Birmingham University Field Archaeology Unit

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# Excavations at Croft Quarry, Leicestershire 1994:

## Post excavation assessment and research design

by

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# Excavations at Croft Quarry, Leicestershire 1994: Post excavation assessment and research design

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APPENDICES

**Excavations at Croft Quarry, Leicestershire 1994:**
**Post excavation assessment and research design**

## 1. INTRODUCTION

This report follows the completion of the fieldwork stage of archaeological investigations prior to the proposed development and landscaping of land adjacent to the Thurlaston Brook at Croft Quarry, approximately 6km to the southwest of Leicester (Figs 1 and 2). It includes an assessment of the results and an outline proposal for post-excavation research. The fieldwork was undertaken by Birmingham University Field Archaeology Unit over an eight week period between January and March 1994. The excavation was sponsored by ECC Quarries Limited and followed an evaluation by Leicester Archaeology Unit (Cooper 1993).

The site (centred on SP517968) lay at 67m OD and was situated on the west bank of the Thurlaston Brook (Fig 2), which has a catchment at this point of *c.* $56km^2$. The south edge of the site (Area 2), was just upstream of the confluence of the Thurlaston Brook with the River Soar, a tributary of the Trent. At this point the River Soar has a catchment of $63km^2$. Catchments of both rivers are low-lying, with the watersheds being below 130m. The underlying geology of the catchments (BGS 155) is the Triassic Mercian Mudstone Group overlain by glacial boulder clay with associated sand and gravel. Alluvium is mapped on the edge of streams.

The report follows the guidelines provided by English Heritage in the 'Management of Archaeological Projects' (MAP II) (English Heritage 1991) and consists of a brief site narrative, summarising the methodology and results of the excavation; an assessment outlining the quantity and quality of the data recovered; and a post-excavation research design, including a publication synopsis and timetable.

## 2.0 SITE NARRATIVE

### 2.1 Objectives

The evaluation (Cooper 1993) defined two areas of archaeological potential within the area of the proposed development (Figs 1 and 2; Areas 2 and 3). The excavation was undertaken in response to the threat to the surviving archaeological and palaeoenvironmental deposits in both these areas. The stated objectives of the investigations as outlined in an archaeological brief prepared by Leicester County Council and research designs prepared by Birmingham University Field Archaeology Unit (BUFAU 1993 and 1994) were:

Area 2

1) To ascertain the sequence of archaeological and alluvial deposits.

2) To ascertain the date of the different episodes within the sequence.

3) To obtain information on the environment of the area at different periods within the sequence.

Area 3

1) To ascertain the sequence of archaeological and alluvial deposits.

2) To clarify the nature of the archaeological activity

## 2.2 Method

### Area 2

Trench F - A large stepped trench (Fig 2, Trench F), approximately 70m long and over 3m deep was excavated across the floodplain on the southwest bank of the Thurlaston Brook in order to examine in more detail the palaeochannel identified during the evaluation.

The west facing section was recorded in detail and all deposits were extensively sampled for plant macrofossils, beetle remains and pollen. In addition numerous samples were collected for radiocarbon dating.

Trenches E and G - These two trenches were excavated across the floodplain in the southern part of Area 2 (Fig. 2) forming an interrupted transect 100m long and approximately 5m wide. A descriptive and drawn record was made of the deposits in both trenches.

Trench H (Fig. 3) - The objective of excavating this trench (37m x 16m) was to help define the nature, extent and date range of the flint scatter and associated features recorded in Trenches 1-4 of the evaluation. These potential deposits were threatened by a proposed water feature which would have involved the stripping of a large area of the overlying alluvium.

The topsoil (up to 0.25m deep) and alluvium were removed by machine under careful archaeological supervision. The alluvium varied between 0.6m deep in the northeastern part of the trench and 0.4m in the southwestern area. Two small areas of the alluvium were left unexcavated in the southwestern part (see Fig. 3). The underlying gravels and associated archaeological features were consequently closer to the present ground surface (0.65m) in the southwestern area than in the northeastern area (0.85m).

The trench rapidly filled with water soon after the removal of the upper deposits. Despite the use of water pumps it proved impossible to obtain a full record of the numerous archaeological features cutting the gravels. However, a limited programme of sample excavation was achieved and some indication of their character and date was obtained. Bulk samples for artefact retrieval and charred plant remains were taken from well-sealed contexts within features containing flints. A section of the west facing section of the trench was drawn in detail at 1:20 scale and described using Soil Survey terminology (Hodgson 1976). Samples were taken for particle size analysis, soil micromorphological analysis, pollen analysis and radiocarbon dating.

### Area 3 (Fig 2)

An area totalling 2,700 square metres was excavated (Trench A). The topsoil and the underlying sandy silt was removed by machine. Sample areas of the underlying gravels were cleaned manually in order to facilitate the definition of archaeological features. It should be noted that this exercise was severely hampered by the bad February weather, high water table and resultant waterlogging in the northeastern half of the trench.

As was noted in the evaluation (Cooper 1993) the gravels proved to be quite varied in their composition and included patches of yellow or red clay. These tended to be concentrated in the southern half of the trench. Numerous potential features were sample excavated. However, the majority were clearly non-archaeological, possibly created by periglacial activity or vegetation. They included many of the features which were identified during the evaluation. The majority of these, together with several modern land drains which criss-crossed the area of the excavation, have been omitted from the illustration (Fig. 4) for reasons of clarity. Bulk samples for artefact and charred plant remains were taken from all excavated features.

### 2.3 Results

#### Area 2

Trench F The earliest deposit identified in the southwestern part of the trench was a grey clay, probably a glacial till, 2m to 3m below the present-day surface. This was overlain in the southwest end of the trench by a substantial deposit of sands, gravels and small rounded stones up to 1m thick; probably a periglacial, river lain terrace deposit. The northeastern part of this terrace deposit was cut by a substantial river channel. The lower, peaty fills of this palaeochannel suggested a series of smaller channel cuts 2m below the present ground surface. The early waterlogged deposits at the bottom of the palaeochannel were overlain by substantial deposits of alluvium which filled both the palaeochannel and covered the associated gravel terrace.

A single worked flake was sealed by the gravels in the southeastern end of the trench suggesting a palaeolithic date. A struck flake was also recovered from the alluvium. Several large mammal bones, two of which were identified as aurochs (see below), were recovered from the peat.

Trenches E and G The palaeochannel was again identified, but only at the extreme northeast end of Trench G.

Trench H Traces of two curvilinear features (F10 and F13, Fig 3) were recorded in the central area of the trench. Small sections were excavated to a depth of between 0.1m and 0.2m through both features. Due to severe waterlogging these sections could not be fully excavated. Both features were approximately 0.3m wide and were filled with dark grey/brown clayey silt and occasional small stones and flecks of charcoal. Several other small pit-like features were also sample excavated (F12 and F14-F16). Again they could not be fully excavated because of waterlogging. However, two were at least 0.35m deep (F11 and F12) and all contained dark grey/brown silty fills with varying amounts of charcoal flecks. Three of the features contained struck flint flakes (four from F11, two from F14 and two from F16).

Unfortunately, further attempts to clean the gravels and clarify the plan of the unexcavated features proved impossible due to flooding. Consequently, any interpretation of the results has to be very tentative. However, the two curvilinear features, F10 and F13 did give the impression that they may have formed complete rings, 6.5m and 7.5m across respectively, suggesting that they may have been palisade gullies associated with post-ring roundhouses. The other features may have been small pits associated with a small settlement.

Arrangements are now being made for the preservation *in situ* of the area of the potential early prehistoric settlement, incorporating Trench H and the evaluation Trenches 1-4.

