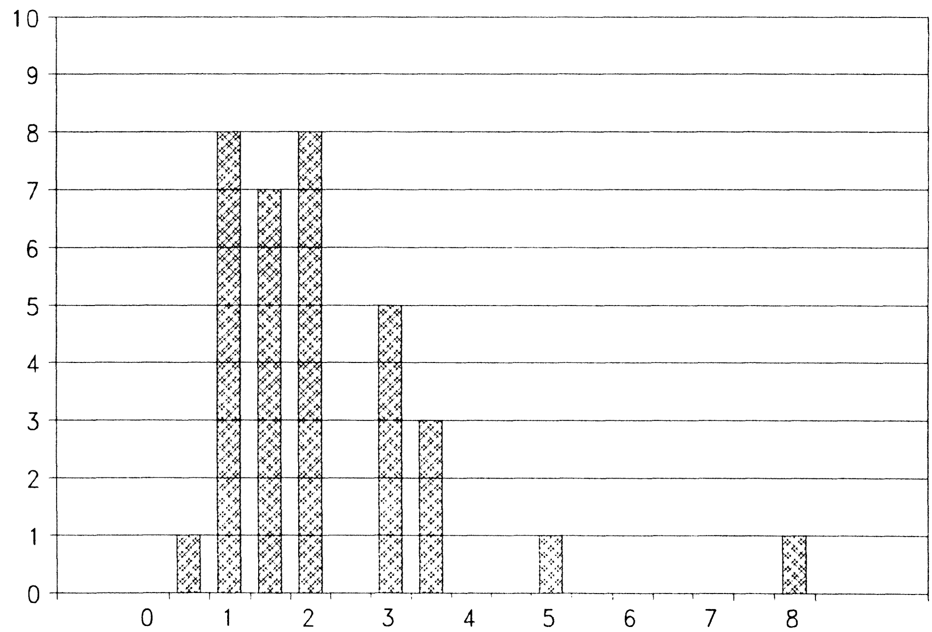
10. Relative quantities of flint, bone and seeds

Frequency distributions

The frequency distributions of densities of flint, bone and carbonised plant remains are graphed in Graphs 10.1-10.3 (the frequency distribution of densities of bone was published in the second report (Watkins *et al.* 1991: Graph 2, page 31), but is repeated here for convenience.) Since the figures are incomplete (some of the 1990 statistics still require finalisation), these graphs should not be considered as conclusive, though they are doubtless indicative. The common feature of all three frequency distributions is that most samples have low frequencies. All three distributions are heavily skewed to the low end of the scale. Arbitrary points were chosen to divide each of the three types into low, medium and high frequencies. In the case of flint, samples with fewer than 20 pieces per 10 litres of deposit were classed as low, samples with between 20 and 40 pieces as medium, and samples with more than 40 pieces as high. For bone, the figures chosen were fewer than 30 fragments per 10 litres of wet-sieved sample, from 30 to 100 fragments, and more than 100 fragments. For seed remains the figures chosen were fewer than 20 seeds or seed fragments per 10 litres of wet-sieved sample, from 20 to 30 seeds, and more than 30 seeds of seed fragments. In these terms, most samples are of low frequency, a few are medium and a very few are high frequencies. Table 10.1 in the Appendix contains the figures consolidated for each context (that is, not by individual sample) and laid out by phase. Only those contexts are included where there were finalised figures for all three categories of seed, bone and flint at the time of writing.

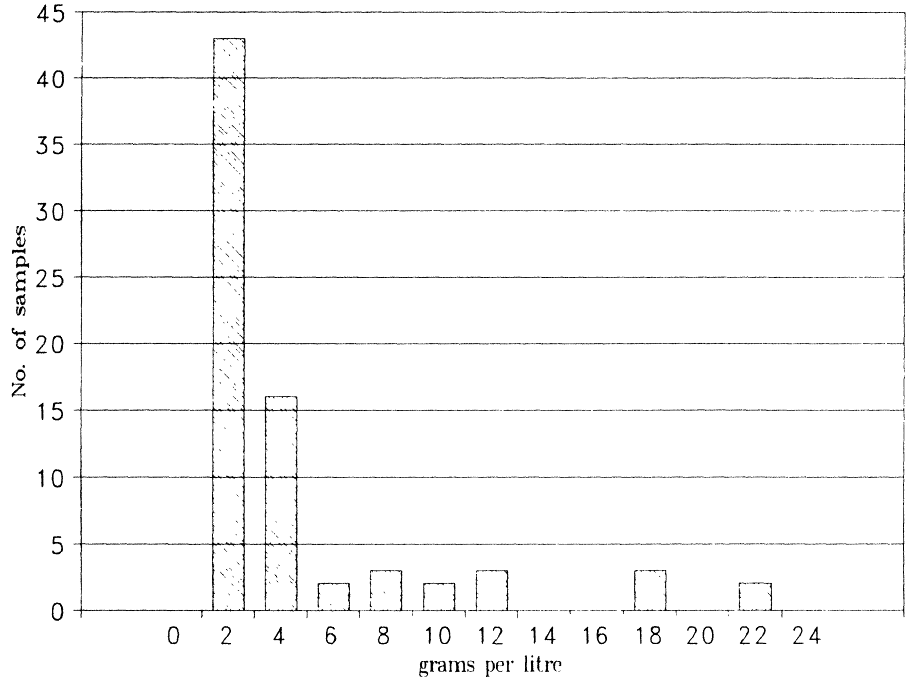


Graph 10.1: frequency distribution of carbonised plant remains per ten litres.

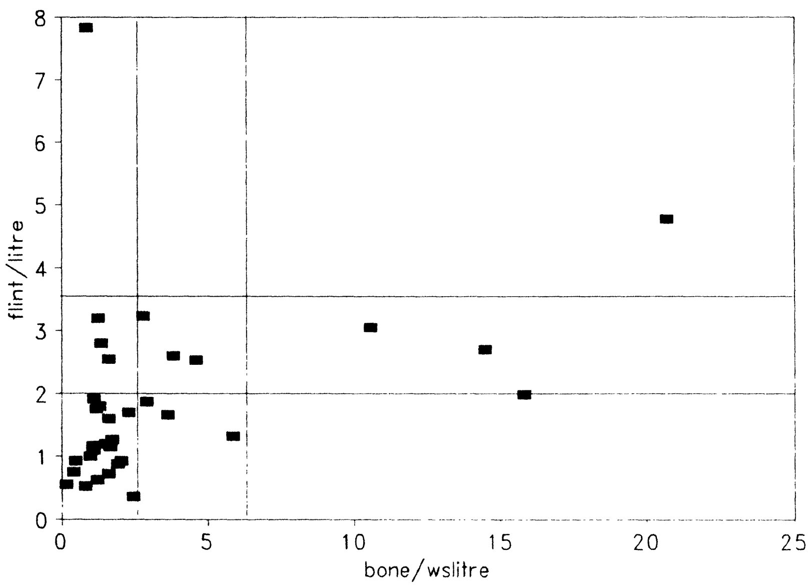


Graph 10.2: Frequency distribution of densities of flint per litre.

It has already been remarked (Watkins *et al.* 1991) that the highest frequencies of bone from wet-sieved samples are concentrated in the lower levels of the midden deposit, and that they tend to be in the north end of the 1989 sounding (Contexts RDM, RDN, RDO and RDP, covering phases 5 to 7). Experience in 1990, when a sounding was dug eastwards from that bone-rich area, showed that the density of bone dropped off very quickly (though the figures are not yet ready for inclusion in this table). Flint concentrations were either high or medium in contexts RMN, RDO and RDP. As far as seed remains are concerned, the fills of the three houses in the southern area were very variable, but the overall frequencies were medium; in general seed remains were scanty in the levels where either bone or flint was relatively dense.



Graph 10.3: Frequency distribution of densities of bone in grams per litre.



Graph 10.4: Scattergram of frequencies of densities of wet-sieved bone versus flint.

When the figures for density of carbonised seed fragments were examined sample by sample, it was noted that the variability within an individual context was frequently considerable. In more than a dozen of the forty contexts which had produced multiple samples of some size, there were sharp contrasts between one sample and another. The inference to be drawn from these preliminary observations, which will be fully tabulated in the final report, is that the seed remains are by no means evenly distributed within what appear to be homogeneous archaeological deposits. This would tend to suggest that these deposits were laid down and buried by further deposits quite rapidly (so that homogenisation by natural mixing agencies could not take place), and that they constitute very many small acts of deposition.

Finally, regression analyses were carried out on the various pairings of seed and bone, bone and flint and flint with seed. The correlation of any one of the three categories with any other was very poor (as low as 0.08, where 0 is no correlation and 1 it full correlation and 0.75 would be a reasonably good level of correlation). The lack of correlation can be seen graphically portrayed in Graph 10.4, in which the flint and bone densities from various frequencies are plotted against one another. Granted that the majority of contexts have low frequencies of both materials, the tell-tale areas of the graph are the medium and high frequency areas away from the bottom left corner. If there were any degree of correlation we should expect to see a concentration in the middle and top right of the graph. In fact the opposite picture emerges: contexts which are medium or high frequency in terms of one material tend to be low frequency in terms of the other.

11. Radiocarbon dates

A short series of six radiocarbon determinations on samples from Qermez Dere was undertaken in 1992 at the Oxford Accelerator Mass Spectrometer Laboratory. The results are summarised in Table 11.1, where they are arranged in descending order of age. No calibration has been attempted. The columns in the table record the age B.P., the standard deviation, the age B.C. and the range at one and two standard deviations.

The first two dates are both from the earliest deposit, CBR, found in 1990 in the northern or central area. The two samples were selected arbitrarily from the floated seeds recovered from a single deposit, the deliberate fill of the earliest, round, subterranean house on the site. It is a puzzle both to the author and the Oxford laboratory why two arbitrarily selected samples from the same material should have produced such divergent dates. Both samples consisted of many broken seed fragments, rather than a single seed, so the possibility of an intrusive, older seed seems to be ruled out. Clearly the later date is consistent with the other dates, and with the close parallels in date suggested by the lithic assemblages.

Dates 3 and 5 in the series (from contexts RDM and RDN) were from samples occurring at the bottom of the sequence of rubbish deposits in the southern part of the site. In fact RDN was stratified below RDM, so the radiocarbon dates are in reverse stratigraphic order. However, that is not very surprising, since these dates were taken from single seeds. Date 4, from context RDI, is from another sounding into the same early midden deposits, and is stratigraphically identical with the sample from RDM. The last date comes from the redeposited fill of one of the already published houses in the southern area. Since the fill is redeposited midden material and not a naturally accumulated post-occupation phenomenon, the date is not a good basis for dating the houses; it only tells us that the redeposited fill was not significantly younger than the undisturbed, stratified midden deposits in the vicinity.

The occupation of the site can be said to have begun before 8000 BC, and, noting that there are no samples relating to the later stages of the occupation, to have continued into the first half of the eighth millennium BC. Leaving aside the single, earliest date, the remaining five dates are a very cohesive group, whose pooled mean lies between 8000 and 7900 BC. The small series is in close accord with the radiocarbon dates from the proposed culturally contemporary site of Tell Mureybet in its late Phase 1 and Phase 2 stages.

12. Summary and conclusions

Since the 1990 season was the last, this third interim report gives the first opportunity to assess the general significance of the research undertaken on material from the site of Qermez Dere. This section proceeds from matters strictly related to the 1990 season to matters which are of much broader significance. It is convenient for the author of this section (TW) to draw attention to the fact that this is the end of the process of producing interim reports; the team now moves to the stage of preparing final reports. The general statements in this section must still be interim statements. These are the first attempts at generalisation: they are preliminary, tentative and largely undocumented. The questions to be answered in this section are to what extent were the objectives of the 1990 field season fulfilled, what has been learned from the site since the second report and up to this date, how that new knowledge modifies our previous understanding, and, with the ending of fieldwork at Qermez Dere, how should we view the significance of the site within its regional and wider context.

For reasons beyond the control of the Directorate of Antiquities and Museums the objective of expanding the field research into a survey programme looking for sites of palaeolithic and early neolithic date on the southern flanks of the Jebel Sinjar was thwarted. We are left with the excavations of the single, badly damaged site of Qermez Dere. In what was planned to be the final season of excavation on the site we had four objectives, all of which were fulfilled.

In the light of the earlier seasons, we needed a broader base of knowledge of the buildings in the southern half of the site. Where we previously had a single house stance, on which a building (RAB) had been built, remodelled destroyed and rebuilt several times (RAD and RAA), the 1990 season showed us that there were other, similar buildings. In the process of expanding our search for these additional buildings we found that the site was considerably more damaged than we had previously thought. One could revise our original site-plan, darken the areas defined as 'massively damaged' and shade the whole of the rest of the site as 'deposits truncated by machine digging'. Much of the surface of the site which we had earlier thought was relatively undamaged can now be shown to have been cut down by earth-moving equipment, damaged by the movement of large earth-moving machines, or occluded by archaeological material which had been recently dug and redeposited by machine. Even if the opportunity had allowed, it is very doubtful if any further areas of the site could have been found where there was any significant survival of relatively undamaged archaeological deposits. Two further structures were found near to the original group of structures. One of them, RAE, was truncated to floor level and beyond; all that was found were damaged parts of some of the floor. The other structure, RAF, was much better preserved, and was the only structure in the southern part of the site which had not been affected by recent machine damage.

