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Ancient Monuments Laboratory
Report 105/97

CHARRED AND WATERLOGGED PLANT REMAINS: THORNBROUGH FARM, CATTERICK, NORTH YORKSHIRE

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Summary

Fifty nine samples from areas adjacent to the Antonine fort at Catterick, North Yorkshire (NGR: SE 223992), were analysed for their charred and waterlogged plant remains. A few dated to the 1st/2nd centuries but the majority were from 3rd/4th deposits - a period little studied in the north. Context types were mainly layers and pit fills. Charred barley grains were dominant throughout, with less than 10% spelt wheat in some contexts. Weeds and chaff fragments were rare and the material was therefore interpreted largely as fully processed grain. The grains were extremely well formed and large, suggesting use as human food; no evidence for malting was found. Limited evidence for burnt hay/dung was found with stronger evidence for discard of either roofing or bedding in the form of heather twigs and flowers. The layers produced little plant material; with moderate amounts of clinker and hammerscale in the flots the general area seems to have been of an industrial nature and kept relatively free of rubbish. Waterlogged material was present but, since most of the taxa recorded produced woody, resistant seeds, the conclusion was drawn that differential preservation had occurred and that little interpretation could reliably be offered. Remarkably few differences were observed between the phases, or indeed when compared with other material from northern sites. It was concluded that the occupants of the site remained conservative in their eating habits over long periods of time.

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Thornbrough Farm, Catterick: CAS452 and 482

The charred and waterlogged plant remains

J.P. Huntley

Introduction

The sites of CAS452 and 482 at Thornbrough Farm, Catterick, North Yorkshire (NGR: SE 223992) were excavated by staff of Central Archaeological Services, under the direction of Pete Wilson, during 1990 and 1993. The trenches were cut through ditches and associated areas of the western side of the Antonine fort. Environmental samples were taken in order to retrieve evidence for the usage of plants at Catterick because, although much excavation has been undertaken in the past, most of this was prior to environmental questions (other than relating to animal bones) being considered. Consequently nothing is known of the cereal usage, for example, of the Romans this far south of the Wall. The other important factor with respect to the current excavations is that deposits span from the first to the fourth centuries with most material from the 3rd to 4th centuries. This is a period little known anywhere in the north of England. The archive will be at CAS, Fort Cumberland, Portsmouth.

Methodology

Bulk samples of 40 litres (for 1990) and 20 litres (for 1993) were taken and processed on-site. For both years the residues were processed to 500μ, for 1990 flots were processed also to 500μ but for 1993 they were processed to 250μ. The material was dried and stored at Fort Cumberland. Residues were sorted by CAS. All sorted material plus the unsorted flots were sent to Durham for initial assessment (Huntley, 1993) and subsequent full analysis as appropriate.

All of the charred items, fruits, seeds and identifiable vegetative remains, were sorted - charred fruits and seeds were counted but all other material was scored on a 4 point scale. The charred items were counted so as to be able to express proportions of grain and chaff of the same species in order to investigate processing practices. Waterlogged material was scored since it gives an indication of the types of habitat represented but numbers mean little in terms of seed production or representation of the plants in the habitat.

In most cases all of the flot was analysed although one or two samples were so rich that they were sub-sampled using a proportional divider. In the latter case the numbers were

adjusted to represent material theoretically present in the whole flot. Cereal grains were only counted when more than half was present thus some samples have very few grains apparently but half of the flot may have consisted of tiny fragmentary grains. This is noted in the accompanying text.

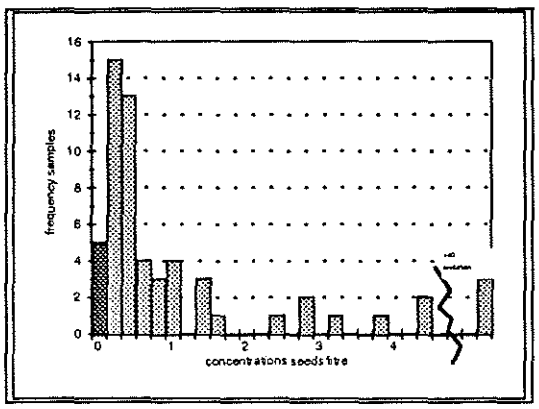
Material was identified by comparison with modern reference material held in the Biological Laboratory at Durham. Nomenclature follows Flora Europaea (Tutin et al. 1964-80). For the rich samples measurements of the cereal grains were taken using a calibrated eye-piece graticule; these data were entered into a standard spreadsheet. The seed data were coded and entered into a file for subsequent manipulation using PHYTOPAK (Huntley, Huntley and Birks, 1981).

Results and discussion

Fifty seven samples from 1990 excavations (CAS 452) were analysed of which five contained no seeds. The two samples from 1993 excavations (CAS 482) contained no charred material. The majority of the samples contained only charred seeds/fruits but a few contained material preserved through waterlogging. In the latter case many of the seeds were those with woody and resistant seed coats and it is presumed that differential preservation may well have occurred with the consequent loss of more delicate material.

The flots were generally small, only 50-100ml, and consisted of charcoal (mixed and variable species), coal and clinker. Industrial waste was present in many of them and hammerscale was recorded too. A considerable number of the flots were remarkable for their lack of small (<2mm) material despite having been processed to 500μ or 250μ. This would suggest that the deposits had very limited matrix components of silts or highly humified soils, smashed up charcoal or whatever as is usual.

In terms of concentrations of seeds/litre sediment processed then thirty eight samples produced less than 1 item per litre, eleven between 1 and 5 items, two between 28 and 32 items and one 135 seeds/litre (see below). Although charred items are usually at low concentrations this is particularly low suggesting that at least this area of the site was kept clean and well maintained. The contexts with noticeably high concentrations were all pits or gully fills.



Such a picture of most samples having low concentrations of material is common and implies that the majority of charred remains represent so-called "background" activity rather than allowing interpretation of specific contexts. However, they are of use in investigation of spatial patterns should the site be appropriate for this.