#### Area 3

In the event only two linear ditch-type features (Fig 4: F1/3 and F2) were clearly of archaeological origin. Both were orientated approximately southeast - northwest. The southern ditch (F1/3) corresponded with features examined in Trenches 28 and

30 of the evaluation (F257/F280). Approximately 50% of the exposed sections were excavated. It was up to 1m wide and between 0.25 and 0.4m deep with a U-shaped profile. The northern ditch had a similar alignment but was slightly curved. It corresponded with features examined in Trenches 29, 30 and 32 of the evaluation (F251, F262 and F275). This ditch also had a U-shaped profile and varied between 0.65m wide and 0.25m deep at is southeastern end and 0.4m wide and 0.2m deep at its northwestern end. Both features were filled with a dark brown, silty sand with some clay although the fill of the southern feature (F1/F3) was rather stonier.

In the northern and eastern areas of the trench, the natural gravels were overlain by alluvium, up to 0.5m in depth. The linear features (F1/3 and F2) both partially cut and were sealed by the alluvium deposits. The overlying top soil was a ploughsoil, about 0.5m in depth with a clear B horizon. The clear development of the B horizon, a process which generally takes several hundred years, suggests the features to be prehistoric or Romano-British in age. Traces of ridge and furrow were visible, both on the surface and in the section, within the southern and western areas of the trench.

The only finds were three flint flakes and a sherd of undiagnostic, abraded pottery (which could be Iron Age or Romano-British in date) from the southern feature (F1/F3) and a single struck flake from the northern feature (F2). In addition, several flint flakes and fragments of medieval and post medieval pottery were recovered from the topsoil.

## 3.0 ASSESSMENT REPORT

### 3.1 Factual data

The following tables contain a quantitative summary of the material and records from the fieldwork.

**Table 1: Quantification of Paper Archive**

| Category | Type | No. of items/trench | | | |
|---|---|---|---|---|---|
| | | Tr A | Tr F | TrE/G | Tr H |
| Stratigraphic records | Features | 6 | - | - | 6 |
| | Contexts | 21 | 48 | 4 | 15 |
| Field drawings | A4 size | - | - | - | - |
| | A3 size | 3 | - | - | 1 |
| | Large format | 8 | 8 | 1 | 2 |
| Photographs | Black and white | 70 | 50 | 15 | 15 |
| | Colour slide | 76 | 56 | 6 | 8 |
| Finds Records | Assemblage summaries | 12 | 4 | - | 5 |

Miscellaneous (Correspondence, Research Designs and other documentation) 3 files

**Table 2: Quantification of Finds**

| Material | Category | No of items/trench | | | |
|---|---|---|---|---|---|
| | | Tr A | Tr F | Tr E/G | Tr H |
| Pottery | IA/RB | 1 | - | - | - |
| | Medieval | 2 | - | - | - |
| | Post-Medieval | 7 | - | - | - |
| | Recent | 2 | - | - | - |
| Flint | | 2 | 2 | - | 9 |
| Stone | | - | - | - | 1 |
| Environmental | Bone | - | 4 | - | - |
| | Wood | - | 12 x 20cm bags | - | - |

**Table 3: Quantification of Environmental Samples**

| Type | Number |
|---|---|
| Radiocarbon | 31 |
| Pollen | 15 |
| Plant macrofossil | 25 |
| Beetle | 25 |
| Soil particle size | 50 |
| Soil micromorphology | 5 |
| Lithological | 6 |
| Charred plant remains | 4 |
| Diatom | 1 |
| Dendrochronology | 1 |

### 3.2 Statement of Potential

#### 3.2.1 Structural and Stratigraphic data

Trench A

The potential of the archaeological features found in Trench A to provide further information in terms of function or age is limited. However, a detailed record was made of the overlying stratigraphy (including detailed drawings of the north and west facing sections at 1:20 scale). This data has the potential for answering specific questions concerning the nature of the alluviation and post-depositional processes in this area.

Trench E, F, G

The potential of the information given in the context records and section drawings of these trenches is very high. The detailed stratigraphic record that was obtained has the potential for providing new and highly valuable information for the archaeological and quaternary science disciplines, in regional and even national terms. It will further complement work carried out by other workers in the region (e.g. Brown and Keough 1992, Rice 1981).

A detailed analysis of the stratigraphic record (giving due consideration to soil descriptions (Hodgson 1976)), in conjunction with the results of the radiocarbon dates and paleaoenvironmental analysis should provide:-

1/ a chronology of Late-glacial and Post-glacial erosional and depositional events in the valley of the Thurlaston Brook. This will be related to climatic and/or anthropogenically induced environmental change that occurred in the catchment.

2/ a detailed and definitive description of Late-glacial and Post-glacial sediments available for comparison with the literature.

Trench H

The stratigraphic and structural information from Trench H was potentially very good. Unfortunately, as outlined above, the high water table meant only a partial record of the archaeological features was obtained. The record is therefore limited, and the nature of the archaeological features can only be suggested. However, it should be possible to provide some indication of the age of the archaeological activity through further examination of the flint assemblage and by obtaining radiocarbon dates. In addition, study of the stratigraphy of this trench (with the archaeology dating the onset of alluviation), will provide important complementary information for comparison with the results from Trenches E, F and G.

#### 3.2.2 Artefactual data

Pottery by Lynne Bevan

All of the pottery, bar one abraded IA/RB piece, was retrieved from the topsoil and is post-medieval in age. Obviously the information this can yield is extremely limited, and no further analysis is required.

Flint by Lynne Bevan

The flint collection comprises 13 flakes, a narrow blade fragment and a piece with some shallow flaking - a possible leaf-shaped arrowhead rough-out. A struck flint, possibly palaeolithic in age, was found in the buried soil below the river terrace (2007). The raw material used was a river gravel flint of unpredictable quality; translucent beige to opaque dark brown and grey in colour. Two large thermally-fractured nodules of this material were recovered from F3, Trench A (Fig 4). A narrow blade fragment, possibly of Later Mesolithic date, was recovered from F14, Trench H. Eight of the flakes were also recovered from this Trench. The possible arrowhead roughout was an unstratified find but indicates Neolithic activity in the area.

It is suggested that the flint from the excavation should be combined with the material collected during the evaluation to produce a short report. It should be possible to obtain some indication of the date of the contexts in which these flints were found (by radiocarbon and stratigraphic relationship).

Bone by Stephanie Pinter-Bellows

Only five pieces were found, all from Trench F. These were identified as cow species (*Bos*). Three are domestic cow (*Bos domesticus*). However, two are probably aurochs (*Bos primigenius*). Aurochs was present in England in the early Post-glacial, common during the Mesolithic period, but extinct by the later Bronze Age period (Smith 1981). In view of the rarity and the uncertainty surrounding the causes and period of extinction of aurochs (Smith 1981), and the question of the effect of large animals on the Mesolithic environment (Bell 1992), these bones should be studied further.

### 3.2.3 Environmental data

Radiocarbon samples (see Appendix I)

A large number of samples of waterlogged wood and charcoal were recovered from contexts relating to all the main phases of activity represented by the detailed stratigraphic sequence in Trench F. It should be possible to obtain radiocarbon dates from the majority of these samples. Dating the stratigraphy in Trench F is crucial to the interpretation of the sequence of depositional and erosional, and environmental phases.

Several samples were also collected for radiocarbon dating from Trench H. These have the potential for providing some indication of the chronological context for the archaeological activity and the onset of alluviation in this area.

