OXFORD ARCHAEOLOGICAL UNIT

YARNTON FLOODPLAIN B 1998 POST-EXCAVATION ASSESSMENT

by

Christopher Bell and Gill Hey

January 1999

CONTENTS

List of figures

SUMMARY

Over a period of thirteen weeks during the late spring and early summer of 1998, the Oxford Archaeological Unit undertook five areas of excavation and a watching brief on the floodplain at Yarnton, Oxfordshire (Fig.1). The three main areas of excavation (Sites 9, 10 and 21) were located to examine prehistoric activity adjacent to, and within, palaeochannels. Two further trenches (4c and 4d) were sited in areas where no archaeological features were found in the 1993 evaluation (Hey 1994a), in order to assess the effectiveness of the 2% sampling strategy that was used. The aim of the watching brief (area 4e) was to record the character and density of scattered archaeological features over one hectare on the floodplain where no detailed excavation was intended.

Site 9

Site 9 was designed to investigate features, which included a double row of postholes, finds scatters on the north bank of a broad palaeochannel and a possible gravel causeway which spanned the channel. However, the trench unexpectedly exposed a substantial limestone causeway, 35 m in length and 5 m in width. Wooden posts, and fallen horizontal timbers, which lay along the edges of this structure (preserved *in situ* by the waterlogged conditions) appeared to represent the remnant of a wooden hand rail. A row of smaller wooden stakes were found beneath the causeway. It remains uncertain whether these stakes were part of a structure which predated the stone surface, or were marker posts associated with its construction. A dense scatter of animal bone lay over the surface of the causeway, and further deposits of animal bone, and a bronze spearhead and an awl, were recovered from directly beneath it. The stratigraphic and artefactual evidence initially suggests a mid to late Bronze Age date for this structure.

At a later phase a narrower gravel causeway had been laid along the middle of the earlier structure where the stones had become worn and this later trackway continued for some distance beyond the north bank of the channel. More rows of wooden uprights, c. 0.10 – 0.15 m in diameter, were found extending across the channel to either side of the causeway and a further scatter of animal bone was recovered from the surface of the channel silts.

The double row of alluvium-filled posthole/slot features on the north bank of the channel were traced over a distance of 23 m. These features appeared to be Iron Age or Roman in date and were possibly associated with field boundaries. However their exact function remains unclear. Other features examined in this trench included several pits containing burnt stone and animal bone, a pit containing well-preserved waterlogged plant remains, including a possible bark object, and Roman field-boundary ditches.

Site 10

Site 10 investigated a segment of the same channel, l00 m to the west of Site 9. This trench exposed a cambered gravel causeway crossing the channel and what appeared to be the remnant of a crude brushwood trackway, represented by a linear concentration of roundwood debris and small vertical stakes. A group of larger wooden uprights was found to the west of the causeway, similar in character to those found in the channel on Site 9. A small number of

features investigated on the north bank of the channel included a pit containing burnt stone and decorated Beaker pottery and a cremation.

Site 21

Site 21 was located in the north–west corner of Field 12 and explored activity associated with a shallow channel which would have flowed into the main channel examined in Sites 9 and 10. The features investigated in this trench comprised a sub-rectangular pit packed with burnt stone and charcoal, two waterholes, and another gravel causeway, which ran obliquely across the bottom of this shallow channel. In addition two clay-filled ditches were found which were possibly associated with the causeway. One of the waterholes was partly backfilled with woodworking debris and wooden objects, and this included a log ladder and a broken bowl. A red deer jawbone and a fox skull were also found within this deposit.

Sites 4c and 4d

These two trenches were situated on gravel islands to the north and south of the main palaeochannel. An oval arrangement of postholes was discovered at the north end of site 4c which represented the ground plan of a post-built structure, *c* 5 m long x 4.5 m wide. A number of pits and postholes excavated in the area adjacent to the building produced a small quantity of Bronze Age pottery and fragments of cylindrical clay loomweights. One larger pit (1.4 m in depth) found in this area appeared to be a waterhole and there was good organic preservation in its lower fills. A further light scatter of pits and postholes lay towards the southern end of the trench.

Only two features were found on Site 4d: a cremation and one small pit, both of which were situated in the north-west corner of the trench, on the southern bank of the palaeochannel.

Observation area 4e

Several large pits containing Bronze Age pottery, burnt stone and charred plant remains were discovered during this observation, but no concentrations, or specific areas of activity were located. Roman field-boundary ditches ran continuously through this area.

BACKGROUND

1 The Project Background

1.1 Location and topography of the site

The area of investigation lies within the ARC Cassington gravel extraction pit in the Upper Thames valley, north of Oxford. The pit is situated north of the river Thames on an area of floodplain and second gravel terrace between the villages of Yarnton to the east and Cassington to the west (SP 4711). The 1998 Yarnton Floodplain B excavations (Sites 4c, 4d, 9, 10, and 21) lay on the area of Thames floodplain on the north side of the modern A40 road in the west of the study area (Fig. 1).

The present, fairly uniform floodplain topography (at *c* 58 m OD) is a product of flooding and alluviation, mainly of Roman and medieval date. In the Neolithic and Bronze Age stream courses crossed the floodplain creating islands in the floodplain gravel. The 1998 areas of excavation explored prehistoric activity specifically associated with the use of these palaeochannels, including causeways, deposits and spreads of burnt stone and wooden structures. In addition to the excavation work, a watching brief was undertaken during ARC's topsoil stripping over an area of 1 hectare.

1.2 The circumstances of the project

The 1998 excavations on Yarnton floodplain formed part of the Oxford Archaeological Unit's (OAU) Yarnton-Cassington Project which is examining an archaeological landscape with sites dating from the Neolithic to the Saxon period. Investigations have been in progress since 1989 and the current work is the fourth year of a four-year field programme (Hey 1994b) agreed by AMAC in November 1994. The sites are being excavated prior to their destruction by gravel extraction.

ARC obtained planning permission to extract gravel from an area of 140 hectares at Cassington and Yarnton with no archaeological conditions imposed. In 1989 a limited trial-trench evaluation, funded by OAU, revealed a complex and long-lived settlement site on second gravel terrace, dating from the Iron Age through to the early medieval period, in an area that was to become the ARC plant site. Subsequent excavation has been funded by English Heritage. A programme of fieldwalking, undertaken in 1990 to locate manuring scatters on fields cultivated from the Roman settlement and to assess the archaeological potential of the remaining areas of the pit, indicated earlier prehistoric activity on the floodplain for the first time. Full-scale evaluation of the ARC gravel extraction area followed in 1993, and exposed the extent of the archaeological landscape. As a result of the significance of the remains, English Heritage have commissioned the current programme of archaeological research.

1.3 Archaeological background

The archaeology of the Thames/Evenlode confluence area is particularly rich.

Important sites from the Neolithic to the Saxon period have been found within a small area (Benson and Miles 1974, 84-7), including late Neolithic pits in Smith's Pit 2 (Case and Whittle 1982) and the Cassington Beaker `flat-grave' cemetery excavated (or, rather, salvaged) by E T Leeds in 1934 in Tolley's Pit (Leeds 1934). Two Beaker ring ditches to the south of Yarnton church were recorded during construction of the Oxford to Worcester railway and associated gravel extraction in the early 1850s. An early copper neck-ring, now on display at the Ashmolean Museum, was recovered from one of the barrows (Clarke, Cowie and Foxon 1985, pl. 7.24) and a small Beaker pot was also found in this area (Kinnes and Longworth 1985, 139 & illust. Oxfordshire UN 49). Neolithic and Beaker pits have occasionally been located in Oxford itself (Leeds 1938), on the gravel terrace, and a single Beaker grave has also been excavated on the floodplain at the Hamel (Palmer 1980, 128-31). However, over the last century many of these sites have been destroyed by gravel extraction, road and railway construction and house building with, at best, only limited and piecemeal recording having taken place.

Although these burial sites and pit groups have been found in the vicinity of the project area, it lies away from the known, major monument complexes. The nearest of these are situated in the lower Windrush Valley (including the Devil's Quoits circle henge monument) *c* 12 km upstream, and around Abingdon and Drayton 17 km downstream (Case 1986).

Excavation on the Yarnton floodplain in 1992-3 (Hey 1993b) and evaluation in 1993 (Hey 1994a) revealed extensive areas where Neolithic and Bronze Age domestic, ceremonial and burial sites were located, as well as areas where tasks peripheral to settlement were carried out. The latest settlement sites on these low-lying areas are of late Bronze Age/early Iron Age date.

A scatter of Neolithic and Bronze Age flints has been recovered from the adjacent gravel terrace and a few earlier prehistoric pits have been excavated during the course of examining later sites (Hey 1993a). In addition to the ring ditches uncovered during railway construction, two circular anomalies observed during geophysical survey near Yarnton church, by Archaeometry Branch of English Heritage in the 1993 evaluation, probably represent similar features (Linford 1994) and another ring ditch can be seen on air photographs of Worton 1.5 km to the west. During the 1995 excavations on Cresswell Field a U-shaped enclosure of either Neolithic or early Bronze Age date was uncovered and three associated inhumation burials of ?Beaker date were excavated (Hey and Bell 1996).

In the early 1st millennium BC settlement sites moved away from the floodplain, probably as a result of a rising water table, and a permanent settlement was established on the edge of the gravel terrace (Hey and Bell 1996). This site was occupied from the earliest Iron Age to the late Saxon period, shifting gradually along the terrace through time. Fields on the floodplain were farmed from this site.

1.4 Evaluation

Fieldwalking in 1990 had revealed scatters of flintwork on the floodplain areas,

mainly over the gravel islands and comprising quite a high percentage of burnt flint (Hey 1991). A light flint scatter, and a sherd of early Bronze Age pottery, was found over the surface of the area excavated in 1998.

In autumn 1993 machine-trenched evaluation over 70 hectares examined 2% of the gravel extraction area which had not yet been taken out of arable production and assessed the southern part of the Worton cropmark site (Hey 1994a).

1.5 Yarnton Floodplain Excavations 1992, 1995, 1996 and 1997

Work on the floodplain to date has revealed the presence of Neolithic and Bronze Age features representing a wide range of activities: domestic, funerary, ceremonial and mundane tasks undertaken away from settlement. Evidence so far indicates that, whereas the sites lie in proximity to each other, there is separation of the different feature types

1. On low-lying ground which would have been fairly dry throughout the Neolithic and early Bronze Age, a site with a seemingly ceremonial function was located (Site 2, Fig. 1). An *in situ* finds scatter was found on the buried ground surface, which included artefacts of a higher quality than located elsewhere so far, including leaf-shaped arrowheads and an edge-ground knife. Cut through this surface were successive ditched, and later posthole, alignments running from the channel south-east to the Thames. Absent from this site were apparently domestic features, pits containing `special' deposits, carbonised plant foods and burials (despite good bone preservation).

2. North of, and on the bank of a palaeochannel, lay a group of sites apparently related to burial practices. A Neolithic rectangular enclosure of a type thought to be associated with mortuary practices lay to the west of the channel (Site 5, Hey 1996). No datable finds were recovered from the lower fills, though Peterborough Ware (Fengate sub-style) came from upper deposits. A small cremation lay in the centre of the enclosure and an unaccompanied, and as yet undated, inhumation near the southern entrance. Another, possibly Bronze Age, inhumation cut the top fill of the enclosure. Seven other small cremations lay in the immediate area. The ring ditch, probably of later Neolithic/early Bronze Age date, lay 150 m north-east, apparently at the north end of the alignments of Site 2. The area between these two monuments was either examined on Site 5 or observed during ARC topsoil stripping. Apart from a few postholes on the west edge of the ring ditch, the only features recovered in this area were four cremations and a Beaker ‘flat grave’ with a grave group comprising one fine and one cruder Beaker pot, an end scraper and six barbed-and-tanged arrowheads. This is an unusually low-density of feature recovery for this gravel island and underlines the special nature of those deposits which were present. A ring ditch partly uncovered in the 1996 area of excavation probably lay further west along the edge of the same palaeochannel (Site 7, Hey and Muir 1997). Beaker ‘flat graves’ on the

floodplain may contrast with ring ditches on the gravel terrace here.

3. Evidence of Neolithic domestic occupation has been found on all the gravel islands, but particularly on the long central island spreading over 1 km in length. Excavations on this gravel island in 1992 and 1996 revealed a wide scatter of postholes and pits, some of which were clustered and contained structured deposits, and finds found within the tops of treethrow pits (Sites 1, 3 and 7, Hey 1993b and Hey and Muir 1997). Many of the pits were finds-rich and significant assemblages of pottery, flint and other artefacts have been recovered. A large sub-rectangular post-built structure of probable Neolithic date was discovered toward the centre of the island (Site 7). From the early Bronze Age occupation becomes more visible and a number of circular buildings, cooking areas and wells have been identified.

4. Areas where activities that were undertaken "off-site" have also been located, particularly on the edges of the palaeochannels, including burnt stone spreads, wooden structures and woodworking debris. In the 1997 excavation two adjacent areas of Bronze Age burnt-mound activity were located on the edge of a shallow palaeochannel, each with an associated waterhole (Site 17, Bell and Hey 1998). The largest of the waterholes contained waterlogged plant remains and wood and a complete wooden implement was recovered.

1.6 Yarnton Cresswell Field excavation 1995

An excavation undertaken on an area of the second terrace in 1995 (Hey and Bell 1996) investigated part of late Bronze Age, early and middle Iron Age settlement. The occupation was characterised by two wide swathes of pits, ditched enclosures, middle Iron Age house gullies and concentrations of postholes, some of which represented early Iron Age post-built structures. Large assemblages of pottery, animal bone, and bone and metal objects were recovered. In addition domestic and burial evidence of Neolithic and earlier Bronze Age date and Saxon occupation was also found to be present. This occupation formed the westernmost, late Bronze/early Iron Age, end of a continuous belt of village-like settlements along the second gravel terrace. The successive occupations shifted eastwards through time providing an apparently unbroken sequence from late Bronze Age to early medieval period (Hey 1994b). The rest of the site (early/middle Iron Age to early medieval) was excavated in 1990-91, as the Yarnton Worton Rectory Farm project (Hey 1993a).

1.7 The 1998 Fieldwork Programme

The overall Yarnton-Cassington project design (Hey 1994b) sets out an integrated proposal for investigation, analysis and publication in the Yarnton-Cassington study area over the next seven years. This was approved by AMAC in November 1994. The project design included four further seasons of excavation on Yarnton Floodplain (YFPB); the 1998 fieldwork was the fourth of these. The project design sets out the potential and aims of the overall project and the rationale, strategy, methods and costings for Yarnton Floodplain B as a sub-project within it. It provides for the submission of a project design comprising a more detailed methodology, task list and cascade chart as a supplement to the existing document.

The 1998 Yarnton Floodplain B excavation comprised five separate areas of investigation (Fig. 1). Sites 9, 10 and 21 examined activity adjacent to, and within, palaeochannels in the south of Field 12. This channel forms the northern boundary of the large gravel island examined in the 1992, 1995 and 1996 excavations on the floodplain. Sites 4c and 4d exposed areas to the north and south of the channel where no archaeological features were found in the evaluation, in order to assess the effectiveness of the 2% sampling strategy that was used. In addition to the areas of excavation, a watching brief (4e) was undertaken during topsoil stripping of 1 hectare in the north of Field 12 (Fig. 2).

2. The Aims and Objectives of the Project

2.1 National research aims

The excavations at Yarnton in 1998 formed an important element in the landscape-wide, multi-period Yarnton-Cassington Project, contributing to many of the overall research aims of that project (Hey 1994b) and benefiting from the information on the wider context of the site. The national research issues of this project were defined (Hey 1994b, 31-3) as examining:

1. *Processes of change*, of which the changing character of Neolithic and Bronze Age settlement, has particular relevance to the Yarnton floodplain excavations. The other issue highlighted as being of national significance to the investigations on the floodplain is the transformation of the landscape at the beginning of the 1st millennium BC.

2. *The character of early settlement and inter-relationships between contemporary sites*, as there is diversity in the location of settlement sites in the study area and in the settlement pattern between periods. The Neolithic and early Bronze Age occupation of the study area offers outstanding opportunities to examine aspects of prehistoric society which are poorly documented elsewhere. The middle and later Bronze Age settlements allow us to assess relationships between sites which are potentially contemporary. Boundaries associated with some occupation sites can be investigated.

3. *Landscapes and past human impact on the environment.*
Reconstructing landscapes and land use across the study area.

4. *Patterns of craft production*, to elucidate social development and the links between sites and regions.

5. *Methodological issues*. Exploring the most effective means to evaluate archaeological sites and landscapes is a critical conservation issue to which the Yarnton-Cassington project has particular potential to contribute.

The results of the 1998 fieldwork in relation to national research aims are discussed in Section 23.

2.2 Project research questions

These academic issues were framed as a series of research questions and aims for the site (Hey 1994b, 11-4). Those of particular relevance to the floodplain work in 1998 were:

1. What is the nature of Neolithic and Bronze Age society in lowland Britain and, in particular, the nature of domestic settlement?

a. *domestic activity*
An appreciation of the dynamics of early settlement, its character, range and scale and the spatial and chronological patterning of feature groups is poorly understood and Yarnton offers excellent opportunities to investigate this issue. As sites of this type have rarely been investigated further examination of features on floodplain will develop effective sampling strategies for this kind of activity.

b. *the economic basis of society, land use and human impact on the landscape*
The recovery of faunal, macrobotanical and pollen remains will elucidate economic strategies of the Neolithic and Bronze Age populations, and provide evidence for landscape variability and woodland clearance across the floodplain.

c. *tasks external or peripheral to settlement*. The examination of the burnt stone deposits on the edges of the palaeochannels provides evidence of tasks external or peripheral to settlement and the use of the channels through time.

d. *the relationship between domestic, other utilitarian, ceremonial and burial sites*
To gain a clearer understanding of spatial patterning and hence processes of change through time.

2. What is the character of the late Bronze Age/early Iron Age transition? Why and how did the landscape become permanently settled and bounded and in what ways did the emphasis change from the monument-dominated landscape of earlier periods? A range of features and deposits relating to middle and later Bronze Age settlement were examined in the 1998 areas of excavation.

3. How did land-use strategies change through the Iron Age, Roman and Saxon periods, particularly in relation to changing hydrological conditions on the floodplain? The investigation of Roman ploughed fields on the floodplain and the effects of increasing flooding and alluviation upon them is an ongoing project.

4. How can well-preserved but fragile landscapes (especially those on the floodplain) be effectively evaluated and how can scattered but important remains be adequately and cost-effectively investigated? The principal concerns of the 1998 floodplain work were to examine the extent and character of off-site activity associated with palaeochannels, and to assess the effectiveness and validity of range of evaluation techniques used.

2.3 Specific research objectives

The specific project objectives were set out in the Yarnton-Cassington Project Design Appendix 4 (Hey 1994b, 63-8). Those of relevance to the 1998 Yarnton floodplain fieldwork can be summarised: The extent to which they were fulfilled is set out in section 21.

Sites 9 and 10

1 Examine the nature and extent of the buried ground surface adjacent to the palaeochannel and recover artefacts to date this deposit

2 Elucidate any patterns of distribution of *in situ* artefacts scatters

3 Define the extent of the gravel causeways and examine the character of their construction

4 Recover artefacts from the causeways to elucidate the date of their construction

5 Establish the stratigraphic relationship between the causeways and the various channel deposits

6 Investigate the origin and longevity of these crossing points and their relationship to topography and settlement

7 Examine the extent and character of the posthole alignments to the north of the channel and attempt to establish the date and function of these features

8 Investigate the nature of the burnt stone spreads on the edges of the channel and to try to elucidate the date and origin of this material

9 Recover worked wood from the channel to provide evidence of Bronze Age woodworking and off-site activities.

10 Elucidate the stratigraphic sequence of the channel deposits and recover artefacts in order to date this sequence

11 Examine the alluvial deposition within the channel to provide evidence of changing land use and hydrological conditions

Site 21

12 Define the nature and extent of the burnt mound deposits

13 Examine the stratigraphic and spatial relationship between these deposits and the channel

14 Establish the date of the burnt stone features and attempt to interpret the activity represented by these deposits

15 Compare the character and date of the burnt stone deposits to those identified elsewhere on the floodplain, and elucidate the chronological span of this activity and its relationship to settlement

16 Obtain carbonised and waterlogged macro-botanical remains from the burnt stone deposits to provide evidence of the character of this activity and recover suitable material for radiocarbon dating

Sites 4c and 4d and observation area 4e

17 Evaluate the success of the machine trenching strategy, in which 2% was sampled, against results revealed in these areas of excavation

18 Assess the extent and density of Neolithic and Bronze Age settlement on the floodplain

All Sites

20 Examine evidence of tree clearance and landscape development in this area. To what extent is this associated with the burnt stone spreads?

21 Explore the relationship between flint densities on old ground surfaces, Roman ploughsoils, and the modern surface

22 Obtain waterlogged macro-botanical remains, beetles, snails and pollen from a range of deposits to provide evidence of the floodplain environment and land use

23 Integrate the results of the environmental analysis with samples taken from elsewhere on the floodplain in order to assess the variability of the environment and land use across the floodplain area

24 Examine Roman and later land use, boundaries and ploughsoils

25 Validate the absence of Iron Age settlement on the floodplain at Yarnton

Sites 9, 10, 21, 4c, 4d and 4e will form part of Module 5 of the floodplain post-excavation work.

FACTUAL DATA AND ITS POTENTIAL

3. Summary of Excavation Results

3.1.1 Sites 9 and 10

These two trenches exposed areas of 100 m x 50 m, and 60 m x 40 m, extending across an east – west palaeochannel in the south of Field 12 (Figs 2, 3 and 6). The various structures found within the channel included stone and gravel causeways, and rows of wooden uprights, which lay buried beneath up to a metre of Roman and medieval alluvium. Prehistoric features to the north of the channel, which included a number of burnt stone features and a waterhole, and a series of burnt treethrow holes on the south bank, were either cut into the floodplain gravel or an undisturbed reddish-brown silt (probably of late Devensian date) which overlay the gravel in patches. These features were also sealed beneath Roman alluvium. A ditch running approximately east – west through the north end of Site 9, and a short stretch of gully on Site 10, were filled by alluvium and appeared to be Roman in date. The double row of postholes to the north of the channel on Site 9 were also directly filled with alluvium.

3.1.2 Site 21

An area 75 m x 40 m was examined adjacent to the western boundary of Field 12 (Figs 2 and 9). The shape and size of this trench was altered from the original design in order to examine magnetic anomalies revealed by geophysical survey undertaken immediately prior to the excavation. Features which lay within the base of the channel, comprising a waterhole, two ditches and another gravel causeway, were sealed beneath up to a metre of alluvium. The ditches were also filled with alluvium. Discrete features to the north of the channel, which included another waterhole and a pit packed with burnt stone, were cut into the floodplain gravel and overlain by a layer of orange-brown clay silt. This layer has previously been observed over extensive areas of the floodplain and evidence has suggested that it is a Roman ploughsoil.

3.1.3 Sites 4c and 4d

These two trenches were located on either side of the palaeochannel in Field 12 (Figs 2 and 9). Site 4c lay to the north of the channel. Although no features were found in the evaluation trenches in this vicinity, fieldwalking located a light scatter of flints over the surface. The shape of this trench was altered during machining in order to fully expose a concentration of features revealed toward its north end, and was therefore reduced in width at its southern end. Trench 4d exposed an area 50 m x 50 m to the south of the channel.

Features on these sites were all cut into the floodplain gravel or overlying Devensian silt and sealed beneath the Roman ploughsoil. They included the postholes of an oval timber structure at the north end of Site 4c, surrounded by small pits and postholes and, at a short distance to the south, a waterhole. On Site 4d only two cut features were found, comprising a small pit and a shallow feature containing a human cremation deposit.

3.1.4 **Observation area 4e**

Archaeological observation was carried out during ARC's stripping of the topsoil over an area of 1 hectare in the north of Field 12 (Fig. 2). A small number of pits and a possible waterhole found in this area were also cut into the floodplain gravel and overlain by the Roman ploughsoil. A series of Roman field boundary ditches which ran through this area were filled by alluvium.

3.2 **Excavation Method**

3.2.1 **All areas of excavation excluding observation area 4e**

The areas of investigation were stripped of overburden, comprising the modern ploughsoil, various deposits of alluvium and buried ploughsoils, using a 360° mechanical excavator under close archaeological supervision. The exposed areas were then cleaned by hand, planned and photographed (Figs 2, 3, 4, 6, 7 and 9). All pits and postholes were half sectioned, and the sections drawn and photographed, before the remaining half was also excavated.

3.2.2 **Site 9** (Fig. 3)

Stone and gravel causeway

Once the existence of this structure had been established, machine excavation continued cautiously to just above the level of the causeway. After the stratigraphic relationships between the causeway, channel silts and overlying alluvium had been examined and recorded, the final 10 cm of silt above the causeway was then carefully removed by hand to fully exposed the structure, and reveal the collapsed timbers and finds scatters *in situ.*

A detailed 1:10 plan was drawn of the causeway and its associated timbers, and all wood was individually numbered. The structure was also extensively photographed (eg Fig. 4) and this included aerial photography by RCHME. Following advice from Maisie Taylor the fallen timbers were then recorded and lifted by the OAU wood specialist, and a selection of the wood was sampled as appropriate for detailed woodworking analysis, species identification, radiocarbon dating and dendrochronology. Finds which lay over

the surface of the causeway (comprising mostly animal bone) were plotted two-dimensionally and given unique small-find numbers.

The narrow gravel causeway, which overlay the earlier stone structure, was excavated in 5 m lengths and each 5 m length was given a separate context number. Where fallen timbers lay at right angles to, and appeared to be overlain by, this later gravel causeway, segments were initially sectioned longitudinally to explore these relationships. Forty litre samples were taken from each excavated segment for flotation for charred plant remains and to recover small artefacts. Processing of the initial samples revealed that limited waterlogged preservation was also present in this deposit, and additional samples were therefore taken for macrobotanical remains. Although the gravel causeway was completely removed to expose the stonework beneath, a number of sections lines were set up in order to recreate a complete cross section through the causeway and channel deposits (Fig. 5).

Several box sections were initially excavated through the stone causeway to examine the relationship between the surface and the upright wooden posts which were incorporated along the edges of the structure. In order to assess any spatial distributions of artefacts or environmental remains recovered from the excavation of the causeway the structure was in divided up using the following method. The causeway was first divided in half lengthways, and then each half was divided up into 2.5 m segments. Each segment was given an individual context number (comprising 27 contexts in all). Finds of any significance recovered during hand excavation continued to be individually plotted and small-found. Small, unidentifiable fragments of bone were bagged by context. All of the spoil produced from between the stones from each segment was sampled. A minimum of 50 litres of this material from each context was wet sieved through a 10 mm mesh to recover small artefacts. A further 10 litres of soil from each context was then sieved through a 2 mm mesh.

In order to examine the relationship between the causeway and a wooden structure revealed beneath the stonework, and to complete the running sections, a number of the segments were excavated as box sections through the early channel deposits beneath the causeway.

After the stone surface had been completely removed the exposed area of channel silts was scanned with a metal detector. Samples were taken from the early channel silts sealed beneath the causeway for waterlogged macrobotanical remains, pollen and snails.

The stones from a representative number of segments were weighed and counted in order to calculate the overall quantity of stone used to construct the causeway. A selection of stones from each segment was retrieved for geological and wear analysis.

Finds from the channel deposits

Finds which lay over the surface of the channel were plotted two-dimensionally and given a unique small-find number. The surface of the channel was scanned with a metal detector and finds recovered by this method were three-dimensionally recorded. At the

end of the excavation the channel deposits on this site were machined out under archaeological supervision. The channel was divided up into 10 m squares and each square was given a separate context number. All finds recovered during the machining were bagged by context. The spoil, and exposed area beneath the channel, were then scanned with a metal detector.

Double row of postholes to the north of the channel

The full extent of the posthole alignment was exposed in plan and photographed. However, a small baulk was left at right angles to the postholes in order to establish and record the relationship between these features and the overlying sequence of alluviation. All of the postholes were half sectioned, and their sections drawn, before the remaining halves were removed. Both transverse and longitudinal sections were employed to examine the character and construction of these features. Samples were taken from a range of the postholes for flotation for charred plant remains and to recover small artefacts. Matt Canti and Mark Robinson visited the site to examine them and samples were taken for soil analysis.

Waterhole or soaking pit

A feature discovered on the north edge of the channel contained well-preserved waterlogged plant remains, including a layer of fibrous material and a possible bark object. In order to fully expose the bark object the feature was excavated in plan and recorded using a running section. The bark object was recorded and photographed *in situ* before being lifted. In addition to the conventional samples for waterlogged plant remains, a block sample was also taken from the layer of fibrous matter in order to examine the structure of this material and elucidate any process involved in its manufacture.

Burnt treethrow holes

A concentration of burnt treethrow holes were exposed on the south bank of the channel. These features were half sectioned and photographed, and samples were taken for flotation for charred plant remains and mineral magnetic profiling.

All other treethrow holes

A small number of unburnt treethrow were also excavated on this site to confirm their interpretation and to recover possible environmental and dating evidence.

Roman ditches

A section was excavated at the junction of two field-boundary ditches located toward the north-east end of the site in order to examine their relationships and to recover dating evidence. Sections were also excavated against the baulks at either side of the excavation trench to establish the relation between these ditches and the sequence of alluviation.

3.2.3 **Site 10** (Fig. 6)

Gravel causeway

Two metre-wide sections were hand dug through the causeway to recover dating evidence and to examine its method of construction. One of the sections was dug against the south edge of the trench in order to establish the relationship between the causeway, channel deposits and sequence of alluviation. Samples for flotation were taken from the causeway, and samples for waterlogged macrobotanical remains, snail and pollen were taken from the channel silts sealed beneath the causeway. A section had previously been excavated through this feature in the 1993 evaluation (Hey 1994a).

Possible brushwood trackway

A linear concentration of small wooden pegs and brushwood extended across the channel on Site 10. The possible structure was fully exposed, planned at 1:10 and photographed. A box section was then excavated through it and the underlying channel silts in order to examine the character of its construction and relationship with the channel deposits. The wood was numbered and recorded and samples were taken for species analysis and dating.

Finds scatter over surface of the exposed channel silts

In order to assess the spatial distribution of finds which lay over the surface of the channel silts, the channel was divided up into a 10 m grid and each 10 m square was given a separate context number. Finds were then lifted and bagged by context.