In terms of spatial patterning for these sites the trenches are considered to have been too small to be of value. With their reasonably complex stratigraphy too few samples are available from any one unit for analysis.

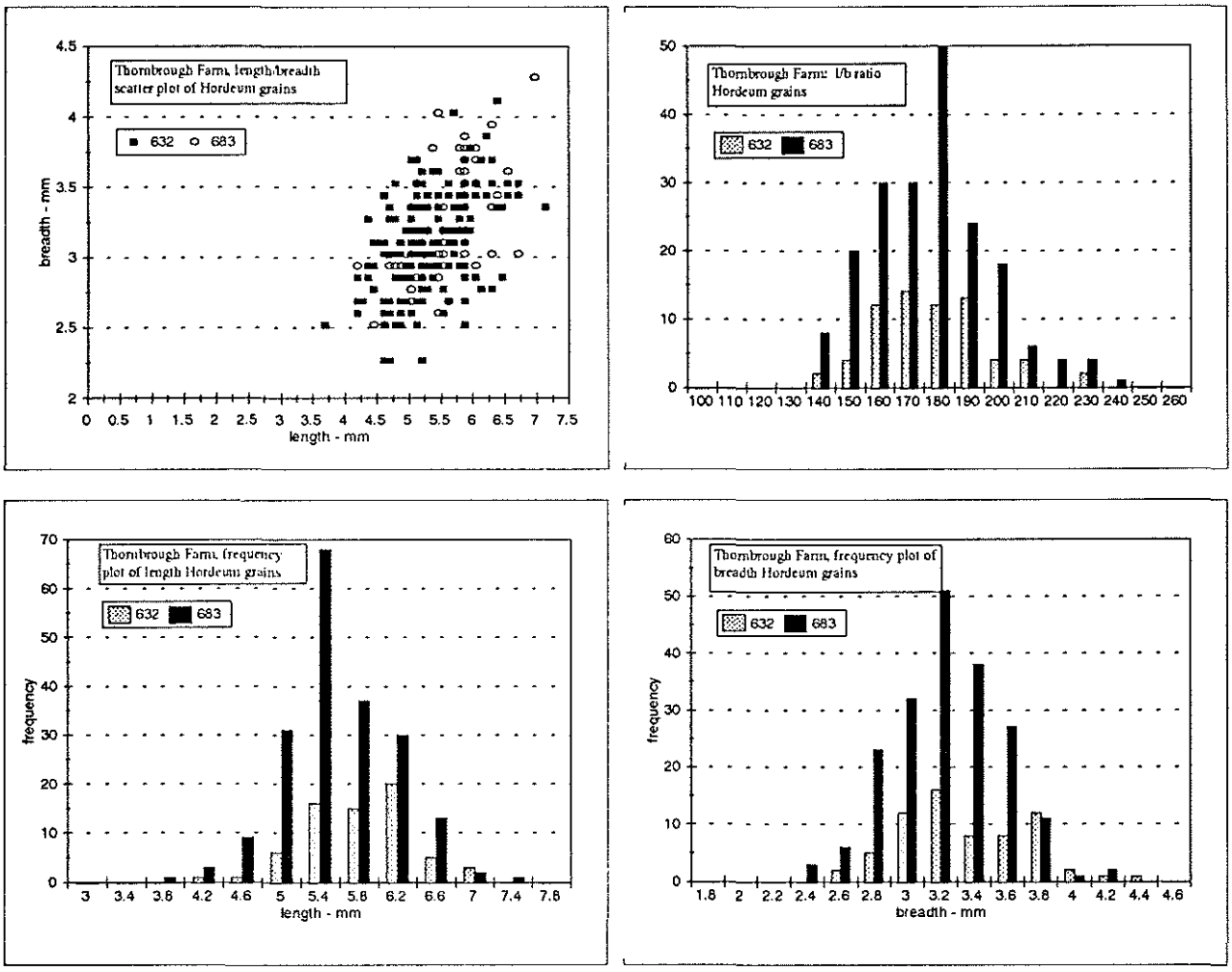
The cereals and other food plants

As expected from the nature of the majority of the deposits and the charred remains most were from cereals. Usually these are accompanied by seeds of weed species and/or cereal chaff but these were in very low quantities throughout these samples. It is thus concluded that the grain represents fully processed material with no evidence for, or against, locality of production.

In terms of the cereals themselves hulled barley was overwhelmingly dominant (see table below). The grains were nearly all particularly large and well formed (figure 1, data from the two major contexts only are presented) even when only one or two were present in a sample. The sharp cut-off points at ca. 4mm length and 2.5mm breadth are, in fact, very similar to those from material analysed from the Annetwell St. fort at Carlisle although there the material was predominantly of 1st/2nd century date (Huntley, 1989). Whether any statistical significance can be applied to the cut-off, in terms of sieve mesh size, is debatable. The linear and ratio measurements have produced normal distribution curves suggesting that there is a single population under discussion rather than material from different populations. None showed evidence of sprouting. Given the extremely low numbers of weed seeds or cereal chaff, as well as the purity and size of the barley, it seems most likely that it was for human consumption. It is unlikely to have been so cleanly processed if it was simply for animal feed. Whether the grains themselves were eaten or sprouted for use as malt has to remain speculative. The requirements of grain for malting are very precise today and it may be that the garrison at Catterick did have a vigorous brewing industry. The grain also could have been ground for use as flour - barley makes a very tasty bread - although classical writers note that barley was used only as a punishment ration for the Roman military. This, of course relates to the military in the heart of its empire, the Mediterranean. Again, if it was for this purpose it was a very high standard product. Without accompanying evidence from cereal bran this continually vexing problem of who ate the barley will remain.

In addition, the quality of preservation of the barley and the low numbers of weeds/chaff does strongly suggest that we are dealing with material as deposited and that, for once, taphonomic factors may be minimal.