In the course of the work in the southern area, and because personnel were not needed for survey work, it was possible to spend additional time and effort in clarifying the details of the trio of structures, RAA, RAB and RAD, which replaced one another on the same stance, and whose investigation had already absorbed much attention in both 1987 and 1989. The results in terms of a close understanding of structural techniques and the ability to reconstruct quite a lot of the history of the construction of plastered clay pillars in these houses mirrors the care with which the pillars themselves were constructed and remodelled and was well worth the effort. For what the extended sample of the southern area is worth, the construction-type represented by RAA, RAB and RAD is repeated elsewhere, and no other construction-type is evidenced.

The second objective of the field season was to supplement the sample of plant remains. That objective was achieved at the price of a very great amount of time spent at the flotation machine. The sample obtained in 1990 exceeds in quantity that collected in the two previous seasons. However, the contrast between the amount collected in two or three days at M'lefaat (more than 300 grams from about 1.5 cubic metres) and the total collected from Qermez Dere in three seasons (a few tens of grams from more than ten cubic metres of deposit) emphasises the great variability in the amount of carbonised plant material which may be incorporated in archaeological deposits. The tiny amounts collected from the wide variety of contexts sampled at Qermez Dere is a demonstration that carbonised plant material is not generally available in archaeologically useful quantities on such a site, and warns us that rich deposits should be treated with caution because they are very unusual.

The third declared objective, that of maximising the quality of the statistical samples of chipped stone, especially from the site's earliest levels, was in one sense achieved but unfortunately in another sense frustrated. There was very selective sampling of the chipped stone, and good, stratified samples were obtained from early levels in both the southern and, more importantly, the northern areas. The fill of the new, well preserved house RAF was also sampled extensively in order to relate it to the fills of the other houses in the southern area. However, many of these samples were obtained in the latter part of the season when it was no longer possible to process them. As related above, Dr Alison Betts, since she was unable to lead the survey team, left before the excavations were over, intending to return to Iraq for a short study visit later in the year. That study visit has been postponed indefinitely and it must be very doubtful whether the stored material will ever be recoverable. For the purposes of the present research, it is now assumed that the material will not be studied. The most serious consequence of the incomplete recording of the chipped stone from the 1990 season is that we lack the detailed characterisation of the early deposits in the northern area, and the fill of the new house RAF also remains unstudied and the fill of the house therefore undated relative to the other fills and midden strata in the southern part of the site.

The fourth objective of the 1990 excavation season was to return to the northern or central part of the site, where work in 1987 had been only superficial. The area in which excavation had begun then was the only surviving portion of that very different part of the site, where the composition of the archaeological deposit was different, the structural remains were different and the composition of the material culture repertoire was different from that found in the southern area. Under David Connolly's supervision, the full depth of the deposit was sampled and a series of structures was uncovered. The deposit proved to be much deeper than might have been anticipated. The circular stone structures which successively filled most of our excavation area were very different from the plaster-faced chambers in the southern area. At the base of the deposit, and at the very end of the season, a large, circular subterranean or semi-subterranean structure was found cut into the clay subsoil, but in the time available the part of the chamber which lay within our excavation area could only be sampled on a very small scale. The sides and floor of the cylindrically shaped chamber were faced with mud plaster. There was no sign of an occupation deposit on the floor. The assemblage of chipped stone in the fill, as in the lowest horizontally stratified deposits in the trench, matched the earliest found in the midden deposits of the southern area in terms of the presence of a few microlithic pieces and the absence of those types which characterised the late deposits in the southern area, such as Nemrik points. The other characteristic of the northern area deposit as identified in the 1987 season, the concentration of ground stone implements in contrast with their scarcity in the southern area, was repeated in the 1990 excavations throughout the whole deposit, which can now be understood to range over the same time period as that in the southern area. The northern area was occupied throughout the occupation of the site. The composition and contents of its deposit were significantly different in detail from those of the deposit in the southern part of the site. The type of structure present in the earlier part of the occupation of the northern area was very different from the stone-built, saucer-shaped constructions which were repeatedly built in the latter part of the area's occupation.

In general terms the results of the 1990 excavations corroborated the results of earlier seasons. No new phases were found, and no alterations or refinements are required to the outline of the last interim report. In the northern area we now have a stratigraphic sequence which reproduces that of the southern area, except that its latest surviving deposit, dug in 1987, is not quite as late as that of the latest house-fills in the southern area as judged in terms of the proportions of Nemrik to Khiam points. The 1990 excavations gave us the additional information needed, increased the depth of our understanding of such matters as the construction history of the houses, allowed us to propose a hypothesis explicating the changing use of the two distinct zones of the site, and produced no complications or new difficulties. Even if there had been areas of the site still available for excavation and opportunity to return to them, it is very debatable that it would have been worth the cost and effort to continue the excavations for a further season.

In particular, one would wish to have further information on the nature of the buildings at the site, because of the pairs of peculiar, plastered clay pillars and the lack of signs of domestic occupation; one would like to have a better view of the earliest structure in the northern area, which was only sampled in a very small way; as with any excavation, one can always think of ways in which the information is less than ideal and might be improved by further work. In the case of Qermez Dere the critical factor (war and political events set aside) is the extent of the damage to the site, which had previously been under-estimated. The 1990 season showed that most of the site had been removed or destroyed, and the small areas of surviving deposit were truncated or severely damaged at their surface. Everywhere that excavation was attempted, traces of the activities of heavy, earth-moving machines were found. A number of the uppermost deposits were seen to be disturbed and redeposited when traces of the passage of heavy machines were found beneath. In 1989 it was recognised that the area around the three houses RAA, RAB and RAD had been truncated and the houses and their clay pillars had been truncated. It was known from 1987 that the 'surface' traces in the northern area had been revealed by bull-dozing. The 1990 season, with its wider ranging search for structures, confirmed that damage was omni-present. The surviving top of the deposits is nowhere representative of what was once (even recently) there. The inferences are so obvious, but they are spelled out here for the record. We do not know whether the houses in the southern area were subterranean or semi-subterranean; we do not know how much midden deposit accumulated in the southern area before the (semi-) subterranean houses were constructed (though analysis of the chipped stone industry suggests that there is only a small gap); we cannot link our two areas of excavation by a running section; we cannot conclude that the uppermost surviving deposits in any area were the last to be formed; therefore we cannot conclude that the occupation of the northern area ended before occupation in the southern area.

A major contribution to our understanding of the site emerged from the final season of excavation, in part because of a crucial couple of metres of section north of house RAF, and but mostly due to the interpretation of the nature of the archaeological deposits offered by Tony Wilkinson (see section 9 above). To recapitulate, these two sources of information allow us to formulate a history of the settlement in which settlement began in (semi-) subterranean houses dug into the clay subsoil, while all sorts of debris and waste was disposed of in the southern area of the site. At a certain stage in the history of the settlement, the domestic area was shifted to the south, where houses were excavated in the deep accumulation of man-made deposit, and the northern area was given over to structures of a different kind and activities such as the preparation of plant foods by grinding and pounding. It needs to be emphasised that this reconstruction is based on two small areas of the site which cannot be directly related to one another by a continuous section. More significantly, we cannot guess how representative either excavation area is: were there two parts to the site, and were they of more or less equal size, or were there other, different areas of which we have no knowledge at all? All that can be added to what has already been said is that, walking over the area of the site, the destroyed and the damaged areas, during three seasons of excavation, we never saw evidence of other than two kinds of deposit. In pockets in the bedrock were residues of the archaeological deposit which had survived the massive destruction; in the southern half of the site the residues were dark and ashy, like those of the excavated stratigraphy in that part, while in the northern half of the site the residues were red and more clay-like in consistency, as we encountered the matrix of the deposit in the small, northern excavation area. We may conclude with some confidence that the site consisted of two types of deposit, but beyond that the questions must remain unanswered.

The community which created and occupied Qermez Dere was small. The overall area of the site (about 0.5 hectare) is small for a neolithic village site, and it must be remembered that domestic occupation was restricted to only about half of that area at any time. The settlement appears to be permanent (that is, the occupation was year-round and sedentary), but in the longer term the occupation was relatively short-lived by comparison with many other sites excavated in the Near East. Its duration in terms of the Levantine cultural sequence is narrowly confined to the very brief Khiam or proto-neolithic phase at the end of the epi-palaeolithic and the beginning of the aceramic neolithic period. The radiocarbon dates place the occupation at the end of the ninth millennium and the early centuries of the eighth millennium BC (uncalibrated).

The material culture of the Qermez Dere community was no doubt functionally competent but by archaeological standards it is rather restricted in range, unspectacular and almost entirely lacking in ornament (one or two pieces of incised bone, and half a dozen simple beads). The surviving repertoire consists very much of chipped and ground stone. The chipped stone industry is a small-scale, bladelet industry in which projectile points play a prominent part (up to 25% or any sample of retouched pieces); the range of retouched tools is very economical. Notched or denticulated pieces as a group may account for more than 20% of any sample; scrapers never exceed 5% and burins 3% in large samples. Early in the site's occupation microlithic tools and particularly lunate-type elements were still being made in the epi-palaeolithic tradition. Khiam points of the classic form were made throughout the duration of the settlement's use, and Nemrik (lozenge-shaped) points were added to the repertoire in the final stages of the occupation. Most of the ground stone tools were made for a variety of plant-food pounding or grinding purposes; some are large and coarse, while others are finely made and small in scale. In addition there was a small number of sub-spherical or piriform maceheads, carefully worked and beautifully finished in selected, fine-grained stones.

At this stage in the study of the botanical and zoological data it appears fairly clear that the community possessed no domesticated herds and there is as yet no sign of cultivation of crops. The community would appear to be dependent on a hunting and gathering economy. In view of their concentration on the classic cereals and legumes with their high nutritional values and potential for storage we may think of the community as hunter-harvesters rather than hunter-gatherers. The animal bones represent a classic final epi-palaeolithic to early aceramic neolithic spectrum of species in which gazelle was the core source of meat. The other particular features of the Qermez Dere meat economy are the steady but small numbers of caprines, fox, hare and birds, the small and erratic occurrence of the large species, cattle and especially equids, and the virtual absence of pig from the diet. Evidence of the plant component in the subsistence economy was hard-won, and amounts and preservation are much less than ideal. Cereals include wild barley and rye, but there is a wide range of other grass-seeds. Lentils, vetches and occasional terebinth (*Pistacia*) complete the range.

Exploitation of the animal food resources of the environment, as was remarked earlier, seem to indicate that cultural factors (either cultural preferences on the part of the occupants of Qermez Dere, or competition or cultural prohibitions by neighbours which restrained their access) played some part in the life of Qermez Dere. Exploitation of other materials from the environment, chipped and ground stone materials, also indicate the play of cultural factors. We may assume that the great bulk of the flint was locally and directly obtained, but there are very small quantities of chipped stone material from other sources. The tiny amounts of obsidian are economically insignificant, typical in quantity for the period, and evidence that the small community of Qermez Dere was in touch with the extensive network which distributed obsidian from sources far to the north or north-west over hundreds of kilometres. The other material is a chocolate-coloured flint which is quite distinct from the great bulk of the grey, local material. The chocolate flint occurs in the form of large (by Qermez Dere standards) blades and blade segments in very small quantities in later contexts. It has been noted in similar minute quantities at both Nemrik and Ginnig within N Iraq.

The absence of both core elements and débitage, and the difference in size between the indigenous bladelets and the conspicuously larger chocolate blades, suggest that the chocolate-coloured flint was derived from a particular source and was circulated in a fully prepared form within the region. The widespread use of black vesicular basalt for food-processing equipment similarly seems to bear witness to a regional network distributing this relatively heavy equipment from some very localised geological source.

The location and investigation of a very early aceramic neolithic site in the Near East is a uncommon event, which of itself increases the importance of Qermez Dere. Later aceramic neolithic sites have proved to be relatively common where prehistoric archaeologists have been active in any numbers (for example, in Jordan and on the Euphrates in SE Turkey), but early aceramic neolithic sites remain rare. The nature of the Qermez Dere settlement in terms of its organisation and architecture is particularly interesting and relevant to the long-running investigation of the social and economic processes which culminated in the wide spread of village-farming. The last season of excavation was particularly useful in showing the clear distinction in building types between the northern and southern areas and in reinforcing the observations of the earlier seasons with regard to the peculiarities of the buildings in the southern area.

Neither of the buildings found in the southern area in 1990 was rebuilt in the same place in the pattern of the RAB-RAD-RAA sequence, and RAE was so poorly preserved as to be able to do no more than to confirm that it was another plaster-surfaced concavity. But RAE repeated very closely the pattern of any of the individual structures in the RAB-RAD-RAA sequence. All the recovered structures in the southern area were subterranean or almost so. Their smooth wall and floor surfaces were finished with a plaster surface, which was repaired, maintained or replaced at intervals. Each structure was equipped with one or two pairs of non-structural plastered clay pillars set symmetrically opposed across the longer axis of the chamber. The pillars were remodelled, removed and replaced with considerable care. None of the structures had any deposit on the floor which related to its occupation and use. The end of the use of a house was marked by deliberate and careful procedures. The RAB-RAD-RAA sequence was peculiar in that one house was abandoned and filled up, and then (partly) re-excavated in the construction of its successor. The last in the sequence had poorly preserved human crania placed on its floor as the chamber was obliterated. The end of the use of RAF was followed by a (short) period of exposure, enough to allow much of the fine plaster surface to deteriorate and crumble. It was then partly filled, and left once again. After the exposed upper parts of the two pillars had eroded quite considerably, revealing the tops of the stones at their cores, the chamber was finally completely filled.