Cremations

Two small adjacent pits containing possible cremation deposits were located on the north bank of the channel. These features were photographed in plan prior to excavation. They were then half sectioned, recorded and 100% sampled.

3.2.4 **Sites 9 and 10**

Wooden uprights in channel

The posts were individually numbered and recorded. Box sections were dug against a selection of the posts on each site in order to examine their relationship with channel deposits and to retrieve them for detailed woodworking analysis. In addition wood samples were also taken from a range of the posts for species analysis, radiocarbon dating and dendrochronology.

Channel deposits

Selected areas of the trench sections were carefully cleaned by hand and drawn to record the sequence of channel deposits and overlying alluvium. Soils and sediments were examined by Matt Canti, Mark Robinson and James Greig, and samples were taken for snails, macrobotanical remains and pollen.

Old ground surface

Areas of surviving old ground surface were located on the north bank of the channel on Sites 9 and 10. A small number of finds which lay on this surface were plotted three-dimensionally, and each given a unique small-find number. On each site three 1 m x 1 m test pits were hand excavated through this deposit in 0.10 m spits, and the spoil was dry sieved to recover further artefacts.

Burnt stone features

A number of features were exposed on the north bank of the channel on Sites 9 and 10 containing burnt stone and charcoal. These features were drawn and photographed in plan prior to excavation. They were then half sectioned and recorded, before the remaining halves were removed. These features were extensively sampled for flotation for charred plant remains. Samples were also taken from the deeper features for waterlogged remains (see Section 9 for treatment and recording of burnt stone).

3.2.5 **Site 21** (Fig. 7)

Geophysical survey

Prior to the removal of the topsoil a magnetometer survey was conducted over the site by Archaeometry Branch of the Ancient Monuments Laboratory (AML). (Fig. 18.1, in Section 18). A survey was then undertaken over the same area once the site had been stripped (Fig. 18.4, Section 18). Archaeometry Branch visited the site during the excavation in order to compare the exposed remains with the survey results and to collect samples for mineral magnetic profiling.

A magnetic susceptibility survey was also undertaken over the stripped area by an AML contractor (Adrian Challands) in order to examine activities associated with burnt mound deposits.

Phosphate survey

A phosphate survey was undertaken over the area where the main concentration of burnt mound deposits was located (comprising an area 20 m x 20 m) in order to provide additional evidence of the character of this activity.

Excavation

Waterholes

Two waterholes were discovered, one within the base of the channel and the other on the north bank. The waterhole in the bottom of the channel had been partly backfilled with woodworking debris which included several wooden objects. Due to the character of this deposit this feature was excavated in plan and recorded by using a continuous running section. Large-scale plans and photography were also used to record this deposit at different levels of excavation. Maisie Taylor advised on the recovery of the wood from this feature, and, in addition to the objects, a significant quantity of the woodworking debris was retrieved for further detailed analysis.

The second waterhole, which lay on the north bank of the channel, was initially sectioned through its longest axis (east – west) to incorporate a ramp which led down from the eastern edge of the feature. Once the section had been drawn and photographed, a third quadrant was excavated, and the opposing section drawn, before fully excavating the feature.

Samples were taken from both waterholes for waterlogged macrobotanical plant remains, pollen and snails, and samples were also retrieved for flotation for charred remains and mineral magnetic profiling. In addition, samples were taken from the primary fill of the waterhole in the bottom of the channel for wet sieving in order to recover any small artefacts.

Gravel causeway running along base of channel

Three sections were excavated through the causeway to examine its method of construction and to recover dating evidence. One of these sections was excavated against the baulk at the west edge of the trench to establish the relationship between the causeway and the sequence of alluviation. Samples were taken from the causeway for possible waterlogged plant remains and to recover small artefacts

Segmented ditches in base of channel

Cross sections were excavated through each segment of the ditches, and their sections drawn and photographed. This included a section excavated against the east edge of the trench to establish the stratigraphic relationship between the ditch and the alluvial sequence. In addition, longitudinal sections were also excavated in order to examine the character of these features. At least 50 % of the ditches was eventually excavated in the attempt to recover dating evidence. Samples were taken for waterlogged macrobotanical plant remains.

Channel deposits

Selected areas of the trench sections were carefully cleaned by hand, drawn and photographed to record the sequence of channel deposits and alluviation. Soils and

sediments were examined by Matt Canti, Mark Robinson and James Greig.

Burnt stone feature to north of channel

An oval pit packed with burnt stone and charcoal was half sectioned in the 1993 evaluation. The section of this feature was redrawn and photographed before the remaining half was excavated. Samples were taken from this feature for flotation and soil analysis. A scatter of postholes and stakeholes which lay around the edges of the burnt stone feature were recorded on a large-scale plan (see below for method of excavation).

Burnt treethrow holes on the south bank of the channel

These features were box sectioned, drawn and photographed. Samples were taken for flotation for charred plant remains and mineral magnetic profiling.

3.2.6 **Sites 4c and 4d**

Waterhole on Site 4c

This feature was half sectioned, and the section drawn and photographed, before the remaining half was excavated. Forty litre samples were taken from each of the upper fills for flotation for charred plant remains and small artefacts. The lower fills of this feature were waterlogged, and were sampled for macrobotanical plant remains, pollen and snails.

Post-built structure at north end of Site 4c

The area where the post-built structure was located on Site 4c was carefully cleaned by hand several times to expose its full layout. All of the postholes were sampled for floatation in order to recover charred food remains and suitable material for radiocarbon dating.

Treethrow holes

A sample of burnt and unburnt treethrow holes was sectioned on each of these sites to recover dating evidence and to examine the character of these features.

3.2.7 **Observation area 4e**

ARC's topsoil stripping was observed over an area of 1 hectare in the north of Field 12. Features were planned using a total station. Selected areas were cleaned by hand to reveal the full extent of features. As the prehistoric features uncovered in this area were small in number but significant in character, all were half sectioned, recorded and then totally excavated. These features were also extensively sampled for waterlogged and

charred plant remains, pollen and snails. Small sections were dug through the Roman field boundary ditches which ran through this area to record their depth and character.

3.3 **All Sites**

Recording Method

All contexts were given a unique number, as were plans, sections, small finds and soil samples. Finds from discrete features were normally bagged by context, except pieces of worked waterlogged wood which were given their own individual context number. The treatment of finds from *in situ* scatters are described above.

Burnt stone and flint

Burnt stone recovered from all features was identified by stone type, weighed and counted on site. All worked stone and flint was retrieved for further analysis; local stone was discarded.

Environmental sampling

Previous experience had shown that those features containing visible quantities of charcoal were the most likely to produce charred plant remains. Contexts with particular potential were selected for sampling but care was taken to ensure that a complete range of feature types, areas and periods was represented.

The waterholes on Sites 9, 21 and 4c, and the channel and causeway deposits on Site 9 in particular were sampled for a range of analyses, including charred plant remains, pollen, molluscs and waterlogged samples.

Mark Robinson visited the site to discuss the environmental sampling strategy.

Dale Serjeantson of the Faunal Remains Unit (FRU) visited to monitor recovery of animal bone, both in hand excavation and sieving.

Recovery and conservation of waterlogged wood and metal objects

Maisie Taylor and Vanessa Fell (AML based at the Institute of Archaeology, Oxford) were consulted to advise on the recovery, conservation and storage of waterlogged wood recovered from the causeway and waterholes. The wooden bowl and bark object have been sent for immediate conservation. These objects were drawn and photographed, and samples were taken for radiocarbon dating, prior to conservation. The need for long term conservation and storage of further wooden objects, including the log ladder, are currently being assessed. The metal objects recovered from the causeway and channel on Site 9, including the bronze spearhead, were also assessed for conservation by Vanessa Fell and these objects are currently held at the Institute of Archaeology, Oxford.

On site recording of worked wood

On site recording of worked wood was undertaken by OAU wood specialist Nick Mitchell. All wood was individually numbered, and its character and dimensions were recorded on a specially designed sheet. In consultation with Maisie Taylor (see below), Nick Mitchell was also responsible for selecting samples of wood for species analysis, and radiocarbon and dendrochronological dating.

Site archive

Site records were archived and entered onto a database and the site plans were digitised. Photographs were labelled and, as with plans and sections, were stored in an appropriate manner. The quantities and weights of finds were entered onto a database.

Features and deposits were ordered into context groups (See Appendix 1).

3.3.1 **Post-excavation Method**

The rarity of stratified deposits and physical relationships meant that only limited phasing could be achieved by this method. Some features were clearly related to others, however, by their patterning and/or similarities of shape or fill. Contexts were assigned to contexts groups in order to facilitate structural analysis, provide accessible information for specialist and assist in the integration of results of their analyses. This was done on stratigraphic grounds where possible, but was also done on spot dating and spatial grouping of features. It must be appreciated that these groupings, like the dating, are provisional, and the paucity of pottery means that a number of the major features discovered remain poorly dated. Further analysis of the finds, fill types, spatial relationships, and information from radiocarbon dating will undoubtedly result in changes to these groups. A table listing the context groups, with a brief description and their suggested dating, can be found in Appendix 1.

The information on context groupings was provided to specialists who assessed the finds and the environmental material. Using their provisional results the integrity of the context groups was checked and an assessment was undertaken of the potential for spatial and structural analysis. A preliminary phase plan was created using these results (Fig. 10).

Using the provisional phase plans, and combining the context and finds databases, limited analysis was undertaken to examine the distribution of finds by period and by feature type within each feature. This method was also used to examine the occurrence and distribution of carbonised plant remains and charcoal.

3.4 Site Summaries and Quantification

3.4.1 All sites

968 individual contexts were recorded and these were ordered into 74 different context groups.
97 plans and 225 sections were drawn
2300 photographs were taken

3.4.2 Site 9 (Fig. 9)

The removal of the overlying ploughsoil, and Roman and medieval alluvium, revealed the course of the palaeochannel defined by its fill of dark grey organic silt. Higher gravel banks were exposed to either side of the channel. The channel appeared to have been approximately 35 m wide and 0.50 m deep. Spreads and dense concentrations of gravel, and a scatter of animal bone lay over the surface of the channel deposits at this level. A small quantity of worked flint and several metal objects were also recovered from this layer. Two double rows of upright wooden posts (c. 0.10 - 0.15 m in diameter) extended across the channel protruding up through the silts.

Hand excavation of the upper layers of channel silt adjacent to the west edge of excavation exposed a limestone causeway, 35 m in length and 5 m in width, which spanned the channel (Fig. 4). The causeway was constructed of up to three layers of small, flat, rounded limestone slabs, with quartzite pebbles used as infilling to create metalling of the upper surface (Fig. 5). The remnants of upright wooden posts lay along the edges of the stone structure, and fallen timbers, and a dense scatter of animal bone, lay over the surface. A later phase of narrow gravel trackway extended along the centre of the stone causeway partly overlying the fallen timbers, and continued on the north bank of the channel, where it curved round to the east. Investigation of this gravel trackway identified two distinct phases of construction. The removal of the gravel surfaces revealed that the stonework beneath was much disturbed, and a row of small roundwood stakes was exposed protruding up along the middle of the southern half of the causeway. It remains uncertain whether these stakes were part of a wooden structure (such as a brushwood trackway) which predated the causeway or marker posts associated with its construction. A layer of early channel silt seen in section beneath the stone causeway appeared to be much disturbed by animal trample (Fig. 5).

More animal bone, a small quantity of pottery and worked flint, including a number of flint tools, were recovered from the excavation of the stone causeway, and a bronze spearhead (Fig. 4) and an awl were found directly beneath it. Additional small bone was retrieved from wet sieving the soil from between the stones and this included a small number of fish bones. The pottery was a small assemblage of only 13 sherds, ranging in date from middle Bronze Age to early Iron Age. All of the sherds were small, mostly weighing 3 to 9 g. Some or all of them may have fallen between the stones. However, five possible early Iron Age sherds were associated with the later gravel trackway.

The possible gravel causeway partly exposed in the evaluation of this area in 1993 (Hey 1994a) was revealed to be a waterlain deposit of gravel within the channel silts to the east of the stone causeway. The accumulation of this material was almost certainly a result of the presence of the various structures which crossed the channel up stream.

Machine excavation of the channel deposits at the end of excavation produced a further assemblage of animal bone, but no other finds despite careful observation and metal detecting.

A feature on the north edge of the channel appeared to be a waterhole or soaking pit, and contained well-preserved waterlogged remains including a possible bark object and a layer of fibrous plant material. Two irregular-shaped features excavated immediately to the north of the waterhole were treethrow holes. Features located further to the west along this bank of the channel included four pits of varying sizes containing burnt stone. The largest of these pits was sealed beneath an area of metalling associated with the use of the gravel trackway. In addition to burnt stone, this feature also contained a complete red deer antler, several pieces of waterlogged wood, a large sherd of Beaker pottery and a small flint knife of similar date. However, the burnt stone in this feature, and in two of the other smaller pits, mostly comprised the same type of limestone used to construct the causeway. The early pottery and flint in this feature may therefore be redeposited.

A small scatter of worked flint was located on the buried ground surface to the north of the channel, but no finds were recovered from the test pits excavated through this layer. A double row of postholes/slots was cut into the old ground surface and lay in a north-west – south-east alignment adjacent to the east edge of excavation. The alignment extended over a distance of 23 m before terminating at the edge of the channel. The features were entirely filled with alluvium and four sherds of Roman pottery were recovered from them. A flint scraper retrieved from one of the postholes was almost certainly redeposited and probably derived from the old ground surface. The features which formed the alignment ranged in character from circular postholes, 0.25 m in diameter and 0.06 m in depth, to linear slots, 1 m in length x 0.26 m in width and 0.08 m in depth. A ditch which ran ESE - WNW in the north of the excavation was also filled with alluvium and appeared to be a Roman field boundary. It was observed that the row of postholes/slots lay at right angles to this boundary and may therefore be associated. Nevertheless, the exact function of the features remains unclear.

The only features discovered in the area to the south of the channel were a small number of treethrow holes which included a concentration of features along the edge of the channel. No finds were recovered from them.

3.4.3 **Site 10** (Fig. 6)

The character of the channel deposits seen in this trench were similar to those on Site 9 and included a scatter of finds over the surface of the channel, revealed after the Roman alluvium had been removed. There were also similar arrangements of upright wooden posts extending across the channel. However, although this site lay only 100 m to the west of Site 9, the character of the earlier alluvial sequence was different.

A cambered gravel causeway (first seen in the 1993 evaluation) was exposed crossing the channel adjacent to the east edge of excavation (Fig. 6). The causeway was 1.5 m in width and comprised two separate phases of construction. No finds were recovered from it. A linear concentration of wooden pegs and wood debris extending across the channel to the west of the causeway was possibly the remnant of a brushwood trackway. A small assemblage of middle Bronze Age pottery was associated with this structure.

A pit packed with burnt stone and charcoal was located on the north bank of the channel, and this feature produced a large assemblage (193 sherds) of decorated Beaker pottery and a small quantity of worked flint. Two shallow features which also lay on this bank contained cremation deposits.

The only other feature discovered on this site was a small length of east – west aligned alluvium-filled gully located in the north-east corner of the trench. This gully lay on the same line as the Roman field boundary on Site 9 and was almost certainly associated.

3.4.4 **Site 21** (Fig. 7)

A linear depression ran east – west through the southern end of the trench representing the line of the shallow channel. However, there were no organic silts within this channel, and a number of features located in the base of the channel, including another gravel causeway, two clay-filled ditches and a waterhole, were directly overlain by alluvium. The causeway, which ran obliquely to the channel, was much eroded and discontinuous. One of the ditches ran parallel to the east of the causeway and was possibly associated. The other ditch, which was segmented, ran parallel to the channel. No finds were recovered from the causeway and the only finds from the ditches comprised a single very worn sherd of late Bronze Age pottery and two horse bones.

The removal of a capping of alluvium in the top of the waterhole revealed that this feature had been partly backfilled with woodworking debris, and several wooden objects including a log ladder and a broken bowl (Fig. 8) were retrieved from this deposit. The only other finds recovered from the waterhole comprised a deer jawbone, a fox skull and a small quantity of burnt stone. The preservation of the worked wood and other waterlogged plant remains recovered from this waterhole was exceptional, and this was almost certainly due to the comparative depth of this feature, which had been dug into the base of the channel and had become sealed beneath over a metre of alluvium. A second waterhole lay on the north bank of the channel and this feature had a ramp leading down from its west edge. Several large sherds of middle

Bronze Age pottery were recovered from the primary fill of this feature.

Further to the north of the channel lay a sub-rectangular pit packed with burnt stone and charcoal, and surrounded by a scatter of stakeholes. Three sherds of early Bronze Age pottery were recovered from this feature to add to the two sherds of late Neolithic/early Bronze Age pottery previously recovered from it in the evaluation (Hey 1994a, 103). A small number of shallow pits were also located in the area of the site. Although none of these features produced any dating evidence, several of them did contain burnt stone suggesting that they may be associated with the burnt mound feature.

In addition to the cut features a small number of treethrow holes were also examined on this site and this included a concentration of burnt treethrow pits on the south bank of the channel. A small quantity of worked flint was recovered from both the burnt and unburnt features.

The geophysical plot revealed a significant magnetic anomaly to the north-east of the area of excavation and the trench was therefore extended to investigate the cause of this reading. However, no corresponding archaeological feature was discovered and this area of the site was completely devoid of features (Fig. 7). This anomaly may therefore have been created by material within the modern ploughsoil.

3.4.5 **Site 4c** (Fig. 9)

The removal of the modern and buried Roman ploughsoils revealed numerous discrete features cut into gravel and silt, comprising pits, postholes and treethrow holes. Although features were scattered throughout the area of excavation two obvious concentrations could be observed, one located at the north end of the trench and the other towards the southern end (Fig. 9). Within the cluster of features at the north end of the site was a sub-circular arrangement of postholes forming the ground plan of a post-built structure *c* 5 m x 4.5 m in size. A shallow rectilinear pit packed with burnt stone and charcoal appeared to cut two postholes on the northern edge of the post ring, suggesting that it post-dated the structure. However, given its location, it remains possible that this feature was associated with secondary structural phase. A large majority of the postholes which formed the post ring also contained burnt stone, and one posthole produced a small quantity of charred wheat and barley grains. The only other finds recovered from the structure were a few pieces of worked flint. The features surrounding the building comprised further postholes and a number of shallow pits. Two of the features in this group produced middle Bronze Age pottery.

A much larger pit (1.4 m in depth) located 30 m south-east of the building appeared to be a waterhole and there was good organic preservation in the lower fills of this feature. A number of finds were recovered from the upper fills of the waterhole, including articulated sheep bones, a flint scraper and two sherds of Bronze Age pottery, but no artefacts were recovered from the lower fills. A small pit and two treethrow holes which lay just to the west of the waterhole contained ash and charcoal-rich fills. Fragments of burnt bone and a single sherd of early Bronze Age

pottery were recovered from the pit and a large flint core was retrieved from the largest of the treethrow holes. These two features also produced charred hazel nut shells.

The light scatter of features located in the central area of the site included a pit containing a deposit of broken middle Bronze Age cylindrical loomweights and a fragment of saddle quern. The group of features located toward the south end of the trench included another concentration of postholes. However, no structures could be defined, and the small quantity of pottery recovered from the feature at this end of the site ranged in date from Beaker to late Bronze Age.

3.4.6 **Site 4d** (Fig. 2)

Numerous treethrow holes were scattered throughout the area of excavation but only two cut features, a small pit and a human cremation, were discovered, and these both lay in the north-west corner of the trench, on the southern bank of the palaeochannel. Two large sherds of middle Bronze Age pottery and a decorated bone pin were recovered from the pit. A selection of the treethrow holes was excavated but none of these produced finds.

3.4.7 **Site 4e** (Fig. 2)

Only a light scatter of discrete features was discovered during the observation of this area and no concentrations or specific areas of activity were located (Fig. 2). However, the features that were discovered included several large finds-rich pits and a possible waterhole which produced significant assemblages of middle Bronze Age pottery and charred plant remains. The largest of the pits, which was 0.75 m deep, also produced nearly 300 kg of burnt limestone. The lower fills of the possible waterhole were waterlogged, and an assemblage of plant and macrobotanical remains was recovered from this feature which were very similar in character to those recovered from the waterhole on Site 4c. Waterlogged preservation was present in the lower fills of another pit in this area and a wooden post was discovered in the base of this feature. This pit also contained a curious mixture of finds, consisting of middle Bronze Age pottery, flint tools and debitage thought to be Neolithic in date, and a deposit of charred grain, comprising the largest assemblage of charred grain ever recovered from prehistoric features on the floodplain.

In addition to the prehistoric features, a series of north – south Roman field boundary ditches ran through this area, one of which formed the continuation of a ditch partly exposed on Site 9.

3.5 Condition of the Archaeology and Comments on the Results

In the three main areas of excavation, Sites 9, 10 and 21, the prehistoric features were sealed beneath varying depths of alluvium, and were generally well preserved, having been protected from modern cultivation. The features and deposits located in the base of former stream channels, which included the stone and gravel causeways, rows of wooden uprights, and the waterhole containing the woodworking debris, lay buried beneath up to a metre of alluvium and had been completely undisturbed. In addition, this thick capping of alluvial clay, and the low-lying nature of these deposits, had created excellent conditions for the preservation of waterlogged wood and other plant remains. The overlying stratified sequence of channel silts and alluvium also allowed for some confidence in the initial dating of these deposits, which were otherwise poorly dated.

It is likely, however, that Roman ploughing had truncated the tops of some of the features which lay on the higher gravel islands prior to the onset of overbank alluviation. Nevertheless, the survival of the layout of the post-built structure on Site 4c suggested that even here this had not been substantial.

The cruder machining techniques employed by ARC during their stripping in the north of Field 12 (observation area 4e), and the limited hand cleaning that could be undertaken in this area, means that smaller features, most notably postholes, would have been missed. Given the nature of the features that were discovered in this area, and the character of the finds assemblages recovered from them, it is likely that there were structures in this vicinity which were not located.

3.6 Documentation

Yarnton Floodplain B forms part of the Yarnton-Cassington study area for which information has been and is being amassed on landscape and land use, as well as on contemporary sites in the locality.

The adjacent Yarnton Floodplain sites (YFP and YFPB 95-97) provided extensive evidence of settlement from the Neolithic through to the late Bronze Age (Hey 1993b; Hey 1996; Hey and Muir 1997, Bell and Hey 1998) and areas where 'off-site' activities took place have also been located. The 1992 excavation on the floodplain (Hey 1993b) found deposits relating to Bronze Age burnt mound and woodworking activity along the edges of a palaeochannel, and several gravel causeways which spanned the channel. In the 1997 excavation (Bell and Hey 1998) two adjacent areas of Bronze Age burnt mound activity were located on the edge of a shallow palaeochannel, each associated with a waterhole containing waterlogged deposits including worked wood. In addition burnt mound deposits have been found on the edge of a channel on the adjacent second terrace.

Evidence of Roman land use has been observed over a large area of the floodplain, and a picture of extensive field systems and droveways is emerging.

3.7 Conclusions and Statement of Potential

3.7.1 Summary

The Yarnton Floodplain B 1998 excavations examined a range of structures and deposits relating to Bronze Age settlement and the use of palaeochannels which will make a major contribution to understanding the character of earlier prehistoric habitation in this area. Extensive waterlogging led to the recovery of wooden structures in the palaeochannels and rare wooden objects which will substantially add to the evidence for Bronze Age woodworking, and provide a rare insight into the activity for which they were made. Waterlogged macrobotanical and plant remains were also recovered from a range of features and deposits from which evidence will emerge of the prehistoric floodplain environment and land use.

3.7.2 Potential for Spatial and Structural Analysis of Features

The nature of the deposits in the three palaeochannel trenches (Sites 9, 10 and 21) and the small number of contemporary features within each of these areas, creates only limited potential for analysis of their spatial distribution. The most significant aspect of these deposits lies in their contribution to the overall picture of prehistoric activity, land use and landscape on the floodplain, and in particular the opportunity to examine the contrasts between these areas and the areas of settlement. Nevertheless, stratigraphic analysis of groups of associated deposits in the channels should enhance our understanding of the activities undertaken there. The character and preservation of some of these deposits discovered, including the stone causeway, wooden structures and waterholes, also makes them significant in their own right and worthy of detailed analysis.

There is potential for wider spatial distribution and structural analysis for Sites 4c and 4e, where an unexpectedly large number of features relating to Bronze Age settlement were found. The range and character of features discovered also provides the potential to examine settlement layout. Dating may show deposits in the palaeochannel trenches were contemporary with this activity.

The stone and gravel causeways

The beautifully preserved stone causeway found on Site 9 in association with Bronze age metalwork and deposits of animal bone, represents an important and unexpected discovery which adds to the range and character of prehistoric remains discovered on the floodplain at Yarnton. This structure is also important on a national level and no parallels have yet been discovered. It was located within a complex sequence of channel deposits and overlying alluvium. In addition to the stone surface, the causeway incorporated a number of wooden structures and later phases of gravel surfaces, and was

also associated with large deposits of animal bone. Detailed stratigraphic and structural analysis will be necessary to define the phasing of the various structural elements and their relationship with other deposits within the channel, and to provide further evidence of the character of construction. The preservation of a sequence of wooden structures which formed part of the causeway should enable the stone surface and the later phase of gravel trackway to be closely dated by radiocarbon determinations, or possibly by dendrochronology. However, the character, and paucity of artefacts from the gravel causeways found on Sites 10 and 21 means the dating of these structures may be reliant on spatial and stratigraphic evidence.

The gravel causeways found on Sites 10 and 21 add to the already numerous causeways and other structures previously found in association with the palaeochannels. Once they are dated the location of all of these crossing points can be examined in relation to topography and settlement. The longevity of these crossings, and their influence on the location and layout of settlement and subsequent field-systems can also be investigated.

Wooden structures within the channel

A linear concentration of wooden pegs and brushwood debris extending across the channel on Site 10 was possibly the remnant of a brushwood trackway and this structure was associated with a small assemblage of middle Bronze Age pottery. This possible trackway was aligned on the Bronze Age building on Site 4c and may be contemporary with it.

Double rows of upright wooden posts, and a number of apparently random posts, were found in the channel in Sites 9 and 10. Similar arrangements of posts were found in a channel in the 1992 excavation on the floodplain (Hey 1993b Site 1). The function of these posts remains unclear, and the problem of establishing which layers of channel silt the posts were driven from, and which layers silted up around the posts, also makes their phasing uncertain. Although this may be clarified to some degree by further detailed stratigraphic analysis, the exact dating of these structures will be reliant on radiocarbon determinations. Once the date of these structures has been established their possible function may become clearer. Were they associated with the use or construction of the causeways, or could they even be related to burnt mound activity ?

Waterholes associated with palaeochannels

Two waterholes were found on Sites 21, one located in the base of the channel and the other on the north bank, and another waterhole was discovered on the north edge of the channel on Site 9. These features lay away from main areas of settlement, and some or all of them may be directly associated with burnt mound activity or a similar process. Along with the burnt mound deposits, these features therefore represent evidence of activity undertaken away from habitation, and examining the location of these features will help to elucidate the overall layout and character of settlement and land use.

In addition to the waterhole found in the base of the channel on Site 21, two waterholes were previously found in the base of a shallow channel in one of the 1997 areas of

excavation (Bell and Hey 1998, Site 17). The location of these waterholes may reflect their early date as they appear to have been dug when conditions on the floodplain were resulted in a lower water table and shallow channels being seasonally dry. Despite its location one of the waterholes found in the channel in 1997 contained no waterlogged remains. This contrasted sharply with the waterhole found on Site 21 in which the waterlogged preservation was exceptional. Once dated, analysis of the relative levels of these features, and the depth and at which waterlogging survived, may provide important evidence on the changing hydrological conditions on the floodplain which preceded the onset of overbank alluviation.

Burnt mound deposits

Features containing burnt stones were located on all three of the main areas of excavation (Sites 9, 10 and 21) and spreads of this material were also found, though these were less extensive on Site 21 than was suggested by the evaluation. Two waterholes on Site 21 may also be associated. In addition, a large pit containing nearly 300 kg of burnt limestone was found in observation area 4e, although this may relate to an entirely different activity. These features and deposits are believed to be the remains of levelled burnt mounds and associated activity and are referred to as such in this report. This assumption will, however, need to be evaluated through further analysis

Once all of these features have been dated, the location of this activity can be examined in relation to contemporary settlement, and comparisons made with the character and distribution of burnt mound deposits previously discovered in the study area. Patterns in the distribution and character of these deposits maybe emerging. For example, burnt mound activity appears to be predominantly located on the north banks of the palaeochannels, and in earlier periods waterholes were more commonly associated with burnt stone generation, possibly because of generally drier conditions and a lower water table. Further work is needed to validate these observations.

The palaeochannels

The causeways, wooden structures, burnt mound deposits, waterholes, finds scatters and layers of animal trample, all contribute to an understanding of the use of the palaeochannels and of off-site activity. There is potential to define the stratigraphic sequence of the channel deposits and alluviation in order to elucidate the character of the activities which took place here and their chronological relationships. This will enable environmental evidence to be linked to human activity.

Cremation deposits

A small number of human cremation burials were found on the banks of the channel on Sites 10 and 4d. The location and distribution of these deposits can be integrated with an important body of data on prehistoric burial and the varied locations in which these are found.

Bronze Age settlement features

An unexpected number of features associated with Bronze Age settlement, including a post-built structure, two waterholes and scatters of pits and postholes were discovered on sites 4c and observation area 4e. Provisional dating suggests that these features could represent a broadly contemporary middle Bronze Age group. There is potential to examine the spatial arrangement of features in order to provide evidence of settlement layout and character. If radiocarbon dating should reveal that some of the causeways, wooden structures and waterholes in the channels, are of similar date, the potential to examine settlement layout and land use would be further increased.

Initial observation suggests the overall character of this area of settlement is very similar to an area of middle Bronze occupation examined in 1992 in the east of the study area (Hey 1993b, Site 1). The size and shape of the post-built structure found on Site 4c also appears similar to those found in 1992. Patterns may therefore be emerging in the layout and character of Bronze Age settlements which merit further investigation. The middle Bronze Age settlement excavated in 1998 will therefore significantly enhance our understanding of the changing character of settlement which forms such an important element of the Yarnton-Cassington research project.

Treethrow holes

Concentrations of burnt treethrow holes were located of the banks of palaeochannels on Sites 9 and 21. Only a small number of finds were recovered and none of this material provided substantial dating evidence. However, the distribution of these features will contribute to the overall pattern of tree clearance throughout the study area.