Figure 1: Measurements of Hordeum grain. Context 632 - 65 grains, context 683 - 192 grains



Spelt wheat was also in use but not to any degree as evidenced by these samples. This is the normal case (barley dominant, spelt present) for deposits throughout the Roman military in northern England with the exception of some granary deposits which are dominated by spelt with, sometimes, bread wheat (van der Veen, 1988). However such deposits have only rarely been analysed. A few bread wheat grains were present at Thornbrough. Again this is not unusual for Roman deposits although, again these are usually 1st/2nd century samples. It may suggest that bread wheat never "caught on" to any degree but, of course as ever, these samples may not be representative of the whole picture. One spelt glume and one other glume base from a wheat were the only cereal chaff present.

What is perhaps more unusual is the presence of naked barley - a species generally associated with earlier prehistoric contexts. The transverse wrinkles were reasonably clear and the grains generally rounded with no evidence of the angularity of hulled barley. However, so few grains are involved that they could simply reflect a casual weed amongst other crops.

Oat grains were present. With them is the problem of identifying whether they were cultivated or simply wild. Without associated chaff it is not possible to say. However, given the low numbers of other weeds and chaff they may be considered a crop although they are approximately the same size as the barley, in relation to separation through sieving, and hence could equally be a weed.

Total numbers of cereal grains for the sites

Avena	oats	77
Cerealia undiff.	Indet. grain	79
cf. *Secale cereale*	possible rye	1
Hordeum hulled	barley hulled	8633
Hordeum indet.	barley	6
Hordeum naked	naked barley	1
Triticum aestivum	bread wheat	6
Triticum (hexaploid)	wheat	11
Triticum spelta	spelt	265

The only other evidence of food plants is a few >4mm legumes, almost certainly Celtic beans (*Vicia faba*) although they could have been pea (*Pisum sativum*).

In terms of the proportions of cereal grain, cereal chaff and weeds cereal grains are dominant in most samples, see table below which only includes samples with >50 items from these categories:

%chaff	%grain	%weeds	totals
0.0	99.6	0.4	5430
0.0	99.5	0.5	1317
0.0	99.3	0.7	1175
0.0	98.3	1.7	174
0.0	100.0	0.0	145
0.0	91.8	8.2	122
0.0	99.1	0.9	109
0.0	14.6	85.4	96
0.0	36.3	63.8	80
0.0	18.8	81.2	69
0.0	98.3	1.7	58
0.0	98.1	1.9	53

It is clear, because of the dominance of cereal grain, that the majority of these samples represent pure, fully processed grain. The three exceptions in fact contain grassland taxa (which could have been weeds) but it is considered that they consist of hay/dung deposits - these are discussed in detail below.

The non food taxa

Of the other seeds/fruits identified (Appendix I) nothing was particularly abundant. In fact the most common "other item" was heather. Large numbers of shoots were recorded in a few contexts and several contained heather charcoal. Heather flowers were recorded too suggesting that some of the material was collected in late summer to early autumn. Heather would have been abundant up the Swale valley and its presence on and around the fort would suggest local trade. It was almost certainly used as roofing and possibly bedding material - the tradition of "black thack", heather thatching, remained in the northern counties until the 19th century and a few examples survive today (Emery, 1986). One house in County Durham is currently being renovated and roofed with heather although modern roofing felt is also being used.

Of the traditional arable weeds corncockle (*Agrostemma githago*) and cornflower *(Centaurea cyanus)* both occur. The latter is quite a rare occurrence on Roman sites in the north although is very common throughout the Medieval period when it is often associated with rye cultivation. The other weedy species indicate cultivation of manured and damp fields with evidence of waterlogging or very wet soils as well. This is not surprising given the locality although achenes of stinking mayweed (*Anthemis cotula)*, a heavy clay taxon, are rare in the north prior to the Medieval period.

Grassland taxa are moderately common and the species include those typical of classical hay meadows such as yellow rattle (*Rhinanthus minor* agg.). There are suggestions of neutral to base-rich grassland through the presence of purging flax (*Linum catharticum)* and ribwort plantain (*Plantago lanceolata).*

Heathland is represented by *Calluna vulgaris* - as shoots, flowers and charcoal, and by heath-Grass (*Sieglingia decumbens)* although this grass may have been an arable weed as well.

Wet ground taxa are principally sedges with the meadowsweet (*Filipendula ulmaria)* and Lesser stitchwort (*Stellaria graminea)* representing more fen-meadow types communities, thus linking to the grassland group.

Discussion by phase

This discussion tabulates the charred data only although a few contexts contained waterlogged material. Where relevant the waterlogged data are discussed. Full data tables are available in the archive.

Phase 0

Three samples were analysed from phase 0 which represented the natural soils of the area. The low numbers of any plant remains in these samples are in accord with their being naturally deposited silts and sands.

Phase 0

Bio.code	1949	1950	1951	sum	count
Context number	505	606	509		
Sample number (+6000)	835	841	834		
Phase	0	0	0		
Cerealia undiff.			1	1	1
Hordeum hulled		12		12	1
Plantago lanceolata		1		1	1
Calluna vulgaris twigs		1		1	1

Phase 1

This phase has been dated up to ca. 160AD. The contexts analysed were generally levelling layers or fills of beam slots associated with the building of the rampart.

The botanical evidence for this early phase of occupation reflects use mainly of spelt wheat although numbers are not particularly high. Preservation is rather varied but there is good waterlogged evidence for a variety of habitats. This includes strawberry (*Fragaria vesca*) which may have been eaten but may simply reflect local established edge of grassy banks/woodland communities. These are the communities which also include the self heal (*Prunella vulgaris*) and purging flax. Somewhat wet ground or even standing water are also indicated by the charred remains but given the context of a beam slot it seems more likely that this is from dumped material. Such a suggestion is reinforced by the presence of cereal straw - perhaps waste bedding material simply being dumped into the slot during some clearance activities on this part of the site.