Pollen by James Greig

Samples were collected in monolith tins from all the different deposits represented in the stratigraphy (see Appendix II). The palaeochannel was sampled in a column from the base, to the lower levels of the alluvium (1.25m of stratigraphy in total). Three samples from this were prepared for pollen analysis at levels of approximately 2.6m, 2.3m and 2.1m below the present-day ground surface. Results from this preliminary work showed that pollen is reasonably well preserved, though not particularly abundant. It indicates that at the lower level the contemporary surrounding vegetation was undisturbed woodland, probably dating to the Atlantic period. At the middle and upper levels there is some sign of human activity in the area with cereals and plantain present suggesting a prehistoric date.

The results from a full analysis of the pollen samples are likely to be very significant. Any pollen evidence from this region is of great importance - there is less pollen evidence from the east midlands than from anywhere else in England. At present there are no pollen diagrams within a radius of about 70km of Croft (Greig in press). These preliminary investigations show that this site can provide a dated sequence including some evidence of probable prehistoric human activity that may partly fill this east midland information gap.

<u>Beetle remains</u> by David Smith

Samples were collected as general biological samples, in plastic bags from all the different deposits represented in the stratigraphy (see Appendix III). The palaeochannel was sampled in three places, from the base to the lower levels of the alluvium (1.25m of stratigraphy in total). All samples were from Trench F. Elsewhere waterlogging was insufficient to preserve identifiable plant and insect remains.

All samples, excepting those from the glacial till and buried soil pre-dating the deposition of the river terrace, were highly organic with visible plant material present. Good plant and insect preservation is likely.

At present there are very few insect faunas of this period from the Midlands. Most work of this period has been restricted to riverine deposits in the Avon and the Severn watersheds. There are at present no published insect faunas of this period from the Trent valley. The samples collected from Croft therefore allow us an opportunity to examine environmental change and riverine conditions in a previously unexamined area. The paleoentomological work at Croft is particularly promising since it can be integrated with information from pollen and plant macrofossil analysis.

The examination of the insects from the deposits at Croft would also complement work being carried out at present elsewhere in the Trent watershed at Girton Quarry, Staffordshire and at Carsington, Derbyshire.

<u>Plant macrofossils</u> by Lisa Moffett

A series of 25 general biological samples of approximately 12 litres were taken from several sequences of layers representing different depositional episodes (see Appendix III). Subsamples of 2 litres were reserved from each general biological sample for plant macrofossil analysis. The palaeochannel was sampled in three places, from the base to the lower levels of the alluvium (1.25m of stratigraphy in total). Most of these samples were highly organic with visible plant material, and seem likely to contain abundant plant remains. The sequences sampled may be contemporary or they may be disparate in age and for this reason it is proposed to wait for the results from radiocarbon dating and preliminary pollen analysis, before selecting samples for analysis. If radiocarbon dating shows that the samples taken from the palaeochannel are of different ages, it is proposed to do a thorough assessment of the samples with the intention that this should identify a minimum number of key samples for full analysis.

Analysis of the plant material from this site is important because very little is known about prehistoric environment and environmental change in the east midlands. Analysis of the Croft material represents an important opportunity within this region to look at environmental change and human impact on the landscape, especially since the results can be integrated with information from pollen and beetle analysis.

Wood

The identification of wood samples collected during the excavation of the peat in Trench F should provide additional information on the nature of the local environment. Wood and charcoal identifications will also be required to assist in the interpretation of the samples selected for radiocarbon dating.

Micromorphology samples

A petrological examination of the soil micromorphological samples should reveal further information about the contemporary environment, as for example, whether ploughing or waterlogging had taken place (see for example Courty *et al* 1989). At Croft five samples were taken from possible buried soil horizons. The analysis of these samples should add further information as to the nature of the environment at particular periods in prehistory.

Soil Particle size

Soil samples, for particle size analysis, were collected in a sequence from the west facing section of Trench A and from all contexts in Trench F. These have the potential for assisting in the characterization of the sediments and the manner of their deposition (e.g. whether by water, wind, gravity).

Lithological analysis by A G Moss

Samples of gravels and stones were collected from the river terrace deposits, and the lower levels of the palaeochannel in Trench F, and from the deposit underlying the alluvium in Trench H. These will be used to help identify the deposits and indicate their derivation. This should help with the interpretation of the stratigraphy. It will also provide an objective base for comparison with sediment description in the literature.

Diatom

Diatoms are unicellular algae with a silica shell, found wherever there is sufficient light for photosynthesis and moisture. They can indicate contemporary water conditions, whether for example it is oligotrophic (low nutrient status) or eutrophic (high nutrient status), and, by interpretation, the climate of the contemporary environment. They are of most use interpreting coastal deposits. A single sample was collected from the pre-terrace soil in Trench F.

Bulk samples collected for charred plant remains and artefact retrieval

Bulk soil samples were collected from a number of the archaeological features in Trenches A and H, with the intention of attempting to recover charred plant remains. However, it is felt that an analysis of any remains that had survived in the samples from Trench A would have little or no value given the uncertainty surrounding the date of the features. However, it is possible that the samples from

Trench H may contain artefactual or environmental material that might assist in their interpretation.

## 4.0 UPDATED PROJECT RESEARCH DESIGN

### 4.1 Background

It seems likely that the two features in Area 3, Trench A, form part of a late prehistoric/Romano-British field system perhaps associated with the seasonal grazing of the floodplain meadows by domestic stock from a nearby settlement. The potential of the archaeology in Area 3 to yield further information regarding age and function is limited. However, the information obtained from the excavation will complement other work undertaken on the nature of late prehistoric and Roman settlement in the area, such as at Grove farm, Enderby (Clay 1992). Further study should also clarify the relationship between the archaeological activity, the sequence of alluviation and other post-depositional processes. This will complement the results from Area 2.

The archaeology in Trench H was of a different nature. The presence and suggested date range of the flint and the complete absence of any pottery or other later artefacts suggests that this possible settlement is early prehistoric in date, probably Mesolithic or Neolithic. If this interpretation is correct, and given the extreme rarity of known settlement sites from these periods, the site is of considerable regional if not national importance. Although the excavation of this site was limited, analyses of the data should at least confirm the date of the site, while the stratigraphic record should date the onset of alluviation.

Trenches E, F and G yielded good environmental data covering, possibly, much of the Holocene period. As indicated above, the potential of this information is very high. Very little pollen, insect, plant and sedimentary work has been done in the region and, consequently, little is known of the Late-glacial or Post-glacial environment. In particular, the opportunity to examine, record and sample long sections across a river valley and to carry out a detailed integrated study, do not often occur. When they do such studies can provide a huge amount of information on the local environment and the wider catchment (see for example Lambrick 1992, Passmore *et al* 1992, Richards *et al* 1987). It is essential to record long sections in detail before sampling, in order to understand the age of deposits and the processes leading to river and valley change (see for example Macklin *et al* 1992 Fig 12.6). Trench F at Croft, across the width of the valley and through a palaeochannel, provided this opportunity. The analysis of the sequence in Trench F, together with the environmental samples provides an unparalleled opportunity for examining the changing relationship between humans and the environment in this part of Leicestershire throughout the prehistoric period.

### 4.2 Aims and Objectives

In addition to providing a general account of the site the specific aims of the post-excavation analysis will be:-

* To trace the history of river channel and catchment change in the Thurlaston valley.

* To obtain a dated pollen diagram covering all periods represented in the stratigraphy, detailed enough to show the phases of human activity and environmental change.

* To integrate pollen, beetle and plant macrofossil analysis with results from the study of sedimentary sequences, radiocarbon dates and other environmental analyses, set out in **3.2.3**.

* To put these results into the regional context by comparison with the literature.

* To establish the age of the features partially excavated in Trench H.

* To set the features in Trench A into the local and regional context.

