QERMEZ DERE, TEL AFAR: Interim Report No 3.

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with contributions by
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Contents

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-

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	Indeterminate	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		Litres	Grasses whole	Grasses frags	Lentils whole	Lentils frags	Bitter Vetch whole	Bitter Vetch frags	Vetches whole	Vetches 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	Indeterminate	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	Indeterminate	Charcoal	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	Indeterminate
1987	1309	71	0	11	207
1989	1643	90	0	6	1226
1990	7320	105	4	1	3921
Total	0272	266	4	18	5351