Phase 1

Bio.code	1954	1955	1956	1957	sum	count
Context number	283	292	297	267		
Sample number (+6000)	813	812	806	751		
Phase	1b	1b	1b	1b		
Cerealia undiff.		1		4	5	2
Hordeum hulled				8	8	1
Hordeum indet.		1	1		2	2
Triticum (hexaploid)		1			1	1
Triticum spelta				25	25	1
Calluna vulgaris flowers		1			1	1
Calluna vulgaris wood		1			1	1
Carex (lenticular)	1				1	1
Eleocharis palustris			1		1	1
Bromus sp(p). grain				1	1	1

Phases 2-4

These have been dated from ca. 160 AD to the early 3rd century AD.

A dump layer produced a few barley and spelt grains plus minimal evidence of heather. The flot consisted mostly of charcoal chunks but there were considerable numbers of waterlogged seeds present too. Large numbers of waterlogged *Urtica dioica* (nettle) seeds indicate a high nutrient level in the deposit. Waterlogged buttercups, purging flax, elderberry (*Sambucus nigra*) and hedge woundwort (*Stachys sylvatica*) were recorded with the elderberry in moderate numbers. There were also occasional fragments of bone present and white "blobs" of glassy industrial waste were common in the flot. Given the large numbers of elderberry seeds the deposit could reflect dietary debris but there may be differential preservation of material too. Other than the purging flax these seeds are all quite woody and resistant to decay. No fine organic debris, i.e. bran, was present.

The limited evidence for this time suggests that barley is the more common cereal although, again, numbers are low. Bread wheat is clearly in use as well as spelt wheat. The nature of seeds preserved through waterlogging suggests that there may have been some differential preservation during this period.

Phases 3 and 4

		sum	count		sum	count
Bio.code	1959			1958		
Context number	418			784		
Sample number (+6000)	755			833		
Phase	3			4		
Stellaria media	1	1	1			
Cerealia undiff.	1	1	1			
Hordeum hulled	12	12	1	5	5	1
Triticum aestivum grain	1	1	1			
Triticum spelta	3	3	1	1	1	1
Gramineae <2mm	2	2	1			
Sieglingia decumbens	1	1	1	1	1	1
Galium aparine	1	1	1			
Carex (lenticular)	1	1	1			
Carex (trigonous)	1	1	1			
Eleocharis palustris	1	1	1			
Calluna vulgaris twigs				1	1	1

Phases 5-14

These phases span the third to fourth centuries and the plant remains present in them are particularly important for the northern region which is otherwise devoid of such samples so far.

Phase 5

The contexts were pit fills with the exception of one gulley fill and one post-hole fill.

Throughout phase 5 barley is the most commonly represented cereal with limited evidence for spelt. Weeds seeds and cereal chaff are more or less absent and it must be assumed that the grains are from fully processed crops. There is no reason to suggest that taphonomic factors had led to missing weeds/chaff.

phase 5

Bio.code	1961	1962	1963	1964	1965	1966	sum	count
Context number	672	610	671	669	697	797		
Sample number (+6000)	818	825	816	817	822	831		
Phase	5	5	5a	5b	5b	5b		
Avena grain			1				1	1
Cerealia undiff.	2		4	1	1	2	10	5
Hordeum hulled	14	55	20	36	17	12	154	6
Triticum (hexaploid)		1					1	1
Triticum spelta	3	1	8	12	4	1	29	1
Corylus avellana nut frag.	1						1	1
Carex (lenticular)		1					1	1
Eleocharis palustris						1	1	1

Phase 6

Contexts from this phase both related to a hearth. Barley grain with spelt and bread wheat were present. Not enough are present to suggest that they are of relevance to the

function of the hearth. With the moderate numbers of industrial waste globules recorded it seems most likely that this was an industrial hearth and not obviously used for any domestic function - at least at the end of its functional life.

phase 6

Bio.code	1960	1967	sum	count
Excavation	30	30		
Context number	391	421		
Sample number (+6000)	745	757		
Phase	6	6		
Cerealia undiff.	3		3	1
Hordeum hulled	21		21	1
Triticum aestivum grain	3		3	1
Triticum spelta	1		1	1
Carex (trigonous)	1		1	1

Phase 7

Contexts were mostly pit fills again but some layers were analysed. Several of the fills produced remarkably pure hulled barley grains with few associated weed seeds or chaff. About 10% of the cereal grain was spelt. It is suggested that they were either storage pits or had been used to dispose of charred barley deposits.

One post-hole fill and produced the expected small assemblage of hulled barley grains. However, in addition it produced a large number of seeds from grassland species as well as much fragmentary monocot. material, probably grass stems. The cereals were not excellently preserved. Many of the weed seeds had lost their outer seed coats or had very crazed surfaces. It, however, could be speculated that this context, in fact, has better preserved material than many of the others and that weed data have been lost in those other contexts. In any case this context has produced evidence of grassland - this may have been local grassland which was burnt when the post-hole (and associated building?) were burnt or could reflect material being burnt on a bonfire elsewhere but nearby and ash being blown around the site.

phase 7

Bio.code	1953	1968	1969	1970	1971	sum	count
Excavation	30	30	30	30	30		
Context number	660	683	689	90	272		
Sample number (+6000)	814	829	827	726	839		
Phase	7	7	7	7	7		
Centaurea cyanus				2		2	1
Fallopia convolvulus		1				1	1
Avena grain		7	3	1		11	3
Cerealia undiff.	4					4	1
cf. *Secale cereale*				1		1	1
Hordeum hulled	153	1191	136	22	3	1505	5
Triticum aestivum grain		2				2	1

Triticum spelta	14	111	6	5	1	137	5
Gramineae 2-4mm	1					1	1
Gramineae <2mm				8		8	1
Galium aparine	1					1	1
Gramineae >4mm		1				1	1
Plantago major				4		4	1
Plantago lanceolata				1		1	1
Calluna vulgaris twigs				9		9	1
Raphanus raphanistrum pod frag.	1	2				3	2
Rumex obtusifolius-type		1				1	1
Legume <4mm		1				1	1
Carex (lenticular)				19		19	1
Carex (trigonous)				6		6	1
Indeterminate				5		5	1
Polygonum sp(p).				5		5	1
Ranunculus repens-type				1		1	1

Phase 8

The contexts analysed were largely layers associated with industrial activity and contained relatively few seeds although clinker and industrial waste was common in the flots. These activities clearly involved metalworking from the hammerscale recorded in several of the flots In the one pit fill seeds from wet grassland habitats were the most abundant with evidence of calcareous water too. The most likely explanation would seem to be that it represents either dung or hay which was subsequently burnt.