* To publish results in appropriate journals.

**Publication Synopsis**

Two publications are proposed. One in the Transactions of the Leicester Archaeological and Historical Society will aim to set the site in its geographical and archaeological context giving a short account of the paleaoenvironmental results. It will be specifically aimed at an archaeological and more general readership. A second account will be prepared for a journal specialising in the presentation of the results of Quaternary research such as the Philosophical Transactions of the Royal Society of London. This will be aimed primarily at a Quaternary science readership. It will be a longer account with full publication of the palaeoenvironmental results including detailed section drawings.

i) The Leicester Archaeological and Historical Society

Synopsis

Acknowledgements

Introduction

| | |
|---|---|
| The Site | Topography, geography, river flow<br>Geology<br>State of research so far and research priorities<br>Archaeological/historical background |

Aims

Methodology

| | |
|---|---|
| Results | Archaeological<br>Sedimentary sequence<br>Summary of palaeoenvironmental results |

Conclusions

References

Appendices

**Estimated Total length; 10 000 words; 8 illustrations; 2 tables; 2 plates**

ii) Quarternary science journal

Synopsis

Acknowledgements

Introduction

The Site    Topography, geography, river flow
            Geology
            State of research so far and research priorities
            Archaeological/historical background

Aims

Methodology

Results     Summary of Archaeological results
            Sedimentary sequence
            Lithological analysis
            Radiocarbon "
            Pollen "
            Beetle "
            Macrofossils "
            Micromorphology "
            Other

Integrated discussion

Conclusions

References

Appendices

**Estimated total length; 20 000 words; 10 illustrations; 8 tables; 4 plates**

## 4.3 Method

**The examination of the stratigraphic and structural evidence.**

<u>Trench A an H</u>

Further analysis of the archaeological records will be undertaken. An attempt will be made to set the results in their local and regional context. This will require a visit to the Sites and Monuments record (SMR), library research and consultation with relevant researchers.

The section drawings will be studied, in combination with the results from sedimentological analysis including particle size analysis and soil descriptions, to examine alluviation, the relationship of the ridge and furrow to alluviation and other post-depositional processes. In particular it is hoped to determine:-

1/ the depth and extent of alluviation;
2/ the age of the alluvium in relation to the archaeological features;

3/ the age of the ridge-and-furrow in relation to the archaeology and deposition of alluvium;
4/ the processes that led to ditch infilling after site abandonment (e.g ploughing, flooding, or slower soil creep).

Trenches E,F and G

A search of bore-hole data, geographical, geological and archaeological literature and consultation with relevant researchers will be undertaken. The stratigraphic information will be integrated with the results of radiocarbon dates and environmental analyses, to provide a chronology of environmental change in the valley. Study of the section drawings of the three trenches, combined with the analyses of sedimentological analyses, context descriptions and environmental samples, will be carried out to provide a chronology of Late-glacial and Post-glacial erosional and depositional events. This will be related to climatic and/or anthropogenically induced environmental change that has occurred in the catchment.

**Examination of the artefactual evidence**

Short reports will be prepared on the small assemblages of flint and animal bone collected.

**Examination of environmental evidence**

Radiocarbon samples

Appendix I lists all samples taken with the rationale for taking the sample. The samples most needed for to be dated are given below, with an explanation for this choice. These selections have been made in close consultation with the specialists who will be working on the beetle remains, the plant macrofossils and the pollen.

Trench F - A minimum number of five dates will be sought for samples of waterlogged wood or peat recovered from the peat infills of the palaeochannel (Appendix I; Sample Nos. 4, 28, 38, 63 and 66). These will provide some chronological indication of the landscape changes suggested by the pollen, beetle and plant macrofossil analysis. Given the size of these samples it should be possible to obtain conventional dates.

In addition dates will be sought for samples recovered from the pre-terrace soil (Sample No. 60), an intermediate phase of the deposition of the gravels (Sample No. 47) and from the buried soil overlying the gravel and underlying the alluvium (Sample No. 6a). The small size of these samples will necessitate accelerator (AMS) dates.

Trench H - A minimum of two dates will be sought from samples recovered from Trench H, in an attempt to provide some indication of the likely date of the archaeological activity in the southwestern part of Area 2. Suitable samples were collected from several of the archaeological features and from the buried soil, probably contemporary with the archaeological activity (Sample No. 67). Accelerator dates will be necessary due to the small size of the samples.

Pollen

Analysis of the principal pollen profile from Trench F (Appendix II; Samples Nos. 2-3 and 15-19) should provide a pollen diagram covering the period between the deposition of the terrace gravels and the deposition of the alluvium. The radiocarbon dates will provide some indication of the date of this sequence. The three small pollen counts done to date demonstrate the presence of pollen and its rough date. It is desirable to undertake a further assessment to see how far up the profile into the alluvium pollen is preserved in the 0-50 cm part of the profile, and to examine the material from the bottom of the profile (100-125) to see how far down into the gravel the pollen can be recovered. It is proposed to prepare samples from 20 cm, 30 cm, 60 cm, 90 cm and 110 cm. An outline pollen diagram based on small counts (ca 100 grains) from samples every 10 cm or so (12 samples) can then be constructed.

If results from this are good, the final profile should be analysed at a resolution of between 5cm and 2.5cm. If phases of human activity can be identified, these should be radiocarbon dated, if possible.

If resources allow, analysis will also be undertaken on the samples from the pre-terrace soil (Sample No 49 or 53), an organic horizon within the terrace gravels (Sample No. 48) and the buried soil horizons overlying the gravel terrace in both Trenches F and H (Sample Nos. 62 and 73)

Beetle and Plant Macrofossils

It is proposed to wait for the results from radiocarbon dating and the preliminary results of the poleen analysis, to determine whether remaining samples are of different ages, before selecting samples for analysis. If radiocarbon dating shows that the three columns taken from the palaeochannel (Appendix III; Sample Nos 20-31, 32-37 and 40-44) are of similar age, only one column will be analysed in detail. If radiocarbon dating shows that the three columns from the palaeochannel are of different ages, it is proposed to initially scan all the samples. If samples prove to have different assemblages, some will be selected and analysed in detail. If samples prove to be similar, one sequence will be selected and analysed in full.

For plant macrofossils, the assessment would consist of washing out a 100ml subsample of each sample and scanning the resulting material under a microscope, noting the assemblage of plant remains present without precise identification of all material or quantification. The assessment should provide sufficient information so that samples providing repetitive information, or information not relevant to the aim of identifying vegetational change, can be recognised. Full analysis should be undertaken on the key samples identified by the assessment as being necessary to understand the sequence of vegetational change.

Wood

A brief report will be prepared following the analysis of the samples collected for wood identification. Wood and charcoal identifications will also be sought for those samples intended for radiocarbon dating

Soil Samples - lithological, micromorphological and particle size

Samples will be selected from these in order to answer specific questions as, for example, whether buried soils were formed on alluvium (thus post-dating alluviation) or terrace gravels.

Four lithological samples, four micromorphological samples and 16 particle size samples will be analysed.

Diatom

The diatom sample taken from the pre-river terrace deposit will be analysed, after pollen analysis and radiocarbon results, to further elucidate the deposit if deemed necessary.

Charred plant remains, bulk samples

Three samples from archaeological features in Trench H will be processed. Processing these samples may also recover artifacts missed during this difficult excavation.