Roman

A number of Roman features and deposits were discovered on all six areas of investigation, comprising ditches, gullies and ploughsoils. Although dating evidence from these features was scarce, their date was substantiated by stratigraphic evidence and in some cases by the spatial distribution and alignment of features. There is potential to integrate these findings into the existing body of evidence on landscape and land use in the Roman period.

3.7.3 **Potential for Artefact and Ecofact Distribution Analysis**

Palaeochannels and associated structures

A dense scatter of animal bone lay over the surface of the stone causeway discovered on Site 9, and further deposits of animal bone and other artefacts, including a bronze spearhead and an awl, were recovered from within and beneath the stonework. Animal bone, worked flint, worked and burnt stone and small number of metal objects, were also recovered from the surface of the palaeochannel on Sites 9 and 10. There is potential to undertake detailed analysis of the distribution and character of this material

in order to examine the use of the channels and of the stone causeway and patterns of finds deposition (deliberate or casual) in these locations.

Provisional analysis of the assessed sample of animal bone recovered suggests that it comprises almost entirely cow and horse. The character of the assemblage, and the recovery of sheep bone from a number of the Bronze Age features, including burnt stones pits adjacent to the causeway, implies that this is not merely a result of preservation. Observations can also be made about the character and occurrence of worked flint from the channel and causeways on Sites 9 and 10. For example, this material included a high percentage of piercers, which could suggest evidence of leather working or other such process adjacent to the channel. Detailed analysis of all the finds recovered is needed to validate these initial observations and to establish wider distribution patterns. In order to substantiate these findings work is also needed to compare the character and distribution of finds from the channels to those recovered from features in areas of settlement.

Burnt mound deposits

In general only a small number of finds were recovered from these deposits, and although they were extensively sampled, none produced charred plant remains. There is therefore little potential for detailed analysis of finds distributions. Important conclusions may however result from comparing the types of finds from similar features across the study area. A burnt stone feature discovered on the edge of the channel on Site 10, however, contained a large assemblage of early domestic Beaker pottery which is of particular significance as it provides the earliest-known example of this type of deposit found within the study area.

Waterholes associated with palaeochannels

The location of waterholes within or adjacent to the palaeochannels on Sites 9 and 21, resulted in the preservation of Bronze Age woodworking debris and plant remains deposited within them, and led to the recovery of rare wooden objects, including a log ladder, a bowl and a possible bark container. However, the absence of pottery or domestic animal bone from either of these features suggests that the character of the finds assemblages may relate to their location and function. Comparing the composition of finds within these features with those found within the areas of settlement may therefore provide further evidence in the differences between settlement and off-site activity. In addition to the wooden objects, the waterhole on Site 21 also contained a fox skull and deer jawbone. Finds recovered from other waterholes excavated within the study area include wooden objects, antler picks, human and wild animal bones. A pattern may therefore be emerging to suggest deliberate placing of deposits within these features.

Features associated with Bronze Age settlement

The features associated with Bronze Age settlement on Sites 4c and 4e produced a range of finds including pottery, loomweights, worked flint, animal bone, burnt stone and

charred plant remains. It has, up to now, proved difficult to recover plant foods from the prehistoric sites excavated on the Yarnton floodplain. In addition waterlogged macrobotanical remains were recovered from the lower fills of the waterholes. There is potential to examine the distribution of all these finds to enhance our understanding of the character of the settlement and identify areas of activity.

Environmental evidence

Waterlogged insects and seeds, charred plant remains, snails and pollen were recovered from a range of deposits which will provide information which can be integrated into the wider picture of the character and variability of the environment and land use across the floodplain. The recovery of environmental evidence from various features and deposits associated with the palaeochannels will provide an important contrast to samples taken from the areas of settlement. Some of the environmental remains recovered from the waterholes within and adjacent to the channels may also comprise material directly associated with burnt mounds or other off-site activities.

Examination of the spread of charred food remains and worked flint in a number of the treethrow holes on Site 4c may clarify whether some clearance took place only a short time before, or possibly at the same time as, the Bronze Age settlement activity.

4 Pottery

by Alistair Barclay, with identifications of Roman pottery by Paul Booth

4.1 Introduction

This report assesses the pottery recovered from sites 9, 10, 21, 4c, 4d and the observation area 4e. The 1998 excavation produced a total of 548 sherds (2.5 kg) of prehistoric pottery and ten sherds of late Iron Age and Roman pottery. The prehistoric pottery ranges in date from Neolithic through to Iron Age and includes important groups of late Neolithic Beaker pottery and middle Bronze Age Deverel-Rimbury pottery. Most of the Beaker pottery is from a single pit, although the assemblage represents an important group of material. The middle Bronze Age pottery is important as both an assemblage and because of the range of contexts that it is associated with which includes a trackway, waterholes and domestic features. The recovery of later Bronze Age and early Iron Age pottery from channel deposits and causeways is an important association.

4.2 Methodology

All the pottery was examined, including material recovered from sieving. The assemblage was recorded by ceramic style, fabric group and where possible assigned to a chronological period and is quantified by sherd count and weight. A record was made of visible residues (eg charred).

4.3 Range and Variety of Material

Most of the assemblage spans a period from the late Neolithic through to the end of the late Bronze Age (approx. 2500-700 BC). Most of the material by belongs to either the late Neolithic Beaker phase (2500-2150 cal BC) or the middle Bronze Age (1750-1150 cal BC). The relatively large quantity of Beaker comes from a single feature in Site 10, while the middle Bronze Age pottery is spread across all of the excavated sites with notable concentrations in sites 21, 4c and 4e.

4.4 Condition

To some extent the condition of the pottery is dependent on fabric, context and the actual date of the material. Pottery in quartzite or flint-tempered fabrics tends to be better preserved than pottery in shell-tempered fabrics which can be leached and in a friable condition.

4.5 **Quantification**

The 548 sherds (2.5 kg) are summarised in Table 4.1. Small crumbs and fresh breaks are included in the sherd count, along with sherds recovered from sieving. To some extent the sieved material inflates the quantification and reduces the average sherd weight.

Table 4.1**:** A summary breakdown of the pottery by site (number of sherds, weight).
* includes sieved material.

	Site 9 CG1-26	Site 10 CG27-41	Site 21 CG43-54	Site 4c CG55-65	Site 4d CG66-70	Area 4e CG71-4	Total
LNEBA	1, 1g	1, 2g					2, 3g
Beaker	1, 12g	*223,744g		1, 1g		*1, 1g	226, 758g
EBA			1, 19g	2, 12g		3, 11g	6, 42g
MBA	2, 23g	9, 24g	14, 104g	*39, 45g	2, 33g	*171, 1187g	236, 1416g
M-LBA	1, 11g	1, 4g		23, 12g		4, 14g	29, 41g
LBA	7, 55g		1, 6g	2, 13g	4, 6g	1, 13g	15, 93g
IA	14, 84g						14, 84g
Indeterminate	*16, 8g	* 1, 1g	2, 7g			*1, 1g	20, 17g
Roman	9, 187g	1, 5g					10, 192
Total	51, 381g	236, 780g	18, 136g	66, 83g	6, 39g	181, 1227g	558, 2646g

A summary of the Pottery Styles

Neolithic
This category includes only plain body sherds with date assigned purely on the basis of fabric analysis.

Beaker
Both fine and domestic wares occur. Typologically most of the Beaker pottery is early. The sinuous profiles, the use of either all-over comb or more complex motifs and the use of aplastic finger-nail impression on coarser domestic vessels perhaps indicate association with styles such as Wessex/Middle Rhine. Some vessels are predominantly flint tempered.

Collared Urn
A grog-tempered collared sherd represents a single late style vessel.

Biconical Urn
A small number of grog-tempered sherds are from early Bronze Age Biconical Urns. Most are body sherds identified by fabric, although one rim is present.

Deverel-Rimbury
Somewhere in the region of 20 vessels are present and this includes both Bucket Urns and Globular Urns. This material is predominantly manufactured from shell-tempered fabrics. One unusual Globular Urn is decorated with a nested chevron motif and two Bucket urns have all-over finger-nail decoration. A small number of these vessels have charred residues.

Late Bronze Age
A small number of sherds are from late Bronze Age vessels. Fabrics tend to be quartzite-tempered. Two rims are from hooked rimmed jars, another is everted, probably from a shouldered vessel.

Early Iron Age
A number of shell-tempered sherds are likely to be of early Iron Age date. This includes a rim and a shoulder from two angular bowls.

Indeterminate
A small number of featureless sherds are too small to be assigned to any particular fabric, although most are probably prehistoric.

Roman
Vessel types represented by rims were a jar in fabric R30 and a flanged bowl in R10, the latter assignable to the 2nd century AD, the former not closely datable but perhaps of 3rd-4th century date. Most striking was the sherd in fabric A22, from the neck of an amphora. The form is uncertain, but may have been Dressel 2-4, in which case a 1st-mid 2nd century date range is likely. This piece, while not intrinsically very remarkable, is very unusual in the context of Yarnton, where only one other amphora sherd is recorded from the whole area.

4.6 Documentation

The later Neolithic-Bronze Age and Iron Age ceramic sequence from these sites complements what has been found in previous excavations on the floodplain and overlaps with the late Bronze Age through to Saxon sequence from Yarnton Worton Rectory Farm and Cresswell Field. Where material overlaps, use can be made of existing fabric and type series.

4.7 Potential and Discussion

The quality of the ceramic assemblage from the 1998 excavations is excellent with material coming from a number of important contexts.

National and Regional
The 1998 assemblage has produced two important groups of material. The first is an assemblage of `early' Beaker Domestic pottery likely to fall with the date range of 2500-2150 cal BC. This material is generally much rarer than the more typical British Beaker Domestic assemblages (*cf*. Gibson 1982). In the Upper Thames valley there has been an increase in the number of recently-discovered Beaker domestic sites, many of which have produced what can be described as early assemblages. The suggested early date for some of these sites (eg Roughground Farm, Lechlade and Trinity Farm, Bagendon) is supported by radiocarbon dating. Yarnton has now produced a significant quantity of

Beaker material from a range of contexts and the potential is there to examine the development of Beaker Domestic assemblages from a single well excavated and understood landscape and place this in its wider regional context. Yarnton can be used as a basis to review the regional evidence for early Beaker domestic assemblages, to define their character and establish their date. On the strength of this evidence previous claims that Beaker pottery is somehow downgraded from prestige ware to domestic ware by the early Bronze Age can be seriously challenged (see Bradley 1984, 72 and fig. 4.2; Whittle 1981).

The second important assemblage is of middle Bronze Age date and belongs to the Deverel-Rimbury tradition. The pottery from Yarnton is important because of its associations with environmental remains and because of its deposition in a wide range of feature types. Outside Wessex, East Anglia and the Middle Thames valley there are still relatively few good assemblages of such material from domestic sites. This is certainly true of the Upper Thames. Therefore, Yarnton presents the opportunity to characterise such a domestic assemblage, containing both Bucket and Globular Urns, for this region. This can then be compared with other regions. Some of this pottery was recovered from features that are likely to contain good samples for radiocarbon dating and some vessels have charred residues that would allow direct dating of individual vessels. The potential is there to obtain a good sequence of dates for this material and its associated contexts.

Intra- and inter-site

The pottery provides one important strand of evidence for when and how the wider landscape at Yarnton was occupied. The concentration of some of this material in certain areas indicates foci of activity, while low concentrations in some of the other areas perhaps reflects the nature of different off-site activities. The recovery of Beaker pottery from pit deposits adds to the established picture of the Yarnton landscape. The relatively large quantity of middle Bronze Age pottery from a range of domestic features is important, as settlements of this date are rare within the region. The pottery also indicates that a number of waterholes and a brushwood trackway could be of this date. The assemblage also represents the greatest concentration of this material so far found during the Yarnton project. The presence of late Bronze Age and mostly early Iron Age pottery in channel deposits and associated structures mirrors what was found elsewhere during the 1992 excavation on the Yarnton floodplain. The pottery indicates an early Iron Age date for the gravel trackway overlying the stone causeway on Site 9.

The small quantity of Roman pottery is primarily of importance for dating the contexts from which it derives, even if such dating is necessarily imprecise in a number of cases and to provide evidence of the use of the floodplain in the Roman period. Overall the material adds nothing to the understanding of the ceramic range at Yarnton, with the sole exception of the amphora sherd. It will be desirable to confirm the identification and, if possible, establish the source of this piece.

5. Fired Clay

by Alistair Barclay

5.1 Introduction

A total of 236 fragments (4.9 kg) of fired clay, including a number of cylindrical loomweights, was recovered from the excavations and the observation area. The fired clay was recovered from a Beaker pit and from features associated with Bronze Age settlement. One deposit from a pit in observation area 4e appears to represent oven clay.

5.2 Method

The fired clay was scanned and examined for evidence of wattle or other impressions, possible finished objects and structural pieces. The material was quantified by number of fragments and weight. No record was made of fabric.

5.3 Range and variety of material

The fired clay assemblage consists of hearth or oven clay, cylindrical loomweights and many oxidised amorphous lumps.

5.4 Provenance

Fired clay was only recovered from sites 9, 10, 4c and 4e. All of the fired clay is discussed under the headings of site and context group below.

5.5 Quantification

Table 5.1 gives a breakdown of the fired clay and a summary quantification by fragment number and weight.

Table 5.1. A breakdown of all fired clay by site

Type	Site 9	Site 10	Site 4c	Area 4e	Total
Amorphous	1, 11g	8, 32g	35, 78g	14, 64g	58, 184g
Oven clay				93, 1500g	93,1500g
Loomweight			85, 3235g		85,3235g
Total	1, 11g	8, 32g	120,3313g	107,1564g	236, 4920g

Amorphous
This category may include fragmentary material from objects and structural pieces that have become too small and worn to classify and clay that has been accidentally burnt.

Oven or hearth clay
Oven clay often appears to consist of generally thick amorphous blocks of fired clay. Little is know of these structures which are rarely found *in situ*. Some may have been no more than clay floored hearths, and in certain cases what is preserved may be little more than fired earth. Relatively thick pieces of fired clay may be from the base of such features, while some moulded pieces might be from the sides or `linings'. Such hearths can be assumed to have a domestic function linked to cooking and eating, although other possibilities for the interpretation of hearth debris could also include activities such as potting (open firing) and cremation (pyre debris).

Loomweights
Cylindrical clay weights are a rare find on Bronze Age sites, especially in the Upper Thames valley. They are usually considered to be loomweights, although there is no direct evidence for this. They are mostly found on middle Bronze Age sites, although an unpublished weight from Oxford with impressed comb decoration could be of early Bronze Age date. In the late Bronze Age they are replaced by pyramidal forms. The deposit of weights from Site 4c is important and mirrors a similar deposit from Cresswell Field. Both could represent placed deposits rather than the simple burial of rubbish and this possibility should be further explored. An unpublished group from Little Marlow, Buckinghamshire was found in a small pit that also produced calcined bone, a piece of worked stone and a decorated sherd of middle Bronze Age pottery and one from Wallingford had been placed at the bottom of a middle Bronze Age waterhole (Barclay forthcoming).

5.6 **Documentation**

The excavated features on the adjacent floodplain sites (eg Sites 1-3) and at Cresswell Field have produced a similar range of material. The results from this analysis will be relevant to the study of material from the above sites. The fired clay from YFPB98 will be integrated into the fabric and type series established for YFP 92 Sites 1-3.

5.7 **Potential**

Fired clay is a good indicator of domestic and industrial activities, which include cooking, textile production and pottery manufacture. The occurrence of fired clay in pits mirrors the associations with pottery found in the adjacent excavation areas (Sites 1-3, 4-5). Previously it was suggested that fired clay from Beaker pits on Site 1 could represent evidence for potting, the same could be true of the Beaker and fired clay associated pit deposits from Site 10. Closer examination of the fired clay, especially of its fabrics and degree of firing, could elucidate its function. The deposit of oven clay from Site 4e mirrors what has been found previously on the floodplain. The feature was originally

thought to be a cremation and one possibility is that the hearth material actually represents pyre debris, although morphologically some of this material looks more like oven clay. The group of cylindrical loomweights from Site 4c is important, as few of these have been found within this area. The overall assemblage from the Yarnton project now comprises the largest group so far recovered from the region. The relatively complete or reconstructible state of the weights from Site 4c mean that weights and sizes can be calculated allowing comparisons to made with ones from elsewhere. A provisional suggestion is that the weights fall at the top end of the size and weight scale and this could be an indicator of a middle rather than a late Bronze Age date.

6. The Flint

by Philippa Bradley

6.1 Introduction

Three-hundred-and-eleven pieces of worked flint were recovered from the excavations. Flint was recovered from Sites 9, 10, 21 and 4c; a quantity of flint was also recovered from observation area 4e. The material came from a range of pits, tree-throw holes, preserved land surfaces, channel deposits and other contexts; approximately one third of the flint was recovered from a single pit (25045) within the observation area.

6.2 Raw materials and condition

The flint is similar in character to material from previous excavations at Yarnton (eg Bradley 1993, 50) and is mostly chalk flint. Calcium carbonate concretion and iron-staining were also noted on some of the material. Cortication was generally light to medium although occasional pieces were very heavily corticated.

6.3 Method

The flint was briefly scanned and recorded using a standard set of codes. The flint was looked at in the context groups as defined by the site analysts, although the assemblage was considered in its entirety for the overall potential of the material. Some technological details (eg hammer mode, butt type, presence or absence of platform preparation or dorsal blade scars) were noted in order to aid the characterisation of the material. The condition of the flint and the types of raw materials used were also noted. Approximately 13.5% (42 pieces) of the assemblage was burnt and 37.2% (116) was broken to some extent.

6.4 **Quantification**

The flint is summarised in Table 6.1 and discussed by context group in Appendix 1. There appear to be some biases in the collection, few blades, blade-like flakes and pieces of irregular waste were recovered (Table 6.1). Chips, apart from one context (25046), were also rarely recovered.

Table 6.1 Assemblage composition

Flakes	Blades, blade-like flakes	Chips	Irregular waste	Cores, core fragments	Retouched forms	Total
172* (55.3%)	6 (1.9%)	47 (15.1 %)	6 (1.9%)	16 (5.1%)	64 (20.5%)	311

* including three core tablets and three core rejuvenation flakes (face/edge)

The retouched element also dominates the assemblage (around 20.5 % of the total flint, Table 6.1). This may be due to a number of factors including site function, depositional practices or period biases. This relatively high percentage of retouched pieces compares with figures of between approximately 9-14% for other assemblages from Yarnton (eg. Sites 1, 2, 4a and 5). Of the retouched types present scrapers, piercing tools and cutting tools (retouched and serrated flakes and knives) dominate (Table 6.2). The diagnostic retouched forms provide the main dating evidence for the flint; as in previous years, Mesolithic activity is represented by a very small quantity of material, in this case by a single microlith but some of the blades and blade-like flakes may also be contemporary. A leaf-shaped arrowhead and two unfinished pieces provide examples of earlier Neolithic material. Of the remaining material numerous pieces may be of Neolithic or early Bronze Age date.

Table 6.2 Retouched forms

Scrapers	Piercers/awl/ denticulate	Retouched/serrated flakes	Arrowheads (including unfinished examples)	Knives	Fabricator	Microlith	Miscellaneous retouch	Total
11	10	15	3	4	1	1	19	64

Flakes dominate the debitage but a few blades and blade-like flakes were also recovered. Multi-platform flake types (Table 6.3) dominate the cores but a wide variety of other forms were recovered. The dominance of keeled and Levallois cores is interesting and may suggest a later Neolithic date as these types are more common during this period (eg Healy 1985); they have also been linked with the production of blanks for transverse arrowheads (Green 1980, 38).

Table 6.3 Core typology

Multi-platform flake	Keeled and Levallois	Core on a flake	Core fragments	Total
5	6	1	4	16

6.5 Discussion

These excavations have produced a fairly small but nonetheless interesting flint assemblage. The material chiefly dates from the Neolithic to early Bronze Age with a small element of probably earlier Mesolithic flint. The flint is spread quite thinly across the various sites excavated, with only a few features or feature groups producing any quantity of material, for example, pit 25045 (observation area 4e). This seems to be the pattern for much of the activity on the floodplain at Yarnton, although some previously excavated areas have had much denser flint deposition (eg YFP92 Sites 1-3). Interestingly no burnt unworked imported flint was recorded from this year's excavations; indeed little of this material has been produced from the whole of the excavations (around 500 pieces). Burnt local flint from the gravels and other stone seems to have been used in preference to the imported flint, presumably because the latter was a prized commodity and it was used carefully. Indeed of the worked flint only 42 pieces (13.5%) from the current excavations was burnt. A small group of flint with good Beaker associations was recovered from Site 10 (contexts 14007 and 14030). The flint from pit 25045, observation area 4e, is interesting as it is clearly not all contemporary and is certainly not contemporary with the middle Bronze Age ceramics recovered from the same fills of the pit. Whether or not this group represents a largely redeposited assemblage with some contemporary Bronze Age flintwork or whether the earlier elements, such as the leaf-shaped arrowhead, have been collected and deliberately placed or even curated, remains to be established.

6.6 Documentation

The flint from these sites greatly enhances the lithic assemblage from recovered from the Yarnton-Cassington project. The overall assemblage is quite small but it is similar in character to material from other parts of the floodplain and elements from Yarnton Worton Rectory Farm (Bradley in prep.) and Cresswell Field (Bradley 1995). Approximately 5180 pieces of flint has been recovered from the Yarnton-Cassington project, forming a substantial assemblage from this area of the Thames valley. The assemblage may also be compared to those from other English Heritage-funded post-excavation projects (for example, Eynsham Abbey, Barrow Hills, Radley, Gravelly Guy and Wallingford Bypass). This will enable the procurement, use and discard of lithics to be studied both temporally and spatially.

6.7 Potential

Individually this group has quite limited potential. However, there is great potential for contributing to the wider picture of lithic use and exploitation across the study area. The large assemblage of mainly Neolithic and Bronze Age flintwork that has been recovered during the Yarnton-Cassington project will enable changes in lithic-reduction sequences, raw-material exploitation, use and discard to be studied across the landscape within this part of the Thames valley. The numerous pit assemblages will be of particular importance. Many of these pit groups have good ceramic associations; the Beaker associated flint assemblages, for example, are of regional and potentially national importance. Both inter- and intra-site studies will be possible for these pit groups. It will be an exciting opportunity to look at, for example, the different Beaker styles to see if the associated flint assemblages possess different characteristics. The flint from the old ground surfaces can be compared with the much larger assemblage found during the 1992 excavations (YFP92 Site 2). Flint from other feature types can also be readily paralleled from other excavations within the Yarnton-Cassington study area.

7. The Worked Stone

by Fiona Roe

7.1 Method and Quantification

All stone suspected of being worked or imported was examined, and a provisional catalogue was made. Burnt local stone was counted, weighed and then discarded. The data was added to the burnt stone database. Table 7.1 shows worked stone and imported unworked material.

7.2 Discussion

Pebbles of quartzite or quartzitic sandstone from the local gravels were consistently used from Neolithic times onwards for tools such as hammerstones, grinding stones or rubbers, and there are five such artefacts from the 1998 excavations.

The remaining finds demonstrate the consistent use at Yarnton of three saddle quern materials. The three fragments of Lower Calcareous Grit are all burnt, and only one shows possible wear traces, but this quern material was used in the area from the Neolithic until the earlier part of the Iron Age. Lower Greensand from around Culham has been recorded at Yarnton from the middle Bronze Age/late Bronze Age onwards, although there is only one weathered fragment from the 1998 excavations. This is another saddle quern material, and was in use until rotary querns became current. The third quern material is a grey, micaceous sandstone which is now thought to come from the Northampton Sand of which there is one example from YFPB98. This variety of stone was used for Neolithic saddle querns at Briar Hill (Bamford 1986, 93), but to date

it has only been recorded from Bronze Age contexts in the Upper Thames valley. Further investigations and fieldwork are needed to establish a possible source area for the Yarnton finds of this quern material.

7.3 Potential

The worked stone from the 1998 excavations provides useful confirmation of the use of particular lithic materials during the Bronze Age. There are ten pieces that are considered to have been artefacts, all but four now fragmentary. All are provisionally dated to the Bronze Age. The 1998 worked stone finds are useful for filling out the picture in what previously was a very neglected area of earlier prehistoric studies. A good deal more work is needed to establish how this use of stone fits in with all other known details of earlier prehistoric sites in the Upper Thames valley.

Table 7.1: The worked stone

Stone type	Description	Site	Context group
Quartzitic sandstone	Pebble, used as grinding stone, with three worn facets; subsequently burnt	9	5
Coarse-grained quartzitic sandstone	Rubber with two worked surfaces, utilising irregularly shaped pebble	9	6
Quartzitic sandstone	Large cobble used as rubber; one slightly concave worn surface; slightly burnt	9	8
Grey micaceous sandstone, probably from Northampton Sand	Burnt fragment with one worked surface, possibly from saddle quern	10	33
Quartzite	Fragment from hammerstone, burnt	10	33
Quartzite	Pebble with traces of battering at one end; probable hammerstone	4c	58
Lower Calcareous Grit	Large burnt fragment, could originally have been part of saddle quern, though now lacks traces of working	4c	60
Lower Greensand	Weathered fragment, now without traces of use, but a quern material	4e	71
Lower Calcareous Grit	Large, unworked fragment of quern material, both burnt and weathered	4e	72
Lower Calcareous Grit	Fragment with possible worked surface, now burnt and weathered; possible saddle quern	4e	72

8. Stone from the causeway

by Philip Powell

The limestone used to construct the causeway discovered on Site 9 is lower cornbrash (a formation in the Great Oolite of the middle Jurassic). On the Geology map the nearest occurrences of cornbrash to Yarnton are at Church Hanborough, Bladon and Begbroke. The rounded edges of the stones suggest that they were most probably picked up off the surface in one (or more) of these areas. Even today some of the ploughed fields in these areas are very stony, and before the onset of intensive agriculture larger stones would have been more abundant.

9. Burnt stone

by Christopher Bell

9.1 Method and Quantification

A total of 9290 burnt stones was recovered from the 1998 excavations, weighing a total of 484.025 kg. To this should be added the burnt stone removed during the half-sectioning of the burnt stone feature on Site 21 in the 1993 evaluation.

Any imported stone, including flint, and worked stone was bagged for further analysis (see Bradley and Roe above). All local stone was sorted into quartzite and limestone, weighed and counted on site and then discarded.

Table 9.1: A breakdown and quantification of burnt stone by site

	No of contexts	Local stone: no	Local stone: weight (kg)	Limestone: no	Limestone: Weight (kg)
Site 9	9	551	10.795	830	75.420
Site 10	4	934	22.315		
Site 21	6	3109	34.215		
Site 4c	33	3324	53.300	3	0.150
Site 4d					
Site 4e	5	105	3.175	424	285.375
	57	8023	123.080	1257	360.945

9.2 Results

The burnt stone recovered from the 1998 excavations comprised a mixture of local quartzite pebbles and limestone, with a very small quantity of burnt flint and other worked stone reported above. However, as can be seen in Table 9.1 above, there was a clear bias in the distribution of the different types of stone from each site. The vast majority of the limestone was recovered from a small number of features on Sites 9 and 4e relating to burnt mound activity. The type of stone used in these features appeared to be the same type of limestone used to construct the causeway on Site 9. The distribution of this material in features predominantly located on a line to the north of the causeway would therefore appear to be significant, and as there was no evidence of robbing from the stone structure, this could suggest that these features represent a phase of activity contemporary with the causeway. In contrast, the burnt stone recovered from the burnt mound features located on Sites 10 and 21 was all quartzite. Previous work within the study area has suggested that the occurrence and proliferation of limestone or quartzite in features may in part be associated with chronological differences and that features containing only quartzite are usually earlier in date. This pattern would accord with the artefactual evidence from the burnt stone features discovered on Sites 10 and 21 which suggests that they are late Neolithic/early Bronze Age in date.

The other main concentration of burnt stone came from the postholes, and surrounding features associated with the Bronze Age house on Site 4c.

9.3 Potential

Burnt stone is a good indicator of prehistoric activity, and as demonstrated by the location and distribution of burnt stone found in this year's excavations, it was clearly used for a range of purposes, both on-site and off-site. There is potential to examine the distribution of burnt stone, and its degree of burning and fragmentation, in order to elucidate the nature of the processes represented by these deposits, and to explore the differences in the character between the material deposited from on-site and off-site activities. Examining patterns of association with other categories of artefacts and charred plant remains may also shed light on the processes being undertaken.

10. Metalwork

by Peter Northover

10.1 Introduction

Six metal finds were recovered in the 1998 excavations, three from stratified contexts associated with stone and sand and gravel causeway on Site 9 and three from silts in the palaeochannel adjacent to them. They span a period which could be as long as

from the end of the early Bronze Age to the late pre-Roman Iron Age. As seems to be increasingly the case in southern Britain these finds display potentially exotic connections as well as typical, more-or-less local products.

10.2 The finds and their potential

SF13240: a slender flanged bracelet with pointed ends from the sand and gravel causeway on Site 9. The type is not immediately familiar but flanged bracelets of other types are known from the middle Bronze Age. An analysis would help materially for dating and a metallographic sample for details of manufacture.

SF1339: a side-looped spearhead found directly beneath the stone causeway on Site 9. This, most probably, dates from Middle Bronze Age I-II, although an even later date is possible. This long-lived type is a fairly frequent find, either as a single item or in small groups from excavations, but the relative chronology of middle Bronze Age metal compositions is sufficiently robust for it to be reasonable to use its composition to date the piece. A solid sample for both microprobe analysis and metallography has the potential to investigate the apparent variation in the manufacture of the blade edges.

SF13400: a double-pointed awl found directly beneath the stone causeway. This is another long-lived type running from the early Bronze Age onwards, and for which a composition would provide dating evidence. This would probably be less precise than for the spearhead because small tools are very likely to be made out of a workshop's residue of scrap but an assignment to one of the broader divisions of the Bronze Age is certainly possible.

SF13087: a copper-or copper alloy-plated iron ring from the palaeochannel silts adjacent to the stone causeway; this most probably dates to the later part of the pre-Roman Iron Age. A section through both plate and iron will elucidate its composition and assist with dating; parallels seem to be in the 2nd century BC to 1st century AD.