There was some evidence of differential preservation in that waterlogged elderberry seeds were common in one context.

phase 8

Bio.code	1976	1977	1979	1980	1981	1985	1983	1982	sum	count
Excavation	30	30	30	30	30	30	30	30		
Context number	73	162	84	198	203	15	217	222		
Sample number (+6000)	723	727			736	720	742	738		
Phase	8	8	8	8	8	8	8	8		
Centaurea cyanus		1							1	1
Polygonum lapth./persicaria		1							1	1
Avena grain				3					3	1
Cerealia undiff.	3	3		9					15	3
Hordeum hulled	6	1		21	8		2	1	39	6
Triticum (hexaploid)	2								2	1
Triticum spelta		10		2					12	2
Gramineae 2-4mm		3							3	1
Gramineae <2mm		12							12	1
Linum catharticum		2							2	1
Plantago lanceolata		6							6	1
Rhinanthus minor agg.		6							6	1
Rumex acetosa		5							5	1
Calluna vulgaris twigs		9							9	1
Galium aparine		1							1	1
Rumex acetosella		2							2	1

Rumex obtusifolius-type		2							2	1
Carex (lenticular)		7							7	1
Carex (trigonous)		15		1			1		17	3
Filipendula ulmaria		1							1	1
Juncus		9							9	1
cf. *Cirsium* sp.		2							2	1
Legume <4mm		1							1	1
Potentilla sp(p).		1							1	1
Ranunculus repens-type		1							1	1
Trifolium sp(p).		4							4	1

Phase 9

The contexts were a mixture of layers and fills with the latter again suggesting storage/discard of large well-formed barley grains. About 1% of the grain was oat but, with no chaff, these could well have been from the wild as opposed to the cultivated species. Wheat formed less than 0.1%. Grassland plants, including rushes, are more common but heather is most common in several contexts. The grassland taxa include a hay component although this is small. *Plantago major* seeds were recorded, this is a plant tolerant of trampling and would be expected around habitation. The *Arrhenatherum* tubers are of interest in that they are often considered to represent a food resource. However, this generally relates to prehistoric samples and it is more likely that they reflect infestation of cereal crops by this noxious grass The quantities of heather are likewise interesting. It is unlikely that they represent the local vegetation, heather is not tolerant of trampling. Maybe they represent burning of local roofing material or were thrown down on the surface to aid consolidation or draining.

The one seed of henbane *(Hyoscyamus niger)* could represent a drug plant or escapee although may reflect a ruderal community growing in the vicinity, as could the thistle (*Cirsium* sp.)

Context 632, fill of gully dating from the early to mid fourth century, is another barley grain dominated assemblage with very very little material less than 2mm and very few weed seeds. However, in the fine fraction, small that it was, were considerable numbers of fragments of lemmas, paleas and glumes, probably from barley, and therefore the lack of weed seeds is likely to be real and not due to poor preservation. Spelt and oat grains were again very sparse.

phase 9

Bio.code	1978	1973	1975	1974	1972	sum	count
Excavation	30	30	30	30	30		
Context number	158	138	756	753	632		
Sample number (+6000)	728	725	832	819	824		
Phase	9	9	9	9	9		
Agrostemma githago			2			2	1
Galeopsis tetrahit					1	1	1
Polygonum lapth./persicaria					1	1	1
Avena grain			54		6	60	2
Cerealia undiff.	1			5		6	2
Hordeum hulled		10	5348	96	1144	6502	4
Hordeum naked				1		1	1

Triticum (hexaploid)		3				3	1
Triticum spelta			5	11	17	33	3
Gramineae 2-4mm		1				1	1
Gramineae <2mm	4	8	6		2	20	4
Plantago lanceolata		2				2	1
Rhinanthus minor agg.		3	2			5	2
Rumex acetosa		4				4	1
Calluna vulgaris twigs	9	100				109	2
Sieglingia decumbens		3				3	1
Galium aparine			2			2	1
Hyoscyamus niger	1					1	1
Plantago major		2				2	1
Prunella vulgaris			2			2	1
Raphanus raphanistrum pod frag.			2	3	2	7	3
Rumex obtusifolius-type	1	1	2			4	3
Carex hostiana-type				1		1	1
Carex (lenticular)		8				8	1
Carex (trigonous)		22	1	1	1	25	4
Eleocharis palustris		1				1	1
Juncus	1					1	1
Arrhenatherum elatius - tuber		1		2		3	2
Bromus sp(p). grain					1	1	1
cf. *Cirsium* sp.	1					1	1
Labiatae undiff.			2			2	1
Legume <4mm				1		1	1
Legume >4mm		1				1	1
Potentilla sp(p).		1				1	1
Ranunculus repens-type		1		1		2	2
Trifolium sp(p).			2	1		3	2

Features in phase 9 are clearly in receipt of significant amounts of extremely well preserved hulled barley. The grain is nearly all large and well preserved and is a very pure sample. Very few weed seeds are present. The material clearly represents cleaned stored grain and it is only the nature of the deposits that remains unclear - was the grain burnt *in situ*, were these pits storage features, or was it burnt elsewhere and dumped into the pits but with very little else; the deposits are remarkably homogeneous. Whichever, there are certainly some considerable amounts of burnt barley around the site at this time

Phase 10

Pits were again sampled in this phase their contents were disappointing from the botanical point of view. The usual suite of mostly barley with some spelt and little else was all that was recorded. No evidence for industrial waste was forthcoming in comparison with other phases.

phase 10

Bio.code	1989	1984	1986	1987	sum	count
Excavation	30	30	30	30		
Context number	775	755	662	634		
Sample number (+6000)	830	820	810	808		
Phase	10	10	10	10		
Cerealia undiff.			2	4	6	2
Hordeum hulled	7	10	45	1	63	4
Triticum (hexaploid)		2			2	1
Triticum spelta	2		5		7	2
Gramineae 2-4mm			1		1	1
Legume >4mm				1	1	1

Phase 11

The two contexts consisted of a pre-road make up of stones and a post-hole fill. It is therefore not surprising that few plant remains survived, or were even present in the first place.