The difficulty of defining the function of these elaborately constructed and maintained subterranean buildings remains. The nub of the problem is that, even after the 1990 season, we have only a very small sample of the whole site and we cannot tell how widespread and commonplace the plastered subterranean chambers were, and none of the three sets of structures had any deposit on its floor. In the light of the 1990 season we do know that similar structures existed at an earlier stage in the site's history in the northern area, and we also know that the peculiarities of RAB-RAD-RAA are repeated. The simplest hypothesis seems to be that the common structural type on the site was basically domestic in function, even if its use as domestic space did not result in archaeologically useful occupation deposits on the floors. Any alternative hypothesis has to begin from the position that the typical, single-chamber construction on the site was not used for domestic purposes and has to contend with the dilemma that the excavations, which revealed structures all over the available parts of the site, failed to locate domestic structures.

The importance of Qermez Dere in Near Eastern archaeology is out of proportion to its small size, poor preservation or the fairly small scale of the archaeological investigations. Qermez Dere belongs chronologically in a very poorly documented period, the beginning of the aceramic neolithic, and it documents the period rather well. It lies developmentally in what is arguably a critically important period in the early history of village societies and their development of controlled, agricultural economies, and it contributes materially to our knowledge of the economic transition. Geographically Qermez Dere lies far to the east of the Levantine focus where so much research has been conducted in Israel, Jordan, certain sites in Syria, and on the Euphrates in SE Turkey. If one had sat down in the mid-1980s to plan on the one hand where research on the development of village societies and their subsistence economies could most usefully be undertaken and on the other hand how one could begin to bridge the chasm between the Zagros and Levantine zones one might have looked at the region between Mosul in Iraq and Diyarbakir in SE Turkey. It is salutary to recall that Qermez Dere presented itself through the agency of alert and intelligent Iraqi antiquities officers working in Tel Afar, and that if it had not happened that it was visited by British archaeologists in 1986 it would have been completely destroyed within a very few years. Its recognition and investigation was frighteningly chancy. As archaeologists we should learn that we draw conclusions in the absence of known evidence at our peril.

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Appendix of tables

Tables for Section 4: Carbonised plant remains

Tables for Section 6: Sample results of faunal analysis

Tables for Section 8: chipped stone tools

Tables for Section 10:

Tables for Section 11:

Table 4.1: Score-sheet of carbonised plant remains

(The table runs across both pages, and is continued on the following pages.)

Sample ID		Litres	Grasses whole	Grasses frags	Lentils whole	Lentils frags	Bitter Vetch whole	Bitter Vetch frags	Vetches whole	Vetches frags
002		10	-	3	-	-	-	-	-	15
004		5	-	14	3	2	1	-	4	19
101		297	1	6	3	3	-	-	4	67
101	58%	-	-	15	-	-	-	-	-	-
103		15	-	3	-	-	-	-	-	-
106		118	-	-	-	5	-	-	1	11
108		77	-	-	-	4	-	-	-	33
111		46	-	2	-	-	-	-	-	-
116		10	-	2	-	-	-	-	-	-
120		60	-	1	-	-	-	-	-	-
201		586	14	190	-	2	1	-	13	78
201	59%	-	-	35	-	-	-	-	-	-
202		15	-	-	-	-	-	-	-	1
203		70	-	6	-	-	-	-	-	5
CBR	501	162	0	0	0	0	0	0	0	6
CBR	502	236	3	3	1	0	0	0	2	5
RBC	502	33	-	-	-	-	-	-	-	2
RBF	501	19	-	-	-	-	-	-	-	-
RBF	502	32	-	6	1	6	-	-	-	22
RBH	15/4	-	-	-	-	-	-	-	-	-
RBH	501	50	-	-	-	1	-	-	1	4
RBK	501	11	-	-	-	-	-	-	-	6
RBN	501	20	-	3	1	9	-	-	-	9
RBN	502	8	4	1	13	-	-	-	-	-
RBP	501	10	4	4	-	-	-	-	-	-
RBR	501	50	-	3	1	1	-	-	-	10
RBR	502	25	-	1	-	-	-	-	-	2
RBS	501	10	-	3	9	-	-	-	-	-
RCA	501	62	-	-	-	-	-	-	-	4
RCA	502	60	-	5	2	4	-	-	-	-
RCA	503	20	-	6	2	-	-	-	-	-
RCA	504	35	-	8	3	8	-	-	1	4
RCG	501	42	-	3	1	1	-	-	-	8
RCG	502	29	-	2	-	-	-	-	-	2
RCG	503	29	-	-	-	-	-	-	-	3
RCG	504	50	-	-	-	-	-	-	-	1
RCK	501	44	2	9	3	19	-	-	-	-
RCP	501	45	-	2	1	4	-	-	-	-
RCP	502	44	-	2	1	5	-	-	-	-
RCS	503	33	-	2	-	-	-	-	-	-
RCS	504	21	-	3	1	-	-	-	-	-
RCX	501	49	-	9	1	10	-	-	-	-
RDA	501	60	-	-	-	-	-	-	-	-
RDD	501	47	-	1	2	12	-	-	-	-
RDD	503	42	-	6	-	-	-	-	-	-
RDF	502	53	-	7	-	-	-	-	2	7
RDF	503	28	-	2	-	-	-	-	-	-

Table 4.1 (continued)

Sample	ID	Litres	Weeds	Pistacia	Pistacia frags	Indeter minate	har- coal	Culm nodes	Total	Seeds/10 l
002		10	1	-	-	-		-	19	19.00
004		5	5	-	-	3		-	51	102.20
101		297	19	-	-	6		-	109	5.39
101	58%		2	-	-	10		-	27	-
103		15	-	-	-	-	-	-	5	21.33
106		118	-	-	-	3		-	20	1.69
108		77	4	0	0	0		0	41	5.32
111		46	1	0	0	0		0	3	0.65
116		10	0	0	0	0		0	2	2.00
120		60	4	0	0	0		0	5	0.83
201		586	32	0	11	48		1	390	8.07
201	59%		0	0	0	136		0	171	-
202		15	0	0	0	0		0	1	0.67
203		70	0	0	0	0		0	11	1.57
CBR	501	162	0	0	0	0	-	0	6	0.37
CBR	502	236	0	1	0	175	XX	0	190	8.05
RBC	502	33	0	0	0	8	-	0	10	3.03
RBF	501	19	0	0	0	2	-	0	2	1.05
RBF	502	32	5	0	0	+	X	0	40	12.50
RBH	15/4		0	0	0	0	X	0	0	-
RBH	501	50	0	0	0	29	X	0	35	7.00
RBK	501	11	0	0	0	19	X	0	25	22.73
RBN	501	20	0	0	0	31	-	0	53	26.50
RBN	502	8	0	0	0	22	-	0	40	50.00
RBP	501	10	0	0	0	60	-	0	68	68.00
RBR	501	50	1	0	1	45	-	0	62	12.40
RBR	502	25	0	0	0	26	XX	0	29	11.60
RBS	501	10	1	0	0	65	-	0	78	78.00
RCA	501	62	3	0	0	27	X	2	36	5.81
RCA	502	60	3	0	0	16	X	0	30	5.00
RCA	503	20	1	0	0	12	X	0	21	10.50
RCA	504	35	6	0	0	75	X	0	105	30.00
RCG	501	42	0	0	0	55	X	0	68	16.19
RCG	502	29	1	0	0	16	X	0	21	7.24
RCG	503	29	0	0	0	14	X	0	17	5.86
RCG	504	50	0	0	0	5	X	0	6	1.20
RCK	501	44	4	0	0	117	X	0	154	35.00
RCP	501	45	3	0	0	160	X	0	170	37.78
RCP	502	44	2	0	0	+	X	0	10	2.27
RCS	503	33	0	0	0	10	-	0	12	3.64
RCS	504	21	1	0	0	12	-	0	17	8.10
RCX	501	49	2	0	0	+	X	0	22	4.49
RDA	501	60	0	0	0	3	-	0	3	0.50
RDD	501	47	1	0	0	19	X	0	35	7.45
RDD	503	42	1	0	0	17	X	0	24	5.71
RDF	502	53	3	0	0	+	XX	2	21	3.96
RDF	503	28	2	0	0	14	X	0	18	6.43

Table 4.1 (continued)

Sample ID			Grasses		Lentils		Bitter Vetch		Vetches	
		Litres	whole	frags	whole	frags	whole	frags	whole	frags
RDH	501	40	-	-	-	-	-	-	-	2
RDH	502	45	-	4	-	4	-	-	-	-
RDI	501	47	0	1	0	0	0	0	0	0
RDI	502	22	1	2	0	17	0	0	0	2
RDJ	501	37	0	1	0	1	0	0	0	0
RDK	501	45	1	2	1	13	0	0	0	0
RDM	501	46	0	11	1	4	0	0	2	0
RDN	501	26	1	2	0	0	0	0	0	0
RDN	502	42	0	0	0	4	0	0	1	4
RDO	501	48	1	1	0	0	0	0	0	0
RDP	501	46	0	2	0	0	0	0	0	3
RDP	502	22	1	12	0	0	0	0	0	2
REA	501	40	0	2	0	0	0	0	1	12
REA	502	39	0	0	0	2	0	0	0	0
REA	503	37	0	0	0	2	0	0	2	22
RDM	510	330	1	21	0	0	0	0	0	3
RDN	510	93	0	3	1	0	0	0	1	4
RDP	510	192	6	32	3	6	0	0	3	16
RFH	502	21	1	0	0	0	0	0	0	3
RFH	503	43	0	0	0	0	0	0	2	5
RFL	501	17	1	12	1	3	0	0	0	0
RFL	502	24	0	1	2	4	0	0	0	0
RFL	503	59	6	28	3	0	0	0	1	16
RFL	505	70	1	25	3	3	0	0	2	16
RFL	506	56	3	39	0	0	0	0	4	17
RFL	507	58	0	11	1	2	0	0	0	4
RFM	501	78	0	0	0	0	0	0	0	5
RFM	503	40	3	29	2	4	0	0	1	20
RFQ	501	47	0	2	0	0	0	0	1	0
RFQ	502	47	1	5	0	1	0	0	0	1
RFR	501	240	0	1	0	0	0	0	1	10
RGB	501	192	0	0	1	0	1	0	0	4
RGB	502	339	0	2	1	1	0	0	1	9
RGB	503	250	0	3	0	0	0	0	0	6
RGB	505	375	0	5	0	0	0	0	2	10
RGB	506	189	2	3	0	0	0	0	0	7
RGB	507	212	0	0	0	0	0	0	1	7
RGC	501	182	1	8	0	0	0	0	0	7
RGC	503	120	2	3	0	0	0	0	0	1
RGC	505	143	0	4	3	0	0	0	0	0
RGE	501	70	1	1	0	0	0	0	1	12
RGE	502	218	3	19	0	0	0	0	0	29
RGF	501	108	0	1	0	0	0	0	0	1
RGG	501	375	1	15	1	0	0	0	0	18
RGG	503	260	2	3	2	0	0	0	0	1
RGH	501	273	1	3	0	0	0	0	0	3
RGH	502	244	3	13	0	0	0	0	1	6

Table 4.1 (continued)

Sample	ID	Litres	Weeds	Pistacia	Pistacia frags	Indeter minate	har-coal	Culm nodes	Total	Seeds/ 10 l
RDH	501	40	2	0	0	22	X	0	26	6.50
RDH	502	45	2	0	3	85	X	0	98	21.78
RDI	501	47	2	0	0	33	-	0	36	7.66
RDI	502	22	6	0	0	89	X	0	117	53.18
RDJ	501	37	2	0	0	42	X	0	46	12.43
RDK	501	45	4	0	0	+	X	0	21	4.67
RDM	501	46	2	0	0	+	XX	0	20	4.35
RDN	501	26	8	0	0	+	X	0	11	4.23
RDN	502	42	4	0	0	+	X	0	13	3.10
RDO	501	48	5	0	0	+	X	0	3	0.63
RDP	501	46	5	0	0	+	XX	0	10	2.17
RDP	502	22	11	0	0	+	XX	0	27	12.27
REA	501	40	0	0	0	9	-	0	24	6.00
REA	502	39	2	0	0	11	-	0	15	3.85
REA	503	37	0	0	0	53	-	0	79	21.35
RDM	510	330	6	0	0	70	X	0	101	3.06
RDN	510	93	2	0	0	28	X	0	39	4.19
RDP	510	192	21	1	0	300	XX	0	388	20.21
RFH	502	21	0	0	0	2	-	0	6	2.86
RFH	503	43	0	0	0	3	X	0	10	2.33
RFL	501	17	1	0	0	43	X	0	61	35.88
RFL	502	24	0	0	0	32	X	0	39	16.25
RFL	503	59	3	0	0	115	X	0	172	29.15
RFL	505	70	1	0	0	38	X	0	89	12.71
RFL	506	56	3	0	0	200	X	0	266	47.50
RFL	507	58	1	0	0	18	X	0	37	6.38
RFM	501	78	0	0	0	37	-	0	42	5.38
RFM	503	40	0	0	0	64	X	0	123	30.75
RFQ	501	47	0	0	0	40	X	0	43	9.15
RFQ	502	47	0	0	0	27	X	0	35	7.45
RFR	501	240	0	0	0	6	-	0	18	0.75
RGB	501	192	0	0	0	58	X	0	64	3.33
RGB	502	339	7	0	0	132	X	0	153	4.51
RGB	503	250	0	0	0	33	XX	0	42	1.68
RGB	505	375	0	0	0	77	X	0	94	2.51
RGB	506	189	1	0	1	69	X	0	83	4.39
RGB	507	212	1	0	0	78	X	0	87	4.10
RGC	501	182	4	1	0	125	X	0	146	8.02
RGC	503	120	3	0	0	65	X	0	74	6.17
RGC	505	143	0	0	0	20	X	0	27	1.89
RGE	501	70	0	0	0	56	X	0	71	10.14
RGE	502	218	6	0	0	250	XX	0	307	14.08
RGF	501	108	3	0	0	22	X	0	24	2.22
RGG	501	375	3	0	0	215	X	0	253	6.75
RGG	503	260	0	0	0	21	X	0	29	1.12
RGH	501	273	2	0	0	77	XX	0	86	3.15
RGH	502	244	5	0	0	96	XX	0	124	5.08