SF13088: a tin or tin-lead alloy strap end from the palaeochannel silts adjacent to the stone causeway. Parallels suggest that it is contemporary with other tin objects in Britain (eg Flag Fen and Caldicot Castle) and Switzerland. A solid sample for microprobe analysis and metallography would enable examination of the segregation of impurities to any intermetallic compounds. This is so far one of the most likely sources of provenance-related data and requires detailed microanalysis. Depending on the lead content, lead isotope analysis might enable comparisons to be made with data now available for the British Bronze Age in general, and Flag Fen in particular (Rohl and Northover 1994).

SF13089: a hollow, riveted sheet bronze ring from the palaeochannel silts adjacent to the stone causeway. This is another Iron-Age type, parallels for sheet bronze claddings for rings of other materials coming from Llyn Cerrig Bach (Lynch 1991). Analysis will determine its method of manufacture.

11. The Worked Wood

by Maisie Taylor

11.1 Introduction

The 1998 season of excavation produced several particularly important closed assemblages of wood: from beneath and around the stone causeway on Site 9 (Context Groups 4, 7 and 11) and from waterholes on Sites 9 and 21 (Context Groups 17 & 47). This is in contrast to previous seasons where, when found, wood was often found as debris in washed-in or derived deposits (for example around posts at the edge of the relict stream), or from deposits whose taphonomy is still poorly understood.

11.2 Discussion

The quality of preservation is generally excellent, but where less than perfect this can generally be attributed to taphonomic causes in antiquity. Preliminary examination of wood from beneath the stonework of the causeway (Context Group 6) suggests the possibility of water erosion of some surfaces. If proved, this could be particularly important in determining whether or not there was an interval between the laying-down of the timber 'foundation' and the positioning of the stonework above. Indeed it will need to be established that the 'foundations' are such, and are not the eroded remnants of a possible earlier trackway or ford. Close examination of the wood surfaces should help resolve this point, but deterioration is already under way, and it is essential that this work by undertaken with an absolute **minimum** of delay. There appears to be very little work done elsewhere on this subject, and so careful recording and photography of the material is very important.

11.3 Potential

The causeway is of national importance and the wood, which appears to form an integral part of its structure, should be studied very closely. The problem of possible water erosion has been noted above. The assemblages from the causeway are from a variety of contexts (posts, horizontal 'bearers', small roundwood, pegs and wood in the channel nearby) and it will be important to compare differential preservation and wear patterns; this will throw light on the role and contemporaneity of the various contexts. The wood can provide evidence that my help to phase the construction of the causeway and provide other details of importance, for example the role of uprights as markers, handrails etc. Given the possibility of a ritual component, examination of the wood might also provide evidence for transverse partitioning or segmentation, as has been found at Flag Fen (Pryor forthcoming). Now that a body of data has been accumulated on woodchip statistics, it should be possible to relate any woodchips either to the *in situ* construction of the timber parts of the causeway, or to other

activities (such as the making of wattlework screens or walkway surfaces) that have left no other archaeological record. The presence of middle Bronze Age metalwork should be reflected in the axe-marks on the timbers (which in theory should be palstaves rather than socketed axes). It will be important to test this statistically using Curvature Index analysis.

The possible crude brushwood track is of great interest, both in the development of the site, and because of the rarity of survival of such constructions. Comparative data is available which should enable the precise nature of the structure to be made clearer. Groups of verticals associated with the brushwood structure may also help with the interpretation.

Wood from waterholes and pits is important because it represents a sealed abandonment deposit and is unlikely to have accumulated over an extended period. Wooden items from these contexts include a number of finished artefacts, which have hitherto been rare at Yarnton. The large fragment of carved vessel or trough (Fig. 8) is extremely well preserved, enabling detailed analysis of the method of carving. The type of vessel is unusual, although of course, wooden vessels from the Bronze Age of any type are rare. Of particular importance is an excellently-preserved notched-log ladder. Other examples, less well or completely preserved, have been found at Sutton Common, Eton Rowing Lake and Fengate (two examples). Wood from this waterhole (Context group 47) will need to be studied in detail, a process that should include a thorough metrical examination of all by-products, debris and roundwood.

The possible bark vessel (Wood 21) from the waterhole or soaking pit on Site 9 (Context group 17) is intriguing, although fragmentary and very fragile. Bark vessels, thought to be Neolithic, were excavated at Lower Horton, and bark and bentwood vessels have been recorded from early prehistory onwards. The rarity, and fragility, of this find makes detailed recording highly important and detailed record must be made as soon as possible.

12. Human Bone

by Angela Boyle

12.1 Introduction and methodology

Two deposits of cremated bone were recovered. During excavation, the entire fills of these features were retained for sieving. Each deposit was passed through a series of three Endicott laboratory test sieves with mesh sizes of 10, 5 and 2 mm, beginning with the largest and ending with the smallest mesh size. The weight of bone present in each sieve size was calculated as a percentage of the total weight of the cremation. At each of the three stages the bone sample recovered was examined in detail and sorted into identifiable bone types which were defined as skull (including mandible and dentition), axial (clavicle, scapula, ribs and vertebrae), upper limbs and lower limbs. Where a distinction could not be made between upper and lower limbs, fragments were grouped

under the heading `long bones'. Metapodials were recorded with the appropriate upper or lower limbs. Each of these samples was then weighed on digital scales and details of colour and largest fragment were recorded, also, where possible, the presence of individual bones within the categories was noted. This procedure was followed for each of the three sieve samples in order to assess the level of fragmentation.

12.2 **Results**

A single deposit of cremated human bone (17009) was recovered from a shallow pit on Site 4d. Charcoal and burnt earth was also present. The pit appeared to have been severely truncated as its surviving depth was only 0.03 m. There were no associated artefacts. The remains weighed 123 g and were identified as a young adult, possibly female. The bone was uniformly white and well calcined and the largest fragment measured 65 mm. Identifiable fragments comprised a single tooth root, a fragment of rib shaft, pelvis, femur and a distal phalange (lower limb). The remainder were unidentifiable long bone shaft fragments. The complete absence of skull fragments is notable, although given the level of truncation it is not possible to argue that this is evidence for the selective burial of only certain parts of the body.

A second deposit (14033) was recovered from a pit on the north bank of the channel on Site 10. A burnt stone feature of Beaker date was nearby. The remains weighed 42 g and were tentatively identified as an adult individual. The colour of the bone varied from white and well calcined through to blackened. Identifiable fragments included long bone shaft, rib shaft and a possible phalange fragment.

Table 12.1 Details of the deposits identified as cremations

Context	10 mm	5 mm	2 mm
14033	14 g: long bone shaft, rib shaft	16 g: possible phalange fragment	12 g: nothing identifiable
17009	63 g: pelvis, femur shaft, miscellaneous long bone shaft	51 g: tooth root, rib shaft, distal phalange (lower limb)	9 g: nothing identifiable

12.3 **Potential**

Given the small size of the deposits it was decided to undertake full analysis at the assessment stage. There is, therefore, little potential for further work other than to integrate the information into the evidence on prehistoric burial practice previously amassed from the work within the study area.

13. The Animal Bone

by Jacqui Mulville

13.1 The research questions

It was hoped that the animal bones would provide information about the nature of the economy at Yarnton and how this developed from the Neolithic/Bronze Age onwards. The distance between the three main areas of excavation (Sites 9, 10 and 21) and known contemporary settlement areas raises questions about the foci of site activities, and the disposal and dispersal of animal bone. For example, is the quantity of animal bone found in the palaeochannels compared to that recovered from the areas of settlement merely associated with better preservation, or is this pattern of distribution genuine? A further aim was to investigate the presence of ritual activity, as potentially evidenced by the fox skull, red deer bone and antler deposits in the waterholes, and by several animal cremations.

13.2 The Fauna

A total of 3416 fragments of bone were recovered. The fragments are unevenly distributed through the sites and phases, with only a few coming from Site 4d, and the majority from Site 9. Material from Site 9 was mostly contained within context groups, 5, 8 and 9 (Appendix 1). There are associated with the Bronze Age stone causeway and the late Bronze Age/Iron Age gravel causeway.

Table 13.1 Quantity of animal bone by number of fragments.

	Site						
Period	4c	4d	4e	9	10	21	Total
Neolithic/Bronze Age	0	0	0	1	0	0	1
Early Bronze Age	0	0	0	0	16	0	16
Bronze Age	0	0	22	517	0	4	543
Bronze Age?	7	30	565	1401	110	104	2217
Mid/Late Bronze Age	0	0	0	8	0	0	8
Mid/Late Bronze Age?	0	0	0	149	0	0	149
Middle or Late Bronze Age	108	0	0	0	0	0	108
Late Bronze Age	0	0	0	0	68	0	68
Late Bronze Age/Iron Age	0	0	0	269	5	18	292
Iron Age?	0	0	0	1	0	0	1
Roman	0	0	1	12	0	0	13
Total	115	30	588	2358	199	126	3416

13.3 Recovery and Preservation

The bone was recovered by hand collection with selected contexts sieved. The material was generally in reasonable condition although some of bone has surface erosion. Few bones show evidence of burning or gnawing by carnivores. All of the bone has been washed and marked and bagged by context and is housed in eight standard and two smaller boxes.

13.4 Number of recordable, ageable and measurable bones.

To assess the quality of the material two standard boxes of material were examined in detail. They were taken to be a representative sample as they contained material from all of the different sites and most of the periods. In total 236 fragments were examined of which 160 (68%) could be identified to species. Of these, 49 fragments came from 21 sieved samples, the majority of which (63%) could not be identified. Twelve bones were complete enough for measurements, and six of these provided greatest length of longbones, and nine could provide useful 'age at death' information.

13.5 Discussion

The bone was examined, identified and recorded as in Mulville 1997. Table 13.2 below indicates the quantities examined and the distribution of bone between the different sites.

Table 13.2 Recorded animal bone

	Site						
	9	10	21	4c	4d	4e	Total
Total	93	62	11	19	2	49	236

The majority of bone examined came from deposits dating to the Bronze Age, and this reflects the overall distribution of material. The assemblage was dominated by domestic species, with only a few wild species present. Tables 13.3-4 summarise the relative proportion of the species and the number of bones with useful size and ageing information.

Table 13.3 Species present in recorded sample

	Bronze Age		Roman
	N	%	n
Cattle	100	*51*	
Sheep/Goat	38	*19*	
Pig	7	*4*	
Horse	13	*7*	
Red deer	2	*1*	
Goose	1	*<1*	
Amphibia	1	*<1*	
Rodent	2	*1*	
Sheep-sized	8	*4*	1
Cattle- sized	24	*12*	
Total	196		1
Unidentified	39		

Table 13.4 Sizing and ageing information in recorded sample

	Measurements	Mandibles
Cattle	7	4
Sheep/Goat	1	5
Horse	4	

Key:
Measurements = number of bones and mandibular teeth which produced useful measurements.

Mandibles = jaws with two or more teeth which provide useful age-at-death information.

There is an abundance of cattle, which reflects the proportions noted at the other prehistoric floodplain sites. At the other sites this dominance may be a result of poor preservational conditions resulting in an abundance of cattle teeth in the assemblage. This is not the case for this assemblage; relatively few teeth were recorded and the abundance of cattle is a result of a large number of bones.

At 7% the quantity of horse exceeds that of pig, and shows similarities with the pattern found at the Yarnton Floodplain Sites 1-3 (Serjeanston 1993). As for cattle, nearly all the material is bone rather than teeth. The low proportion of pig is similar to that noted at Yarnton Floodplain Sites 1-3 (Serjeanston 1993) and in the Beaker Pit at Cresswell Field (Mulville in prep.), although pig was absent from the 1997 assemblage from Yarnton Floodplain B (Mulville 1998).

The presence of two red deer bones in the small assessment sample suggests a higher

proportion of red deer present at this site than at others in the study area. One of the deer bones, an almost complete jaw was found in association with a fox skull. In addition to the assessed bones, a large worked red deer antler with worn tines was recovered from a large Bronze Age pit on Site 9. This has similarities to other fragments of red deer antler previously recovered from a Beaker pit (Mulville in prep.) and three waterholes (Mulville, 1997, 1998 and Mulville in prep.) at Yarnton. The placing of antler tools within waterholes may have a special significance at these sites.

This site has the best-preserved bone of any of the of any of the Yarnton Floodplain sites. The preservational conditions induced by the limestone causeway have resulted in a high proportion of recovered bone compared to teeth. As noted above teeth account for only a small proportion of the assemblage (14%). At Yarnton Floodplain B 1997 and Yarnton Floodplain Modules 1 and 2, teeth accounted for a quarter and 60% of the assemblage respectively. There were a number of animal cremations, but apart from these there were few incidences of burnt bone. Although some of the bone had been gnawed, generally good surface preservation has allowed the identification of fine butchery marks on some of the bone.

There are a few bones which merit further comment. As mentioned above a complete fox skull, in association with the red deer mandible, was recovered from a Bronze Age waterhole on Site 21. Also recovered from the limestone causeway, Site 9, were a number of fragments of fish bone. A preliminary examination of the sample indicated the presence of pike and other as yet unidentified species. Previously a single fragment of bream was recovered from Floodplain Sites 1-3, but this may have been non-anthropogenic in origin. There are few fish bones found at other Bronze Age sites (Serjeantson 1994) so their presence at Yarnton is of great interest.

Two examples of worked bone have been identified. A sheep tibia bone awl was recovered from the stone causeway. The second a tiny bone (or ivory) pin was recovered from a small pit on Site 4d (context group 66).

13.6 **Division of the assemblage**

This assemblage is large enough for some sites, most notably Site 9, to be divided into individual features. On other smaller sites material may have to be grouped for analysis. However it will be possible to compare and contrast the different feature types with those found on the other contemporary Yarnton sites. Due to the nature of the deposits excavated much of the material has to be dated through radiocarbon analysis. It is anticipated that most of the currently uncertain or unassigned contexts will be dated.

13.7 **Potential**

This work continues on from the previous seasons of excavation on the floodplain. As this assemblage is the largest and best-preserved earlier prehistoric bone assemblage recovered from the area its value is without question. Although the

assemblage was gathered from the edges of the settlement with little direct evidence of occupation the bone should reflect the activities occurring in the associated settlements. The Yarnton Floodplain B 1998 animal bones are worth studying for the following reasons:

a) The good evidence for early activity

b) The possibility of amalgamating all the floodplain material and contributing to the spatial, economic and symbolic analysis of the animal bone

c) The further evidence for unusual deposits within waterholes, the fox skull, red deer mandible and worked antler, are of particular interest

d) Prehistoric animal bone has now been found in a wide range of features. Yarnton 1998 has produced more bone from features already noted and some from features not seen before. The incorporation of animal bone in the causeways at Site 9 has provided an entirely new type of deposits. Analysis and comparison of all these different deposits should allow us to build up a clearer picture of the disposal of bone.

e) The relative abundance of metrical and dental data at the site will add substantially to the body of data available from early prehistoric sites.

f) The better preservation at this site will allow an estimate of the loss of material and information in other more eroded assemblages.

g) A detailed comparison of the butchery marks from all the Yarnton prehistoric sites would allow an investigation of the tools, particularly the difference between stone and metal tools, and methods of butchery through time.

h) The find of fish bone is extremely rare on site of this period in Southern Britain.

i) It will be possible to compare the Yarnton Floodplain sites with each other and with a number of other Neolithic/Bronze Age floodplain sites such as Whitecross Farm, Cholsey (Clark and Powell 1996), Runnymede (Serjeantson 1996) and possibly with the Eton Rowing Lake (Allen in prep.).

14. Macroscopic Plant and Invertebrate Remains

by Mark Robinson

14.1 Quantification of Materials

A total of 118 samples of up to 50 litres were taken for charred plant remains and floated onto a 0.3 mm mesh. Twenty-three samples, each of 1 kg, were taken from non-waterlogged contexts for molluscs. Fifty-one samples, mostly of the order of 10 kg, were taken from waterlogged sediments.

14.2 Data Collection and Method Statement

The dried flots from the bulk flotation were all scanned at x10 magnification under a binocular microscope. Any charcoal, seeds or chaff observed were identified and an estimate made of their abundance. Summary results for carbonised remains other than charcoal are given in Tables 14.1-3 and more detailed results for the samples which contained material are given in Table 14.4.

Charcoal from the flots was broken transversely and examined at up to x50 magnification. While this is an appropriate means for the identification of *Ulmus* and *Quercus*, identifications of the diffuse-porous taxa (*Acer*, *Prunus*, Pomoideae and *Alnus* / *Corylus*) should be regarded as tentative. Summary results are given in Tables 14.1, 14.4 and 14.5.

The molluscs were assessed by a combination of scanning flots for shells from those contexts which had been sampled for charred remains as well as molluscs, scanning the wash-overs from organic samples and sieving 1 kg samples on a 0.5 mm sieve, drying them and scanning them at x10 magnification. The number of samples assessed was reduced to 15 because very similar results were obtained from samples from the small pits of Context Group 9. The results are given in Table 14.6.

Sub-samples of 1 kg from 22 of the waterlogged samples, chosen to cover a representative range of waterlogged contexts, were washed over onto a 0.25 mm sieve and scanned at up to x50 magnification for macroscopic plant remains and Coleoptera. Preservation in Samples 13040 (context group 17), 15001 (context group 47), 16004, 16100 (context group 59), 21063 (context group 47) and 25004 (context group 71) is good and it proved worth assessing the Coleoptera from them. Preservation in the other samples is less good but they were all still assessed for macroscopic plant remains. The results are listed in Table 14.8 for waterlogged seeds, Table 14.9 for other waterlogged plant remains and Table 14.10 for Coleoptera.

14.3 **Discussion**

Palaeohydrology and Alluviation

The palaeochannels appear to be of Late Devensian origin and show no evidence of Flandrian migration or even very active flow. The earliest sediments in the major palaeochannel as exposed in Site 9 are gleyed clays which are possibly Devensian. They show much evidence for trees rooting into them prior to the date of the causeway, with iron pan root pseudomorphs immediately beneath the causeway and preserved woody roots at depth. This suggest that the palaeochannel was at least seasonally dry. Some rise in the water table must have occurred by the date of the construction of the causeway because wood survived in the structure. Alluvial sediment containing poorly-preserved organic remains at the base covered all three causeways and filled the palaeochannels.

Further evidence of a period when the permanent water table was below the bed of the palaeochannels came from the minor palaeochannel in Site 21. A ditch had been cut along the lowest part of the bed of the channel in the Bronze Age and even the sediment of the ditch only contained poorly-preserved organic remains.

A thin circumneutral brown earth soil had developed over the floodplain gravels. There was evidence from the higher areas of floodplain that it had been cultivated. While the final date of cultivation was probably Roman it is possible that some areas also experienced earlier cultivation. This soil is sealed by alluvial clay. Alluvial layers can be traced from the upper fills of the palaeochannels onto the lower areas of the floodplain. Only a thin band of alluvium seals the palaeosol on intermediate level areas of floodplain and on the highest area of floodplain, modern ploughing has entirely incorporated it into the ploughsoil. Undisturbed alluvium lies directly on the gravel at the northern end of Site 10. This implies that at some stage, probably in the Iron Age or Roman period, the soil had been stripped from the site and bare gravel exposed. The palaeosol was intact alongside the channel, so it is unlikely that the soil was removed by river action.

Charred Plant Remains

All but two of the samples which contain charred plant remains, apart from charcoal, are from Bronze Age features in the vicinity of the middle/late Bronze Age house on Site 4c (Context Groups 56, 59, 60, 62). Small quantities of cereal grain, including cf. *Triticum* sp. (wheat) and *Hordeum vulgare* (six-row hulled barley) were recovered from a posthole of the house (Context Group 56), the waterhole (Context Group 59) and a shallow pit (Context Group 60). Another pit in Context Group 60, however, contained large quantities of nut shell fragments of *Corylus avellana* (hazel). A few hazel nut shell fragments were also noted from a treethrow hole (Context Group 62).

A charred weed seed from the causeway on Site 21 (Context Group 50) is probably only a chance find. Of more interest is a large assemblage of grain including *Triticum* cf. *dicoccum* (emmer wheat) and *Hordeum* sp. (hulled barley) amongst much charcoal in a middle Bronze Age pit on Site 4e (Context Group 71, Sample 25009). This sample probably contains as much grain as has been recovered from all the other Yarnton Floodplain sites put together.

Unlike those from the other seasons of the Yarnton Floodplain excavations, over half the samples contain charcoal, almost all of it coming from middle/late Bronze Age contexts. *Quercus* sp. (oak) predominates, but a range of other species was recorded (Table 14.5). Of particular interest are records of *Ulmus* sp. (elm) from the fill of a Bronze Age pit containing burnt stone on Site 9 (Context Group 18, Samples 13041, 13042). Along with the occurrence of possible *Acer* sp. (maple) charcoal in Sample 13042, this might suggest greater woodland survival than need be implied by the oak.

The larger assemblages of charcoal are mostly from Bronze Age pits containing burnt stone, which were found on most of the sites including Site 10, Context Group 35, Samples 14005 and 14006; Site 21, Context Group 44, Sample 21056 and Site 4c, Context Group 57, Sample 16015. Not surprisingly, some of the treethrow holes contain much charcoal from the burning of the trees which grew in them, for example *Quercus* sp. from Site 4e, Context Group 73, Sample 25001. Two human and two animal cremations were discovered, all of which are charcoal-rich. The human cremation from Site 10 (Context Group 36, Sample 14007 and 14008) just contained *Quercus* sp. charcoal; two animal cremations from Site 4e, which had been inserted into the top of large pits, are mixed although cf. Pomoideae (hawthorn, apple etc) predominates. A very large mixed assemblage of charcoal was found in the top of another pit in this context group (Sample 25009), along with much charred grain.

Molluscs

Shells are virtually absent from the deposits associated with the various causeway structures on Site 9 (Context Groups 2, 9, 12). A few shells of aquatic molluscs including *Gyraulus albus* are present in a sample from beneath the causeway on Site 10 (Context Group 28) but these sediments are also largely decalcified. In contrast, an alluvial assemblage which included the flowing water species *Bithynia tentaculata* was found in a short length of gully of possible Iron Age/Roman date north of the palaeochannel (Context Group 37). Much richer alluvial assemblages are present in the enigmatic alignments of small pits of probable Iron Age/Roman date on Site 9 (Context Group 19). A flowing water element is provided by *Valvata cristata* and *Bithynia tentaculata* while numerous shells of *Lymnaea truncatula* probably reflect muddy conditions on the floodplain.

Most of the non-waterlogged deposits which did not contain alluvial sediments are devoid of shells. One exception is Sample 13041 from a Bronze Age pit containing burnt stone on Site 9 (Context Group 18) from which a few shells of terrestrial species were recovered. One of the waterlogged samples from a Bronze Age waterhole contains shells of the stagnant water snail *Lymnaea palustris* (Context Group 47, Sample 21063) while shells of terrestrial species occur in two other samples (Context Group 59, Samples 16004 and 16100).

Waterlogged Macroscopic Plant Remains and Insects

Waterlogged remains are almost absent from beneath the stone causeway across the palaeochannel in Site 9 (Context Group 2). The later gravel trackway which overlay the stone surface (Context Group 9) contains rather badly preserved seeds of aquatic plants such as *Zannichellia palustris* (horned pondweed) along with seeds of annual weeds

such as *Stellaria media* gp. (chickweed) and *Valerianella dentata* (corn salad). However, it is difficult to establish which seeds were imported with the gravel, which appeared to have been derived from a river channel bed, and which were seeds from the surrounding environment of the causeway.

The alluvial deposit beneath the causeway on Site 10 (Context Group 28) is more productive of seeds. They comprise a flora appropriate to a river channel and bank. Seeds of *Ranunculus* S. *Batrachium* sp. (water crowfoot) are the most numerous but other seeds of aquatic plants included *Oenanthe aquatica* gp. (water dropwort) and *Sagittaria sagittifolia* (arrow-head).

The Bronze Age waterhole in the bed of the palaeochannel on Site 21 (Context Group 47) contains a very different assemblage from the other waterholes at Yarnton. The well-preserved organic deposit from the bottom (Sample 21063) contains much evidence of alder woodland, with abundant seeds of *Alnus glutinosa* (alder). Alder catkins are also present along with leaves, bud scales and twigs. The seeds of herbaceous plants are mostly from species which grow in shaded habitats such as *Stellaria* cf. *neglecta* (greater chickweed) and *Moehringia trinervia* (sandwort). Although seeds of plants of wet habitats around the waterhole such as *Polygonum hydropiper* (water pepper) are present, there are no seeds of fully aquatic plants, confirming that the channel bed did not hold water at this date. Insects from the well include *Grynobius planus*, which bores into dead wood.

The waterlogged plant remains from the Bronze Age waterhole or soaking pit on Site 9 (Context Group 17) in contrast suggest wet grassland. The most abundant seeds are of *Thalictrum flavum* (meadow rue), *Potentilla anserina* (silverweed) and *Juncus articulatus* gp. along with other seeds of grassland species such as *Prunella vulgaris* (self heal) and *Leontodon* sp. (hawkbit). The beetles include *Agriotes* sp., which feeds on the roots of grassland herbs, and the dung beetle *Geotrupes* sp., which feeds on the droppings of domestic animals on pasture. The only evidence for trees or shrubs was fragments of deciduous leaves.

Preservation of waterlogged remains is very poor in another pit on Site 9 (Context Group 18) and a second waterhole on Site 21 (Context Group 46). Seed preservation is also poor in the ditches on the bed of the palaeochannel in Site 21 (Context Group 51) although Samples 15008 and 15271 contain numerous seeds of *Juncus bufonius* gp. (toad rush). Seeds of *J. bufonius* gp. are the only remains from a pit on Site 4c (Context group 58).

The Bronze Age waterhole on Site 4c (Context Group 59), however, yielded well-preserved organic deposits. A scrub element is suggested by *Crataegus* / *Prunus* tp. (hawthorn or sloe) thorns, deciduous leaf fragments and twigs. The majority of the seeds are from weeds of disturbed habitats, for example *Chenopodium album* (fat hen), *Fallopia convolvulus* (black bindweed) and *Urtica dioica* (stinging nettle). Crop processing remains were represented by glumes of *Triticum dicoccum* (emmer wheat) and both seeds and capsule fragments of *Linum usitatissimum* (flax). Frond fragments of *Pteridium aquilinum* (bracken) were probably derived from material imported for animal

bedding because the floodplain and gravel terrace soils are unsuitable for the plant to have grown locally. The insects from the waterhole suggest open conditions. Dung beetles including *Geotrupes* sp., *Aphodius* sp. and *Onthophagus* sp. are quite well represented as are leaf beetles which feed on herbaceous weeds, for example *Chaetocnema concinna*.

Two of the three deep, middle Bronze Age pits on Site 4e (Context Group 71) show poor preservation (Samples 25010 and 25001). Well-preserved organic material, however, was discovered in the third (Sample 25004). The plant and insect assemblages from it show many similarities to those from the Context Group 59 waterhole on Site 4c, including the occurrence of waterlogged crop processing remains. Seed and capsule fragments of *L. usitatissimum* are again present but glumes of *Triticum spelta* (spelt wheat) had replaced *T. dicoccum*. Scarabaeoid dung beetles are quite well represented.

14.4 **Potential**

The sampling for charred plant remains concludes the programme established for other Yarnton Floodplain sites. The assemblages of seeds and nut shell fragments from Site 4c are of particular interest because of their association with the middle Bronze Age house. It is recommended that these samples be analysed in full for the palaeoeconomic evidence that they will provide. The rich assemblage of grain from the middle Bronze Age pit on Site 4e (Context Group 71, Sample 25009) is of importance because all the other cereal assemblages from the floodplain sites have been sparse. It is recommended that this sample be investigated in detail, even though sorting will be time-consuming because the sample also contains much charcoal. Analysis for charred plant remains (excluding charcoal) would follow the conventional well-established procedures, making identifications by direct comparison with reference material.

The most interesting assemblages of charcoal are those from the burnt stone pits, the tree-throw holes and the cremations because they can be more closely related to particular activities. It is recommended that full charcoal identifications are undertaken of this charcoal to confirm and refine the identifications. Some of the assemblages are large and will require sub-sampling. Identifications would be undertaken using high-power incident-light microscopy.

The molluscs associated with the causeway on Site 9 are disappointing and no further analysis is recommended. The molluscs from beneath the causeway on Site 10 (Context Group 28, Sample 14001) are of more interest because they have the potential to show conditions in the palaeochannel at the time of construction of the causeway. Likewise, the flowing water molluscs in the gully of possible Iron Age date (Context Group 37, Sample 14002) have the potential to help in the understanding of the archaeology, so it is recommended that these two samples be analysed. The analysis of some of the samples from the small pit alignment on Site 9 (Context Group 19) is necessary to characterise these enigmatic features. However, the analysis of two samples, for example Samples 13000 and 13001, ought to suffice rather than all 16 samples. The molluscs from the waterlogged samples from the waterholes are only of local interest so no further analysis

of them will be required other than recording results from those samples which are being processed for the full range of macroscopic plant and invertebrate remains. Molluscan samples of 0.5 to 1.0 kg (depending on shell concentration) should be sieved to 0.5 mm, sorted and the shells identified with comparison to reference specimens.

The waterlogged macroscopic plant remains from the deposits associated with the causeway on Site 9 show little potential so no further analysis is recommended. However, some time should be allowed for sorting this material, as it maybe required for radiocarbon dating. The sample from beneath the causeway on Site 10 (Context Group 28, Sample 14001) should be analysed for macroscopic plant remains to obtain further information about the environs of the channel crossing but the insects remains in this sample are not sufficiently well preserved for further analysis. Likewise, one of the samples from the bed of the palaeochannel in Site 21 (Context Group 51) should be analysed for macroscopic plant remains to give evidence for conditions after clearance but prior to the reactivation of the channel, even though insect remains are not well enough preserved for analysis. The samples from the waterholes of Context Groups 18, 46, 58 and the waterlogged pits represented by Samples 25010 and 25011 are all too badly preserved to justify further analysis. The Bronze Age waterholes of Context Groups 47, 17, 59 and 71 Sample 25004 have all given interesting results on assessment. Context Group 47 is possibly the earliest waterlogged deposit so far found on the project and can give information on alder woodland growing on the site. Context Groups 59 and 71 Sample 25004 are the only waterlogged deposits so far discovered with evidence of crop processing and nearby settlement. It is recommended that two samples be analysed in full for macroscopic plant and insect remains from each of these waterholes in order to demonstrate these aspects of the environmental sequence at Yarnton. Analysis of the samples should follow the standard procedures, with a sub-sample being washed over onto a 0.2 mm sieve and sorted for macroscopic plant remains and, where necessary, a larger sub-sample similarly washed over and then subjected to paraffin flotation to recover insect remains. Identifications should be made by comparison with reference specimens.