So little evidence for this phase is available that no interpretation may be offered.

phase 11

Bio.code	1991	1990	sum	count
Excavation	30	30		
Context number	61	70		
Sample number (+6000)	721	722		
Phase	11	11		
Stellaria media	1		1	1
Hordeum hulled	6	2	8	2
Hordeum indet.	1		1	1
Triticum spelta	1	1	2	2
Plantago lanceolata		1	1	1
Triticum glume base		1	1	1
Triticum spelta glume		1	1	1
Gramineae <2mm		1	1	1
Carex (trigonous)	1		1	1

Phase 12

Layers and drain fills were sampled. Data are few with the usual hulled barley and its few associates all present in low numbers - these are being viewed as background to the main areas of activity on the site at whatever period. There is strong evidence for differential preservation in that waterlogged elderberry seeds are abundant in two of the samples. One occurrence of the cornflower (*Centaurea cyanus*) is noteworthy in that it is an unusual species for Roman material

phase 12

Bio.code	2007	1992	1993	sum	count
Excavation	30	30	30		
Context number	324	42	50		
Sample number (+6000)	734	716	719		
Phase	12	12	12		
Centaurea cyanus			1	1	1
Hordeum hulled	2	20	12	34	3
Triticum spelta		2		2	1
Gramineae 2-4mm		1		1	1
Gramineae <2mm		1	1	2	2
Plantago lanceolata			1	1	1
Sieglingia decumbens		1		1	1
Carex (lenticular)			1	1	1
Carex (trigonous)			1	1	1
Bromus sp(p). grain			1	1	1
Legume <4mm		1		1	1
Legume >4mm	1			1	1

Phase 13

Context 16 was a fill of the roadside ditch but contained only the few cereal grains and some hammerscale which may also be seen as part of the background for this site, where present in small amounts such as here.

phase 13

Bio.code	1994		sum	count
Excavation	30			
Context number	16			
Sample number (+6000)	703			
Phase	13			
Cerealia undiff.	2		2	1
Hordeum hulled	4		4	1

Phase 14

Ten various pit and other fills contain predominantly background floral assemblages needing no further discussion

phase 14

Bio.code	1988	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	sum	count
Excavation	30	30	30	30	30	30	30	30	30	30	30		
Context number	108	130	751	103	106	118	765	136	122	119	124		
Sample number (+6000)	705	717	828	701	704	709	826	718	711	712	715		
Phase	14	14	14	14	14	14	14	14	14	14	14		
Anthemis cotula		1										1	1
Polygonum lapth./persicaria								1				1	1
Stellaria media		1								1		2	2
Avena grain	1		1									2	2

Cerealia undiff.	3	8	5	1	7							24	5
Hordeum hulled	2	12	97	11			9	8	2	7	11	159	9
Hordeum indet.						3						3	1
Triticum (hexaploid)						1					1	2	2
Triticum spelta		4	5	1			1			1		12	5
Gramineae 2-4mm		1										1	1
Gramineae >4mm		2										2	1
Gramineae <2mm					3							3	1
Rhinanthus minor agg.		1										1	1
Sieglingia decumbens		2			10	1			1			14	4
Galium aparine					1							1	1
Lapsana communis										1		1	1
Raphanus raphanistrum pod frag.			1									1	1
Rumex obtusifolius-type					3				1			4	2
Triticum spelta glume		1										1	1
Crataegus monogyna		1										1	1
Carex (lenticular)	3				3		1					7	3
Carex (trigonous)	2	7						1	1	1		12	5
Eleocharis palustris		1			8					1		10	3
Stellaria graminea										1		1	1
Arrhenatherum elatius - tuber								1				1	1
Bromus sp(p). grain		8			1			1				10	3
Indeterminate										1		1	1
Luzula sp(p).					2							2	1
Mentha type		1										1	1