### 4.4 Timetable (Fig. 5)

Proposed start date 6th June 1994

| Task No | Description | Personnel | Days |
|---|---|---|---|
| Week 1 | | | |
| 1 | Stratigraphic and Structural analysis | R Roseff | 1 |
| 2 | Preparation of samples and liason with specialists | R Roseff | 2 |
| 3 | Drafts of section drawings | R Roseff | 2 |
| 4 | Additional pollen assessment | J Greig | 5 |
| Week 2 | | | |
| 4 | Preparation of final section drawings | M Breedon | 5 |
| 6 | Wood identifications | Rowena Gale | - |
| 7 | Processing bulk samples | R. Roseff | 2 |
| Week 3-11 | | | |
| 8 | Initial radiocarbon analysis | Various | - |
| 9 | Preparation of finds reports | | |
| | Flint | L Bevan | 3 |
| | Animal Bone | Stephanie Pinter Bellows | 1 |
| 10 | Preparation of specialist reports | | |
| | Micromorphology | R Roseff | 3 |
| | Soil particle analysis | R Roseff | 2 |
| | Lithological analysis | A G Moss | 3 |
| Weeks 12-18 | | | |
| 11 | Preparation of environmental reports | | |
| | Pollen | James Greig | 15 |
| | Plant macrofossils | Lisa Moffett | 28 |
| | Beetle remains | David Smith | 20 |
| | Diatom analysis | ? | ? |
| 12 | Remaining radiocarbon analysis | Various | |
| Week 19 | | | |
| 13 | Library research | R Roseff | 3 |
| 14 | Preparation of remaining drawing roughs | R Roseff | 2 |
| Week 20 | | | |
| 15 | Preparation of remaining site drawings | M Breedon | 5 |
| 16 | Preparation of first draft of report for Leicester Transactions | R Roseff | 5 |
| Week 21 | | | |
| 17 | Editing first draft | A Woodward | 1 |
| | | G Hughes | 1 |
| Week 22-23 | | | |
| 18 | Corrections to first draft | R Roseff | 1 |
| | | M Breedon | 1 |
| 19 | Circulation of second draft and submission to publishers | | |
| Week 23 | | | |
| 20 | Preparation of first draft for Quarternary science journal | R Roseff | 5 |
| Week 24 | | | |
| 21 | Editing first draft | A Woodward | 1 |
| | | G Hughes | 1 |
| Week 24-25 | | | |
| 22 | Corrections to first draft | R Roseff | 1 |
| | | M Breedon | 1 |
| 23 | Circulation of second draft and submission to publishers | | |
| Week 26 | | | |
| 24 | Preparation of research archive | R Roseff | 2 |
| 25 | Deposition of archive and finds | R Roseff | 1 |

## 5.0 ACKNOWLEDGEMENTS

The excavations at Croft were directed by Becky Roseff and Gwilym Hughes with the assistance of L. Jones, S. Butler, B. Burrows, D. Moscrop and S. Lane. David Smith, Lisa Moffett and James Grieg (University of Birmingham) assisted with the on site sampling of environmental deposits and contributed to the post excavation assessment and research design.

The project was monitored by Anne Graf on behalf of Leicester County Council.

Several individuals visited the site and provided useful comments and advice. These included Patrick Clay, Lyndon Cooper and Angela Monkton (Leicester Archaeological Unit), and Tony Brown and John Rice (University of Leicester).

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## 6.0 REFERENCES

Bell, M 1992 'Archaeology under alluvium: human agency and environmental process. Some concluding thoughts', in Needham and Macklin pp271-277.

BGS Barrow G 1932 *Geological Survey of England and Wales, sheet No. 155 Drift, 1":1 mile*, Atherstone.

Brown, A G and Keough, M K 1992 'Palaeochannels and palaeolandsurfaces: the geoarchaeological potential of some Midland floodplains', in Needham S and Macklin M G, pp185-197.

BUFAU 1993 *Research Design: Croft Quarry*, unpublished report.

BUFAU 1994 *Progress report and proposed revisions to research design*, unpublished report.

Clay, P 1992 'An Iron Age farmstead at Grove Farm, Enderby, Leicestershire', *Transactions of the Leicestershire Archaeological and Historical Society*, 66, 1-82.

Cooper, L 1993 *An archaeological evaluation at Croft*, Leicester Archaeological Unit, unpublished report.

Courty, M-A, Goldberg, P and Macphail, R 1989 *Soils and Micromorphology in Archaeology*, Cambridge University Press, Cambridge.

English Heritage 1991 *Management of Archaeological Projects*, London.

Gardiner, V (ed) 1987 *International Geomorphology 1986 Part 1.*

Greig, J (in press) 'England' in Berglund, B E (ed) International Geological Correlation Project 158.

Hodgson, J M (ed.) 1976 *Soil Survey Field Handbook* Technical Monograph No. 5, Soil Survey, Harpenden.

Macklin, M G, Passmore, D G, Rumsby, B T 1992 'Climatic and cultural signals in Holocene alluvial sequences; the Tyne basin, northern England', in Needham, S and Macklin, M G, pp123-141.

Macklin, M G and Smith, R S 1990 'Historic riparian vegetation development succession and alluvial metallophyte plant communities in the Tyne basin, north-east England, U.K.', in Thornes, J B, pp239-256.

Needham, S and Macklin, M G (eds) 1992 *Alluvial Archaeology in Britain*, Oxbow Monograph 27, Oxford.

Passmore, D G, Macklin, M G, Steveson, A C, O'Brien, C F, and Davies, B A S 1992 A Holocene alluvial sequence in the lower Tyne valley, northern Britain. A record of river response to environmental change, *The Holocene* 2 (2), pp138-147.

Rice, R J 1981 'The Pleistocene deposits of the area around Croft in south Leicestershire', *Philosophical Transactions of the Royal Society of London* B 293, pp385-418.

Richards, K S, Peters, R, Robertson-Rintoul, M S E and Switsur, V R 1987 'Recent valley sediments in the North York Moors: evidence and interpretation', in Gardiner, V, pp869-883.

Simmons, I G and Tooley, M J (eds) 1981 *The Environment in British Prehistory*, Duckworth, London.

Smith, A G 1981 'The Neolithic', in Simmons, I G and Tooley, M J (eds), pp125 -210.

Thornes, J B (ed) 1990 *Vegetation and Erosion*, Wiley, Chichester.

# APPENDIX 1

## Radiocarbon Dates

All samples below refer to Trench F unless otherwise stated.

| Sample No | Reason Date Wanted | Method |
|---|---|---|
| 1 | To date peat, beetle and plant macrofossil samples in earliest channel within the palaeochannel | C* |
| 4 | As sample 1 above | C |
| 14 | Lies immediately over peat (2000) and marks beginning of channel infilling with alluvium | C |
| 24 | To date pollen sequence 15-19, beetle and plant macrofossils 20-31 | C |
| 28 | As sample 24 above | C |
| 38 | To date beetle and plant macrofossil samples 32-37 | C |
| 39 | Small roots, growing through peat into gravels below, to date samples 32-37, as above, however, it cannot be known at what level the tree grew so this sample would yield an uncertain date | AMS* |
| 45 | Large piece wood; to date 15-19 and 20-31 | C |
| 46 | Pre-dates ice wedge cast, dates deposition of terrace | AMS |
| 47 | As sample 46 above | AMS |
| 50 | To date pre-terrace soil and pollen sample 49 | AMS |
| 52 | To date pre-terrace soil and samples 51, 53-55 | AMS |
| 60 | Tree root to date pre-terrace soil and samples 49-55 | C |
| 61 | To date deposition of terrace gravels, as sample 47 | AMS |
| 63 | Root growing through peat (2000) in palaeochannel, thus representing the overlying soil that has been eroded away. Sample equivalent to 24,28,14. | C |
| 64 | To date the earliest stage of a levee at the edge of the palaeochannel | AMS |
| 65 | As samples 64 above | AMS |
| 66 | A surface slice of peat (2000) to compare with 63, compare also with 24,28,14 | C |
| 67 | Trench H To date the buried soil horizon | AMS |
| 69 | To date the infilling of palaeochannel, as sample 14 | AMS |
| 70 | To date a buried soil horizon at the surface of the terrace gravels, possibly pre-dating the infilling of the palaeochannel | AMS |
| 72 | Dating uppermost part of levee feature in palaeochannel, compare to samples 64 and 65 | AMS |
| 74 | To date buried soil, equivalent to 70 | AMS |
| $6_a$ | To date buried soil, equivalent to 70,74 | AMS |
| $7_a$ | Charcoal from a tree-throw hollow, representing buried soil, equivalent to 70,74,$6_a$ | AMS |
| $8_a$ | Root in lowermost unit, dates pre-terrace soil (2016) | AMS |
| Trench H | Two charcoal samples from F11, one from F12, one from F13, one from F16, **5 in total.** To date age of archaeological activity in area of Trench H. | AMS |

