Prehistoric palaeochannels and a ring ditch at Stanwick Quarry, Northamptonshire

by

ANDY CHAPMAN

with contributions by
Karen Deighton and Rowena Gale

SUMMARY

Earlier stages of mineral extraction at Stanwick Quarry had been subject to excavation and survey in the 1980s and early 1990s as part of the Raunds Area Project, which investigated an extensive and long-lived prehistoric landscape, a large area of Iron Age and Roman settlement at Stanwick and the deserted medieval village of West Cotton. In this earlier work areas near the present river channels, where the gravel was overlain by 1.0-3.0m of alluvial clays, had been excluded from extraction. The final phase of working involved the extraction of gravel from these marginal areas so that the mineral resource was fully exploited.

Given the quality of the previous results, the three areas involved were subject to an archaeological watching brief between 2002 and 2004 to determine the presence of any unrecognised dry-land sites and to examine the form and development of the palaeochannel system. The work has defined further details of the palaeochannels contemporary with the Neolithic and Bronze Age monument complex. A minor channel defining the eastern edge of Irthlingborough island had silted well before the commencement of monument building in the early fourth millennium, and a number of cut-off channels had silted at various dates during the Neolithic period and the sequence has been radiocarbon dated using waterlogged wood samples. In the early/middle Bronze Age a line of oak posts had been driven into the margins of a silted oxbow channel, and a small undated ring ditch, 10.5m in diameter, has added another monument to the prehistoric landscape.

INTRODUCTION

Hanson Aggregates have been extracting the remaining mineral reserves at Stanwick Quarry, Northamptonshire (centred on SP 9669 7150, Fig 1). The quarry had previously been subject to an extensive programme of archaeological excavation and survey in the 1980s and early 1990s as part of the *Raunds Area Project*. This had examined a major prehistoric landscape, a large area of Iron Age and Roman settlement, which culminated in the construction of a major villa complex, as well as half of the deserted medieval village of West Cotton, although this latter site lies to the north of the watching brief area in the present study.

Prior to the final phase of extraction commencing, Mike Dawson carried out a desk-based assessment and Northamptonshire Archaeology carried out geophysical survey (NA 2000). Subsequently, Northamptonshire Archaeology carried out a programme of archaeological trial trenching in the southern part of the area in August 2001, and this work indicated that here there was 1.5 to 2.5m of alluvial clays sealing the natural gravel (Fig 2 and Plate 1; Chapman 2001). A former meadow south of the processing plant was similarly subject to geophysical survey (Hindmarch 2001) followed by trial trenching, and produced similar results, although in this area the depth of alluvial clays did not exceed 2.0m (Carlyle and Chapman 2001). It was not possible to carry out any meaningful evaluation in the processing plant area as this was then still in active use, while the northernmost area was used for storage and was largely covered by sand and gravel stockpiles.