Ecological groupings by phase

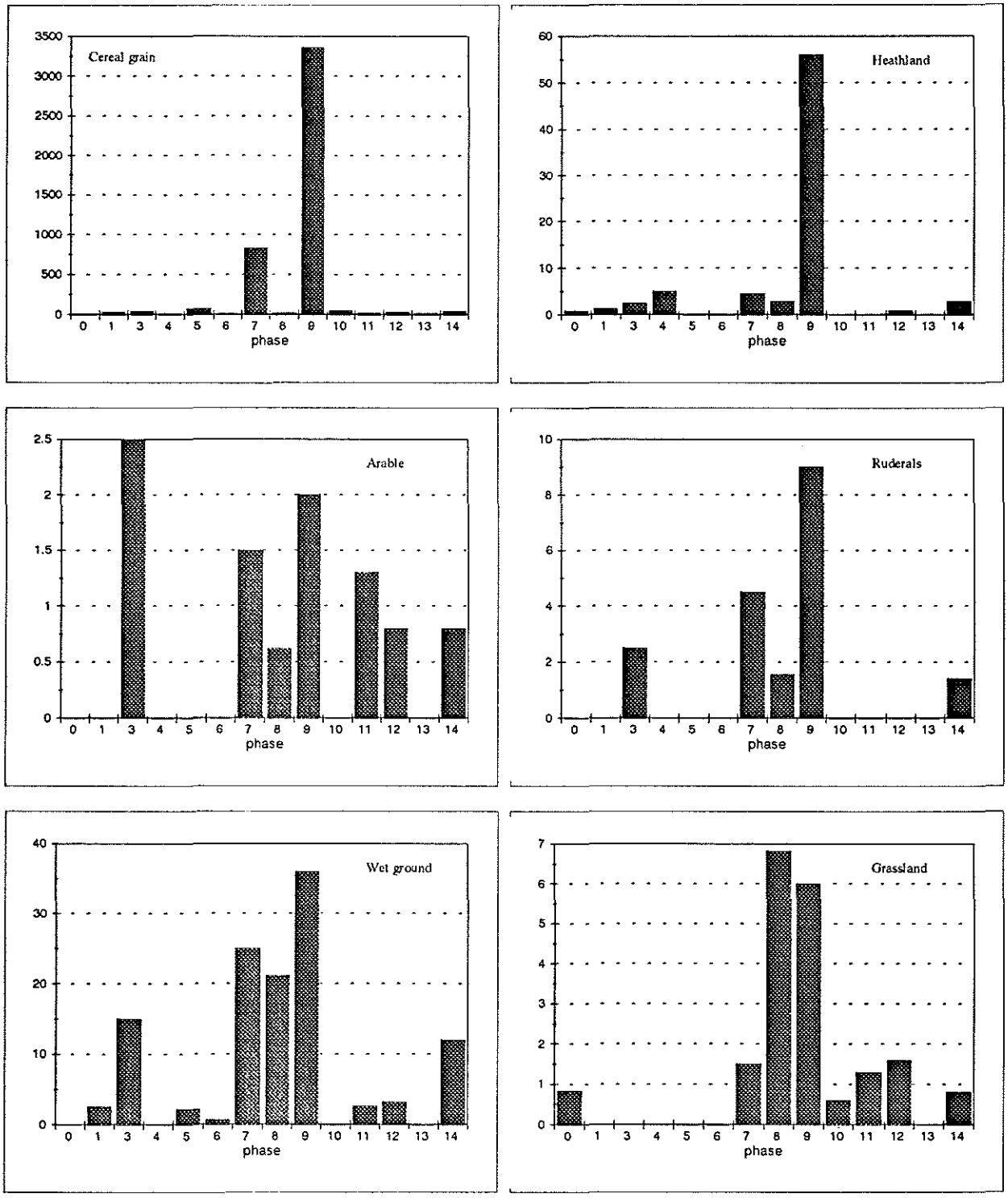
The individual taxa were assigned, where possible, to the most typical ecological group in which they occurred. This is highly debatable given that many taxa can survive in a variety of habitats but does give a broad indication of conditions represented at an archaeological site. The complete list of taxa and their categories is produced in appendix II. In terms of distribution between the phases this is summarised below using percentage total seeds calculations. The difficulty here is that total numbers are rather small for some of the phases.

Ecological groups by phase

Phase	0	1	3	4	5	6	7	8	9	10	11	12	13	14
Σ samples	3	4	1	1	7	3	5	8	5	4	2	3	1	11
weeds			3·6				0·2	1	0·1		5·6	2		1.3
grain	86·7	85·4	60·7	75·0	96·8	93·3	94·6	35·.9	96·4	97·5	61·1	73·5	100·0	65·0
grass	6·7						0·2	11·1	0·2	1·3	5·6	4·1		1·3
chaff											11·1			0·3
ruderals			3·6				0·5	2·5	0·3					2·3
heath	6·7	4·2	3·6	25·0			0·5	4·5	1·6			2·0		4·5
wet		8·3	21·4		2·8	6·7	2·9	34·3	1·0		11·1	8·2		19·3
broad		2·1	7·1				1·1	10·6	0·5	1·3	5·6	10·2		5·8
tree					0·5									0·3
total seeds	15	48	28	8	217	30	1754	198	6953	80	18	49	6	311

Figure 2 presents the data for selected non cereal categories. "Tree" category is omitted but only contains one fragment of hazelnut shell and one hawthorn (*Crataegus monogyna*) fruit stone. The wet category is the most common and abundant. It consists largely of sedge nutlets (*Carex* spp.) with spike rush (*Eleocharis palustris*) and rush (*Juncus* spp.) seeds. Whilst these can indicate wet sedge "grassland" of fen meadows for example they may well have formed part of the arable community on poorly drained ground - a clear reason why assignment to a single category should only be interpreted broadly. In addition, taxa may well have been present in arable fields when, today, they would not. The wet ground taxa would certainly have been common in the Swale valley at this time. Phases 3, 8 and 11 have more wet ground representatives than at other times and this is not just due to low sample numbers. Grassland is most common during phase 8 and this includes various pits which seem to have had spent dung or byre waste thrown into them (see above).

Figure 2: Ecological groups by phase
y-axis = seeds per 100 litres for phase as a whole
NB: different scales



Summary discussion

Thornbrough Farm has produced a useful set of data pertaining to the third century with a more limited suite for the first and second centuries. The majority of the plant remains were charred and, as to be expected with such preservation, related to cereals. Grain was most abundant and will relate to fully processed crops being brought to the site as indicated by the lack of chaff and weed seeds. Although the grain may well have been produced locally there is no evidence for or against this supposition. Most of the grain was hulled barley, almost certainly all 6-row. Of interest is the particular size and purity of this crop and it seems most likely that it was for human consumption. This may have been for use as flour or malt. Spelt and bread wheat were in use. The low numbers of bread wheat are in accord with other local Roman sites of the first/second centuries and it would seem that the people remained very conservative with respect to their food resources. Weed seeds and cereal chaff were rare throughout. A few samples gave indications of disposal of either hay, spent bedding or dung. Again this is quite usual in Roman deposits from the region. Wet ground taxa were the most commonly represented and probably were gathered from the Swale valley immediately adjacent to the fort.

The waterlogged data produced a suite of taxa represented by rather woody seeds and it is considered most likely that differential preservation has occurred.