Table 4.1 (continued)

Sample ID		Litres	Grasses whole	Grasses frags	Lentils whole	Lentils frags	Bitter Vetch whole	Bitter Vetch frags	Vetches whole	Vetches frags
RGI	501	149	1	1	1	1	0	0	0	5
RGI	502	216	2	20	2	3	0	0	3	8
RID	501	160	3	1	0	0	0	0	2	5
RID	502	205	3	2	0	0	0	0	1	8
RID	503	446	13	21	0	0	0	0	2	13
RJD	501	108	0	0	0	0	0	0	0	3
RKJ	501	49	0	0	0	0	0	0	0	0
RKJ	502	173	0	0	0	4	0	0	0	8
RKJ	503	235	0	4	1	3	0	0	0	11
RKJ	504	216	0	2	2	4	0	0	0	27

Year	Litres	Grasses whole	Grasses frags	Lentils whole	Lentils frags	Bitter Vetch whole	Bitter Vetch frags	Vetches whole	Vetches frags
1987	1309	15	277	6	16	2	0	22	229
1989	1643	7	123	21	163	0	0	10	131
1990	7320	62	345	32	41	1	0	32	340
Total	0272	84	745	59	220	3	0	64	700

Year	Litres	Identifed seeds	Indeterminate fragments	Percentage indeterminate	Total seeds per 10 litres
1987	1309	649	207	24	6.54
1989	1643	551	1226	69	10.82
1990	7320	963	3921	80	6.67

Table 4.1 (concluded)

Sample	ID	Litres	Weeds	Pistacia	Pistacia frags	Indeter minate	har- coal	Culm nodes	Total	Seeds/ 10 l
RGI	501	149	1	1	0	40	X	0	51	3.42
RGI	502	216	8	0	0	200	XX	0	246	11.39
RID	501	160	1	0	0	92	X	0	104	6.50
RID	502	205	0	0	0	68	X	0	82	4.00
RID	503	446	20	0	0	750	XX	0	819	18.36
RJD	501	108	0	0	0	14	-	0	17	1.57
RKJ	501	49	0	0	0	4	-	0	4	0.82
RKJ	502	173	0	0	0	33	X	0	45	2.60
RKJ	503	235	4	0	0	77	X	0	100	4.26
RKJ	504	216	1	0	0	51	X	0	87	4.03

Year	Litres	Weeds	Pistacia	Pistacia frags	Indeter minate
1987	1309	71	0	11	207
1989	1643	90	0	6	1226
1990	7320	105	4	1	3921
Total	0272	266	4	18	5351

Tables for Section 6: animal bone statistics from selected contexts.

Notes to Tables 6.1 - 6.6.

The categories in the tables vary. 'Small mammals' comprises as yet undifferentiated small mammals, and 'Birds' is similar. 'Caprine' covers undifferentiated sheep and goat. No species is yet offered for the 'Gazelle'. 'Caprine/Gazelle' is an inelegant label for the (as yet) undifferentiated mass of bone fragments which may be sheep, goat or gazelle. 'Equid' is rather rare and remains undifferentiated as to species. 'Large mammals' indicates equid- or bos-sized bone fragments which cannot be refined as to species. In some samples there are additional species (e.g. cat, badger or polecat), which are left to the end of the list because they are not the regularly occurring species which help to characterise the strategy of animal exploitation.

In each table there are three sets of statistics. The sorted bone was weighed and the fragments were also counted. These two statistics, weight and number of fragments, offer two ways of looking at the relative significance of different categories. Weights and counts of fragments are converted into percentages. Finally, the mean weight of bone fragments in each category is given in the final column.

Table 6.1: Context CBR

	Wght(gr)	per cent	Frags	per cent	Wght/frag
Birds	8.03	1.0%	12	3.8%	0.67
Small mammals	6.97	0.9%	28	8.9%	0.25
Hare	1.29	0.2%	2	0.6%	0.65
Fox	43.57	5.5%	67	21.4%	0.65
Equid	52.30	6.6%	1	0.3%	52.30
Gazelle	214.55	27.3%	106	33.9%	2.02
Caprine	39.95	5.1%	12	3.8%	3.33
Caprine/Gazelle	239.26	30.4%	56	17.9%	4.27
Cattle	159.50	20.3%	25	8.0%	6.38
Large mammals	21.63	2.7%	4	1.3%	5.41
Polecat					
Badger					
Cat					
Total	787.05		313		

Table 6.2: House-fill RAB

	Wght (gr)	per cent	Frags	per cent	Wght/frag
Birds	24.22	3.8	155	14.1	0.16
Small mammals	20.63	3.2%	145	13.2%	0.14
Hare	16.14	2.5	64	5.8	0.25
Fox	78.02	12.3	201	18.3	0.39
Equid	0.00	0.0	0	0.0	-
Gazelle	0.00	0.0	0	0.0	-
Caprine	119.07	18.7	29	2.6	4.11
Caprine/Gazelle	320.22	50.4	499	45.4	0.64
Cattle	57.57	9.1	6	0.5	9.60
Large mammals	0.00	0.0	0	0.0	-
Polecat					
Badger					
Cat					
Total	635.87		1099		

Table 6.3: Context RDM

	Wght (gr)	per cent	Frags	per cent	Wght/frag
Birds	15.90	2.6	95	13.2	0.17
Small mammals	0.37	0.1%	13	1.8%	0.03
Hare	19.38	3.2	52	7.2	0.37
Fox	38.19	6.2	97	13.5	0.39
Equid	0.00	0.0	0	0.0	-
Gazelle	51.41	8.4	27	3.8	1.90
Caprine	9.25	1.5	4	0.6	2.31
Caprine/Gazelle	475.65	77.4	431	59.9	1.10
Cattle	0.00	0.0	0	0.0	-
Large mammals	4.34	0.7	1	0.1	4.34
Polecat					
Badger					
Cat					
Total	614.49		720		

Table 6.4: Context RDN

	Wght (gr)	per cent	Frags	per cent	Wght/frag
Small mammals	0.67	0.0%	8	0.6%	0.08
Birds	70.8	5.0	300	21.0	0.24
Hare	6.54	0.5	43	3.0	0.15
Fox	254.14	17.9	432	30.2	0.59
Equid	0.00	0.0	0	0.0	-
Gazelle	50.35	3.5	30	2.1	1.68
Caprine	0.00	0.0	0	0.0	-
Caprine/Gazelle	1034.08	72.6	608	42.5	1.70
Cattle	0.00	0.0	0	0.0	-
Large mammals	4.34	0.7	1	0.1	4.34
Polecat					
Cat	3.60	0.3	6	0.4	0.60
Badger	3.28	0.2	3	0.2	1.09
Total	1423.46		1430		

Table 6.5: Context RDO

	Wght (gr)	per cent	Frags	per cent	Wght/frag
Birds	20.90	3.88	72	10.33	0.29
Small mammals	6.70	1.24%	31	4.45%	0.22
Hare	12.77	2.37	62	8.90	0.21
Fox	58.69	10.91	193	27.69	0.30
Equid	0.00	0.0	0	0.0	-
Gazelle	151.27	28.11	86	12.34	1.76
Caprine	24.54	4.56	5	0.72	4.91
Caprine/Gazelle	194.29	36.1	231	33.14	0.84
Cattle	0.00	0.0	0	0.0	-
Large mammals	65.89	12.24	14	2.01	4.71
Polecat	0.16	0.03	1	0.14	0.16
Badger	2.98	0.55	2	0.29	1.49
Cat					
Total	538.19		697		

Table 6.6: Context RDP

	Wght (gr)	per cent	Frags	per cent	Wght/frag
Birds	16.81	3.12	95	13.63	0.18
Small mammals	6.10	1.13%	33	4.73%	0.18
Hare	13.78	2.56	58	8.32	0.24
Fox	38.42	7.14	52	7.46	0.74
Equid	0	0.0	0	0.0	-
Gazelle	188.00	34.93	83	11.91	2.27
Caprine	34.13	6.34	31	4.45	1.10
Caprine/Gazelle	275.25	51.14	310	44.48	0.89
Cattle	0	0.0	0	0.0	-
Large mammals	70.93	13.18	3	0.43	23.64
Polecat					
Badger					
Cat	0.32	0.06	1	0	0.32
Total	643.74		666		

Tables for Section 8: chipped stone tools

Table 8.1a: Chipped stone tool types by stratigraphic phase for Area R and Q (southern area).

Phase >	1	2	3	4	5	6	7
TOTAL retouched >	223	179	67	124	11	114	32
(a) projectile (points)	18	35	18	31	1	26	5
(b) notches & denticulates	22	39	12	29	1	27	8
(c) truncations	2	2	3	3	0	3	0
(d) scrapers	3	4	3	1	0	1	1
(e) retouched blade fragments	60	48	16	36	3	20	6
(f) crested, fine retouch	0	0	0	0	0	8	2
(g) backed pieces	1	3	3	2	2	9	1
(h) sickle glossed pieces	0	1	0	0	0	0	0
(i) burins	3	4	1	2	0	0	1
(j) retouched flakes	7	17	3	13	0	10	4
(k) small-scale retouch	7	25	8	6	4	7	3
(l) unclassified	0	1	0	1	0	3	1

Table 8.1b: - percentages for above table

Phase	1	2	3	4	5	6	7
(a)	14.6%	19.6%	26.9%	25.0%	9.1%	22.8%	15.6%
(b)	17.9%	21.8%	17.9%	23.4%	9.1%	23.7%	25.0%
(c)	1.6%	1.1%	4.5%	2.4%	0.0%	2.6%	0.0%
(d)	2.4%	2.2%	4.5%	0.8%	0.0%	0.9%	3.1%
(e)	48.8%	26.8%	23.9%	29.0%	27.3%	17.5%	18.8%
(f)	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	6.3%
(g)	0.8%	1.7%	4.5%	1.6%	18.2%	7.9%	3.1%
(h)	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%
(i)	2.4%	2.2%	1.5%	1.6%	0.0%	0.0%	3.1%
(j)	5.7%	9.5%	4.5%	10.5%	0.0%	8.8%	12.5%
(k)	5.7%	14.0%	11.9%	4.8%	36.4%	6.1%	9.4%
(l)	0.0%	0.6%	0.0%	0.8%	0.0%	2.6%	3.1%

Table 8.2: Chipped stone tool types from mixed context 200, and for the central area.

	Context 200		Central area	
TOTAL retouched	27		109	
(a) projectile (points)	4	(14.8%)	22	(20.2%)
(b) notches & denticulates	9	(33.3%)	29	(26.6%)
(c) truncations	0	(0.0%)	0	(0.0%)
(d) scrapers	2	(7.4%)	4	(3.7%)
(e) retouched blade fragmts	5	(18.5%)	34	(31.2%)
(f) crested, fine retouch	0	(0.0%)	1	(0.9%)
(g) backed pieces	0	(0.0%)	2	(1.8%)
(h) sickle glossed pieces	1	(3.7%)	1	(0.9%)
(i) burins	3	(11.1%)	8	(7.3%)
(j) retouched flakes	3	(11.1%)	8	(7.3%)
(k) small-scale retouch	0	(0.0%)	0	(0.0%)
(l) unclassified	0	(0.0%)	0	(0.0%)

Table 8.3: Mean and standard deviations of lengths and breadths in millimetres of blade and bladelet debitage from contexts 106, 201 and 203.

Context	106		201		203	
Sample size	122		200		83	
	Length	Breadth	Length	Breadth	Length	Breadth
Mean	16.66	8.27	16.51	8.47	18.92	9.12
St. dev.	6.28	3.39	6.16	2.66	6.36	3.94

Table 8.4a: Blade-form/flake, regular/irregular, debris and retouched figures by phase.

Phase	Blade	Flake	Regular	Irregular	Debris	Retouched	Total
0	154	298	310	1251	283	170	2592
1	165	248	187	2213	157	169	3376
2	396	745	651	4337	643	519	7692
2.5	64	134	130	508	156	90	1136
3	243	548	685	3752	786	376	6611
4	134	348	200	1151	156	106	2216
5	152	252	307	1483	280	153	2784
6	291	811	369	2203	662	340	5139
7	210	412	308	2305	518	143	4260
8	47	69	57	321	45	90	664
Houses	703	1427	1466	8597	1585	985	15439
Midden	787	1823	1184	7142	1616	742	14399
North	47	69	57	321	45	90	629

Table 8.4b: Ratios of flakes to blade-forms (F:B), and irregular to regular (I:R), and percentages of retouched pieces relative to totals, presented by phase.