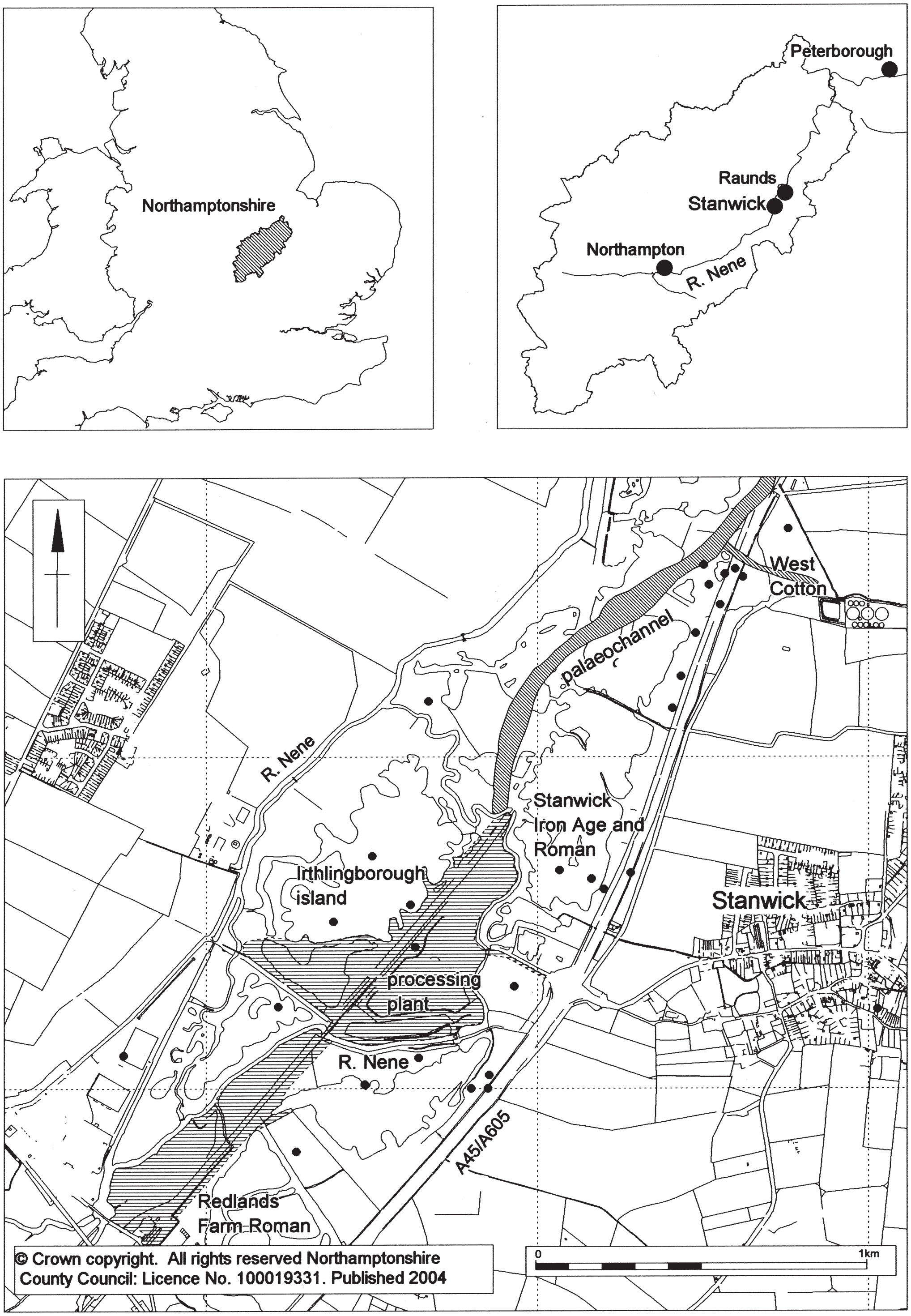


Fig 1 Stanwick Quarry, location plan

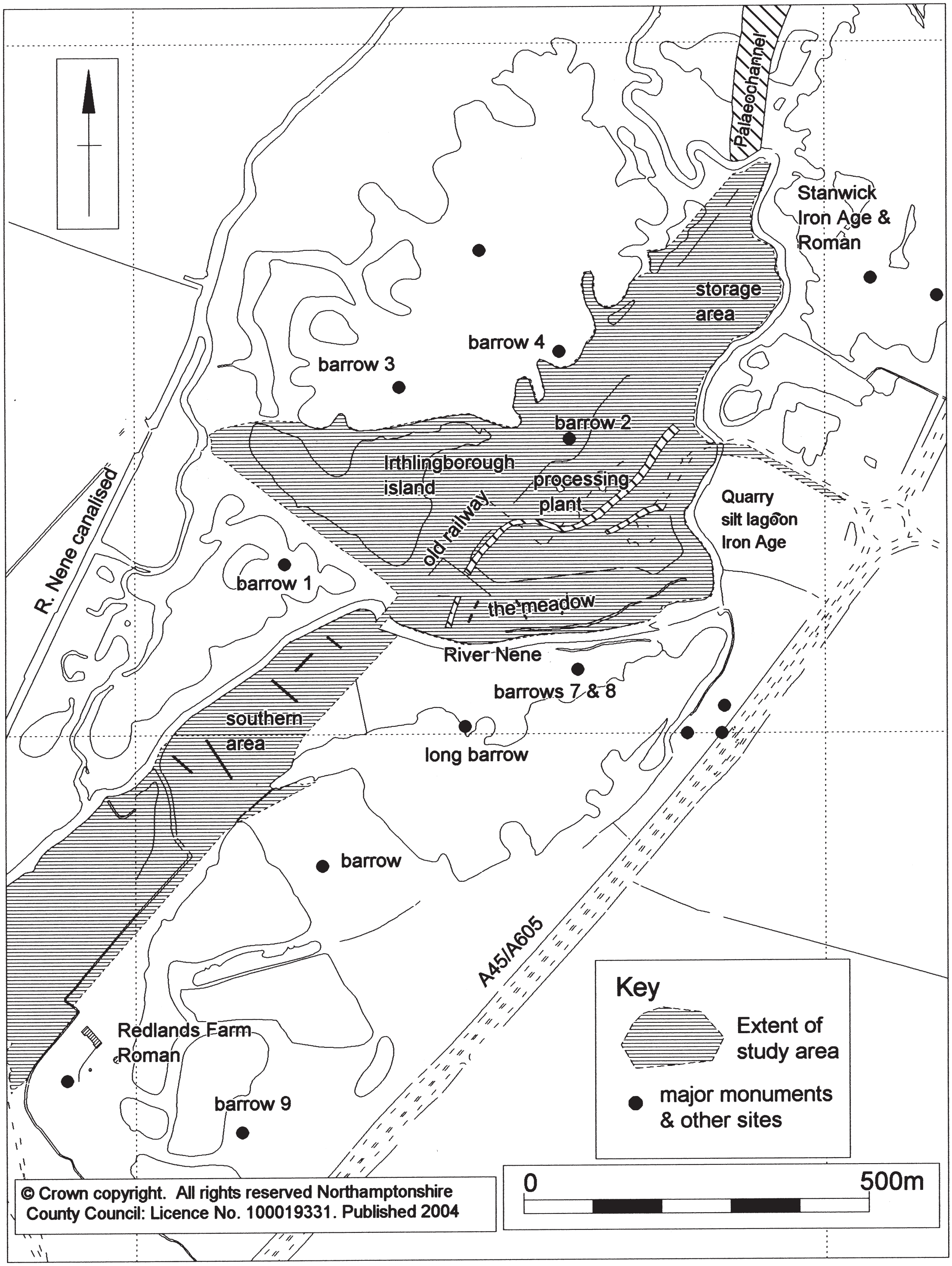


Fig 2 Areas of extraction and major sites

Plate 1 Trial trenching over the backswamp

The potential for survival beneath the old railway embankment that ran the length of the quarry was also unknown.

Borehole survey data indicated that all the areas due for extraction in the final phase were likely to be broadly similar, with a considerable depth of alluvial clay overburden. Indeed, the very reason these areas had been excluded from extraction earlier in the working of the quarry was that the greater depth of overburden had made them less attractive, given the consequent shallower depth of the mineral reserve beneath. The purpose of this final stage of working was to exploit these less productive zones in order to maximise the recovery of the gravel and sand resource from the quarry prior to its closure.

There was a single area which was not sealed by deep alluvium. An upstanding round barrow lay on the eastern margin of Irthlingborough island, between the old railway embankment and the processing plant, and had been preserved rather than being excavated as part of the Raunds Area Project programme (Fig 2, barrow 2, SAM 13667). It was fenced-off prior to the commencement of the final phase of extraction.

Given the low potential of the eroded and deeply buried areas, the Historic Environment Team (HET), Northamptonshire County Council requested the provision of a watching brief during soil stripping, with contingencies allowed for dealing with any significant unexpected discoveries. The first phase began at the end of March 2002 at the northern end of the processing plant area, which had been used for storage of aggregates. Once the area had been partly cleared, a geophysical reconnaissance survey was carried out over the open area. This produced no positive results. A test pit excavated within this area confirmed that 2.0m of alluvial clay overlay the gravel.