Table 14.1: Presence of Charred Plant Remains

	No. of samples
Seeds, chaff etc	9
Charcoal	68
Total number of samples	118

Table 14.2: Presence of Charred Economic Plants

			middle or late Bronze Age	Iron Age
Triticum cf. *Dicoccum* Schübl.	(emmer wheat)	grain	+	-
Hordeum vulgare L.	(six-row hulled barley)	grain	+	-
Corylus avellana L.	(hazel)	nutshell	+	-

Table 14.3: Concentration of Charred Remains (excluding charcoal)

	Percentage of samples	
No. of items per sample	middle or late Bronze Age	Iron Age
0	91	100
1-9	6	0
10-99	2	0
100-200	1	0
Total number of samples	100	18

Table 14.4: Occurrence of Charred Remains (excluding charcoal)

	Context Group		50	56	59	60			62		71
	Context		15070	16077	16015	16020	16021	16030	16024	16025	25046
	Sample		15560	16034	16003	16007	16008	16013	16009	16010	25009
Triticum cf. *dicoccum* Schübl.	(emmer wheat)	grain	-	-	-	-	-	-	-	-	+
cf. *Triticum* sp.	(wheat)	grain	-	-	-	-	-	+	-	-	-
Hordeum vulgare L.	(six-row hulled barley)	grain	-	-	+	-	-	-	-	-	-
Hordeum sp.	(hulled barley)	grain	-	-	-	-	-	-	-	-	++
cereal indet.		grain	-	+	-	-	-	+	-	-	+++
Corylus avellana L.	(hazel)	nutshell	-	-	-	++	++	-	+	+	-
weed indet.			+	-	+	-	-	-	-	-	-

+ 1-9, ++ 10-99, +++ 100-200

Table 14.5: Presence of charcoal

Charcoal		middle or late Bronze Age	Iron Age
? *Acer* sp.	Maple	+	-
cf. Pomoideae	hawthorn etc	+	-
cf. *Prunus* sp.	sloe etc	+	-
Ulmus sp.	Elm	+	-
Alnus/*Corylus* sp.	alder/hazel	+	-
Quercus sp.	Oak	+	+

Table 14.6: Concentration of Charcoal

	Percentage of samples	
Charcoal	middle or late Bronze Age	Iron Age
Absent	33	94
Present in low concentration	48	6
Present in high concentration	19	0
Total number of samples	100	18

Table 14.7: Presence of Molluscs

Context Group	2	9			12		28	37	19			18	59		47
Context	13253	13252	13011	13010	13009	13008	14014	14010	13030	13032	13034	13219	16017	16016	15113
Sample	13104	13074	13073	13072	13071	13070	14001	14002	13000	13001	13027	13041	16100	16004	21063
GASTROPODA															
Valvata cristata Müll.	-	-	-	-	-	-	-	-	++	+	-	-	-	-	-
V. piscinalis (Müll.)	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-
Bithynia tentaculata (L.)	-	-	-	-	-	-	-	+	++	+	+	-	-	-	-
Bithynia spp.	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-
Lymnaea truncatula (Müll.)	-	+	-	-	-	-	-	-	++	++	+	-	-	-	-
L. palustris (Müll.)	-	-	-	-	-	-	-	-	+	+	+	-	-	-	+
L. peregra (Müll.)	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
Planorbis planorbis (L.)	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-
P. carinatus (Müll.)	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Anisus leucostoma (Mill.)	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
A. vortex (L.)	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Gyraulus albus (Müll.)	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-
Armiger crista L.	-	-	-	-	-	-	-	-	++	+	+	-	-	-	-
Succinea or *Oxyloma* sp.	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Vallonia costata (Müll.)	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
V. excentrica Sterki	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Discus rotundatus (Müll.)	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Trichia plebeia (Drap.) or *hispida* (L.)	-	-	-	-	-	-	-	+	-	-	-	-	-	++	-
Cepaea sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
BIVALVIA															
Pisidium spp.	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-

+ present, ++ abundant

able 14.8: Presence of Waterlogged Seeds

		Context Group	2		9		28	47			17		18	46		51			58	59		71		
		Context	13299	13289	13246	13242	14014	15113	15088	15012	13189	13059	13273	15077	15074	15037	15032	15047	16218	16017	16016	25024	25047	2504
		Sample	13107	13106	13109	13108	14001	21063	21055	15001	13040	13030	13076	21052	21049	15031	15008	15271	16099	16100	16004	25004	25101	2501
anunculus cf. *acris* L.	meadow buttercup	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-
. cf. *Repens* L.	creeping buttercup	-	-	-	-	+	-	-	-	+	+	-	-	-	+	-	-	-	-	+	+	-	-
. S. *Batrachium* sp.	water crowfoot	-	-	+	+	++	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-
halictrum flavum L.	meadow rue	-	-	-	-	-	-	-	-	+	++	-	-	-		-	-	-	-	-	-	-	-
umaria sp.	fumitory	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
hlaspi arvensis L.	field pennycress	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ychnis flos-cuculi L.	ragged robin	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
tellaria media gp.	chickweed	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
neglecta Weihe	greater chickweed	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moehringia trinervia (L.) lairv.	sandwort	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Montia fontana L.	blinks	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Chenopodium polyspermum .	all-seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
. album L.	fat hen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
triplex sp.	orache	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
inum usitatissimum L.	flax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
ubus fruticosus agg.	blackberry	-	-	-	-	-	+	+	-	+	+	-	-	-	+	-	-	-	-	-	+	-	-
otentilla anserina L.	silverweed	-	-	+	+	-	-	-	-	++	+	-	-	-	-	-	-	-	-	-	-	-	-
phanes arvensis L.	parsley piert	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crataegus cf. *monogyna* ac.	hawthorn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
allitriche sp.	starwort	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chaerophyllum temulentum .	rough chervil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Oenanthe aquatica gp.	water-dropwort	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ethusa cynapium L.	fool's parsley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
olygonum aviculare agg.	knotgrass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
. *persicaria* L.	red-shank	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
. *hydropiper* L.	water-pepper	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

		Context Group	2		9		28	47			17		18	46		51			58	59		71		
		Context	13299	13289	13246	13242	14014	15113	15088	15012	13189	13059	13273	15077	15074	15037	15032	15047	16218	16017	16016	25024	25047	2504
		Sample	13107	13106	13109	13108	14001	21063	21055	15001	13040	13030	13076	21052	21049	15031	15008	15271	16099	16100	16004	25004	25101	2501
allopia convolvulus (L.) öve		black bindweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
umex conglomeratus Mur.		sharp dock	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
. maritimus L.		golden dock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
umex spp.		dock	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+
rtica urens L.		small nettle	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
. dioica L.		stinging nettle	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	++	+	-	-
lnus glutinosa (L.) Gaert.		alder	-	-	-	-	-	++	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
orylus avellana L.		hazel	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mentha cf. *aquatica* L.		water mint	-	-	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
ycopus europaeus L.		gypsy wort	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
runella vulgaris L.		self-heal	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-
alerianella dentata (L.) ol.		corn salad	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
arduus sp.		thistle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
apsana communis L.		nipplewort	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
eontodon sp.		hawkbit	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
onchus oleraceus L.		sow-thistle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
asper (L.) Hill		sow-thistle	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
lisma sp.		water plantain	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
agittaria sagittifolia L.		arrow-head	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
otamogeton sp.		pondweed	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
annichellia palustris L.		horned pondweed	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
uncus bufonius gp.		toad rush	-	-	+	+	-	-	-	-	-	+	-	-	+	-	++	++	+	-	-	-	-	+
articulatus gp.		rush	-	+	-	-	-	-	-	-	++	+	+	-	-	-	+	+	-	-	-	+	-	-
is pseudacorus L.		yellow flag	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
leocharis palustris (L.) R. & S. or *uniglumis* (Lin.) ch.		spike-rush	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
arex spp.		sedge	-	-	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
-ramineae indet.		grass	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-

able 14.9: Presence of Other Waterlogged Plant Remains

			Context Group	2		9		28	47			17		18	46		51			58	59		71		
			Context	13299	13289	13246	13242	14014	15113	15088	15012	13189	13059	13273	15077	15074	15037	15032	15047	16218	16017	16016	25024	25047	2504
			Sample	13107	13106	13109	13108	14001	21063	21055	15001	13040	13030	13076	21052	21049	15031	15008	15271	16099	16100	16004	25004	25101	2501
lnus glutinosa (L.) Gaert.	alder	female catkin	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
uds and bud scales			-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chara sp.	stonewort	oospore	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crataegus / *Prunus* tp.	hawthorn / sloe	thorn	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
eciduous leaves			-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	+	+	+	-	-
inum usitatissimum L.	flax	capsule frag.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
teridium aquilinum (L.) Kuhn	bracken	frond frag.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
riticum dicoccum Schübl.	emmer wheat	glume	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
. *spelta* L.	spelt wheat	glume	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
wigs			-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
icia / *Lathyrus* sp.	vetch	pod frag.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-

Table 14.10: Presence of Coleoptera

Context Group	47		17	59		71
Context	15113	15012	13189	16017	16016	25024
Sample	21063	15001	13040	16100	16004	25004
Carabus sp.	-	-	-	-	+	-
Nebria brevicollis (F.)	+	-	-	+	-	-
Bembidion sp.	-	+	-	-	-	+
Pterostichus melanarius (Ill.)	-	-	-	+	-	-
Pterostichus sp.	-	-	-	-	-	+
Calathus fuscipes (Gz.)	-	-	-	-	+	-
C. melanocephalus (L.)	-	-	-	+	-	-
Harpalus S. *Ophonus* sp.	-	-	-	-	+	-
Noterus clavicornis (Deg.)	-	+	-	-	-	-
Agabus bipustulatus (L.)	-	+	+	-	-	-
Helophorus aquaticus (L.) or *grandis* Ill.	+	-	-	-	-	-
Helophorus spp. (*brevipalpis* size)	+	-	+	-	-	-
Cercyon sp.	-	-	-	-	-	-
Megasternum obscurum (Marsh.)	-	-	-	+	+	-
Hydrobius fuscipes (L.)	+	-	-	-	-	-
Onthophilus striatus (Forst.)	-	-	-	-	+	-
Silpha sp.	-	-	-	-	-	+
Lesteva longoelytrata (Gz.)	-	-	-	-	+	-
Anotylus sculpturatus gp.	-	-	-	-	-	-
Philonthus sp.	-	-	-	+	-	-
Geotrupes sp.	-	-	+	+	+	-
Aphodius cf. *sphacelatus* (Pz.)	-	-	-	-	-	+
Aphodius spp.	-	+	-	+	-	+
Onthophagus ovatus (L.)	-	-	-	-	+	+
Dryops sp.	+	-	-	-	-	-
Athous sp.	-	-	-	-	+	-
Agriotes sp.	-	-	+	-	-	-
Grynobius planus (F.)	+	-	-	-	-	-
Cryptophagidae indet. (not *Atomaria*)	-	-	-	-	+	-
Gastrophysa sp.	-	-	-	+	-	-
Longitarsus spp.	-	-	-	+	+	-
Chaetocnema concinna (Marsh.)	-	-	+	+	-	+
Apion aeneum (F.)	-	-	+	-	-	-
Apion sp. (not *aeneum*)	-	-	-	-	+	-
Ceuthorhynchinae indet.	-	-	-	-	-	+

15. Pollen

by James Greig

15.1 The Samples

The 1998 season of excavations revealed a number of waterlogged features in which organic material was preserved, mainly in waterholes. The main parts of the site with base-rich clays and gravels do not offer suitable conditions for the preservation of pollen. The samples were taken from three of the Bronze Age waterholes in which organic material was preserved: feature 15014 located in the base of the channel on Site 21 (Context group 47), feature 15077 located on the north bank of the channel on Site 21 (Context group 46) and feature 16010 located on Site 4c (Context group 59). Waterhole 15077 had a deep and varied enough organic fill for it to be worth collecting three samples (top, middle and bottom) to elucidate whether this fill represented a single event or a series of events.

15.2 Laboratory work

All five pollen samples were processed using the standard method; about 1 cm^3 sub-samples were dispersed in dilute NaOH and filtered through a 70µm mesh to remove coarser material. The organic part of the sample was concentrated by swirl separating on a shallow dish. Fine material was removed by filtration on a 10µm mesh. The material was acetolysed to remove cellulose, stained with safranin and mounted on microscope slides in glycerol jelly. Counting was done with a Leitz Dialux microscope. Identification was using the writer's pollen reference collection, seen with a Leitz Lablux microscope. Standard reference works were used, notably Fægri and Iversen (1989) and Andrew (1984). Small counts of 50-60 grains were done for the purposes oft this assessment. One slide was also scanned to show how many additional taxa were present (recorded as + for presence).

15.3 Results

The results are listed in Table 15.1 below. Nomenclature and order of the taxa follows Bennett (1994) and Kent (1992) respectively. Pollen was for the most part adequately preserved and present in reasonable quantities, so there is no problem in obtaining a full and representative count.

Sample 1: Waterhole 15014. Nearly 60% of the pollen was from trees and shrubs, which is a high proportion for an archaeological site. Most of this was *Alnus* (alder), *Corylus* (hazel) and *Quercus* (oak). The other pollen was more in keeping with an occupied grassland landscape, with Poaceae (grasses, *Rumex* (docks and sorrels), *Ranunculus* (buttercups) and *Plantago* (plantains). No crop plants or possible weeds of arable were present. Neither were aquatic or wetland plants abundant.

Samples 2, 3 and 4: Waterhole 15077 (samples taken from top, middle and bottom of fill). Tree pollen is low. There is a wide range of dry land herbs, including probable

weeds, and cereals in two samples. There were considerable signs of wetland and aquatic plants such as Cyperaceae (sedges) and Alismataceae (water-plantains). The middle sample has an ovum of the intestinal parasite *Trichuris*. These worms are found in many animals, but a likely source is from humans, and suggests sewage.

Sample 5: Waterhole 16017. This feature contained a moderate amount of pollen, mainly Quercus (oak). Scanning of the slide showed that there is a wide range of tree and shrub pollen present, including both *Prunus* (sloe, wild cherry) and *Crataegus* (hawthorn). The latter are very underrepresented as pollen, and their mere presence suggests that they may be significant. Their archaeological importance is as possible hedgerow indicators, which may in turn suggest that stock was being kept. There is an early record of *Fagus* (beech), if this deposit proves to be Bronze Age in date.

15.4 **Potential**

All five pollen samples proved productive, and the small assessment pollen counts show great potential for further useful information from full counts.
The results obtained will help in the interpretation of the rest of the environmental evidence from the plant remains, insects and molluscs, and hence of the archaeological evidence and will contribute to a knowledge of the environment in the wider study area.

Table 15.1: **Pollen, spores and Parasite ova**

Sample	**1**	**2**	**3**	**4**	**5**	
Pteridium	-	4	1	-	1	bracken
Polypodium	-	-	1	-	+	polypody
Pinus	2	1	1	2	-	pine
Ranunculus-tp.	3	2	2	3	10	buttercup, crowfoot
Fagus	-	-	-	-	+	beech
Quercus	6	4	2	1	9	oak
Betula	-	-	-	-	+	birch
Alnus	10	-	-	-	6	alder
Corylus	8	-	1	1	1	hazel
Chenopodiaceae	-	4	1	2	8	goosefoot
Persicaria bistorta-tp.	-	-	-	1	-	bistort etc.
Rumex-tp.	5	-	-	1	-	docks and sorrels
Tilia	1	1	-	-	+	lime
Potentilla-tp.	-	-		tormentil,cinquefoil		
Crataegus-tp	-	-	-	-	1	hawthorn
Prunus-tp	-	-	-	-	+	sloe
Trifolium pratense-tp	1	-	-	-	-	red clover
Acer	-	-	-	-	+	maple
Apiaceae	-	-	-	-	+	umbellifers
Plantago lanceolata	1	-	2	-	2	ribwort plantain
Plantago major	2	1	-	-	-	greater plantain
Galium-tp	-	-	-	2	-	bedstraws
Cirsium-tp	-	-	-	1	+	thistles
Lactuceae composites	1	6	4	2	1	a group of
Aster-tp	-	1	-	1	-	daisies etc
Artemisia	-	-	-	-	2	mugwort
Anthemis-tp.	-	1	-	1	-	mayweeds etc.
Alisma-tp.	-	1	-	23	-	water plantain
Cyperaceae	2	16	28	16	-	sedges
Poaceae	6	19	8	40	17	grasses
Cerealia-tp.	-	3	-	3	5	cereals
Sparganium-tp	-	-	1	-	-	spike-rush
unidentified pollen	1	4	-	1	1	
Parasite ova						
Trichuris	-	-	1	-	+	

16. Phosphate

by Christopher Bell

16.1 Introduction

A phosphate survey was undertaken in the area surrounding a burnt stone feature on the north bank of the channel on Site 21. It is believed that soils from many kinds of human activity (burials, food processing, latrines, cattle compounds etc) become enriched with organic phosphates forming insoluble complexes at or near the point of deposition. The phosphate level raised above the background level in the immediate vicinity of the burnt stone feature might therefore provide evidence of the character of the activity represented by these enigmatic deposits.

16.2 Sampling strategy

An area 20 m x 10 m was sampled with samples taken at 0.50 m intervals. An additional east – west transect measuring 10 m x 4 m, and extending westward from this area, was then sampled at the same interval (Fig. 16.1).

16.3 Laboratory Method

The laboratory method was the same as that used in 1995, 1996 and 1997. The samples were tested in random order using a qualitative spot-testing method described by Eidt (1977). Only a proportion of the total phosphate is measured by this method and its limitations are acknowledged (see, for example, Gurney 1985).

A 50 mg sub-sample of sieved soil was treated on a filter paper with an acid-molybdate solution (hydrochloric acid and ammonium molybdate) to form molybdophosphoric acid. After 30 seconds this was reduced (with ascorbic acid) to form a molybdenum-blue complex, the intensity of which was read after two minutes and graded. Initially the sample was graded and termed `trace'; `weak'; or `positive' but a `weak/positive' value was soon added, as so many equivocal readings were encountered. Positive in this scheme was used to denote a strong colour reading.

The laboratory work was undertaken by Alison Gledhill and Leigh Allen. The results were entered into a database and plotted using Gsys CAD plotting system (Fig. 16.1). The symbol sizes on the plot representing the samples are scaled from 1 to 4. 1 = Trace, 2 = weak, 3 = `weak/positive' and 4 = positive.

[Phosphate plot]

16.4 **The Results**

The distribution of phosphate results was not random. A very high percentage of the samples were positive, with an obvious decrease in phosphate level at the north end of the area sampled (Fig. 16.1). However, there was no particular concentration in the immediate vicinity of the burnt stone feature. Therefore, given the location of the area sampled, it is possible that this broad concentration suggests either that associated activity was spread over a wide area or that it resulted from other activities which may have taken place along this bank of the channel, for example animals coming down to drink at the water's edge. Nevertheless, the overall level of phosphate recorded in this area is much higher than that recorded in any previous surveys undertaken in the study area, including those undertaken within, or adjacent to palaeochannels (Hey 1996; Hey and Muir 1997; Bell and Hey 1998).

16.5 **Potential**

The phosphate survey did not produce random results. If validated by laboratory testing of a sample of the readings obtained in this year's field test, further analysis may provide additional evidence for the character of activities being undertaken in areas where burnt stone was generated.

17. Geoarchaeology

by Matthew Canti

17.1 Two problems needing geoarchaeological examination were found during the 1998 excavations. The first was a double row of posthole/slot features to the north of the channel on Site 9 (Context group 19). Similar features have been found at Yarnton before, but these latest ones were a particularly clear example. They comprised around 20 pairs of shallow postholes/slots aligned approximately north-east – south-west. The sides of the features were sloping rather than vertical, and had similar alluvial fills notably paler than the surrounding matrix. Sampling was carried out with the aim of determining whether: a) the fills were of similar material and, b) whether the overlying material sealing the postholes and the matrix was the same as the pit fills or different. The samples were taken from postholes exposed in plan, and from the

[Matt’s illustration]

section of a small baulk at the north end of the line (see Figure 17.1). They comprised:

Posthole/slot fills	13026
	13044
	13045
Surrounding sediment	13015A
	13015B
Overlying sediment	13004A
	13004B

Similarity will be tested using particle size analysis to provide evidence of the character and form of these enigmatic features in order to shed light on their possible function.

17.2 The second area requiring analytical work was areas of soil-reddening on the south bank of the channel on Site 9. The high degree of reddening was assumed to be due to high temperatures (ie above 600°C), as is usually the case for most sediments and soils. Research on fires was carried out during the summer of 1998 at Yarnton as part of a separate AML project. Preliminary results suggest that open fires do not heat soil above 450°C, due to the development of the insulating ash layer. This degree of reddening would therefore signify sediment held up in a fire (eg on root-plates) or subjected to forced draught (broadly industrial) procedures. However, the experimental work on the gravels showed clearly that, on this one substrate at least, reddening could occur at a much lower temperature, below 400°C for certain, and maybe lower. It is intended to clarify this issue by heating gravel samples to a range of temperatures for different times and comparing the colour with 13114. This will be done in conjunction with a broader range of heating experiments needed for magnetic work (see Linford, Section 18). A thin section of 13114 will also be compared with the thin section taken after one of the experimental fires on gravel.

18. Geophysical survey and Mineral Magnetic Profiling

by Neil Linford

18.1 Magnetometer survey

Geophysical survey was conducted during March 1998 over an area encompassing the subsequent location of Site 21. An additional area immediately east of Site 21 was surveyed whilst the excavation was in progress with a high-sensitivity caesium magnetometer. Following the removal of topsoil from Site 21 both fluxgate gradiometer and magnetic susceptibility surveys were also conducted over the exposed excavation surface.

Following the varied success encountered during previous geophysical survey on the floodplain and the wide distribution of the proposed sites for the 1998 excavation it was decided to concentrate the investigation to an area surrounding Site 21 and develop the survey methodology applied. An area of 60 m × 120 m encompassing the proposed location of Site 21 was first surveyed with a Geoscan FM36 fluxgate gradiometer utilising the AML standard sample interval of 0.25 m × 1.0 m with the lower sensor of the instrument held at the standard operating height approximately 0.4 m from the ground surface (Fig. 18.1B). Subsequently, the same area was resurveyed with identical instrumentation at a revised sample interval of 0.25 m × 0.5 m and reading averaging over 16 individual observations applied at each measurement station (Fig. 18.1A). Whilst the revised sampling regime considerably slowed data acquisition it was hoped that the signal-to-noise ratio of the data would be much improved and allow more subtle anomalies to be distinguished above the background soil noise (*cf* Schmidt and Marshall 1997). The magnitude of the recorded anomalies was further amplified by reducing the height of the lower fluxgate sensor to within 0.05 m of the ground surface through a minor mechanical modification to the instrument carrying handle. Given the significant reduction of magnetic field intensity with distance ($^1/r^3$ for a dipole source) a considerable increase in anomaly magnitude would be expected.

Results from the magnetic data demonstrate the high density of ferrous detritus present in the modern ploughsoil at Yarnton which hampers the identification of underlying subtle anomalies. However, a diffuse positive anomaly was identified in both the standard and high-resolution data sets related to the course of the palaeochannel. To the west of this anomaly three discrete positive anomalies are evident which from the magnitude of their response (>10nT standard resolution data) could be interpreted as thermoremanent in origin. Subsequent excavation revealed the underlying causative features to be a series of burnt tree boles.

In addition to the magnetic survey, a limited earth resistance survey was applied to identify the position of the palaeochannel and its relation to the magnetic anomalies (Fig. 18.2). This was conducted with a Geoscan RM15 resistance meter together with a MPX15 multiplexer to facilitate the simultaneous collection of twin electrode configuration readings at 0.5 m and 1.0 m mobile probe separations. The data identifies three distinct ranges of earth resistance values visible as discrete statistical distributions in the histogram grey scale keys of Figure 18.2A and 18.2B. These distributions apparently relate to the varying response of the high-resistance gravel islands, intermediate values along the edge of the palaeochannel and a central, low-resistance anomaly following the deepest course of the former channel.

No correlation was observed between earth resistance anomalies and subsequently excavated features. However, a subtle linear anomaly was detected in the north-east corner of the survey which could not be identified where it entered the excavation trench. It is of interest to note that the magnetic anomalies associated with the palaeochannel appear, with respect to the earth resistance data, to be situated on the southern edge of the water course. The origin of these anomalies is likely to be a depositional remanent magnetisation (DRM) formed when detrital magnetic minerals settle from suspension and align with the ambient magnetic field. The stability of the

DRM process will depend upon the turbidity of the water course which may well favour shallow edges rather than the faster flowing central course of the channel (Rees 1961).

A high resolution magnetometer survey was conducted over ~0.92 ha to the east of Site 21 by Jörg Faßbinder of the Bayerischen Landesamt für Denkmalplege, München, Germany, as part of a continuing collaborative project with the AML. Data was collected at 0.25 × 0.5 m intervals with a Scintrex CS-2 caesium vapour total field magnetometer system (Fig. 18.3A). Due to the timing of the survey it was not possible to extend the adjacent excavation trenches to examine significant anomalies within the data. However, a tentative interpretation is provided (Fig. 18.3B), indicating the course of the palaeochannel and a scatter of pit-type responses distinguishable from the litter of near surface ferrous detritus. Of particular interest are the group of intense (>10nT) anomalies immediately north of the palaeochannel that may well indicate the location of thermoremanent features similar to the burnt treethrow holes revealed in the adjacent gradiometer conducted over Site 21.

Figure 18.4 illustrates the results of the fluxgate gradiometer and magnetic susceptibility surveys conducted over the topsoil stripped excavation surface of Site 21. The magnetometer data was collected following the high resolution fluxgate methodology detailed above for the surface survey and magnetic susceptibility measurements were collected at a 0.5 m × 0.5 m by Adrian Challands utilising a TR Systems Ltd. magnetic susceptibility meter and 20cm field coil (Challands 1998). The fluxgate data reveals a number of anomalies that were not evident in the surface survey including responses associated with the gravel causeway and a modern ceramic field drain running north - south across the length of the site (marked *AA´*on Fig. 18.4C). Comparison of this data with the susceptibility results illustrates that many of the magnetometer anomalies are produced by remanent magnetisations associated with the various features. For example, neither the field drain or the alluvium along the course of the palaeochannel produce a distinct susceptibility contrast in Figure 18.4B, however, both are easily discernible in the fluxgate data.

The magnetic response of the gravel causeway is of interest as it would appear to be either constructed from a higher-susceptibility material than the channel deposits or have had magnetically enhanced topsoil compacted along its course during use. Furthermore, both surveys provide evidence for a second, slightly weaker, linear anomaly to the west of the excavated gravel causeway, suggesting a previous alignment of the crossing.

18.2 Mineral magnetic profiling and archaeomagnetic dating

Samples were collected from a range of archaeological features and underlying natural sediments throughout the excavated areas as part of the continuing mineral magnetic profiling research project. Bulk magnetic properties including natural remanent magnetisation, susceptibility, isothermal and anhysteretic magnetisations have been determined for all samples. More detailed analysis will be performed on representative samples and magnetic extracts in due course.

In addition to the samples collected for mineral magnetic profiling, orientated samples

were recovered for potential archaeomagnetic dating. Three burnt treethrow features were sampled from Site 21 together with an alluvial sequence containing six visually identifiable units through the palaeochannel exposed in Site 9 adjacent to the limestone causeway. Unfortunately, none of the sampled features produced a stable characteristic remanent magnetisation (ChRM) that fell upon the UK calibration curve. This was surprising given the intense magnetisation of the burnt treethrow holes and may be due to either the deformation of the features after exposure to the elements prior to sampling or, perhaps, the failure of the original burning episode to produce a consistent *in situ* thermoremanent magnetisation. The failure of the alluvial sequence to provide stable ChRMs is less surprising as results from such weakly-magnetised sediments can be quite varied (*cf* Ellis and Brown 1998). However, consideration of the magnetic declination data alone together with the stratigraphic relationship between the various subunits produces the highly tentative sequence of dates presented in Table 18.1 below.

Table 18.1: Archaeomagnetic date of alluvial sequence based on declination data. Possible centre dates shown in bold with approximate error bars. No usable declination data could be recovered from unit 3.

UNIT	*AD*				*BC*		
1	1700	**1440**	940				
		1320					
2		1640	**1100**	80			
			940				
3							
4					420	**480**	2000
5					420	**470**	520

Neil

Neil

Neil

Neil

19. Dating

by Christopher Bell with Alex Bayliss

The stratigraphic and artefactual evidence initially suggests that the stone causeway discovered on Site 9 is mid to late Bronze Age in date which, if substantiated, would make this structure of national importance. Scientific dating will therefore be essential to validate this assumption. In addition to the stone surface the causeway incorporated various phases of wooden structures, comprising a row of upright stakes beneath the stone surface, the remnants of posts along its edges, and a series of horizontal timbers overlying it, which in turn were overlain by the later phases of sand and gravel trackway. There is therefore potential to date a stratified sequence of material enabling date ranges on the results produced to be significantly reduced. There is a small chance that some of the larger posts recovered from the causeway may be suitable for dendrochronological dating. If not, material for radiocarbon dating is present from all levels. In addition to dating the causeway, this sequence will assist in creating a chronology for broader deposition within the channel, including the large assemblage of animal bone. If this crossing proves to be long-lived it may also be appropriate to date a sample of the bone to elucidate its associations.

Bronze Age brushwood trackways of the type found on Site 10 rarely survive (Taylor, Section 11) and radiocarbon dating would enable its context to be established, both on a national level and within the sequence of occupation in the study area. No finds were recovered from either of the gravel causeways found on Sites 9 and 10 and it remains uncertain whether there will be sufficient material available for radiocarbon dating.

The date and function of the rows of wooden upright posts extending across the channel on Sites 9 and 10 is uncertain. A series of upright posts was also found in the channel on Site 1 in the 1992 excavation on the floodplain (Hey 1993b) of late Bronze Age or early Iron Age date (2585 ± 75, OxA-3644; 2465 ± 18, UB-4060) (Bayliss in prep.). However, the posts found in the 1998 excavations were slightly more substantial and formed more regular rows which extended across the full width of the channel. Radiocarbon dating should be considered to resolve the relationship of the posts to other deposits within the channel and occupation beyond. This will shed light on their function. Were they associated with the use or construction of the stone causeway, or did they form the foundations of timber walkways which post-dated the silting of the causeway ?

Radiocarbon dating is essential for providing the chronological context of these crossing points, and exploring their spatial relationships and influence on settlement layout and land-use.