Phase	F:B	I:R	Ret:Tot
0	1.94	4.04	6.6%
1	1.50	11.83	5.0%
2	1.88	6.66	6.7%
2.5	2.09	3.91	7.9%
3	2.26	5.48	5.7%
4	2.60	5.76	4.8%
5	1.66	4.83	5.5%
6	2.79	5.97	6.6%
7	1.96	7.48	3.4%
8	1.47	5.63	13.6%
House-fills	2.03	5.86	6.4%
Midden	2.32	6.03	5.2%
North	1.47	5.63	13.6%

Table 10.1: Comparative figures for seeds, bone and flint

The figures are presented by phase as the number of seeds or seed fragments, bone fragments or chipped stone pieces per ten litres of wet-sieved sample.

Phase: 2

	Context	Seeds/10l	Bone/10l	Flint/10l
	RBC	3.0	4.9	9.3
	RBF	8.2	15.1	12.0
	RBH	7.0	12.0	17.7
	RBK	22.7	24.5	3.6
	RBN	33.2	16.1	16.1
	RBP	68.0	11.0	11.0
	RBS	78.0	13.0	18.0
Mean for phase		31.5	13.8	12.5

Phase: 2.5

	Context	Seeds/10l	Bone/10l	Flint/10l
	REA	10.2	13.6	28.0
Mean for phase		10.2	13.6	28.0

Phase: 3

	Context	Seeds/10l	Bone/10l	Flint/10l
	RBR	12.1	27.7	32.4
	RCA	10.8	19.1	8.7
	RCG	7.5	15.9	25.4
	RCK	35.0	16.5	11.5
	RCP	20.2	16.0	7.2
	RCX	4.5	12.2	6.2
Mean for phase		15.0	17.9	15.2

Phase: 4

	Context	Seeds/10l	Bone/10l	Flint/10l
	RDA	0.5	29.2	18.7
Mean for phase		0.5	29.2	18.7

Phase: 5

	Context	Seeds/10l	Bone/10l	Flint/10l
	RDD	6.6	58.6	13.2
	RDH	14.6	46.0	25.4
	RDM	3.2	158.1	19.8
Mean for phase		8.1	87.6	19.5

Phase: 6

	Context	Seeds/10l	Bone/10l	Flint/10l
	RDI	22.2	38.2	26.0
	RDJ	12.4	10.8	11.8
	RDN	3.9	144.7	27.1
Mean for phase		12.8	64.6	21.6

Phase: 7

	Context	Seeds/10l	Bone/10l	Flint/10l
	RDK	4.7	20.4	9.4
	RDO	0.6	209.9	47.7
	RDP	16.3	105.4	30.5
Mean for phase		7.2	110.9	29.2

Table 11.1: Radiocarbon dates

Lab	ID	Context	B.P.	s.d.	B.C.	Range	at 1 s.d.	Range	at 2 s.d.
OxA-	3753	CBR	11990	100	10040	10140	9940	10240	9840
OxA-	3752	CBR	10145	90	8195	8285	8105	8375	8095
OxA-	3756	RDM	10115	95	8165	8260	8070	8355	7985
OxA-	3755	RDI	9710	85	7760	7845	7675	7930	7590
OxA-	3757	RDN	9640	85	7690	7775	7605	7860	7520
OxA-	3754	RCK	9580	95	7630	7725	7535	7820	7440

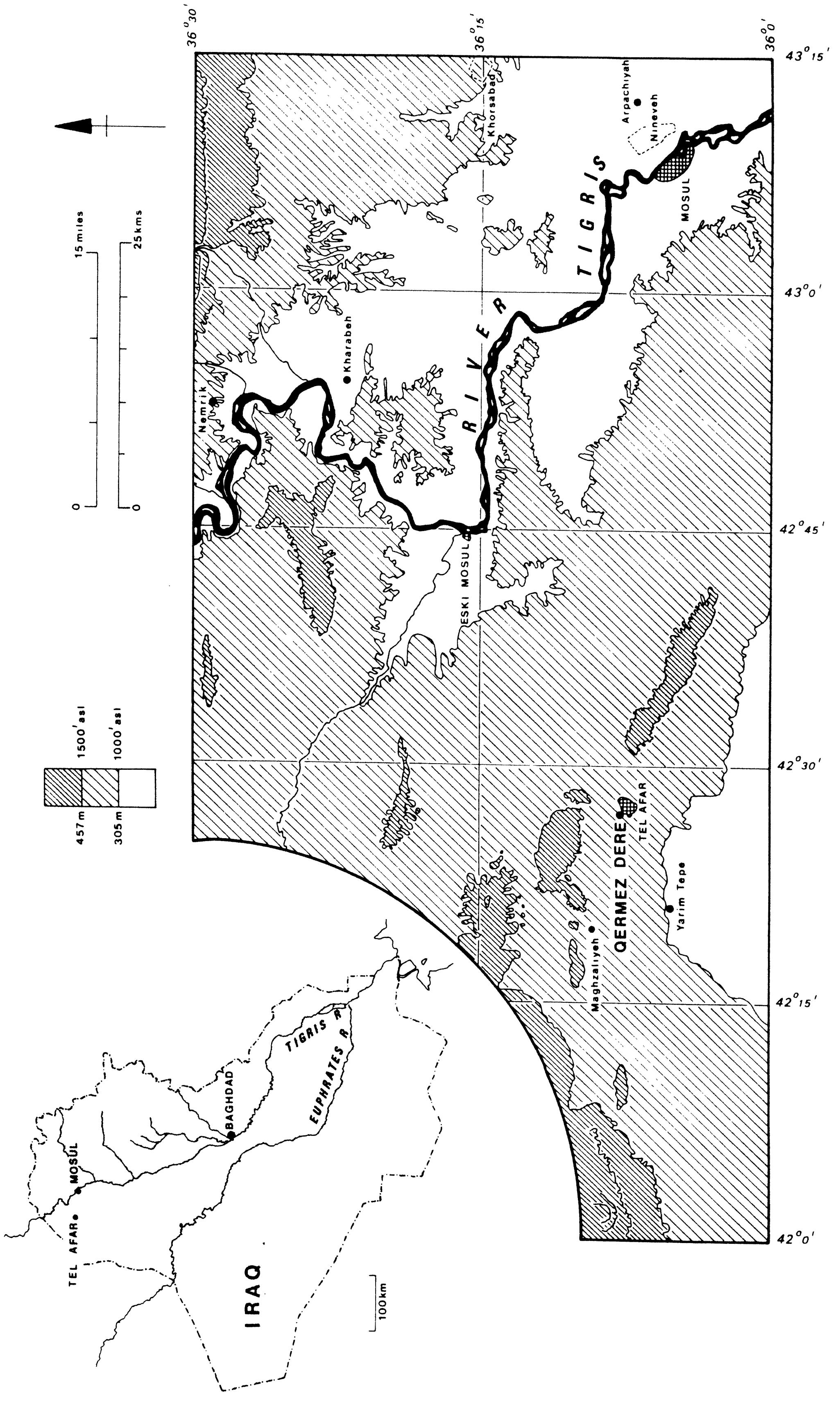


Figure 2.1: Map, location of site.

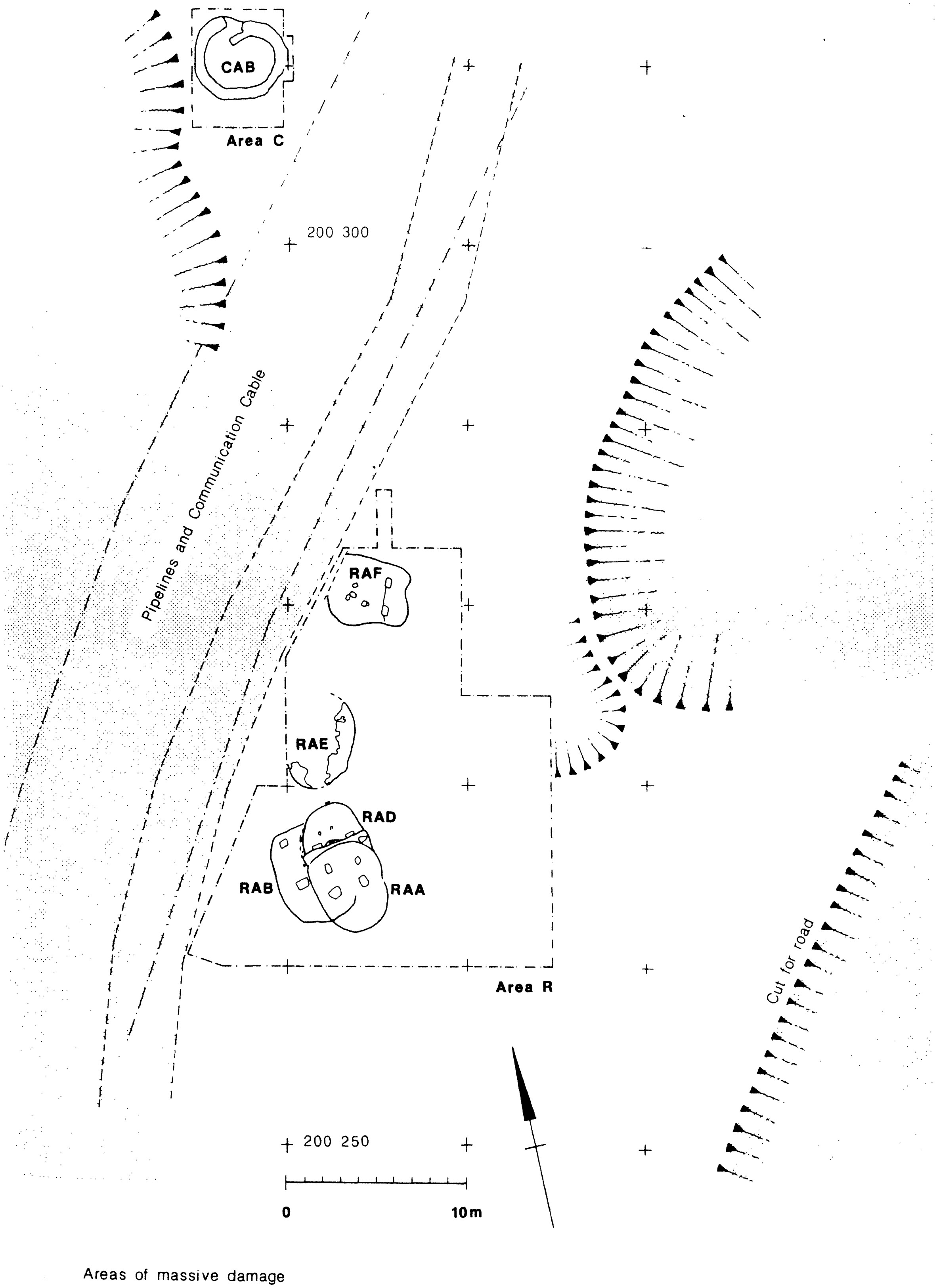


Figure 2.2: Site plan.

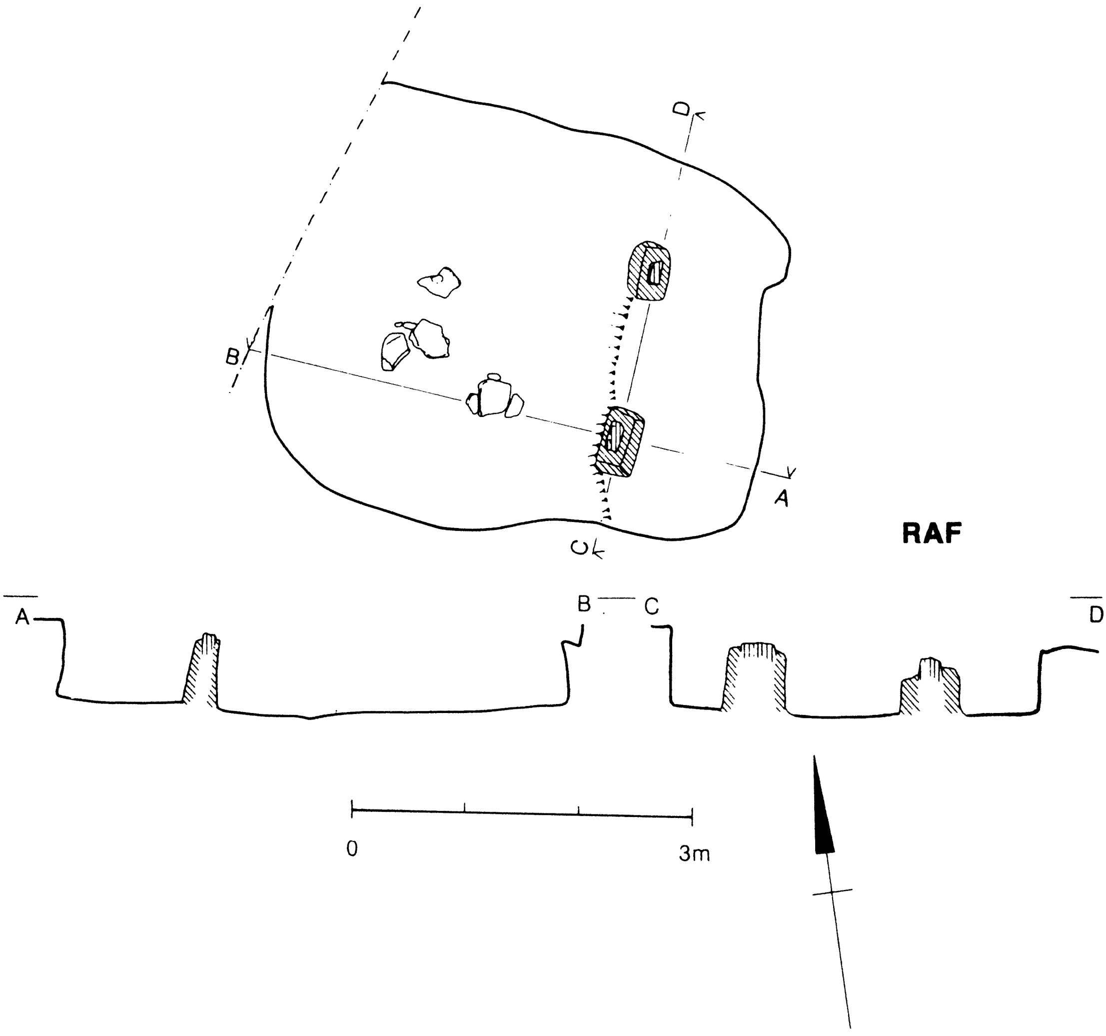


Figure 2.3: Plan of house RAF.