From April 2002 onward the line of the old railway adjacent to the northern area and the much of the northern area itself was stripped of alluvium and the gravel was extracted. At the same time the area to the south, which had been subject to evaluation in 2001, and part of the adjacent railway embankment was also partly stripped and extracted. Over the winter of 2002-2003 the meadow south of the processing plant area was stripped and extracted.

The second phase of watching brief began in late 2003 and continued into early 2004. The buildings and machinery of the former processing plant were dismantled and the area was stripped and extracted. By the end of June the works had come to an end, completing a programme of some 20 years of quarrying at Stanwick.

The present report describes the results of the watching brief carried out between 2002 and 2004, but also includes relevant information from the trial trenching of August 2001. Thanks are due to Frances Healy and to Steve Parry as it has only been possible to put the results of the watching brief into context by reference to their respective reports on the results of the prehistoric excavations and the Raunds Area Survey in advance of publication (Harding and Healy in press, and Parry in press).

PREVIOUS ARCHAEOLOGICAL WORK

The Raunds Area Project had its origins in the late 1970s and the early 1980s with the excavation of the medieval church and churchyard and the associated sequence of manor houses at Furnells manor in Raunds (Boddington 1996 and Audouy forthcoming). A subsequent examination of archaeological priorities for the county (Foard 1979) identified Raunds as a largely intact historic landscape coming under threat from gravel extraction, road-building, housing and industrial development. The Raunds Area Project was a joint initiative between Northamptonshire County Council and English Heritage to combine the large-scale rescue excavations of threatened sites with a programme of fieldwalking, survey and documentary research to provide an integrated exercise in landscape history (Parry in press). Initial works were carried out in 1984 as the quarry operations commenced with the construction of a silt lagoon (Jackson 1985) and the establishment of the processing plant (Fig 2).

The major excavations began in 1985 and were focussed on the Iron Age and Roman settlement at Stanwick and the deserted medieval hamlet of West Cotton (Chapman forthcoming) (Fig 1). The known earlier monuments then only comprised the small group of upstanding barrow mounds on Irthlingborough island, and these were to be investigated in a more limited programme of work (Harding and Healy in press). However, as work progressed in 1985 and 1986 it became apparent that much of the prehistory of the area had lain hidden beneath a combination of alluvial deposits and features of Roman and medieval date. It was also apparent that the alluvial deposits concealed the complex history of river valley evolution, and the complexity of the system of old river channels was also slowly revealed as quarrying progressed.

The work of the Raunds Area Project was coming to an end by 1989/90. However, further areas of proposed mineral extraction to the south of Irthlingborough island and containing a long barrow, further round barrows and another Roman villa, at Redlands Farm (Fig 2), were subject to archaeological investigation in the early 1990s by the Oxford Archaeological Unit, although the results will be incorporated with those of the Raunds Area Project.

The results of the Raunds Area Project are being published as a series of monographs. The present watching brief has provided information of greatest relevance to the study of the prehistoric landscape. However, the volume relating to this work is now in press (Harding and Healy), so the new evidence cannot be incorporated with that publication. The present report therefore forms, in effect, a supplement to the report on the major excavations of the 1980s and 1990s. It should therefore be read in conjunction with that report, although the broader prehistoric chronology is summarised as necessary to relate the new discoveries to the previous work.

The results also complement work at other locations along the Nene valley, such as the study of Neolithic and early Bronze Age palaeochannels at Turnells Mill Lane, Wellingborough (Brown and Meadows 1996-97). Here pollen analysis has shown the presence of alder, hazel and oak woodland on the floodplain in the mid/late Neolithic, with a decline in these species, presumably related to systematic woodland clearance, occurring between *c*1800 and 1650 cal BC, with a second decline in the alder beginning *c*1500 cal BC, at the end of the early Bronze Age.