Despite the increasing evidence for burnt mounds, the activity represented by these deposits is still poorly understood and its chronological span remains uncertain. Along with the deposits excavated in the 1997 excavations on the floodplain (Bell and

Hey 1998), the features found in this year's excavations appear to provide evidence that the chronological span of this activity began earlier than previously thought (eg Hodder 1990, fig. 47; Ehrenberg 1991, 41), and that more of these deposits than expected may date from the late Neolithic and earlier Bronze Age. Given their national significance validating these assumed early dates by ^{14}C determinations would be worthwhile. In addition to the charcoal recovered from these deposits, there are waterlogged plant remains from the bottom of the largest burnt stone feature on Site 9 which would provide some stratigraphic control to limit the date ranges of radiocarbon results.

Important assemblages of charred plants and waterlogged macrobotanical remains, beetles and pollen were recovered from the waterholes in the channel trenches, and from those found in association with areas of settlement on the higher gravel islands. Two of the waterholes also produced rare wooden objects. These features will therefore provide important information on the environment and land use in this area, and on woodworking and craft production. However, only one of these features could be dated by artefact association. Radiocarbon dating of these features will enable the landscape development of this area to be more fully understood and would provide the potential to examine the contrast in the character of the environment and land use between areas of settlement and areas of off-site activity. Once dated these features will also provide important information on changing hydrological conditions.

Although a number of the features found on Sites 4c and 4e produced reasonable assemblages of middle Bronze Age pottery, no artefacts were recovered from the post-built structure found in this area. However, one of its postholes produced a small quantity of charred grain and there is potential to date this structure by ^{14}C determinations. The assemblages of charred plant remains recovered from the features in this area include rare evidence of crop-processing waste which will provide significant information on Bronze Age food consumption and land use. Relating these deposits to the emerging pattern of changing agricultural practices from the early Neolithic to the Iron Age will be important.

20. STORAGE AND CURATION

20.1 The excavated pottery is in a variably condition. Most of the sherds have been bagged and are bulk boxed. Inevitably further breakage will occur over the long term.

The animal bones will be stored at the Oxford Archaeological Unit. No conservation is required.

20.2 **Conservation Assessment Report**

by Vanessa Fell

The following materials have been assessed for conservation requirements:

20.3 **Wood**

There are at least three unusual wooden artefacts from Bronze Age waterlogged deposits and other artefacts may be recognised during finds processing:

- A rectangular wooden container with well-preserved tooling marks
- A sheet of bark 'cut' to a semi-circle
- A ladder with well-preserved tooling marks (which has not yet been assessed for conservation needs)

Condition

All are waterlogged. The container appears overall to be fairly robust but there are numerous hairline cracks running longitudinally (with the grain) which suggest that it may not be in as good condition as it appears. It has now been cleaned and repackaged by the conservator. The bark sheet is very fragile and brittle and was recovered in numerous fragments.

Requirements

Continued wet, cold and dark storage in the short term. Early stabilisation by freeze-drying is recommended, as soon as recordings are complete.

20.4 **Metal**

There are seven artefacts (four copper alloy, one lead/tin allow and two iron).

Condition

All appear to be stable and in good condition.

Requirements

All have been x-rayed but will benefit from some further cleaning to enable archaeological and scientific analysis. Continued dry storage is required.

20.5 **Ceramic**

The one complete poorly-fired Bronze Age loomweight.

Condition

In numerous friable pieces.

Requirements

It has been x-rayed. May require some consolidation and reconstruction to enable recording and study.

20.6 **Potential**

The log ladder and wooden bowl are rare and important items. The good condition of the wood makes them suitable for stabilisation for further study and potentially display. Further cleaning and reconstruction of the metal and ceramic objects may provide further evidence of the character and form of some of the objects. The bronze spearhead may also be suitable for display.

20.7 **Methods statement**

Artefacts will be examined to assist identification, study and recording, to enhance the finds descriptive catalogue and interpretation according to the site objectives. Standard investigative conservation techniques and scientific analysis will be used where relevant. Finds will be stabilised or placed in stable storage conditions.

OVERALL STATEMENT OF POTENTIAL

21. Specific Research Objectives

The results of the Yarnton Floodplain B 1998 excavations measured against the specific objectives of the project (see above 2.3) are summarised in the table below, and their significance is discussed more fully in a revised statement of potential in relation to the project aims (Section 22).

	Research Objectives	Comments
	Site 9 and 10	
1	Examine the nature and extent of the buried ground surface adjacent to the palaeochannel and recover artefacts to date this deposit.	Areas of surviving old ground surface were located on the north bank of the channel on Sites 9 and 10. A small number of artefacts, comprising mostly worked flint of Neolithic and Bronze Age date, were retrieved from the surface of this deposit, but no further artefacts were recovered from test pits excavated through this layer.
2	Elucidate any patterns of distribution of in situ artefact scatters.	Although no concentrations of artefacts were located on the old ground surface to the north of the channel, a dense scatter of finds lay over the surface of the channel itself on both of these sites. All of the finds were either two-dimensionally plotted or bagged by contexts closely defined by individually-numbered segments. There is therefore potential to carry out detailed distribution analysis of these artefacts to provide evidence of activities being undertaken adjacent to, and associated with, the use of the palaeochannels.
3	Define the extent of the gravel causeways and examine the character of their construction.	The possible gravel causeway partly exposed in the evaluation of Site 9 was revealed to be a linear concentration of gravel within the channel silts. However, a perfectly preserved limestone causeway, 35 m in length and 5 m in width, was unexpectedly found spanning the channel further to the west. The causeway incorporated various wooden structures, including a possible hand-rail. Two phases of narrow gravel trackway had later been constructed along the centre of the stone surface. The gravel causeway located spanning the channel on Site 10 was exposed in plan and investigation of this feature revealed that it also comprised two separate phases of construction. In addition, the remnant of a possible brushwood trackway was located to the west and another gravel causeway was found running obliquely across the shallow channel on Site 21.

4	Recover artefacts from the causeways to elucidate the date of their construction.	A dense scatter of animal bone lay over surface of the stone causeway on Site 9, and further artefacts, including a Bronze spearhead and an awl, were recovered from within and beneath it. The preservation of various phases of wooden structure associated with this causeway will provide a stratified sequence of material for radiocarbon dating. A few small sherds from the upper sand and gravel causeway suggest it may be early Iron Age. The possible brushwood trackway on Site 10 was associated with a deposit of middle Bronze Age pottery. Wood recovered from this structure could also be used to confirm the date of its construction by radiocarbon dating. No artefacts were recovered from either of the gravel causeways on Sites 10 and 21. The dating of these features may therefore be reliant on the evidence of their stratigraphic and spatial relationship to other dated deposits.
5	Establish the stratigraphic relationship between the causeways and the various channel deposits.	Running sections, and sections excavated against the edges of the trenches, were used to examine and record the relationship between the causeways, trackways and channels deposits. All of the various structures crossing the channels were sealed beneath Roman alluvium.
6	Investigate the origin and longevity of these crossing points and their relationship to topography and settlement.	The discovery of a wooden structure and a layer of animal trample beneath the stone causeway on Site 9 suggests that the causeway was built on the line of an existing crossing point. The construction of two later phases of gravel trackway above the earlier stone surface suggests that this crossing point remained in use over a considerable period of time. The possible brushwood trackway found on Site 10 was aligned on a Bronze Age house found to the north of the channel on Site 4c and may have formed part of a contemporary phase of activity associated with this area of settlement. Once dated, the location and distribution of all of the crossing points can be examined in relation to topography and settlement.
7	Examine the extent and character of the posthole alignments to the north of the channel and attempt to establish the date and function of these features.	The double row of posthole/slot features to the north of the channel on Site 9 was traced over a distance of 23 m. The alignment lay at right angles to a Roman field boundary and the alluvial character of the fill of the postholes/slots suggested they may be contemporary with this field-system. However, the exact function of the features remains unclear.
8	Investigate the nature of the burnt stone spreads on the edges of the channel and try to elucidate the date and origin of this material.	Several areas of compacted burnt stone found to the north of the channel on Site 9 were revealed to be in situ burnt mound features. A scatter of burnt stone was recovered from the surface of the channel on Site 10. Some or all of this material probably derived from a burnt stone feature found on this bank. (See 12-14 for description and dating of these features).

9	Recover worked wood from the channel to provide evidence of Bronze age woodworking and off-site activities.	Numerous wooden structures were found in the channel on Sites 9 and 10. In addition, woodworking debris and rare wooden objects, including a possible bark container, a log ladder and a bowl, were recovered from waterholes on Sites 9 and 21. The range and scale of the material recovered greatly exceeded expectation and will provide significant evidence of Bronze Age woodworking and craft production.
10+11	Elucidate the stratigraphic sequence of the channel deposits and examine alluvial deposition to provide evidence of changing land use and hydrological conditions.	The stratigraphic sequence of the channel deposits was established, and separate phases of Roman and medieval alluvium were identified. The physical relationships between the various channel deposits and features and deposits on the banks of the channels were also established. These included burnt mound deposits, causeways, wooden structures and layers of animal trample. Waterlogged macrobotanical remains and molluscs were retrieved from some of these deposits which demonstrate changing hydrological conditions. Their physical relationships to dateable structures will provide greater insight into issues such as the period from which these channels started to flow and flooding began.
	Site 21	
12	Define the nature and extent of the burnt mound deposits.	The only burnt mound feature exposed on Site 21 was the sub-rectangular pit packed with burnt stone previously found in the evaluation. However, an unexpected number of burnt mound features were discovered to the north of the channel on Site 9, and another was discovered on the north bank of the channel on Site 10. These also comprised pits of various sizes packed with burnt stone and charcoal. Comparing the character of these features and their location has potential to shed light on the activities being undertaken.
13	Examine the stratigraphic and spatial relationship between these deposits and the channel.	The stratigraphic relationship between the burnt stone features and the various deposits and structures within the channel was established. As with a majority of the burnt mound features previously found on the floodplain, all of the burnt stone features found in 1998 lay to the north of the channels. A genuine pattern of distribution therefore appears to be emerging which suggests that this activity was predominately undertaken on the north banks of channels. The possible significance of this distribution remains uncertain.
14	Establish the date of the burnt mound features and attempt to interpret the activity represented by these deposits.	Three sherds of early Bronze Age pottery were recovered from the burnt stone feature on Site 21 to add to two previously recovered from it during the evaluation. The burnt stone feature on Site 10 produced a large and important assemblage of early Beaker pottery. The largest of the burnt stone pits on Site 9 produced a single large sherd of Beaker pottery and a flint knife. However, the finds in this feature may be redeposited. The range and character of burnt mound deposits now found within the study area provides a significant opportunity to examine the nature of this activity.

15	Compare the character and date of the burnt mound deposits to those identified elsewhere on the floodplain, and elucidate the chronological span of this activity and its relationship to settlement.	The artefactual and environmental evidence recovered from burnt mound features during the 1997 and 1998 excavations on the floodplain suggest that the chronological span of this activity began earlier than previously thought, and that a larger number of these deposits than expected may date to the earlier Bronze Age. Once all of the burnt mound deposits have been dated the location and spatial distribution of this activity can be examined in relation to areas of contemporary settlement.
16	Obtain carbonised and waterlogged macrobotanical remains from the burnt mound deposits to provide evidence of the character of this activity and to recover suitable material for radiocarbon dating.	Although the burnt mound features on Site 9, 10 and 21 were extensively sampled none produced charred food remains. Some of the charcoal recovered from these features maybe suitable for radiocarbon dating. Poorly-preserved waterlogged remains were recovered from the largest of the burnt mound features on Site 9.
	Sites 4c and 4d and observation area 4e	
17	Evaluate the success of the machine trenching strategy, in which 2% was sampled, against the results revealed in these areas by excavation.	The results of the evaluation suggested although some features may be located in these three areas, no major concentrations of features or specific areas of activity would be found. The small number of features discovered on Site 4d, and the paucity of the features in observation area 4e, validated the results of the evaluation of these two areas. However, a concentration of features associated with Bronze Age settlement was located on Site 4c. The excavation of these Sites therefore revealed that the trial trench evaluation had only been partly successful in predicting the extent of deposits in these areas (though see also 21) and underlines the problems of locating clusters of features widely spaced.
18	Assess the extent and density of Neolithic and Bronze Age settlement on the floodplain.	The excavation of Site 4d established that the large concentration of Neolithic features seen to the east on Site 7 did not extend into this area, and no Neolithic features were found in any of the areas to the north of the channel. The recovery of a range of features relating to Bronze Age occupation found on Sites 4c and 4e will provided further evidence the overall density of character of Bronze Age settlement on the floodplain.

	All Sites	
19+20	Examine evidence of tree clearance and landscape development in this area. To what extent is this associated with burnt mound activity ?	Varying numbers of treethrow holes were exposed in each of the areas of investigation, and a selection of these were excavated to confirm their interpretation and to recover dating evidence. A concentration of burnt treethrow holes was located along the south banks of the channels on Sites 9 and 21. However these did not appear to be associated with burnt mound features which were all situated on the north banks.
21	Explore the relationship of flint densities on the old ground surface, with the Roman ploughsoils and the modern surface.	Less flint than expected was recovered from the old ground surface on the north bank of the channel on Sites 9 and 10, and although dense finds scatters were recovered from the surface of the channel itself, these were sealed beneath alluvium and remained undisturbed by cultivation. A scatter of flint recovered from the surface of Field 12 during field walking corresponded with a concentration of features associated with middle Bronze Age settlement exposed on Site 4c. These features were sealed beneath the Roman ploughsoil. This material must therefore have been incorporated into the earlier ploughsoil before being brought to the surface by modern ploughing.
22	Obtain waterlogged macrobotanical remains, beetles, snails and pollen from a range of deposits to provide evidence of the floodplain environment and land use.	Well-preserved waterlogged macrobotanical remains, beetles, snails, pollen and charred plant remains, were recovered from a wide range of deposits, both from features in areas of settlement and from deposits associated with off-site activities.
23	Integrate the results of the environmental analysis with samples taken from elsewhere on the floodplain in order to assess the variability of the environment and land use across the floodplain area.	The information obtained from the environmental remains recovered from the 1998 areas of excavation will make a significant contribution to the overall picture of the floodplain environment and land use, and in particular will provide the opportunity to examine the contrast between areas of off-site activity and areas of settlement.
24	Examine Roman and later land use, boundaries and ploughsoils.	Evidence of Roman land-use, comprising, ditches, ploughsoils and various deposits of alluvium, was found in all six areas of investigation.
25	Validate the absence of Iron Age settlement on the floodplain at Yarnton.	No Iron Age features associated with settlement were found in any of the 1998 areas of excavation. However, a number of features and deposits relating to off-site activity, including gravel causeways and wooden structures within the channels, may be Iron Age in date, and a small quantity of early Iron Age pottery was recovered from a causeway and channel deposits on Site 9.

22. Revised Statement of Potential in Relation to Project Aims

22.1 The principal concerns of the 1998 floodplain work were to examine tasks external or peripheral to settlement, particularly activity associated with the use of palaeochannels, and to measure the success of using a 2% sampling strategy for evaluation.

The three main areas of excavation, Sites 9, 10 and 21, exposed a range of deposits associated with the use of palaeochannels, including gravel causeways, waterholes, wooden structures and finds scatters. However, most significantly, a perfectly preserved stone causeway associated with Bronze Age metalwork and large deposits of animal bone were found on Site 9. Well-preserved waterlogged plant remains were obtained from a range of deposits, and worked wood, including several wooden objects, were recovered from two of the waterholes. In addition to the deposits found within the palaeochannels, a number of features relating to burnt mound activity were found adjacent to channels on all three sites, and one of these features on Site 10 produced a large and important assemblage of early Beaker pottery. The various burnt mound features discovered add to the already significant body of evidence on this activity previously amassed from the work within the study area.

The excavation of Sites 4c, 4d and 4e revealed that the evaluation had been only partly successful in predicting the location and distribution of features in these areas. The discovery of only two cut features on Site 4d in the area to the south of the palaeochannel validated the findings of the evaluation that the large concentration of Neolithic features investigated on Site 7 to the east (Hey and Muir 1997) did not extend into this area. However, whereas the evaluation also suggested little activity in the area to the north of the channel, the excavation of Site 4c exposed a range of features associated with Bronze Age settlement, including a post-built structure, a waterhole and scatters of pits and postholes. Further features contemporary with this settlement activity, including another waterhole, and several finds-rich pits, were discovered in observation area 4e, although the features in this area were sparsely scattered.

22.2 Chronology

The date of a number of features found in the channels, including the gravel causeways, rows of wooden uprights and waterholes, currently remains uncertain and initial observations suggest that they may date from several periods. The dating of these deposits will therefore be reliant on radiocarbon determinations, or evidence of their spatial and stratigraphic relationship to other dated deposits. This is also true of the burnt mound features found to the north of the channel on Site 9. However, unusually for these types of deposits, the burnt stone features discovered on Sites 10 and 21 both produced pottery. A large assemblage of Beaker pottery came from the feature on Site 10, and a smaller quantity of early Bronze Age material from the pit on Site 21. Although no pottery was recovered from the waterhole located in the base of the channel on Site 21, the character of the environmental indicators from this

feature suggests that it is most likely to be earlier Bronze Age. This waterhole could potentially be contemporary and directly associated with the burnt mound feature to the north.

Although no pottery was recovered from the post-built structure found on Site 4c, a small quantity of middle Bronze Age pottery, and a deposit of middle Bronze Age cylindrical loomweights, was found in features nearby. Larger assemblages of middle Bronze Age pottery were retrieved from the pits found to the east, in observation area 4e, and middle Bronze Age pottery was also recovered from one of the waterholes on Site 21, a pit on Site 4d and the area of the possible brushwood trackway on Site 10. In addition, the bronze spearhead recovered from the beneath the stone causeway on Site 9 is thought to date from this period. Many of the features and deposits found in the 1998 areas of excavation could therefore represent a broadly contemporary phase of activity. The recovery of either waterlogged or charred plant remains from a large majority of these features (including the post-built structure), means that suitable material will be available for radiocarbon dating to substantiate their middle Bronze Age dates.

22.3 **The Nature of Neolithic and Bronze Age settlement**

22.3.1 *Domestic activity*

The unexpected discovery of a small group of Bronze Age domestic features clustered around a post-built oval building enhances our understanding of the location and density of Bronze Age settlement in this floodplain landscape. To date over fifteen Bronze Age houses have been uncovered on the different gravel islands, and these have occurred individually and in groups. The settlement evidence found in the 1998 excavations is considerably enhanced by the recovery of well-preserved waterlogged remains from waterholes associated with the buildings. In addition, assemblages of charred cereals were also found, and this included evidence of crop processing on site which has not previously been recovered. This will have a significant impact on the interpretation of the character of these settlements and the activities carried out there.

22.3.2 *The economic basis of society, land use and human impact on the environment*

The retrieval of a substantial assemblage of animal bone will significantly enhance our understanding of the animals being reared and the strategies adopted for food procurement. The large deposit of bone found in association with the stone causeway on Site 9 comprised predominantly cow and horse, with very little pig and very few wild species represented. However, account will have to be taken of whether these deposits derived from domestic activity or were associated with ritual practice.

Faunal remains are generally poorly preserved on the floodplain, and the animal bone from the channel on Sites 9 and 10, and a similar deposit of material from a channel adjacent to Bronze Age settlement in the east of the study area (Hey 1993b, Site 1), now form a large proportion of the total assemblage of the animal bone recovered from the excavations. On each of these sites the paucity of other

categories of artefacts in comparison to the quantities of bone implies that this material may not represent the accumulation or disposal of general refuse, but specifically deposits of animal bone. This may be supported by the paucity of gnawed or burnt bone in these deposits.

The recovery of waterlogged macrobotanical remains, beetles, snails, pollen and charred plant remains, from such a wide range of features and deposits will significantly add to the evidence of the prehistoric environment and land use on the floodplain and its changing character over time. In particular, these remains provide the potential to compare the character of the environment and land use between areas of settlement and contemporary areas and off-site activity. It is rarely possible to achieve in-depth analysis over such a wide area for early periods. Evidence from the treethrow pits examined in the 1998 work will increase understanding of the extent, character and date of tree clearance in earlier prehistory.

22.3.3 *Tasks external or peripheral to settlement*

Yarnton presents an unprecedented opportunity to examine activities carried out away from settlement because of the scale and character of the investigations and variety of different topographies examined. The deposits found in 1998 increase the range and scale of the prehistoric remains found on the floodplain, and in particular, greatly enhance the potential to examine the character and variety of activities associated with the use of palaeochannels.

Excavation of several causeways crossing the channel enables us to investigate how settlements were linked to the wider landscape and to other sites, and to see how people might have moved across this landscape. The stone causeway is exceptional. Considerable effort had been invested in the transport of this quantity of imported stone to the site. Once the source of the stone has been established there is potential to investigate the method employed to obtain it and the way in which it may have been transported. The accumulation of animal bone and other artefacts over and adjacent to some of these causeways may not be fortuitous and there is potential to examine deliberate deposition associated with crossing places.

Despite the fact that the burnt stone features on Sites 9, 10 and 21 were extensively sampled none produced charred plant remains. This follows an established pattern for these types of deposit previously found within the study area (Bell and Hey 1997). Given the charcoal-rich nature of the fills of these features, this would appear to represent genuine evidence of absence of charred food remains associated with this activity, and implies that these deposits were not, as is commonly believed, associated with cooking. Establishing the true nature of the processes being undertaken is integral to understanding the overall character of early settlement. The considerable body of data now amassed on burnt mounds from the work in the study area provides an excellent opportunity to address this question.

22.3.4 *The character of funerary sites*

Although not anticipated, the small number of cremated deposits discovered in the 1998 excavations extends the range of unaccompanied and unmarked burials found away from ceremonial sites. Patterns appear to be emerging in the location and character of these deposits: they are often located on the banks of the channels, only small quantities of bone are usually present (ie not complete individuals) and it is impossible from their surface appearance to distinguish between human and animal cremations.

22.3.5 *The relationship between domestic, other utilitarian, and burial sites*

The results of the 1998 excavations make a significant contribution to an understanding of the relationship between areas of settlement and off-site activity because they add to the range of activities represented and the location in which they were carried out.

22.3.6 *What is the character of the late Bronze Age/early Iron Age transition and how did land use strategies change through the Iron Age, Roman and Saxon period ?*

The use of the channels from the Bronze Age through to the Iron Age will enhance our understanding of the nature of the transition from the late Bronze Age to the early Iron Age.

The gravel causeways found on Sites 10 and 21 are presently undated, but were very similar in character to a number of gravel causeways previously discovered on the floodplain which are thought to be Iron Age or Roman in date (Hey 1993b). Provisional dating suggests that the gravel trackway constructed above the stone causeway on Site 9 is also no earlier than earlier Iron Age. However, unlike the other gravel causeways which have been directly overlain by alluvium, this trackway also lay buried beneath organic channel silts. This could suggest that these structures do not represent a contemporary network of crossings but were either short-lived or constructed over a considerable length of time.

Evidence of Roman activity, comprising ditches, ploughsoils and various deposits of alluvium was recovered from all six areas of investigation to add to the already significant body of data on Roman land use on the floodplain and the changing hydrological conditions during this period. The double row of postholes found to the north of the channel on Site 9 may also be associated with Roman field boundaries.

22.4 **Effectively evaluating floodplain landscapes**

The 2% sampling strategy of the evaluation was only partly successful in estimating the character and extent of the deposits exposed within the six areas of investigation. The evaluation accurately predicted a concentration of activity within the palaeochannel exposed on Sites 9 and 10, including causeways and worked wood, but did not fully represent the scale and preservation of these deposits. Although a 2% sample would be very unlikely to locate a structure such as the stone causeway, this does underline how deposits best preserved beneath alluvium are the most difficult to detect. This was also demonstrated by the discovery of the waterholes found within the shallow channels in 1997 (Bell and Hey 1998, Site 17) and on Site 21 this year, which in both cases lay buried beneath over a metre of alluvium. Waterlogging within these features led to the preservation of a number of rare wooden objects and important assemblages of macrobotanical and plant remains. However, the existence of these features, cut into the base of channels, had not been anticipated and none of these features were located by the evaluation.

The only burnt stone feature exposed on Site 21 was that previously located in an evaluation trench. The results of the evaluation led to the expectation of more extensive burnt mound activity within this particular area. Nevertheless, the discovery of a number of burnt stone features on Sites 9 and 10 showed that deposits and spreads of burnt stone were well distributed along this bank of the palaeochannel.

Magnetometer survey over the floodplain has not generally been successful, particularly in locating discrete features. The survey undertaken over the area of Site 21 prior to excavation was also largely unsuccessful and the only features located were a series of burnt treethrow holes on the south bank of the channel. However, the survey did locate diffuse magnetic anomaly along the whole of the southern bank of the channel which may be of significance. This phenomenon was also recorded by a survey undertaken over a palaeochannel on Cresswell Field (Hey and Bell 1995), and may reflect the character of the processes undertaken on these banks of these channels, including enhancement associated with burnt mounds and cremation.

Although the machine trench evaluation failed to locate the concentration of Bronze Age settlement features in the area of Site 4c, a light scatter of flint was recovered from the surface of the field in this area during fieldwalking, and the position of the trench had been specifically placed to investigate this scatter. The subsequent discovery of features, which included a post-built structure, therefore reiterated the value of using a range of evaluation techniques.

The general paucity of evidence provided by non-intrusive evaluation techniques on the floodplain, due mostly to the alluvial cover over earlier features, means that the evaluation of these areas is predominantly reliant on trenching. This raises the question of whether a 2% sampling strategy is adequate for floodplain landscapes and whether different sampling strategies

could be used. The opportunity to follow up evaluation over a large area of the floodplain with extensive excavation provides the potential to examine a range of issues connected with the methodologies and interpretation of evaluation work, and in particular to assess which techniques, or combination of techniques, is most successful and cost-effective in evaluating different topographies.

23. The Academic Issues and the National, Regional and Local Context

23.1.1 Movement through the landscape

A good deal of attention has recently been focused on human movement through ritual landscapes (eg Barrett 1994; Tilley 1994), but much less is known about traversing domestic landscapes. This is partly because it has rarely been possible to investigate settlement within a largely intact environment on the scale at which the Yarnton excavations have been conducted. The excavation of numerous stone, wood and sand and gravel causeways across long stretches of two palaeochannels at Yarnton will make a significant contribution to understanding how sites were linked and how different topographies were utilised.

23.1.2 Structures and finds deposition within palaeochannels

Although there are examples of Bronze Age wooden bridges or causeways, including those recently discovered at Testwood, Hampshire (Wessex Archaeology 1996) and at Dorney, Buckinghamshire (Allen and Welsh 1998), no parallels appear to exist for the substantial stone causeway found on Site 9. If the suggested mid to late Bronze Age date of the causeway is borne out by radiocarbon dating, this structure will be of national significance, perhaps representing the earliest stone-built 'bridge' or ford yet found in Britain, and also the earliest example of a metalled surface. Analysis of the causeway will therefore contribute important evidence on the range and character of Bronze Age structures and construction techniques.

The unusual nature and scale of this structure, and the resources required to collect and transport the stone to site, raises the question of whether it was constructed for a purely functional purpose.

The quantity of animal bone that was recovered from the stone causeway, and from the adjacent areas of the channel, is clearly significant, but the origin of this material is uncertain. Decaying butchery waste can be particularly obnoxious and will create a health hazard by attracting vermin and other infestations. The deposition of this type of waste into watercourses provides a convenient and effective method of disposal. Evidence of this practice in later periods is available from the records for medieval London, where the pollution of water supplies is well documented (eg Carlin 1996, Sabine 1933). The quantity of

animal bone found in the channels could therefore represent dumps of refuse from settlement.

Alternatively, the distribution of this material could be associated with the character of the activities being undertaken adjacent to the channel. An increasingly popular interpretation of burnt mounds is that they are associated with the preparation of animal skins or textile production, and historical and ethnographic parallels have been found for the use of burnt stone to heat water to create steam for a range of processes associated with such activities (Jeffery 1991). If this interpretation is correct there is a possibility that the deposits of animal bone are associated with the burnt mounds, and could represent evidence of an integrated process in which the butchering of animals and the preparation of the skins was undertaken adjacent to channels. The desirability of undertaking these processes away from areas of settlement, and the necessity of a good supply of water for leather or fabric production, would make this an ideal location for such activities.

Nevertheless, there is also the possibility that some of these deposits of animal bone in the channels, especially the concentration of material associated with the stone causeway, could be a result of deliberate, ritual deposition. Evidence of such activity in channels in the Bronze Age, including deposition associated with wooden causeways or platforms, is well documented at sites such as Flag Fen (Pryor forthcoming). Analysis of the wooden platform and finds distributions at Flag Fen suggested that there was evidence of partitioning of this structure. The quantity of finds recovered from the causeway on Site 9, and the preservation of the wooden structural elements, means there is potential to investigate evidence of similar activity associated with the stone causeway.

A substantial body of evidence relating to off-site activity has now been amassed within the study area, and the investigation of the wider landscape at Yarnton provides the opportunity to explore the occurrence and distribution of this activity in relation to areas of contemporary settlement. There is therefore potential to examine the evidence of all the issues raised above and to provide significant information on the nationally important issue of understanding the overall character, economy and organisation of Bronze Age settlement.

23.2 **Burnt mounds**

The majority of burnt mound deposits, including those found within the study area, appear to be Bronze Age in date, and although a few examples of late Neolithic burnt mounds have also been discovered (eg Jones 1990) these are relatively rare. The burnt stone feature found on Site 10 containing large assemblage of early Beaker pottery therefore represents a significant discovery which will elucidate the chronological span of this activity. In addition to the evidence of its early date, this feature is unusual because it is uncommon to recover any pottery from these types of deposit, let alone an assemblage of this size. However, one aspect that was typical was the absence of charred food remains, and this provided a significant contrast to the Beaker pits found on the

higher gravel islands which have been comparatively rich in both charred grain and wild foods (Hey 1993b; Hey and Bell 199; Hey and Muir 1997).

In addition to its contribution to the evidence for burnt mounds, the character of the pottery recovered from the burnt feature on Site 10 makes this assemblage important in its own right (see Barclay above). Although fine Beaker pottery has previously been recovered from a number of pits found the study area (eg Hey 1993b; Hey and Bell 1996) it is uncertain whether these deposits are genuinely associated with domestic activity or represent special deposits. The recovery of a such a large assemblage of fine Beaker wares from a burnt mound deposit will therefore provide important information on the use of Beaker pottery.