The generally low concentrations of seeds suggests that this area of the site was well maintained, this may relate to the industrial activities which were clearly in progress in this area too. Perhaps the lack of food debris simply indicates that it was, indeed, an industrial area with domestic activities kept well away elsewhere. However, at Ribchester in the west the industrial areas nonetheless contained quite large concentrations of food debris (Huntley, 1994).

Perhaps the most interesting feature is, in fact, the similarity with many other datasets in the region although these all relate to earlier occupation in the Roman period. The fact that 200 years of occupation seems to have led to few changes in diet must say something of the conservatism of the people. What is clearly needed is more later material, from Catterick itself or elsewhere, to see if this hypothesis can be validated or not.

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Appendix I: Percentage occurrence of taxa by period

Phase	0	1	3	4	5	6	7	8	9	10	11	12	13	14
Σ samples	3	4	1	1	7	3	5	8	5	4	2	3	1	11
Agrostemma githago									20					
Anthemis cotula														9.09
Centaurea cyanus							20	12.5				33.3		
Fallopia convolvulus							20							
Galeopsis tetrahit									20					
Polygonum lapth./persicaria								12.5	20					9.09
Stellaria media			100								50			18.2
Avena grain					14.3		60	12.5	40					18.2
Cerealia undiff.	33.3	50	100		85.7	33.3	20	37.5	40	50			100	45.5
cf. Secale cereale							20							
Hordeum hulled	33.3	25	100	100	100	33.3	100	75	60	100	100	100	100	81.8
Hordeum indet.		50									50			9.09
Hordeum naked									20					
Triticum aestivum grain			100			33.3	20							
Triticum (hexaploid)		25			14.3			12.5	20	25				18.2
Triticum spelta		25	100	100	100	33.3	100	25	60	50	100	33.3		45.5
Triticum sp(p). grain														
Gramineae 2-4mm							20	12.5	20	25		33.3		9.09
Gramineae >4mm							20							9.09
Linum catharticum								12.5						
Plantago lanceolata	33.3						20	12.5	20		50	33.3		
Rhinanthus minor agg.								12.5	40					9.09
Rumex acetosa								12.5	20					
Calluna vulgaris flowers		25												
Calluna vulgaris twigs	33.3			100			20	12.5	40					
Calluna vulgaris wood		25												
Sieglingia decumbens			100	100					20			33.3		36.4
Galium aparine			100				20	12.5	20					9.09
Hyoscyamus niger									20					
Lapsana communis														9.09
Plantago major							20		20					
Prunella vulgaris									20					
Raphanus raphanistrum pod frag.							40		60					9.09
Rumex acetosella								12.5						
Rumex obtusifolius-type							20	12.5	60					18.2
Triticum glume base											50			
Triticum spelta glume											50			9.09
Corylus avellana nut frag.					14.3									
Crataegus monogyna														9.09
Carex hostiana-type									20					

Carex (lenticular)		25	100		14.3		20	12.5	20			33.3		27.3
Carex (trigonous)			100			33.3	20	37.5	80		50	33.3		45.5
Eleocharis palustris		25	100		28.6				20					27.3
Filipendula ulmaria								12.5						
Juncus								12.5	20					
Stellaria graminea														9.09
Arrhenatherum elatius - tuber									40					9.09
Bromus sp(p). grain		25							20			33.3		27.3
cf. Cirsium sp.								12.5	20					
Gramineae <2mm			100				20	12.5	80		50	66.7		9.09
Indeterminate							20							9.09
Labiatae undiff.									20					
Legume <4mm							20	12.5	20			33.3		
Legume >4mm									20	25		33.3		
Luzula sp(p).														9.09
Mentha type														9.09
Polygonum sp(p).							20							
Potentilla sp(p).								12.5	20					
Ranunculus repens-type							20	12.5	40					
Trifolium sp(p).								12.5	40					

Appendix II: taxa and assigned ecological categories

First letter code - c=charred; second letter code - a=arable weed, c=cereal grain, g=grassland, h=heathland, r=ruderal, s=chaff/straw, t=woodlands/scrub, w=wet ground, x=broad/unclassified

ca Agrostemma githago
ca Anthemis cotula
ca Centaurea cyanus
ca Fallopia convolvulus
ca Galeopsis tetrahit
ca Polygonum lapth./persicaria
ca Stellaria media
cc Avena grain
cc Cerealia undiff.
cc cf. Secale cereale
cc Hordeum hulled
cc Hordeum indet.
cc Hordeum naked
cc Triticum aestivum grain
cc Triticum (hexaploid)
cc Triticum spelta
cc Triticum sp(p). grain
cg Gramineae 2-4mm
cg Gramineae >4mm
cg Linum catharticum
cg Plantago lanceolata
cg Rhinanthus minor agg.
cg Rumex acetosa
ch Calluna vulgaris flowers
ch Calluna vulgaris twigs
ch Calluna vulgaris wood
ch Sieglingia decumbens
cr Galium aparine
cr Hyoscyamus niger
cr Lapsana communis
cr Plantago major
cr Prunella vulgaris
cr Raphanus raphanistrum pod frag.
cr Rumex acetosella
cr Rumex obtusifolius-type
cs Triticum glume base
cs Triticum spelta glume
ct Corylus avellana nut frag.
ct Crataegus monogyna
cw Carex hostiana-type
cw Carex (lenticular)
cw Carex (trigonous)
cw Eleocharis palustris
cw Filipendula ulmaria
cw Juncus
cw Stellaria graminea
cx Arrhenatherum elatius - tuber
cx Bromus sp(p). grain
cx cf. Cirsium sp.
cx Gramineae <2mm
cx Indeterminate
cx Labiatae undiff.
cx Legume <4mm
cx Legume >4mm
cx Luzula sp(p).
cx Mentha type
cx Polygonum sp(p).
cx Potentilla sp(p).
cx Ranunculus repens-type
cx Trifolium sp(p).