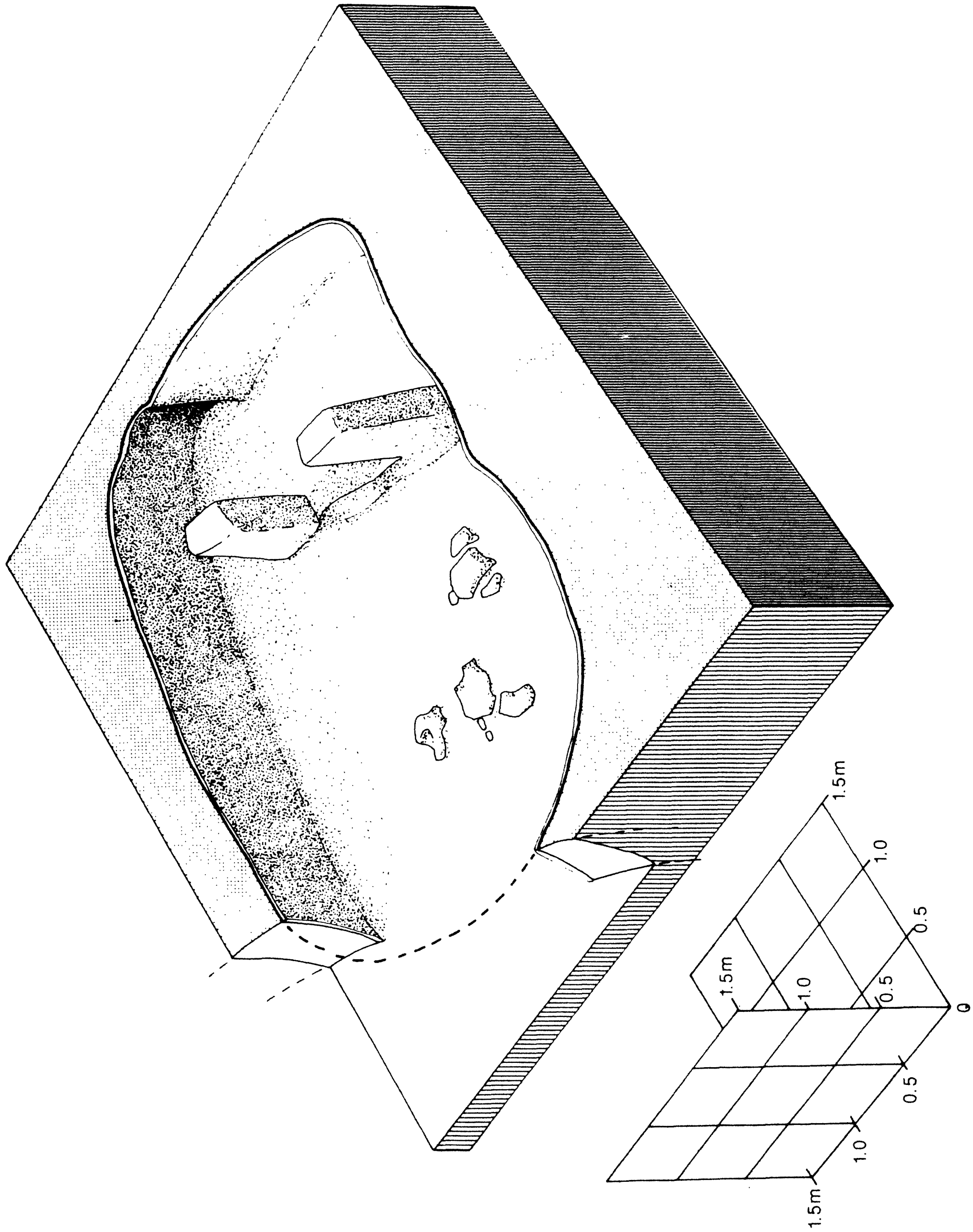


Figure 2.4: Reconstruction drawing of house RAF.

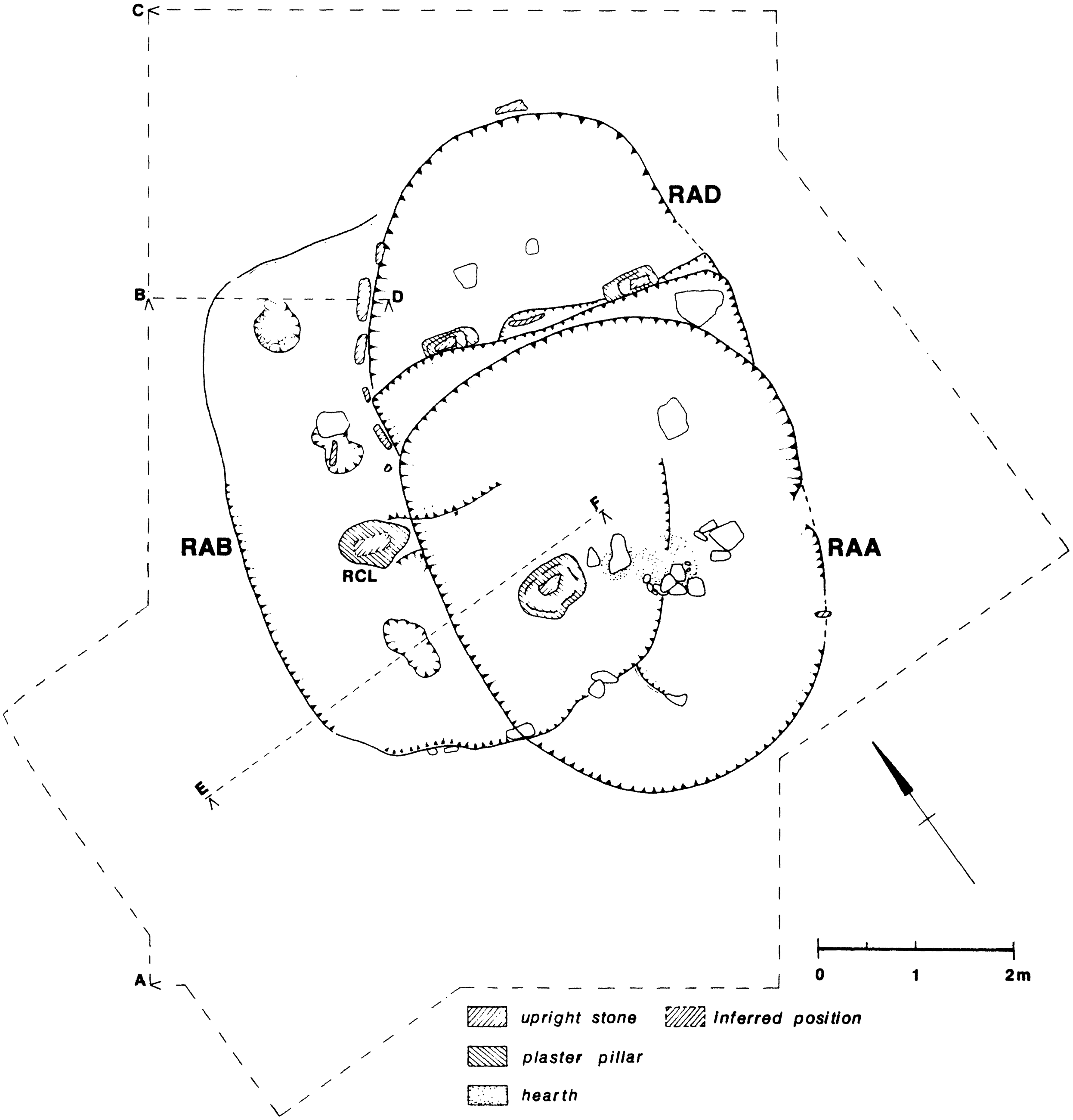
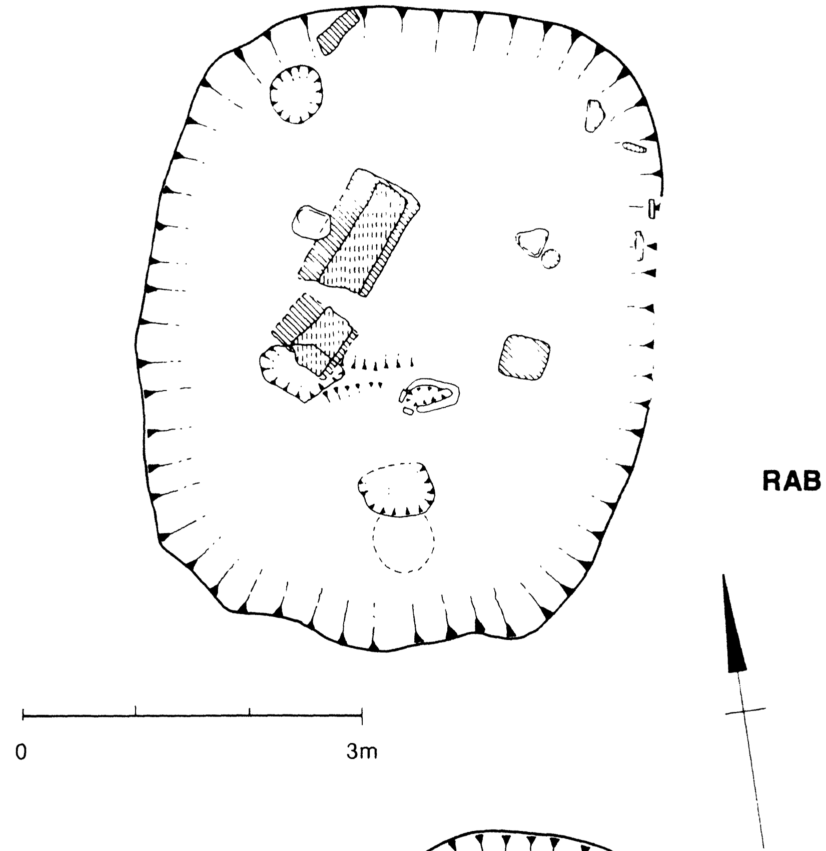