* C By conventional radiocarbon technique
*AMS By accelerator mass spectrometry technique

## APPENDIX II

List of Pollen Samples

| | | |
|---|---|---|
| 2,3 | Trench F | Palaeochannel, peat, earliest pollen sample from palaeochannel |
| 15-19 | " | Palaeochannel, peat and inwashes of sand. A sequence from above samples 2,3, to the beginning of the alluvium infill. |
| 49,53 | Trench F | From soil pre-dating deposition of terrace gravels. Sample from here also collected by A. G. Brown, Leicester University |
| 48 | Trench F | Small grab sample from organic horizon in terrace gravels |
| 64,72 | Trench F | Small grab samples from levee feature in palaeochannel |
| 73 | Trench F | Small grab sample from buried soil horizon overlying terrace gravels |
| 62 | Trench H | Monolith tin from buried soil horizon below alluvium at level of archaeology |

## APPENDIX III

List of samples collected for beetle and plant macrofossil remains

Samples were collected in the following places. All samples were from Trench F.

| | |
|---|---|
| 5,6 | From earliest peat deposit in palaeochannel, equivalent to 2,3 above |
| 20-30 | Sequence from palaeochannel, equivalent to 15-19 above |
| 32-37 | Sequence from palaeochannel, either contemporary with or pre/post-dating 20-30 |
| 40-44 | Sequence from palaeochannel, either contemporary with or pre/post-dating 20-30 |
| 31 | Sample from earliest deposit, a glacial till |
| 55 | Sample from soil pre-dating terrace deposit and palaeochannel |