The quantity and range of burnt stone deposits that have now been investigated within the study area present the opportunity to examine the chronological span of this activity within a single area and to explore any changes in the character of the activity over time. The environment immediately around the spreads can be investigated and compared to that around settlements.

23.3 **Processes of change**

The 1998 excavation contributes to the large body of data on settlement and associated activities which have been collected in the Yarnton-Cassington study area. The changing use of the channels as the water levels rose and the strategies adopted for crossing them can now be fully addressed. The environmental evidence retrieved in association with the structures and with a sequence of deposits will enable the investigation of changing landscapes. The investigation of another Bronze Age settlement unit enhances an understanding of the changing character of settlement from the Neolithic to the late Bronze Age.

23.4 **Landscapes and past human impact on the environment**

Collection of environmental samples from the 1998 excavations provides data from the west side of the study area which will enable the investigation of landscape variability over a relatively restricted area. Does the woodland flora recovered from the waterhole on Site 21 indicate an earlier date for this feature, or that some parts of the landscape were cleared and others not ?

The large body of evidence on tree clearance, waterlogging and alluviation recovered from the work within the study area will enable the link between clearance and flooding to be investigated. There is also potential to examine the impact the causeways may have had on silt deposition and localised flooding in their immediate vicinity.

23.5 **Craft production**

The preservation of the various wooden structures within the channel, and the recovery of wooden objects and woodworking debris from the waterholes, will provide important evidence of Bronze Age woodworking and craft production, rarely preserved in association with contemporary settlement. This material included several rare objects for example the possible bark container, the wooden bowl and log ladder which will contribute to the range and character of Bronze Age wooden artefacts on a national level.

None of the burnt stone recovered from the 1998 excavations was of unworked, imported flint, and burnt flint has been rare in any of the features excavated on the floodplain. This suggests that imported flint was a prized commodity which was carefully used. A high percentage of the flint tools recovered from the channel on Sites 9 and 10 comprised piercers, and other finds from the channel included two awls, one made of bone and the other of bronze. The recovery of these implements could suggest evidence of leather working adjacent to the channel and the possible link between burnt stone deposits and leather processing has already been mentioned

23.6 **Methodology**

It has seldom been possible to follow evaluation of a large and varied landscape with such extensive excavation and observation as has been undertaken at Yarnton. Initial observation regarding the success of the various evaluation techniques that have been used within the study area suggest the importance of employing a range of techniques, even for assessing the character and extent of contemporary features within a single topographical zone.

The work on the floodplain over the last two years has greatly increased the knowledge of the range and scale of deposits found in association with palaeochannels, and has shown the particular problem of evaluating these deposits which lie where the alluvial cover is at its deepest, but where by the nature of these conditions, some of the best-preserved deposits are to be found. Further work to assess the effectiveness of the various evaluation techniques that have been used, will therefore not only examine which techniques produced the best results on different topographies, but also which types of evaluation techniques were most successful in detecting specific types of deposit.

A better understanding of the relative merits of different evaluation techniques, and recommendations for a more appropriate application of them, should emerge from this work.

23.7 **The Regional and Local Context**

Although isolated prehistoric pits or small pit groups have been excavated in the Upper Thames valley, for example at Sutton Courtenay and in the Stanton Harcourt area (Leeds 1934; Barclay *et al*. 1995), Neolithic activity is mostly known through examination of monument complexes. Yarnton is the first site on which domestic activity has been examined on any scale and will provide a major contribution to the understanding early settlement of this area. Bronze Age settlement sites, although known, are also scarce and small-scale. The importance of the extensive Bronze Age landscape at Yarnton to knowledge of regional patterns is considerable.

Evidence of extensive deposits of burnt stone in low-lying areas of the Thames valley is increasingly coming to light (Bell and Hey 1998). The evidence from Yarnton will enable an assessment of how these deposits formed part of the wider settlement pattern.

Evidence of Neolithic and Bronze Age landscapes in the Upper Thames valley is limited and has not been recovered over large areas in a consistent manner. The work at Yarnton and Cassington will greatly enhance knowledge of the impact of Neolithic and Bronze Age communities upon their environment and the strategies they adopted to exploit it.

Although Neolithic and Bronze Age settlement in the Evenlode to Cherwell confluence areas is well known, it is poorly understood. Neolithic pits have been excavated, for example at Cassington Mill (Case and Whittle 1982, 121-9) and a Neolithic burial enclosure was dug north of Eynsham in 1968 (Kenward 1982), but it has not been possible to set these features within a wider settlement pattern. No major monument complexes have been located. Excavations in the Yarnton-Cassington study area will provide a well-excavated context within which to re-assess previous work and gain a clearer understanding of the dynamics of early settlement of this area.

24. Bibliography

Andrew, R, 1984 *A practical pollen guide to the British flora*. Quaternary Research Association, Technical Guide **1**, Cambridge

Allen, T, and Welsh, K, 1998 *Eton Rowing Lake, Dorney, Buckinghamshire, Third Interim Report,* South Midlands Archaeology **28**, 75-84

Allen, T, in prep. *Excavations at Eton rowing lake,* OAU Thames Valley Landscape Monograph

Bamford, H ,1986 *Briar Hill: Excavations 1974 – 1978,* Northampton Development Corporation Archaeological Monograph **3**

Barclay, A, 1993 The pottery in *Yarnton Floodplain 1992 post-excavation assessment* (G Hey), internal OAU and English Heritage report, November 1993

Barclay, A, Gray, M and Lambrick, G, 1995 *Excavations at the Devil's Quoits, Oxfordshire 1972-3 and 1988,* Thames Valley Landscapes: the Windrush Valley **3**, Oxford

Barclay, A J Forthcoming The fired clay, in *Excavations along the line of the Wallingford Bypass* (A Cromarty, A Barclay and G Lambrick), OAU Thames Valley Landscapes Monograph

Barrett, J C, 1994 *Fragments from Antiquity*, Blackwell, Oxford

Bell, C and Hey, G, 1998 *Yarnton-Cassington Project: Yarnton Floodplain B 1997 post-excavation assessment*, internal OAU and English Heritage report, February 1998

Bennett, K D, 1994 *Annotated catalogue of pollen and pteridophyte spore types of the British Isles*, unpublished report

Benson, D & Miles D, 1974 *The Upper Thames valley. An archaeological survey of the river gravels,* Oxford Archaeological Unit, publication **1**

Bradley, P, 1993 Flint, in *Yarnton Floodplain 1992 Post-excavation assessment* (G Hey) internal OAU and English Heritage report, November 1993

Bradley, P 1995 The flint, in *Cresswell Field post-excavation assessment*, (G Hey and C Bell) internal OAU and English Heritage report, January 1996

Bradley, P, in prep. Worked flint, in *Yarnton: Neolithic and Bronze Age settlement and landscape* (G Hey), Thames Valley Landscape Monograph

Bradley, R, 1984 *The social foundations of prehistoric Britain*, Longman

Carlin, M, 1996 *Medieval Southwark,* Hambledon Press

Case, H J, and Whittle, A W R, 1982 Cassington, 1950-2: late Neolithic pits and the Big Enclosure in *Settlement patterns in the Oxford region: excavations at the Abingdon causewayed enclosure and other sites* (eds H J Case and A W R Whittle), CBA and Dept of Antiquities, Ashmolean Museum, 118-51

Case, H, 1986 The Mesolithic and Neolithic in the Oxford region in *The archaeology of the Oxford region* (eds G Briggs, J Cook and T Rowley), Oxford University Department for External Studies, Oxford, 18-37

Challands, A, 1998, *Report on the magnetic susceptibility survey at the A.R.C. quarry, Yarnton*, Oxfordshire, May 1998, unpublished geophysical survey report commissioned by English Heritage

Clark, K and Powell, A, 1996 *The Late Bronze Age animal bone from Whitecross Farm, Cholsey, Oxfordshire*, Centre for Human Ecology, unpublished manuscript

Clarke, D V, Cowie, T G and Foxon, A, 1985 *Symbols of power*, National Museum of Antiquities of Scotland, Edinburgh

Ehrenberg, M, 1991 Some aspects of the distribution of burnt mounds, in *Burnt mounds and hot stone technology*, Papers for the second international burnt mound conference (eds M A Hodder and L H Barfield), West Bromwich

Eidt, R C, 1977 Detection and examination of anthrosols by phosphate analysis. *Science* **197**, 1327-33

Ellis, C, and Brown, A G, 1998 Archaeomagnetic dating and palaeochannels sediments: Data from mediaeval channel fills at Hemington, Leicestershire, *Journal of Archaeological Science*, **25**, No. 2, 49-65

Fægri, K and Iversen, J, 1989 *Textbook of pollen analysis* (4th edn.),Wiley, Chichester

Gibson, A M, 1982 *Beaker domestic sites: a study of the domestic pottery of the late third and early second millennia BC in the British Isles*, Brit Archaeol Rep Brit Ser **107**, Oxford

Green, H S, 1980 *The flint arrowheads of the British Isles*, Brit Archaeol Rep Brit Ser, **75**, Oxford

Gurney, D A, 1985 *Phosphate analysis of soils: a guide for the field archaeologist.* IFA Technical Paper, **3**

Healy, F, 1985 The struck flint, in The excavation of a ring-ditch at Tye Field, Lawford, Essex (S J Shennan, F Healy and I F Smith), *Archaeol J* **142**, 177-207

Hey, G, 1991 *Yarnton & Cassington Worton Rectory Farm; 1990/91 assessments*, internal OAU and English Heritage report, July 1991

Hey, G, 1993a *Yarnton Worton Rectory Farm 1990/1 assessment*, internal OAU and English Heritage report, February 1993

Hey, G, 1993b *Yarnton Floodplain 1992 post-excavation assessment*, internal OAU and English Heritage report, November 1993

Hey, G, 1994a *Yarnton-Cassington evaluation 1993*, internal OAU and English Heritage report, March 1994

Hey, G, 1994b *Yarnton-Cassington Project: A Neolithic to Medieval landscape*, internal OAU and English Heritage report, November 1994

Hey, G, 1996 *Yarnton-Cassington Project: Yarnton Floodplain B 1995 post-excavation assessment*, internal OAU and English Heritage report, February 1996

Hey, G and Bell, C, 1996 *Yarnton Cresswell Field post-excavation assessment*, internal OAU and English Heritage report, January 1996

Hey, G and Muir J, 1997 *Yarnton-Cassington Project: Yarnton Floodplain B 1996 post-excavation assessment*, internal OAU and English Heritage report, March 1997

Hodder, M A, 1990 Burnt mounds in the English West Midlands, in *Burnt Offerings: international contributions to burnt mound archaeology*, (ed. V Buckley), Dublin

Institute of Geological Sciences, 1972, *Geological survey of Great Britain*, Sheet 232, Witney - solid with drift

Jeffery, P, 1991, Burnt mounds, fulling and early textiles, in *Burnt mounds and hot stone technology*, Papers for the second international burnt mound conference (eds M A Hodder and L H Barfield), West Bromwich

Jones, P, 1990, Neolithic field monuments and occupation at Staines Road Farm, Shepperton, *Surrey Archaeological Society Bulletin* **252**, November 1990

Kent, D H, 1992 *List of vascular plants of the British Isles* Botanical Society of the British Isles, London

Kenward, R, 1982 A Neolithic burial enclosure at New Wintles Farm in *Settlement patterns in the Oxford region: excavations at the Abingdon causewayed enclosure and other sites* (eds H J Case and A W R Whittle), CBA and Dept of Antiquities, Ashmolean Museum, 51-4

Kinnes, I A and Longworth, I H, 1985 *Catalogue of the excavated prehistoric and Romano-British material in the Greenwell Collection*, British Museum, London

Leeds, E T, 1934 Recent Bronze Age discoveries in Berkshire and Oxfordshire, *Antiquaries Journal* **14**, 264-276

Leeds, E T, 1938 Beakers of the Upper Thames district, *Oxoniensia* **3**, 7-30

Linch, F M, 1994 *Prehistoric Anglesey, the archaeology of the island to the Roman conquest*, 2nd ed., Llangefni, Anglesey Antiquarian Society

Linford, N, 1994 Geophysical survey, in *Yarnton Cassington evaluation 1993* (G Hey), internal OAU and English Heritage report, March 1994, 53-55

Linford, N, 1994a Report on geophysical survey at Mead Farm,Oxon., *Ancient Monuments Laboratory Report Series*, **112/93**

Linford, N, 1994b Report on geophysical survey at Worton Rectory Farm, Oxon., *Ancient Monuments Laboratory Report Series*, **113/93**

Linford, N T, 1995 Report on geophysical survey at Cresswell Field, Yarnton Cassington project, Oxfordshire, 1993, *Ancient Monuments Laboratory report series* **16/95**

Longworth, I H, 1971 The Neolithic Pottery, in *Durrington Walls: excavations 1966-1968*, (G J Wainwright with I H Longworth) Rep. Res. Comm. Soc. Antiq. London **29**

Mulville, J, in prep. The animal bone in *Yarnton: Neolithic and Bronze Age Settlement and Landscape* (G Hey) Thames Valley Landscapes Monograph

Mulville, J, 1997 Assessment of the animal bone from Yarnton Floodplain B 1996, Site 7, in *Yarnton-Cassington Project: Yarnton Floodplain B 1996 post-excavation assessment*, (G Hey and J Muir), internal OAU and English Heritage report, March 1997

Mulville, J, 1998 Assessment of the animal bone from Yarnton Floddplain B 1997, Sites 17, 22 and 25, in *Yarnton-Cassington Project: Yarnton Floodplain B 1997 post-excavation assessment*, (C Bell and G Hey) internal OAU and English Heritage report, February 1998

OAU 1992 *Oxford Archaeological Unit field manual*, August 1992

Palmer, N, 1980 A Beaker burial and medieval tenements in the Hamel, Oxford, *Oxoniensia* **45**, 124-225

Pryor, F, forthcoming, *Archaeology and Environment of the Flag Fen Basin*, English Heritage Monograph

Rees, A. I, 1961, The effect of water currents on the magnetic remanence and anisotropy of susceptibility of some sediments, *Geophysical Journal of the Royal Astronomical Society*, **5**, 235-5

Rohl B M and Northover J P 1994 *The metalwork from Flag Fen*, Journal of the Historical Metallurgy Society **28** 103-111

Sabine, E L, 1933 *Butchery in medieval London*, Speculum **8** 335-53

Schmidt, A, and Marshall, A, 1997, Impact of resolution on the interpretation of archaeological prospection data, in *Archaeological Sciences 1995*, (eds A G M Sinclair, E A Slater, and J A J Gowlett), Oxbow, Oxford, 343-48

Serjeanston, D, 1993, assessment of the animal bone from Yarnton Floodplain Sites 1-3, in *Yarnton Floodplain 1992 post-excavation assessment*, (G Hey), internal OAU and English Heritage report, November 1993

Serjeantson, D, 1996, The animal bones in refuse and disposal at Area 16 East Runneymede, in *Runnymede Bridge Research Excavations, Volume 2*, (eds S Needham and T Spence), British Museum Press

Smith, I F, 1965 *Windmill Hill and Avebury*, Clarendon Press, Oxford

Tilley, C 1994, *A phenomenology of Landscapes*, Berg, Oxford

Wessex Archaeology 1996, *Testwood Lakes, Netley Marsh, Hampshire; Meadow Lake Excavations: Assessment Report*, internal Wessex Archaeology report, December 1996

Whittle, A, 1981 Later Neolithic society in Britain: a realignment, in *Astronomy and society during the period 4000-1500 BC* (eds C Ruggles and A Whittle), Brit Archaeol Rep Brit Ser **88**, 289-96

Appendix 1: Context Groups 1 - 9

Grp. No.	Group Type	Description	Provisional Dating
Site 9			
1	Pre-channel deposits	Alluvial deposits which appear to pre-date the palaeochannel.	Late Devensian
2	Early channel deposits	Early fills of palaeochannel. An undulating layer of silt was visible in section beneath the stone causeway in the deepest part of the channel. This layer appeared to have resulted from animal trample, suggesting this crossing point was in use prior to the construction of the causeway.	Bronze Age
3	Finds reference number	Finds recovered from machining out the channel at the end of the excavation.	Bronze Age ?
4	Wooden structure beneath causeway	Small roundwood stakes running along the middle of the southern half of the stone causeway. It remains uncertain whether these stakes were part of a wooden structure which predated the causeway or were marker posts associated with the construction of either the stone, or later gravel causeway.	Bronze Age ?
5	Finds reference number	Finds incorporated within and lying directly beneath the stone causeway. This material consisted mostly of animal bone, but also comprised a bronze spearhead and an awl.	Bronze Age
6	Limestone causeway	Substantial stone causeway spanning the palaeochannel (35 m in length and 5 m in width). The causeway lay buried beneath over a metre of channel silts and alluviual clay. The stratigraphic and artefactual evidence initially suggests a mid to late Bronze Age date for this structure	Mid/late Bronze Age
7	Wooden structure along the edges of the causeway	Wooden posts, and fallen horizontal timbers, which lay along the edges of the stone causeway (preserved *in situ* by the waterlogged conditions) and appeared to represent the remnant of a wooden hand rail. This rail seemed most likely to be contemporary with stone structure, but a slight possibility remains that it could be associated with the later phases of gravel causeway (see Group 9 below).	Bronze Age ?
8	Finds scatter	A dense scatter of animal bone which lay over the surface of the stone causeway.	Bronze Age ?
9	Gravel causeway	Narrow gravel causeway which had been laid along the middle of the earlier stone causeway and continued for some distance over the north bank of the channel. Two phases of construction were identified.	Early Iron Age ?

Appendix 1: Finds from context groups 1 – 9

Grp. No.	Pottery	Flint	Other finds
Site 9			
1			
2			
3	A single early Roman sherd.	A single broken flake.	A large quantity of animal bone
4			
5	A total of 13 sherds of mixed date were found from contexts that formed the causeway (13256, 13258, 13260, 13262, 13276 and 13284. This included two possible middle Bronze Age shell-tempered sherds (sf 13412, 13542), two late Bronze Age quartzite-tempered sherds (sf 13468, 13473) and nine early Iron Age shell or sand-tempered sherds (sf 13501 – four sherds, 13476, 13482 & 13506). The later included an angular shoulder sherd and a decorated sherd.	49 pieces of worked flint, comprising 31 flakes, a piece of irregular waste, a core fragment, a multi-platform flake core and 15 retouched pieces (five piercers, one awl, three retouched flakes, one backed knife, one unfinished arrowhead, two end scrapers and two miscellaneous pieces). The retouched forms are dominated by piercing tools. A broad date range of Neolithic to early Bronze Age would be appropriate for these pieces.	A bronze spearhead and an awl, a bone awl, one piece of worked stone and a large quantity of animal bone.
6			One worked stone (rubber).
7			
8	A single early Roman sherd.	Two core fragments, a backed knife, and a piercer. The backed knife has been made on a re-worked flake; it has fine, steep retouch and has cortical backing. The piercer has a small point. These pieces may be early Bronze Age in date.	A large quantity of animal bone and one worked stone (rubber).
9	Context 13247 contained two Iron Age sherds and 13248 contained a single flint-tempered sherd of probable LBA date and two indeterminate pot crumbs. Indeterminate crumbs of pottery came from the sieved contexts 13243 (ss.13056) and 13248 (ss.13068). The Iron Age sherds contain calcareous temper that would favour an early date within this period. However, it must be noted that both sherds were small and worn and that an early Iron Age date for this causeway based solely on these sherds is only a tentative suggestion.	Thirty-three pieces of worked flint were recovered from the gravel causeway. This group consists of 22 flakes, two core rejuvenation flakes (one tablet and one face/edge type), a single blade-like flake, two chips, a piece of irregular waste and four retouched pieces. The retouched pieces consist of an end scraper, an unfinished leaf-shaped arrowhead, a retouched flake and a flake with miscellaneous trimming. The flakes are dominated by small, hard-hammer struck examples. One or two pieces are worn and abraded perhaps indicating that this group may be of mixed date.	A small quantity of animal bone.

Appendix 1: Context Groups 10 – 18

Site 9			
10	Areas of trample on north bank of channel	Patches of compacted quartzite pebbles and gravel, with burnt stone and animal bone incorporated, which lay to either side of the gravel causeway on the north bank of the channel. Although parts of this surface may simply have been caused by trampling, some patches appeared to be deliberate metalling to fill in hollows.	Iron Age ?
11	Timber uprights in channel	Several rows of timber uprights (c. 0.10-0.15 m in diameter) extending across the channel in the areas to either side of the causeway. The date and function of these posts remains uncertain.	Uncertain Late Bronze Age/Iron Age?
12	Later channel deposits	Layers of organic clay silt which overlay the causeway and represent the later silting up of this channel. One of the latest layers in this sequence contained dense lenses of gravel.	Late Bronze Age/ Iron Age
13	Finds reference number	Finds recovered from the surface of the channel.	Late Bronze Age?
14	Buried old ground surface	Layer of late Devensian silt which overlies the gravel and formed the prehistoric ground surface. A small scatter of finds, comprising mostly flints and animal bone, was recovered from this old ground surface in the area to the north of the channel, and a series of 1 m square test pits were excavated through this deposit to assess the quantities and spatial distribution of finds within it.	Neolithic/Bronze Age
15	Burnt treethrow holes on south bank of channel	Concentration of burnt treethrow holes along the south bank of the channel. Although several of these features were excavated no datable finds were recovered.	Bronze Age ?
16	All other treethrow holes	Scatter of unburnt treethrow holes to north of channel.	Bronze Age ?
17	Waterhole or soaking pit	Pit located on the north edge of the channel containing waterlogged plant fibres and worked wood, including part of a possible bark container.	Bronze Age ?
18	Burnt stone features on north bank of channel	Several pits of varying sizes on the north bank of the channel containing burnt stone and animal bone. The stone in a number of these features was the same limestone used to construct the causeway (elsewhere on the floodplain these type of features have usually contained quartzite).	Bronze Age ?

Appendix 1: Finds from context groups 10 – 18

Grp. No.	Pottery	Flint	Other finds
Site 9			
10		A single Levallois core weighing 41 g was recovered from context 13240. The core has been worked on both sides.	Animal bone.
11			
12			Animal bone.
13	Seven sherds and 12 small pot crumbs of indeterminate character (sf 13044 & 13050). The pottery ranged in date from MBA to EIA (sf 13025, 13028, 13033, 13044, 13050, 13054-6). Diagnostic sherds include the rim from a MBA Bucket Urn (sf 13054), the rim and shoulder from a Upper Thames type of furrowed bowl of earliest Iron Age date (sf 13033) and a sand and flint-tempered flaring rim of transitional LBA/EIA date (sf 13056).	Thirty-three pieces of flint, consisting of 14 flakes, five chips, two pieces of irregular waste, three multi-platform flake cores, a core fragment and eight retouched pieces. Miscellaneous tools that are either broken artefacts or flakes with small areas of retouch dominate the retouched pieces. Two end scrapers and a piercer were also recovered. A Neolithic/Bronze Age date seems likely for this material but it probably derives from several episodes of activity as the condition of the material is quite varied.	A Large quantity of animal bone.
14	A single flint and sand-tempered sherd that is of either MBA or LBA date and a one Roman sherd.	Seven pieces of flint were recovered from the old ground surface, a flake, a core tablet, two retouched flakes, serrated flakes, an end scraper and a piercer). The retouched forms are fairly undiagnostic but the piercer has a long point which may indicate a later Neolithic date and the forms would be consistent with a Neolithic or early Bronze Age date.	
15			
16			
17			Fragment of possible bark container.
18	Context 13271, the primary fill of pit 13275, produced a single large decorated body sherd of Beaker date. The sherd has a number of horizontal bands of incised decoration (both cross-hatched and oblique) that had originally held white inlay.	Five flakes and a backed knife were recovered from this context group. The knife has shallow retouch along its left side with cortical providing backing along the right side. It is difficult to date such a small group of flint especially as the material was spread between three different features but the knife may be of early Bronze Age date.	Burnt quartzite and limestone, animal bone, including a Red deer antler and waterlogged wood.

Appendix 1: Context Groups 19 - 26

Site 9			
19	Double row of alluvium-filled posthole/slot features on north bank of channel	Parallel row of shallow posthole/slot features which extended over a distance of 23 m to the north of the channel and terminated at the channel edge. No significant dating evidence was recovered from these features, but the alluvial nature of their fill suggests they post-date the Bronze Age. Their function remains unclear.	Iron Age or Roman ?
20	Other alluvium-filled features	Shallow alluvium-filled features lying within hollow to the north of the channel. Although a few of these features were possibly small pits or postholes, others may be natural.	Iron Age/Roman
21	Early alluvium	Shelly alluvium which extended over the north-eastern corner of the site and filled the slot features	Roman
22	Roman ditches	Two ditches at the north end of the site associated with the extensive Romano-British field-system observed across the floodplain.	Roman
23	Early ploughsoil	Buried Roman ploughsoil extending over the areas of the site to the north and south of the palaeochannel.	Roman
24	Roman alluvium	Various deposits of alluvium. Up to a metre of this material had accumulated above the deepest part of the palaeochannel.	Roman
25	Medieval alluvium	Thin layer of brownish alluvium beneath the present ploughsoil. This deposit extended over much of field 12.	Medieval
26	Post-medieval activity	Modern ploughsoil	Post-medieval

Appendix 1: Finds from context groups 19 – 26

Grp. No.	Pottery	Flint	Other finds
Site 9			
19	Five sherds of early Roman pottery and a single very small (1 g) and worn fragment of residual Neolithic pottery.	Two flakes and an end and side scraper were recovered from these features. Again this group is too small to provide any firm dating evidence but the scraper may be of Neolithic or early Bronze Age date. The blade scars on the dorsal face of one of the flakes suggests a careful reduction strategy, perhaps of Neolithic date.	
20			
21			
22			
23			
24			
25	A single sherd of Roman pottery.		
26			

Appendix 1: Context Groups 27 - 41

Grp. No.	Group Type	Description	Provisional Dating
Site 10			
27	Pre-channel deposits	Alluvial deposits which pre-date the palaeochannel	Late Devensian
28	Early channel silts	Channel silts stratigraphically earlier than the gravel causeway.	Bronze Age
29	Gravel causeway	Cambered gravel causeway running slightly obliquely across the palaeochannel. At least two phases of construction were identified.	Uncertain Late Bronze Age/Iron Age ?
30	Brushwood trackway ?	Linear concentration of small roundwood debris and upright stakes extending across the channel to the west of the gravel causeway. This appears to be the remnant of a crude brushwood trackway.	Middle Bronze Age ?
31	Timber uprights	Several timber uprights located within the deepest part of the channel to the west of the gravel causeway. These posts were similar in size and character to those seen in the channel on Site 9 (Context group 11).	Late Bronze Age/Iron Age ?
32	Later channel deposits	Layers of organic clay silt representing later silting up of channel.	Late Bronze Age ?
33	Finds reference	Scatter of finds on the surface of the channel.	Late Bronze Age ?
34	Buried old ground surface	Layer of late Devensian silt which overlay the gravel and formed the prehistoric ground surface.	Neolithic/Bronze Age
35	Burnt stone pit on north bank of channel	Pit packed with burnt stone and charcoal and containing a large assemblage of decorated Beaker pottery.	Beaker
36	Cremations on north bank of channel	Two small features containing cremated bone and charcoal.	Bronze Age ?
37	Alluvium-filled gully	Short stretch of alluvium-filled gully to north of channel.	Iron Age/Roman
38	Early alluvium	Distinctive deposit of shelly alluvium which extended throughout Site 10, but was not seen anywhere else in Field 12. Although slightly different in character, this deposit is possibly contemporary with the alluvium which filled the slot features on site 9 (Context group 21).	Iron Age/Roman
39	Early ploughsoil	Buried Roman ploughsoil. Only extended in a small area of the trench to the south of the channel.	Roman
40	Roman Alluvium	Various deposits of alluvium, some of which extended beyond the channel.	Roman
41	Medieval alluvium	Thin band of alluvium beneath the present ploughsoil.	Medieval

Appendix 1: Finds from context groups 27 – 41

Grp. No.	Pottery	Flint	Other finds
Site 10			
27			
28			
29			
30	Context 25001 produced 19 sherds of MBA Deverel-Rimbury pottery from which 18 belonged to a single quartzite–tempered Bucket Urn. These sherds were relatively small, but it is possible that the trackway could be of the same date.		
31			
32			
33	Context 14021 produced a single small and very worn late Neolithic sherd. Context 14024 produced a single sherd of either MBA or LBA date.	Thirteen pieces of flint, consisting of seven flakes, two blade-like flakes, a microlith; a backed knife and two miscellaneous retouched pieces. The material is obviously of mixed date; the microlith being probably of earlier Mesolithic date. The knife has been finely worked. An early Bronze Age date is likely for this piece. The two miscellaneous pieces are a flake with a small area of retouch and a possible unfinished piercer.	A large quantity of animal bone and burnt stone and two pieces of worked stone.
34		A single large flake.	
35	Context 14007 contained 142 sherds (405 g) of decorated Beaker pottery. Several fine vessels are represented of which most have sinuous profiles. Decoration includes finger-nail and all-over comb. Stylistically the assemblage is early within the Beaker sequence. Context 14030 produced a further 51 sherds (250 g) of similar material. In addition, a further 30 sherds came from soil sieved for environment analysis.	This pit produced 12 pieces of worked flint, comprising two flakes, and a miscellaneous retouched piece, which is either a scraper or knife fragment, seven flakes, a chip and an end scraper. The flakes are mostly hard-hammer struck and one has a very steep flaking angle. This material is not particularly diagnostic but would accord with the Beaker pottery, which was recovered from the feature.	Burnt stone (quartzite).
36	Context 14033 (ss 14007) produced a minute indeterminate crumb of pottery.		Cremated bone.
37			
38			
39			
40			
41			