Figure 2.5: General plan of houses RAB, RAA and RAD

Figure 2.6: Plan of house RAB



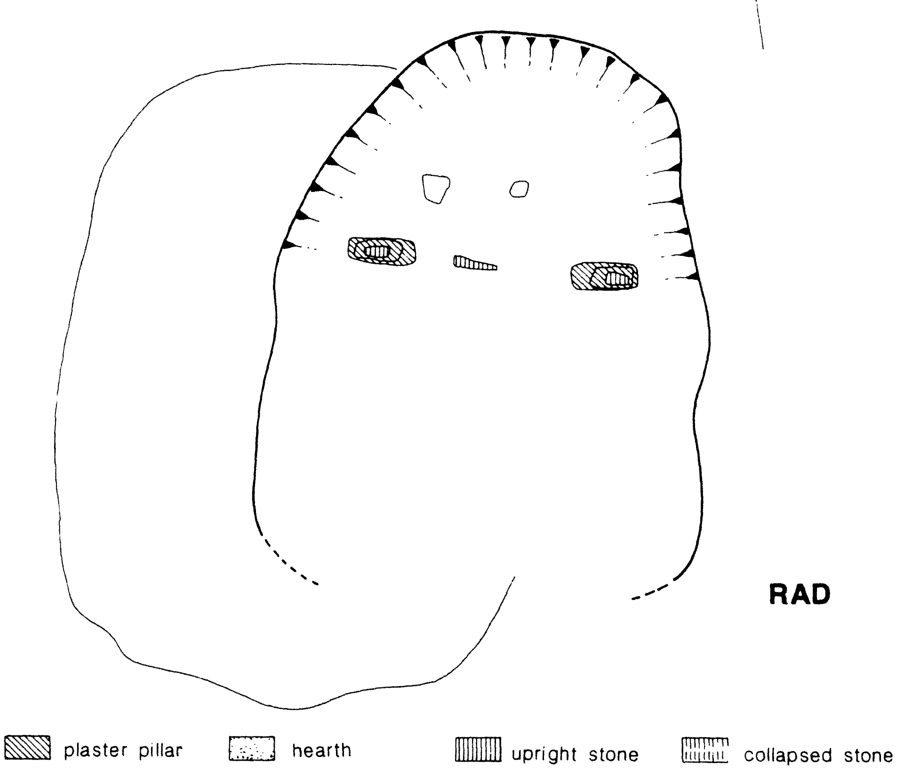
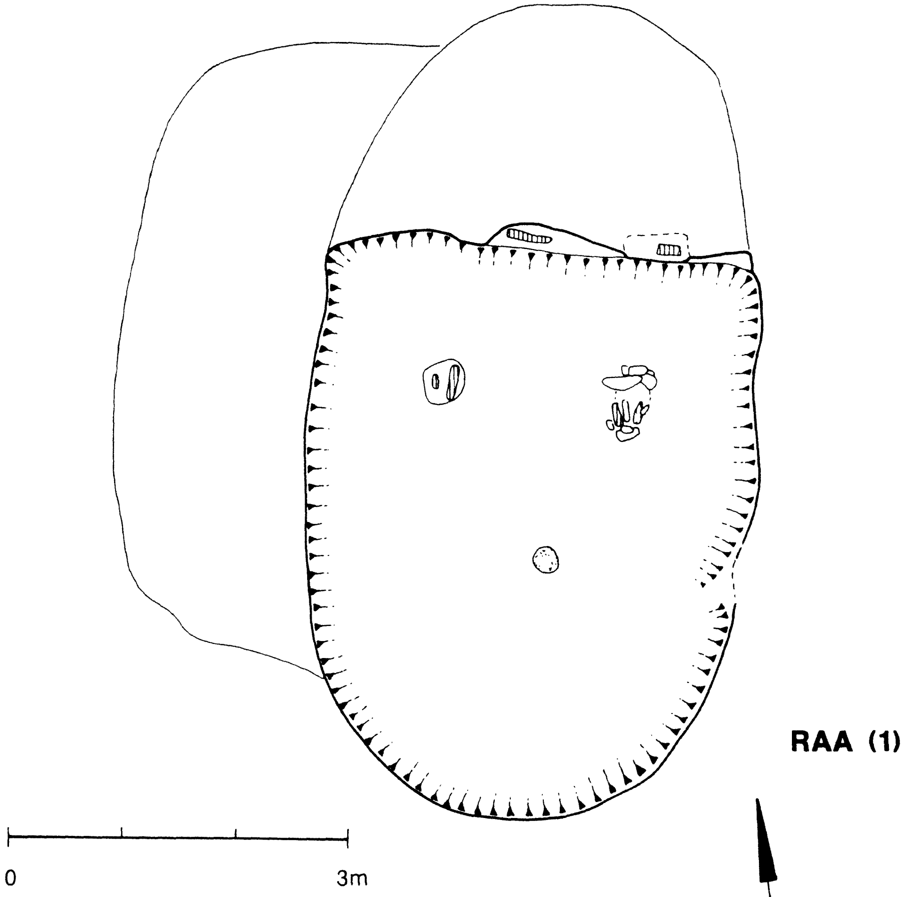


Figure 2.7: Plan of house RAD

Figure 2.8: Plan of house RAA, first phase.



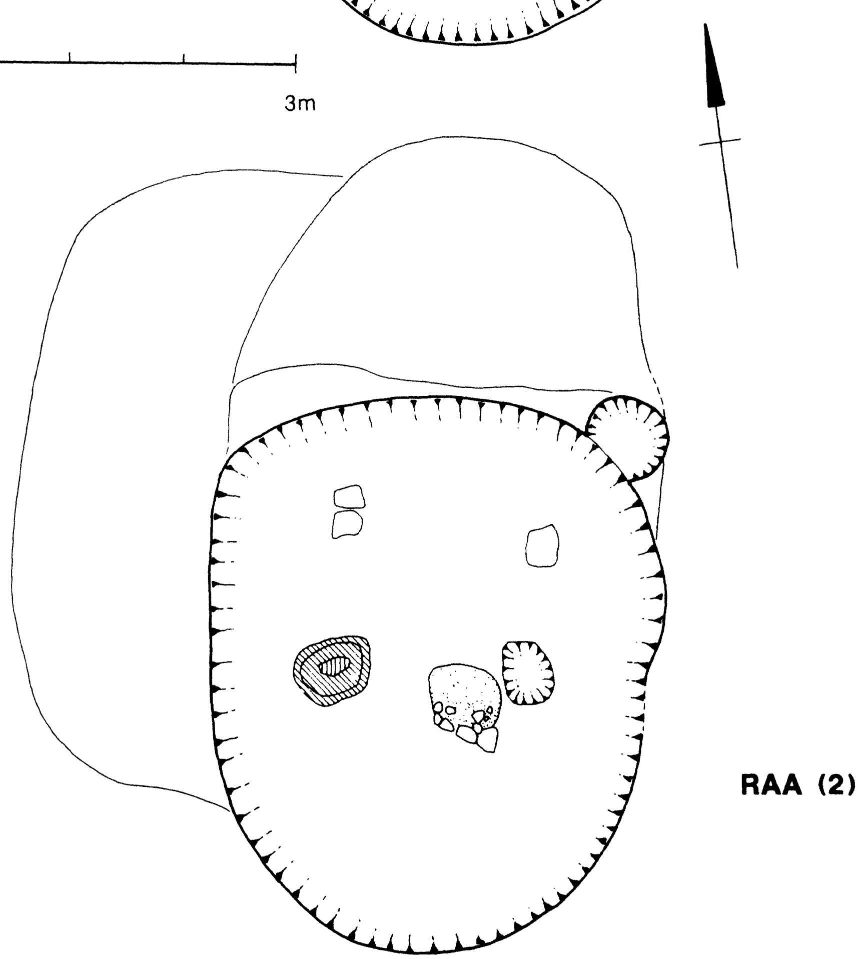


Figure 2.9: Plan of house RAA, second phase.

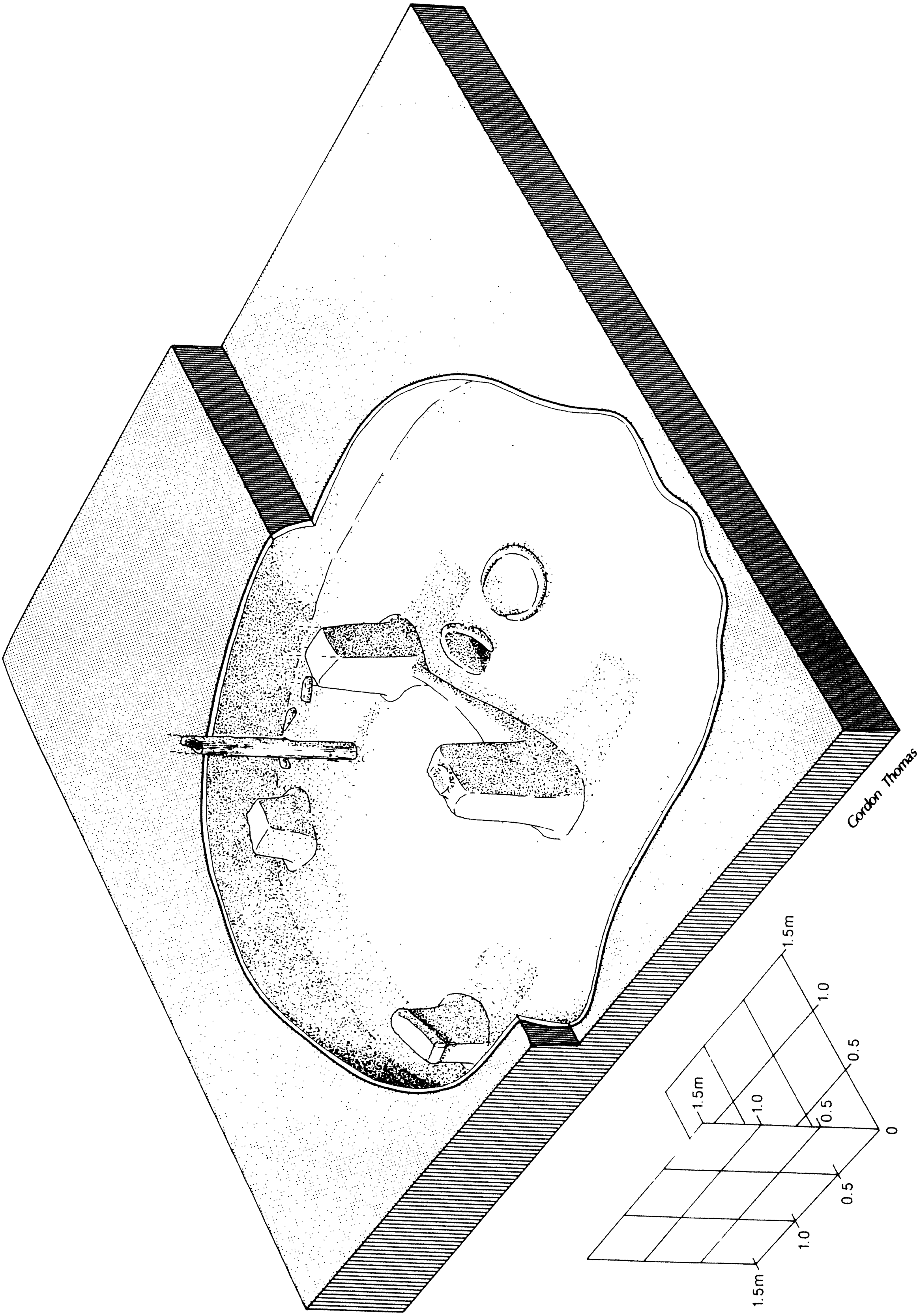


Figure 2.10: Reconstruction drawing of house RAB.

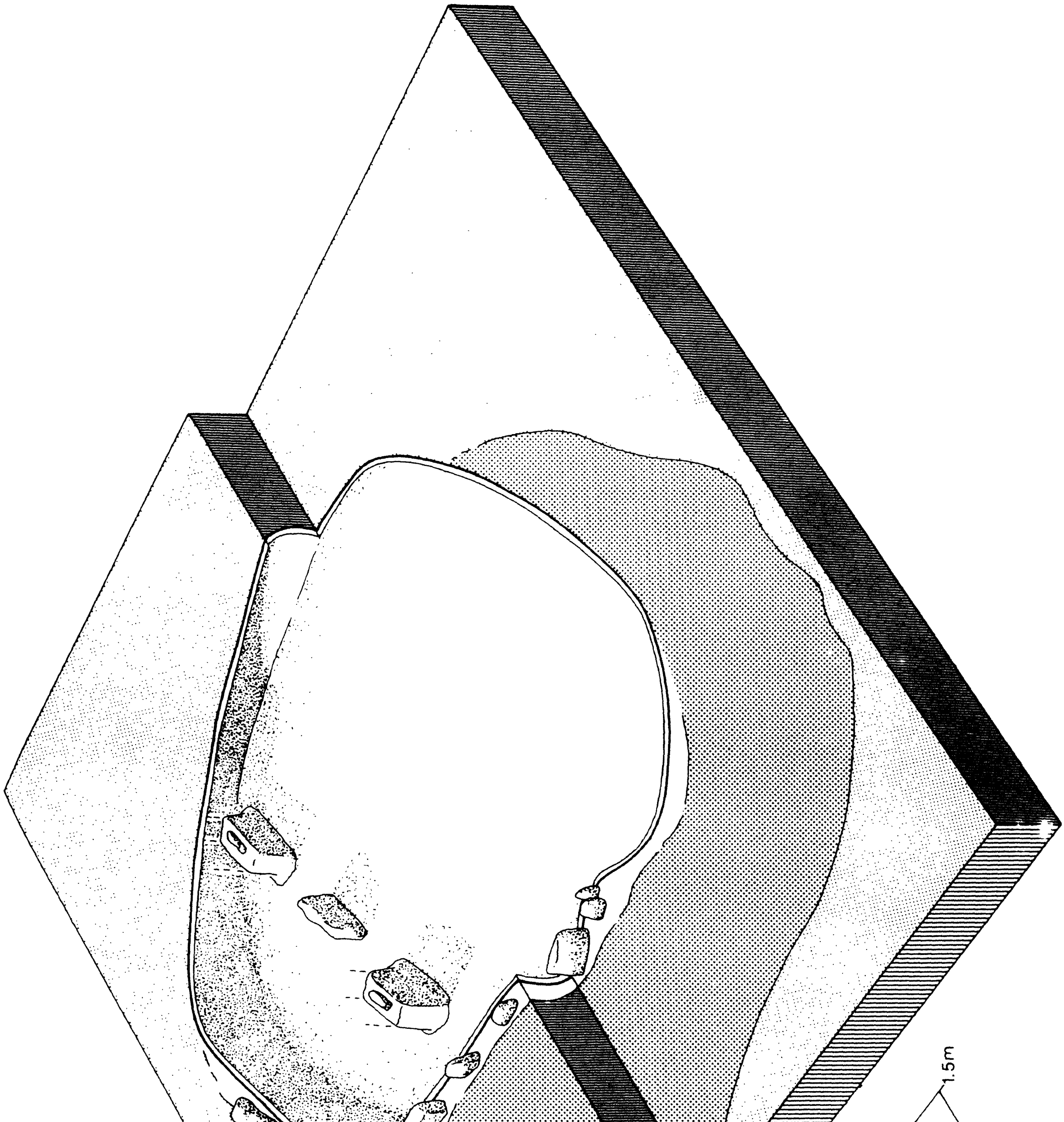


Figure 2.11: Reconstruction drawing of house RAD.