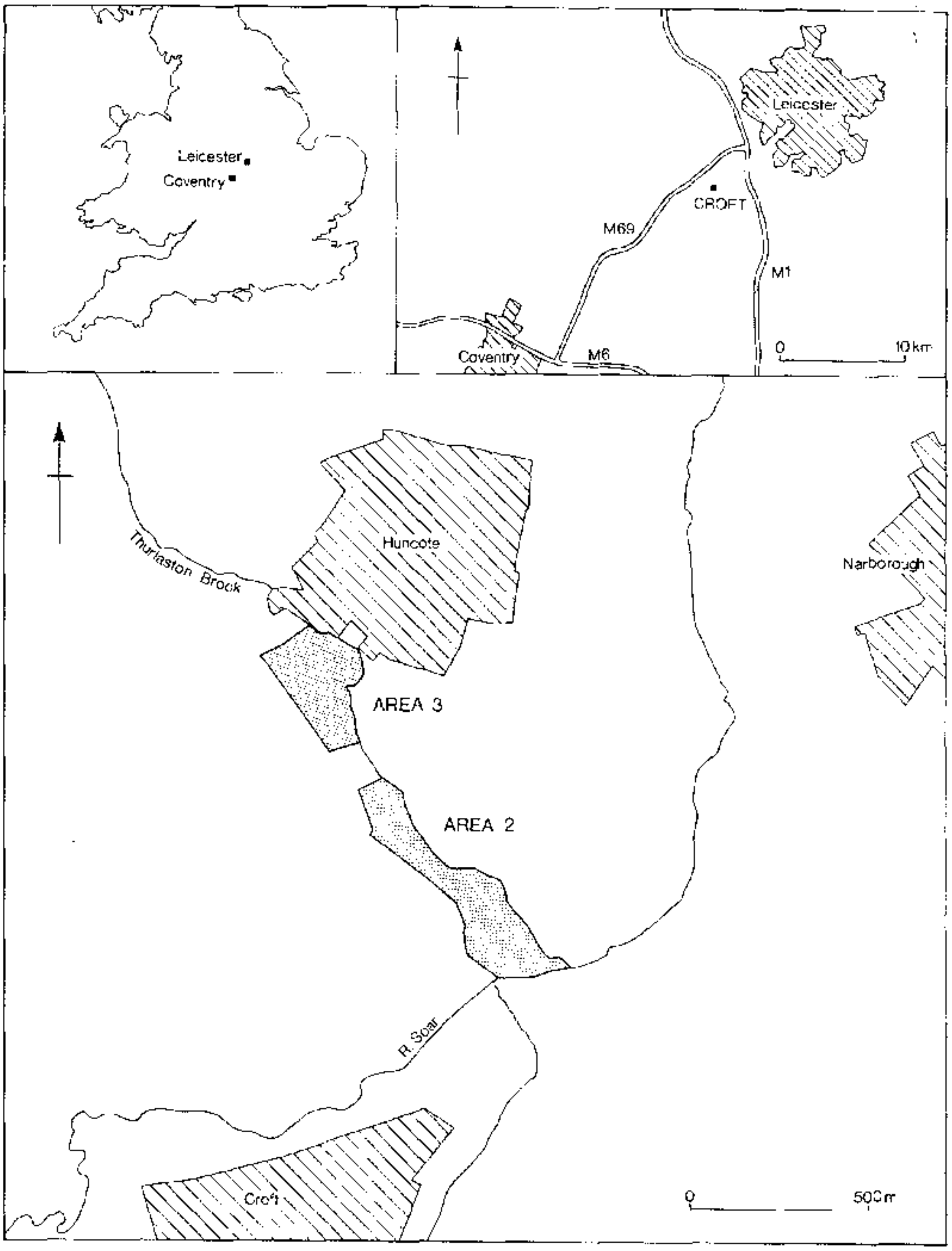


Fig. 1 - Location of development areas

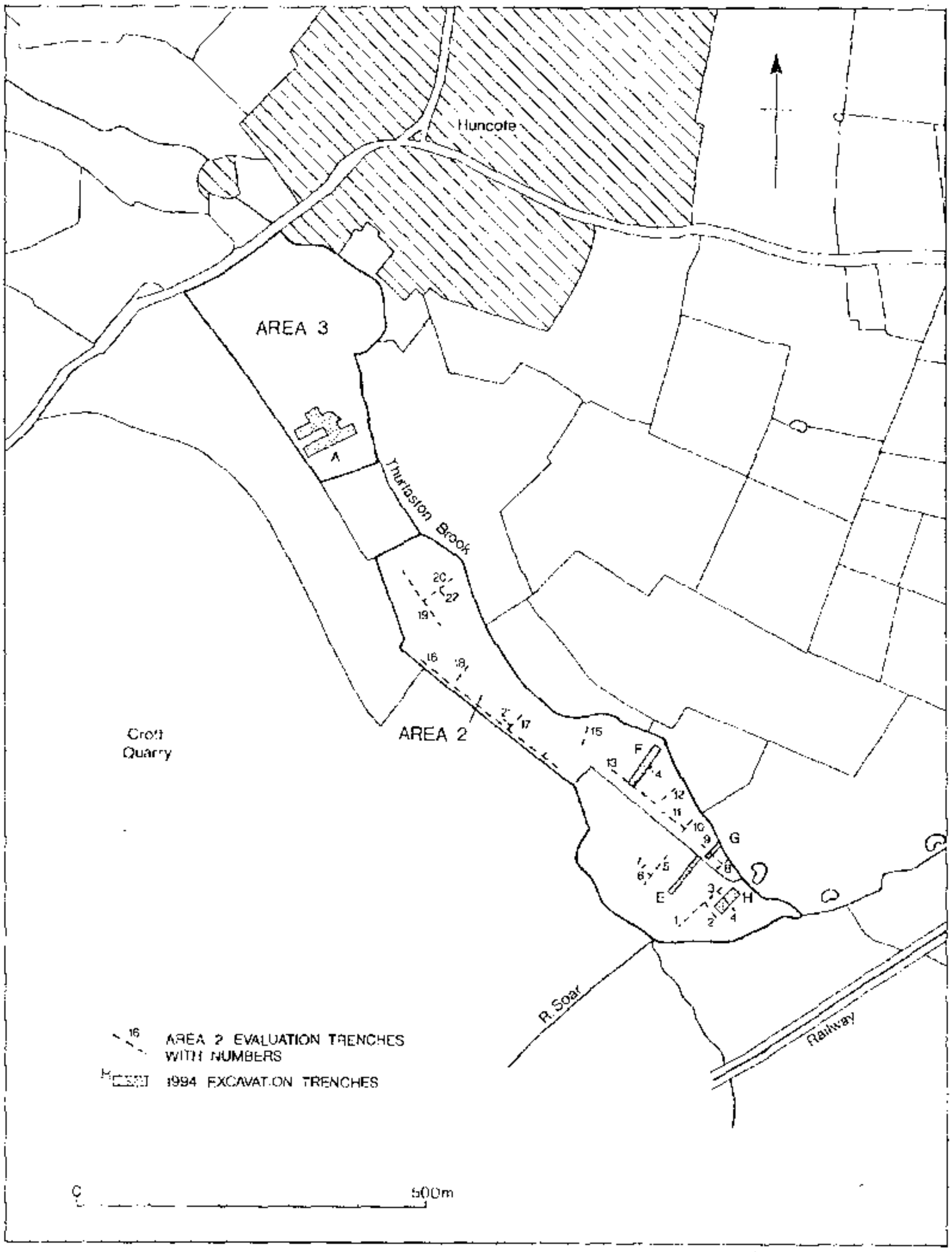


Fig. 2 - Location of excavated areas

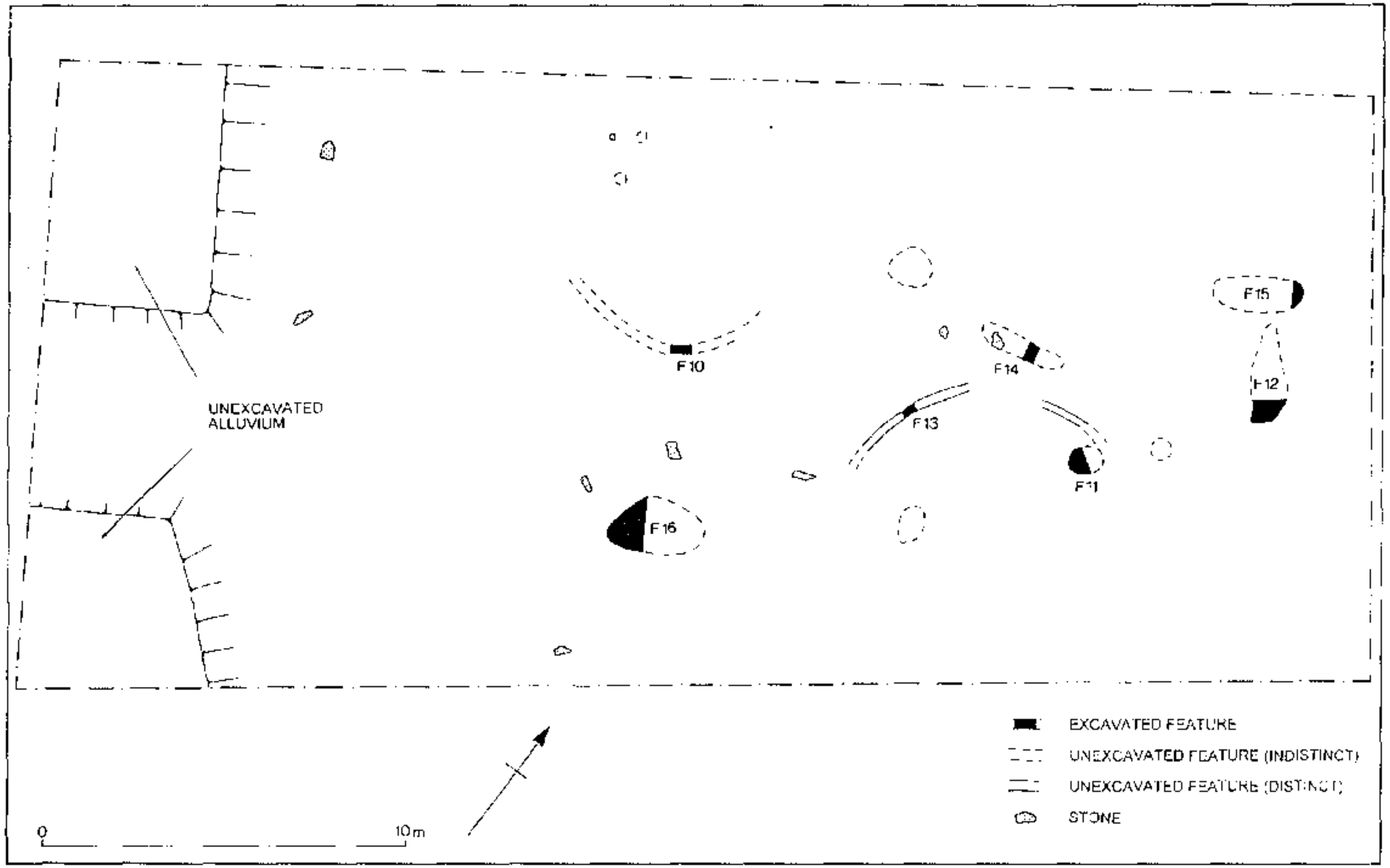


Fig. 3 - Plan of Trench H: 1:200

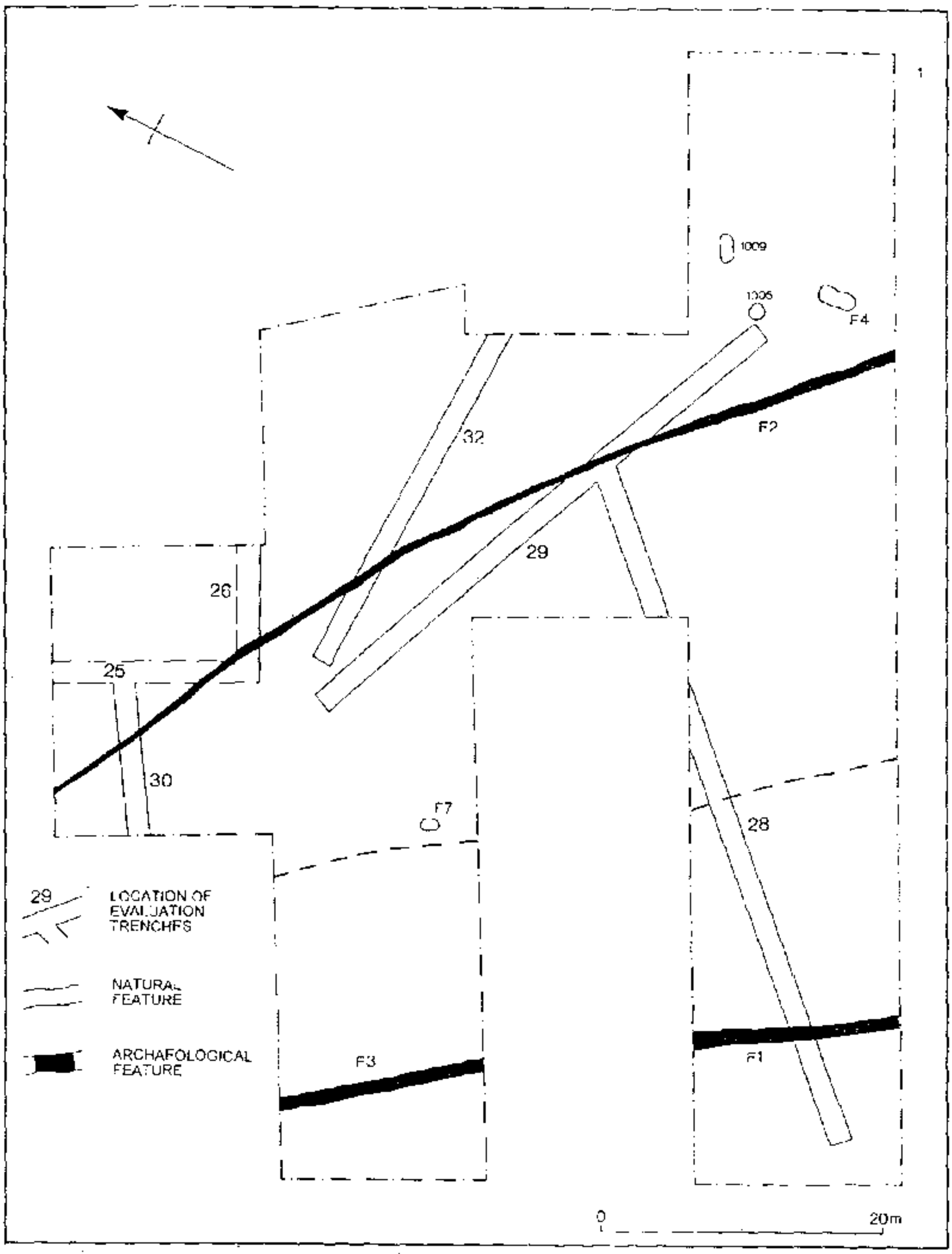


Fig. 4 - Plan of Trench A: 1:500

## Croft Post Excavation Programme

| No. | Task | Responsible |
|---|---|---|
| 1 | Stratigraphic and Structural analysis | R. Roseff |
| 2 | Preparation of samples and liaison with specialists | R. Roseff |
| 3 | Drafts of section drawings | R. Roseff |
| 4 | Additional pollen assessment | J. Greig |
| 5 | Preparation of final section drawings | M. Breedon |
| 6 | Wood identifications | R. Gale |
| 7 | Processing bulk samples | R. Roseff |
| 8 | Initial radio-carbon analysis | Various |
| 9 | Preparation of finds reports | |
| | Flint | L. Bevan |
| | Animal bone | S. Pinter-Bellows |
| 10 | Preparation of specialist reports | |
| | Micromorphology | R. Roseff |