Appendix 1: Context Groups 43 - 54

Grp. No.	Group Type	Description	Provisional Dating
Site 21			
43	Buried old ground surface	Layer of late Devensian silt which overlay the gravel and formed the prehistoric ground suffice.	Neolithic/Bronze Age
44	Burnt stone feature	Large rectangular pit packed with burnt stone and charcoal. A small number of stakeholes lay around the edges of this feature.	Early Bronze Age ?
45	Pits on north bank of channel	Scatter of shallow pits to the north and east of Context group 42. A number of these features contained burnt stone and may be associated with the burnt mound feature.	Bronze Age ?
46	Waterhole on north bank of channel	Well or waterhole with a ramp cut into the west edge. Large sherds of Bronze Age pottery were recovered from the primary fill of this feature.	Mid/late Bronze Age
47	Waterhole in bottom of channel	Well or waterhole. This feature had been partly backfilled with woodworking debris and wooden objects and this included a log ladder and part of a large wooden bowl. A Red deer mandible and a fox skull were also recovered from this deposit.	Bronze Age
48	Burnt treethrow holes	A concentration of burnt treethrow holes was located on the south bank of the channel and a further scatter lay in the area to the north of the channel.	Bronze Age ?
49	All other treethrow holes	A small number of unburnt treethrow holes which were also examined on this site.	Bronze Age ?
50	Gravel causeway	Narrow gravel trackway running obliquely across the bottom of this shallow channel.	Uncertain Late Bronze Age/ Iron Age ?
51	Clay filled ditches	Two shallow clay filled ditches which also ran into the bottom of the channel. These ditches are possibly associated with the gravel causeway, though their function remains unclear.	Uncertain Late Bronze Age/Iron Age ?
52	Roman alluvium	Various layers of alluvial clay. Up to a metre of this material had accumulated above the deepest part of the channel.	Roman
53	Medieval alluvium	Thin band of medieval alluvium beneath the modern ploughsoil	Medieval
54	Post-medieval activity	Modern ploughsoil and field drain	Post-medieval

Appendix 1: Finds from context groups 43 – 54

Grp. No.	Pottery	Flint	Other finds
Site 21			
43			
44	Context 15034 contained the rim from a Biconical Urn and two body sherds (which have no added temper) that are of indeterminate prehistoric date. The rim sherd indicates that the pit could be of EBA date.		Burnt stone (quartzite).
45			A small quantity of animal bone and burnt stone.
46	Context 15076 (primary fill) contained 14, mostly refitting, sherds (104 g) from a thin-walled decorated bipartite vessel. The decoration consists of a nested chevron motif that has been incised above the shoulder. The bipartite form is slightly unusual, although the shell-tempered fabric would indicate a MBA date. The vessel could be a rare form of Globular Urn.	A single broken flake was recovered from this feature.	
47			Several wooden objects, including a bowl and a log ladder, and a fox skull and a deer jawbone.
48		A retouched flake and a serrated flake were recovered from tree-throw holes. Both pieces are broken.	
49	Context 15017 (sf 15003) contained a large quartzite-tempered sherd of LBA date.	Five pieces of flint were recovered from the tree-throw holes (three flakes, one blade-like flake and an end and side scraper). The flint was dispersed over three contexts, with 15017 producing the most material (two flakes and a blade-like flake). The scraper from context 15111 has been steeply retouched; it may be later Neolithic in date.	
50			
51	Context 15032 contained a single sherd of probable LBA date. This sherd was worn indicating that it could be redeposited.		A small quantity of animal bone.
52		A single blade, with possible use damage to its edges.	
53			
54			

Appendix 1: Context Groups 55 - 65

Grp. No.	Group Type	Description	Provisional Dating
Site 4c			
55	Buried old ground surface	Layer of late Devensian silt which overlay the gravel and formed the prehistoric ground surface	Neolithic/Bronze Age
56	Structure 16209 at north end of site	Group of postholes which seem to form an oval post-built structure c. 5 m long x 4.5 m wide. A cluster of postholes on the south-east edge of the structure appear to represent to a projecting porch.	Middle Bronze Age ?
57	Burnt stone feature on north edge of structure 16209	Shallow rectilinear pit packed with burnt stone and charcoal. This feature was originally thought to be associated with structure 16209 but appears to truncate two of its postholes and may therefore be later.	Bronze Age
58	Features in the area immediately adjacent to structure 16209	Small number of pits and postholes mostly clustered to the south and east of structure 16209.	Middle Bronze Age
59	Waterhole	Well or waterhole situated c. 30 m south-east of structure 16029. Well-preserved waterlogged plant remains were present in the lower fills of this feature.	Middle Bronze Age ?
60	Features in central area of site	Light scatter of pits and postholes. One of these features contained a deposit of broken middle Bronze Age cylindrical clay loomweights.	Middle Bronze Age
61	Discrete features at south end of site	Cluster of shallow pits and postholes at the southern end of the site. Only a small number of these feature produced finds.	Bronze Age ?
62	Treethrow holes	Treethrow holes scattered across the site. Several of these features showed evidence of burning and a small number of those examined produced finds.	Bronze Age ?
63	Early ploughsoil	Buried Roman ploughsoil which extended throughout this trench and sealed the prehistoric features.	Roman
64	Medieval alluvium	Thin deposit of alluvium beneath the modern ploughsoil.	Medieval
65	Post-medieval activity	Modern ploughsoil.	Post-medieval

Appendix 1: Finds from context groups 55 – 65

Grp. No.	Pottery	Flint	Other finds
Site 4c			
55		A single blade with possible use damage to one edge.	
56		A flake, a chip and a miscellaneous retouched piece. The miscellaneous piece is interesting as is would appear to be an unfinished piercer of Mesolithic date.	Small quantities of burnt stone were recovered from nearly all of the postholes which formed this structure.
57			Burnt stone (quartzite).
58	Context 16109 contained 32 very worn sherds that include a rim from a MBA Bucket Urn. Sieved material of MBA date came from contexts 16109 (ss.16046) and 16071 (ss.16031).	A blade-like flake, two flakes and a small, rather crude discoidal core. Both of the flakes are hard-hammer struck.	A hammerstone.
59	Context 16013 contained a grog-tempered sherd of EBA date. The sherd could be from a Biconical Urn. Context 16015 produced a small incurving rim fragment. The rim could be from a vessel of hooked rimmed form and of LBA date.	A very fine end and side scraper. It has been made on a non-cortical blank and has been invasively retouched. It may be of Neolithic date.	A small quantity of animal bone, including articulated sheep bones.
60	Context 16020 contained the base of a collar from a late style Collared Urn of EBA date. The sherd is grog-tempered and is decorated with finger-nail impressions. Context 16138 contained a probable MBA sherd.	Two flakes and two chips. Both of the flakes have been burnt.	Pit 16018 contained 84 fragments (3235 g) from two or more cylindrical loomweights and fill 16019 (ss.16012) produced a further eight amorphous fragments. This pit also contained a fragment of quernstone.
61	Context 16126 produced a cordoned sherd from a MBA Bucket Urn. Context 16162 contained 23 small sherds of flint-tempered pottery that is of either MBA or LBA date. Context 16178 produced a probable LBA rim sherd and context 16180 produced a small grog-tempered Beaker sherd. Sieved material included a small crumb of MBA pottery from context 16126 (ss.16052).	Seven pieces of flint were recovered from a pit and three postholes from this area of the site. This material is really too scrappy to provide any evidence for dating.	
62		A large multi-platform flake core weighing 109 g. There are many hinge fractures on the core and some incipient cones of percussion. Areas around its circumference have been battered, perhaps through use as a hammerstone.	
63			
64			
65			

Appendix 1: Context Groups 66 - 70

Grp. No.	Group Type	Description	Provisional Dating
Site 4d			
66	Features in north-west corner of trench	A small pit and a cremation were found on south bank of the channel. These were the only archaeological features identified on this site.	Bronze Age
67	Channel deposits	Only the edge of the channel was exposed in the north-west corner of the trench. A small quantity of animal bone was recovered from these deposits.	Bronze Age ?
68	Early ploughsoil	Buried Roman ploughsoil which extended throughout this trench.	Roman
69	Medieval alluvium	Thin band of alluvium beneath the modern ploughsoil	Medieval
70	Post-medieval activity	Modern ploughsoil	Post-medieval

Appendix 1: Finds from context groups 66 – 70

Grp No.	Pottery	Flint	Other finds
Site 4d			
66	Context 17011 produced two large body sherds from a MBA Bucket Urn.		Cremated human bone and a bone pin.
67	Context 17006 contained four small quartzite and sand- tempered LBA sherds.		A small quantity of animal bone.
68			
69			
70			

Appendix 1: Context Groups 71 - 74

Grp. No.	Group Type	Description	Provisional Dating
Site 4e			
71	Pits	Small number of finds-rich pits including a possible waterhole. Several of these features contained carbonised and waterlogged plant remains.	Middle Bronze Age
72	Burnt stone feature	Very large pit containing burnt stone, charcoal and Bronze age pottery. The type of stone used in this features is the same as that used to construct the causeway on Site 9.	Middle Bronze Age
73	Shallow scoops and treethrow holes	Shallow features of uncertain function	Bronze Age ?
74	Roman ditches	Ditches associated with an extensive Romano-British field system.	Roman

Appendix 1: Finds from context groups 71 - 74

Grp. No.	Pottery	Flint	Other finds
Site 4e			
71	Context 25015 produced 96 sherds (754 g) of MBA pottery. This includes the rims from four different Bucket Urns as well as a number of sherds with decorated cordons, a sherd with a lug and refitting base sherds. A further eight sherds from Bucket Urns came from ss. 25002. Context 25043 produced four rim sherds that could come from either a MBA Bucket Urn or a LBA hook-rimmed jar and a possible Beaker sherd came from a sieved soil sample (ss.25008). Context 25046 contained 19 sherds from a small number of Bucket and Globular Urns with a further six sherds, including a Bucket Urn rim, coming from the sieved sample ss.25009. Context 25047 produced two small EBA Biconical Urn sherds that could be residual and five flint-tempered MBA sherds. Context 25048 produced a single sherd in a shell, grog and flint-tempered fabric that is more likely to be of LBA date.	Four pits (25014, 25042, 25045 and 25009) produced 116 pieces of worked flint. The majority of this material was recovered from pit 25045 (108 pieces). This material is dominated by debitage (56 flakes, 33 chips, two pieces of irregular waste and three cores). The retouched forms include two retouched flakes, three serrated flakes, one end and side scraper, a leaf-shaped arrowhead and seven miscellaneous pieces. The leaf-shaped arrowhead provides an earlier Neolithic date for some of this material. However, the general condition of the material would indicate that there has been some mixing and it seems unlikely that all of the material is contemporary.	Pit 25014 contained 95 fragments c.1513 g of oven clay. Some flat surfaces and corner fragments mostly oxidised reddish-brown (this includes two amorphous fragments from ss. 25015). These pits also produced a small quantity of animal bone, several fragments of quernstone and a large quantity of charred grain.
72	Context 25009 contained a single MBA sherd in a shell-tempered fabric. Context 25011 produced 36 sherds from at least three MBA Bucket Urns and a residual grog-tempered sherd of probable EBA date. These features are clearly of MBA date.	A single broken flake, with possible use damage, was recovered from this feature.	A large quantity of burnt limestone.
73			
74			

YFPB 98

N

212000

211000

Yarnton

Edge of second gravel terrace

Church

Saxon cemetery

YCF

YWRF

YFP

YFPB

Tuckwell's Pit

Cassington

Church

Saxon cemetery

Tolley's Pit

Edge of second gravel terrace

River Thames

6 7 8 9 10 11 12 13 14 15 16 17

17 21 22 25

4a 4b 4c 4d 4e

1 2 3 4 5 7 9 10

446000 447000 448000

Excavated areas

Evaluated area

Gravel terrace

Palaeochannels

Observation areas

12 Field numbers

0 0.5 1 km

scale 1:10,000

Figure 1

KEY
Cremations
Waterholes
Burnt stone features
Causeways and trackways
Structure
Pits and postholes
Rows of timber uprights
Ditches
Treethrow holes
Test pits

Site 21

Area 4e

Site 4c

46700
11000

46900
11000

N

Site 10

Site 9

palaeochannel

palaeochannel

palaeochannel

Site 4d

46600
10800

46900
10800

0 50 100 m
scale 1:1000

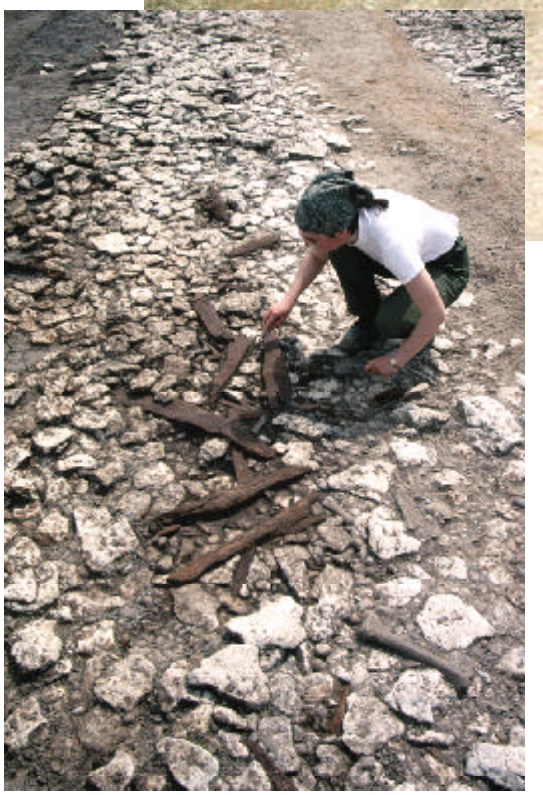
Figure 2

Site 9

Group no.	Group type
1	Pre-channel deposits
2	Early channel deposits
3	Finds reference number
4	Wooden structure beneath causeway
5	Finds reference number
6	Limestone causeway
7	Wooden structure along edges of causeway
8	Finds scatter
9	Gravel causeway
10	Areas of trample on north bank of channel
11	Timber uprights in channel
12	Later channel deposits
13	Finds reference number
14	Buried ground surface
15	Burnt treethrow holes on south bank of channel
16	All other treethrow holes
17	Waterhole or scalding pit
18	Burnt stone features on north bank of channel
19	Double row of alluvium-filled posthole/slot features on north bank of channel
20	Other alluvium-filled features
21	Early alluvium
22	Roman ditches
23	Early ploughsoil
24	Roman alluvium
25	Medieval alluvium
26	Post-medieval activity

Figure 3

Stone and gravel causeway



Fallen timbers and animal bone lying on the surface of the causeway

Bronze spearhead found lying directly beneath the causeway. Scale 1:1 approx.

Figure 4

Site 9: Reconstructed section through deepest part of channel showing level of stone and later gravel causeways

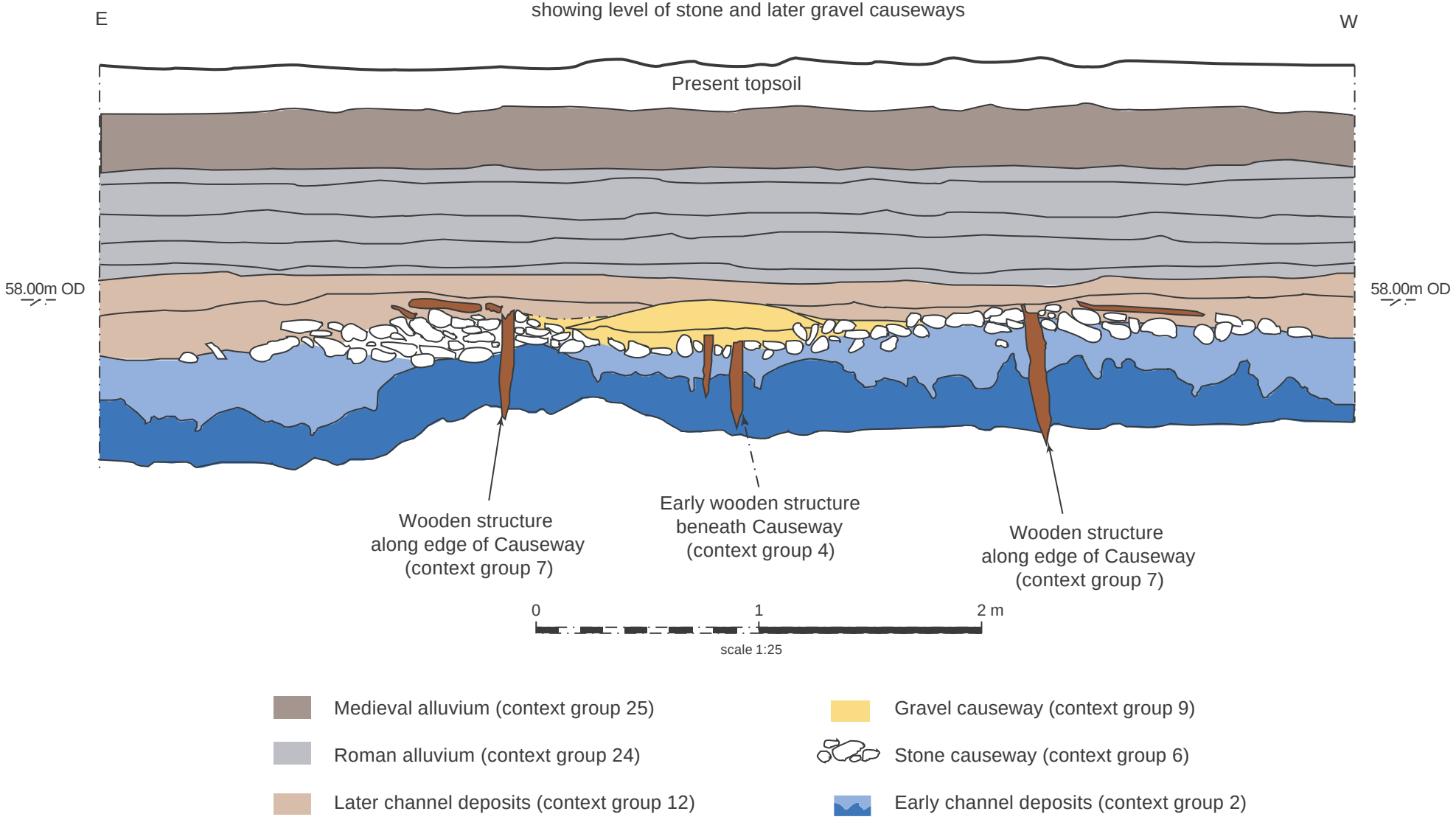
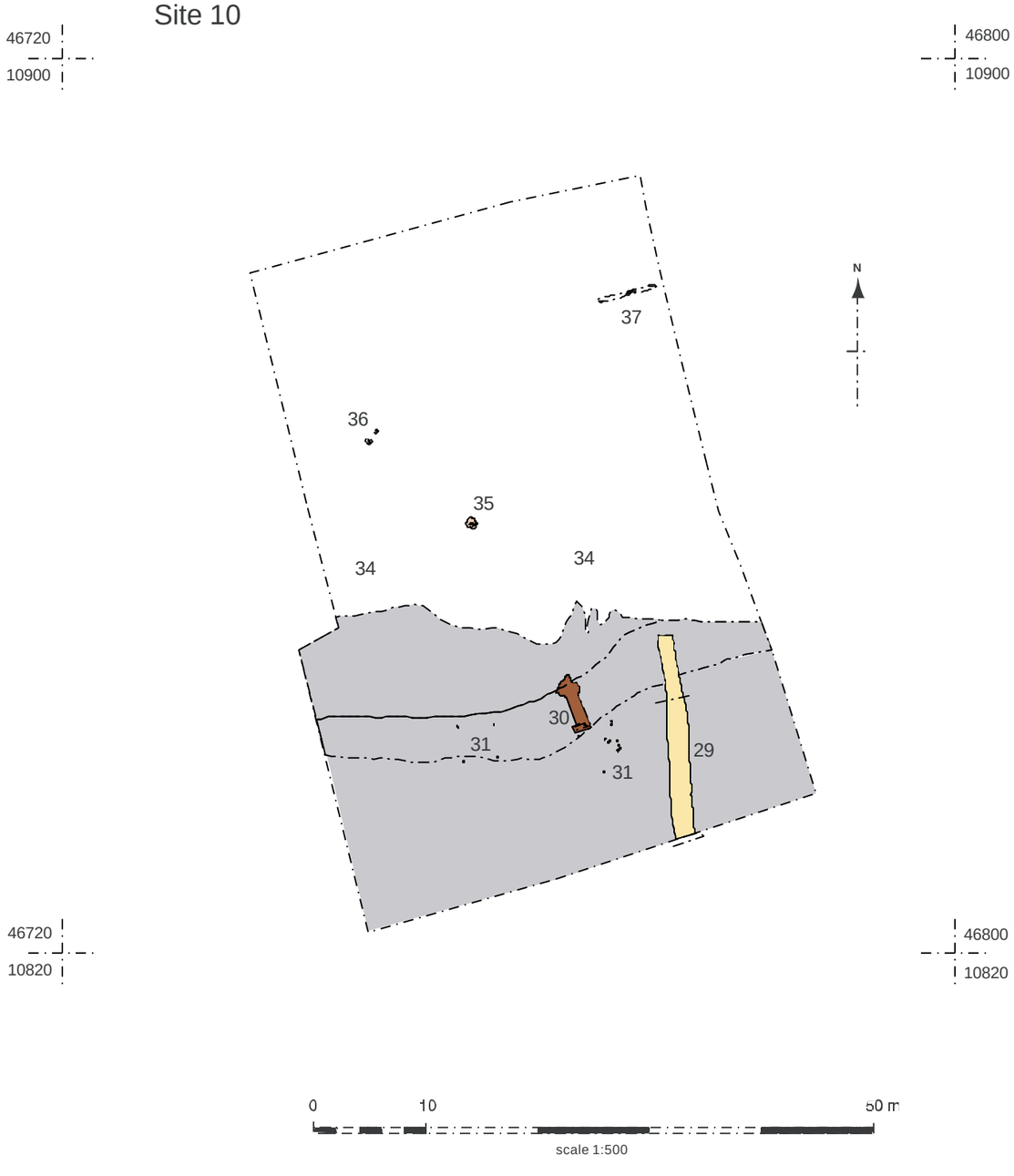


Figure 5

Site 10



Group No.	Group Type
27	Pre-channel deposits
28	Early channel silts
29	Gravel causeway
30	Brushwood trackway?
31	Timber uprights
32	Later channel deposits
33	Finds reference
34	Buried ground surface
35	Burnt stone pit (on north bank of channel)
36	Cremations on north bank of channel
37	Alluvium-filled features
38	Early alluvium
39	Early ploughsoil
40	Roman alluvium
41	Medieval alluvium

Figure 6

Site 21

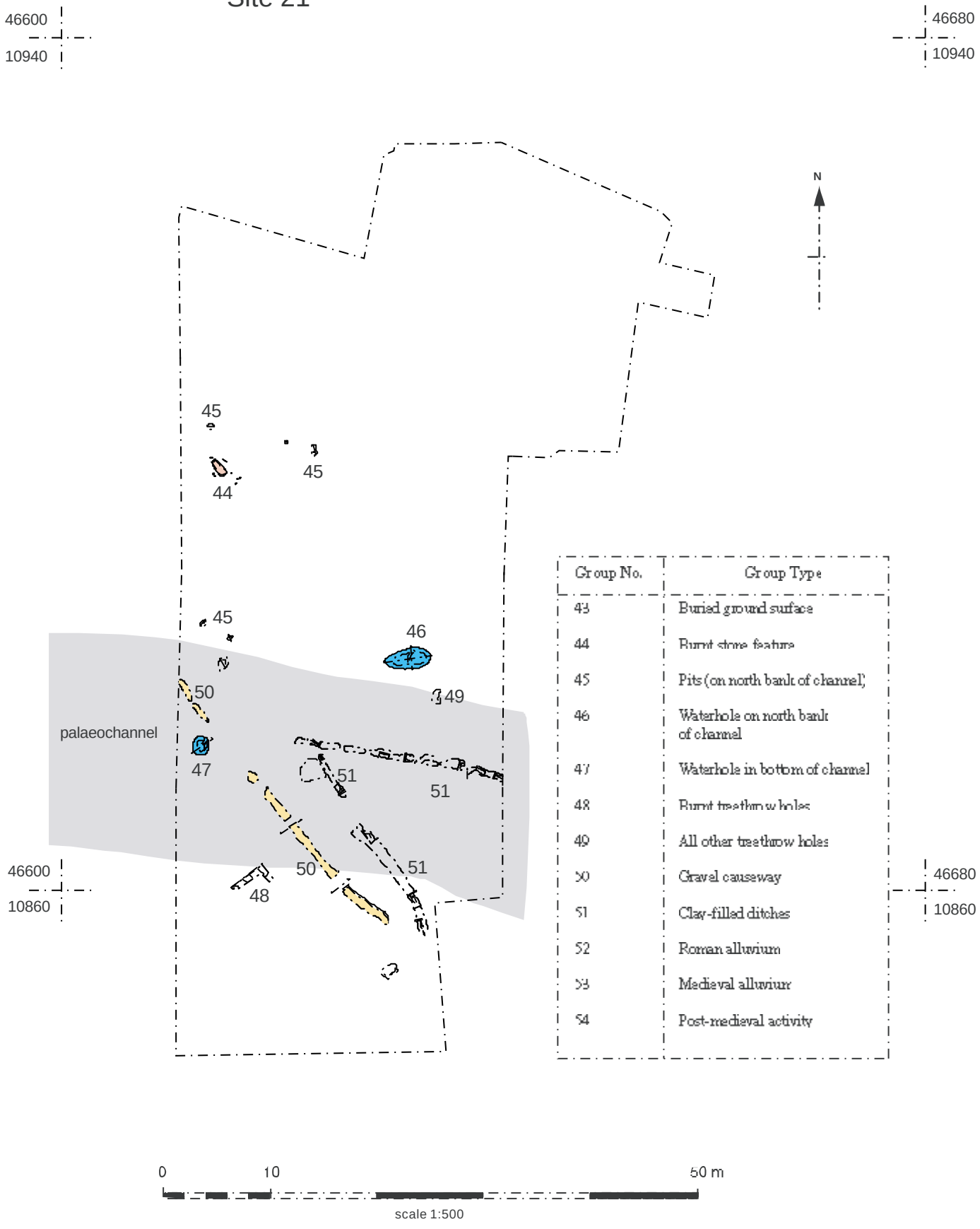
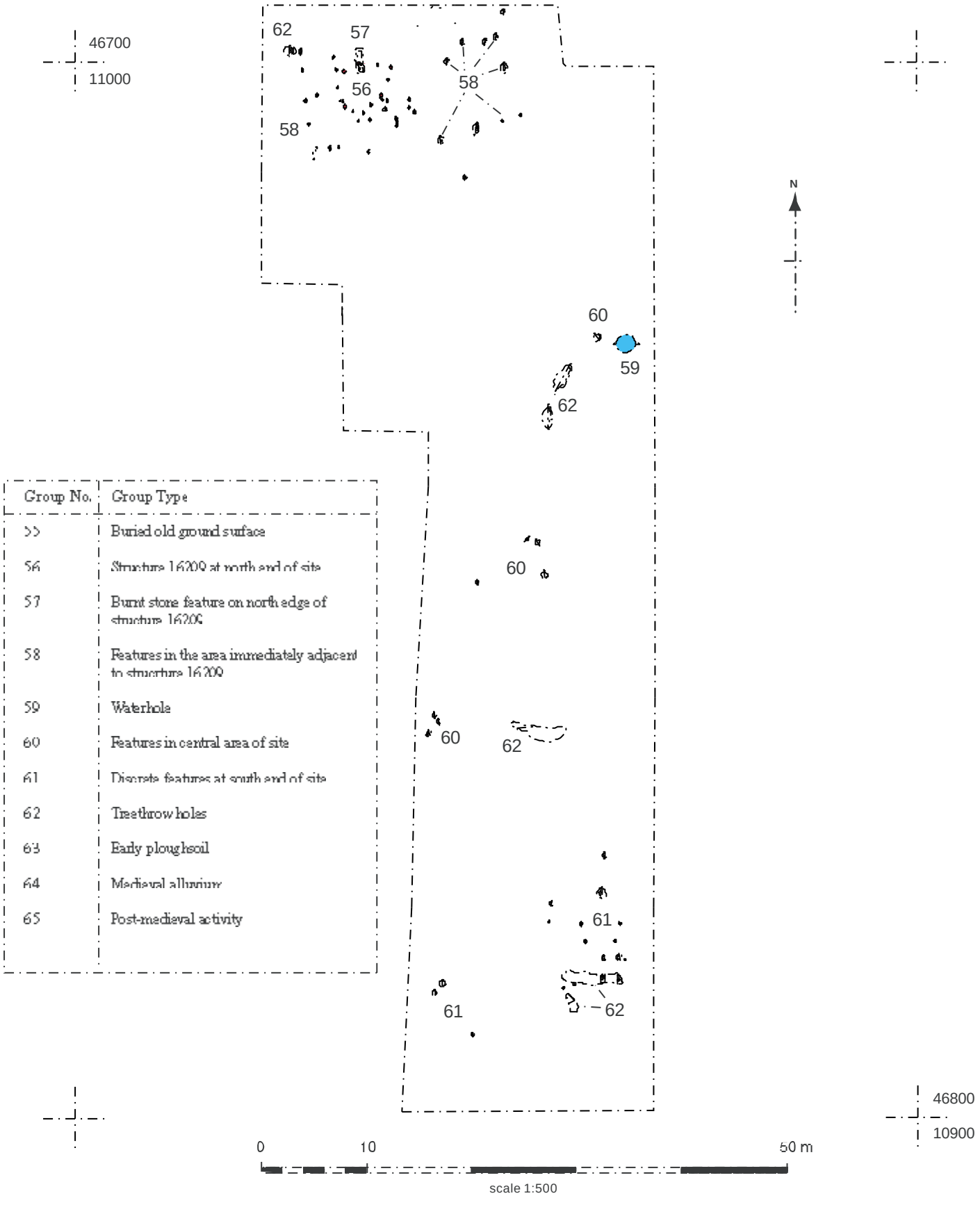


Figure 7

Site 21:Wooden trough recovered from the waterhole located in the base of the channel

Site 4c



Group No.	Group Type
55	Buried old ground surface
56	Structure 16209 at north end of site
57	Burnt stone feature on north edge of structure 16209
58	Features in the area immediately adjacent to structure 16209
59	Waterhole
60	Features in central area of site
61	Discrete features at south end of site
62	Treethrow holes
63	Early ploughsoil
64	Medieval alluvium
65	Post-medieval activity

Figure 9

KEY
Cremations (Undated prehistoric)
Beaker
Early Bronze Age
Middle Bronze Age
Middle/Late Bronze Age
Late Bronze Age/Iron Age
Romano-British

N

Area 4e

Site 4c

46700
11000

46900
11000

Site 21

Site 10

Site 9

palaeochannel

palaeochannel

palaeochannel

Site 4d

46600
10800

46900
10800

0 50 100 m
scale 1:1000

Figure 10