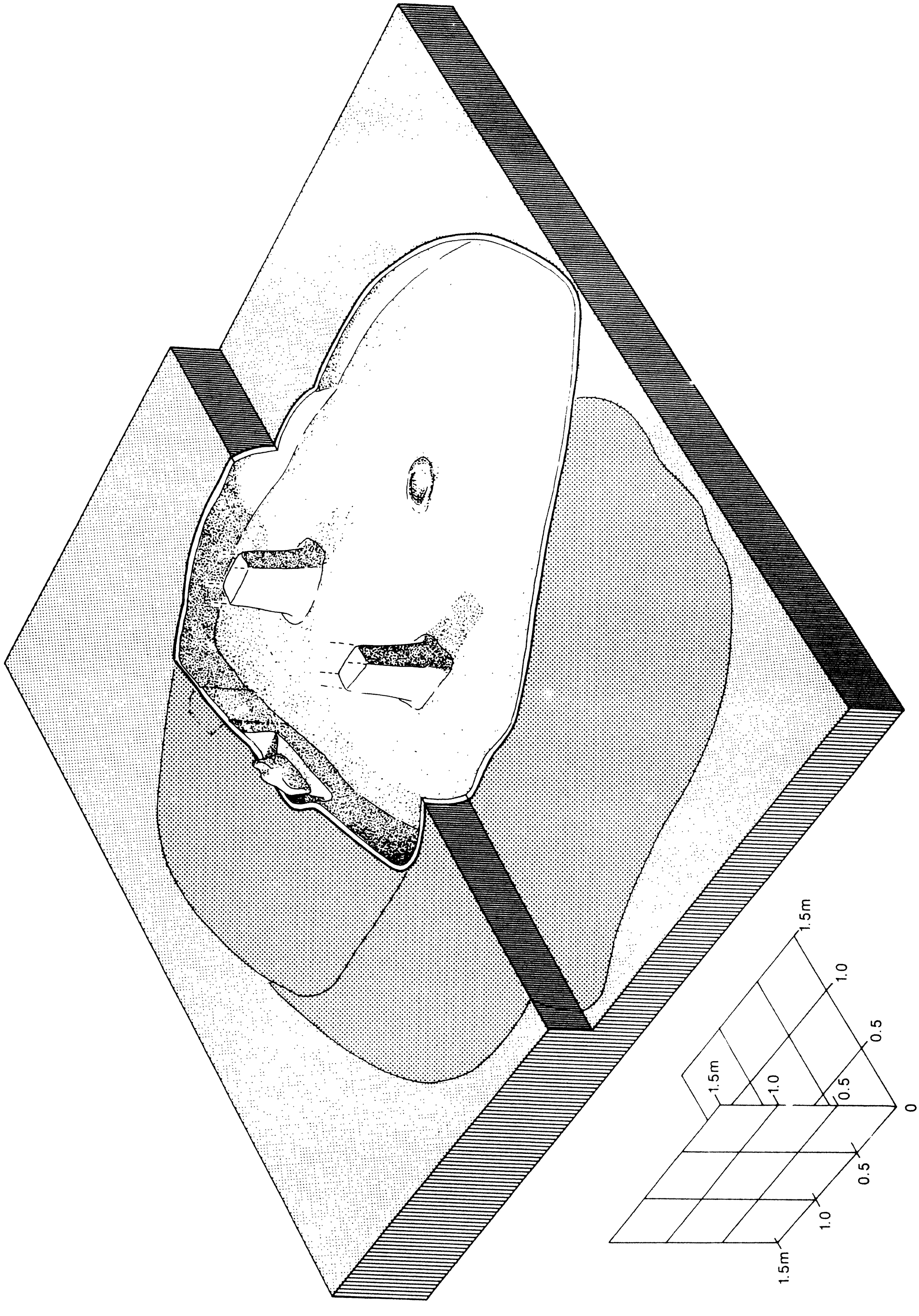


Figure 2.12: Reconstruction drawing of house RAA, first phase.

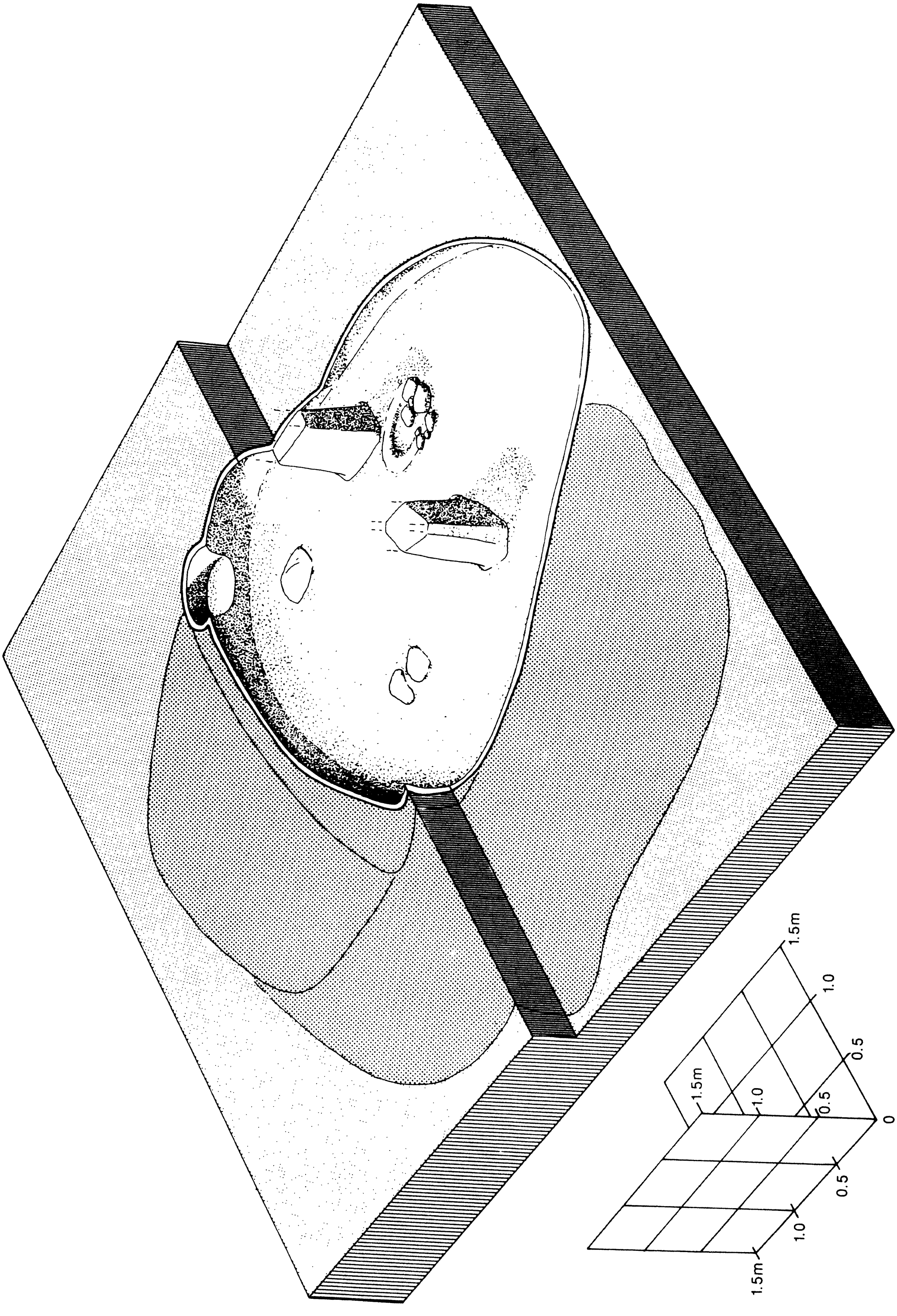


Figure 2.13: Reconstruction drawing of house RAA, second phase.

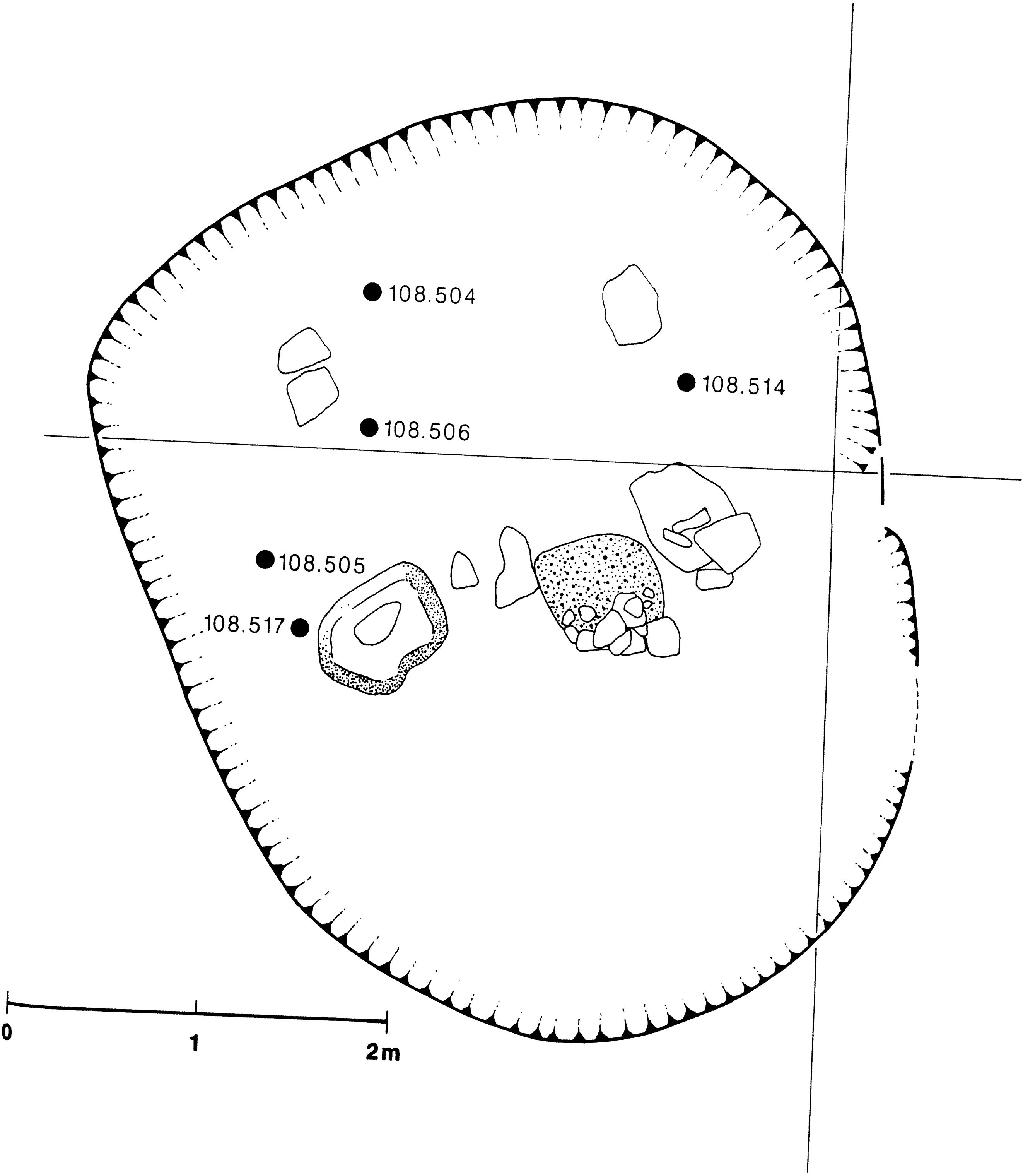


Figure 2.14: House RAA, final phase, showing locations of deposits of human bone

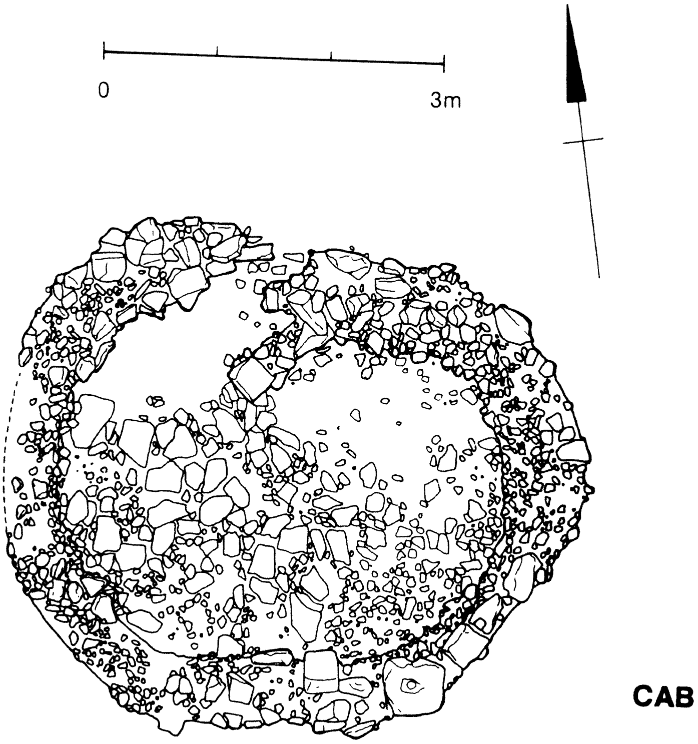


Figure 3.1: Central area, plan of structure CAB