| | Soil particle analysis | R. Roseff |
| | Lithological analysis | A.G. Moss |
| 11 | Preparation of environmental reports | |
| | Pollen | J. Grieg |
| | Plant macrofossils | L. Moffett |
| | Beetle remains | D. Smith |
| | Diatom analysis | ? |
| 12 | Remaining radio-carbon analysis | Various |
| 13 | Library research | R. Roseff |
| 14 | Preparation of remaining drawing roughs | R. Roseff |
| 15 | Preparation of remaining site drawings | M. Breedon |
| 16 | Prep. of first draft report for Leicester Transactions | R. Roseff |
| 17 | Editing first draft | A. Woodward |
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| 21 | Editing first draft | A. Woodward |
| | | G. Hughes |
| 22 | Corrections to first draft | R. Roseff |
| | | M. Breedon |
| 23 | Circulation of second draft and submission to publishers | |
| 24 | Preparation of research archive | R. Roseff |
| 25 | Deposition of archive and finds | R. Roseff |

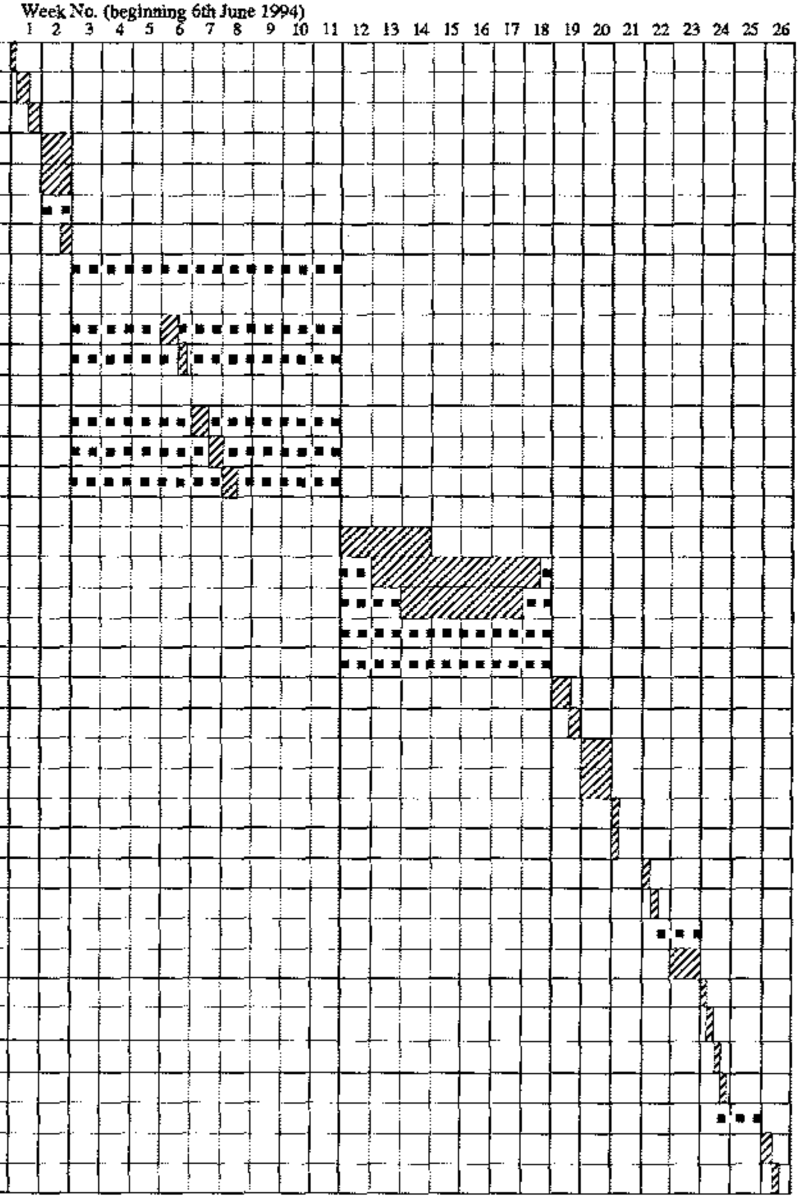


Fig. 5