TOPOGRAPHY

After rising to the west of Northampton, the River Nene flows in a north-easterly direction and passes Peterborough on its way to the North Sea coast at the Wash (Fig 1). Stanwick and Raunds lie 25 km downstream from Northampton and 35 km upstream from Peterborough. The relief is undulating, with the valley sides rising to 80mOD while the valley floor lies at 32 to 36mOD. The modern floodplain of the River Nene is 750-900m wide and the gentle gradient makes the Nene slow flowing. At Irthlingborough the river divides into two channels. The western channel was canalized in the eighteenth century, and it is rejoined by the meandering eastern channel a further 1.4km to the north to form Irthlingborough island, an area of approximately 70ha. The floor of the floodplain was fairly level, but this topography is of relatively recent origin and obscures a more complex earlier history, as discussed below.

FUTURE USE

At the time of the current fieldwork much of the floodplain had previously been quarried for gravel and reinstated as a complex of lakes, while the embankment of a disused railway still partly ran across the quarry, and had been utilised as the main haul road and the course of the quarry conveyor belt system transporting the aggregate to the processing plant. The areas included in the final phase of extraction have now been similarly landscaped to form further lakes. The surviving dry-land landscape comprises largely un-quarried areas along some major former field boundaries and, ironically, above some of the former major palaeochannels, due to the lack of viable minerals beneath them. Other areas have been partially reinstated following extraction, including parts of the old railway embankment. Finally, the single unexcavated round barrow remains as an upstanding earthwork set on an island within the former quarry. The quarry area, now known as Stanwick Lakes, has been taken on by the Rockingham Forest Trust to develop and manage it as a mixed recreational facility and conservation area.

ARCHAEOLOGICAL OBJECTIVES

As the trial trench evaluation had shown the limited potential for the survival of major monuments within areas that were typically marginal to present and former river channels, the objectives for the watching brief were consequently limited. The proposal was to maintain a watching brief during the stripping of overburden so that when the basal levels of the alluvial clays were being removed the extent and nature of any palaeochannels and any remnant dry land features could be identified and recorded.

Given the limited resources available for the watching brief, the emphasis was placed on establishing the form and chronology of the palaeochannel system. Wood samples were taken for submission for species identification, to provide environmental information, and for potential radiocarbon dating to provide a chronology. This has enabled the work to be placed within the landscape history established from the results of the Raunds Area Project, and it will supplement the broader understanding already generated by that study. A more detailed programme of sampling and analysis was not attempted given the much greater resources that had already been devoted to the subject within the Raunds Area Project.

Any minor dry land features were to be investigated and recorded as part of the watching brief, with a contingency allowed for the fuller investigation of any more significant archaeological remains. In the event, only a single dry land feature was found, and this was investigated within the watching brief provisions.

The water deposited silts were also to be examined for survival of built-structures, such as fish-traps or fish weirs, or the presence of other worked timbers. The only man-made features located were a series of oak posts driven into the margin of a palaeochannel, but these were pulled-out during machining operations when no archaeologist was in attendance. The machine driver recognised these timbers as an unusual occurrence and retained them for later archaeological inspection. All other waterlogged wood was found to be unworked wood debris.

METHODOLOGY

The watching brief took the form of intermittent site visits to examine areas as they were reduced to the level of the natural gravel. Given the complexity of the process of soil stripping, this took the form of regular visits during periods of active stripping of the overburden, with these periods of intensive activity typically separated by periods of months during which only mineral extraction was undertaken. As a consequence, most of the surface of the underlying gravel was observed either as it was being exposed or within a few days of exposure. Excavation was carried out using large tracked 360° excavators with the spoil being carried away by dump trucks. Given the nature of the site, dump truck traffic was often across areas of exposed gravel, leading to some rutting of parts of the surface prior to examination. In addition, the stripping was taken to a level that exposed clean sands and gravel, removing all alluvial clays and the dirty upper surface of the gravel, so some shallow features could have been lost in this process.

Some marginal areas were subject to a more erratic and piecemeal programme of extraction, often relating to drainage works, and in these instances the whole of the stripped area was not always seen before extraction. In these cases the exposed sections were examined for the presence of features, but the only features recorded in this fashion were palaeochannels.

Given the methodology employed, it is clearly possible that smaller features, such as isolated cremations or even individual inhumation burials, could have been either lost or obscured, but it was encouraging that a small ditched monument was recognised in the final stages of the watching brief, even though it had been partially damaged. It is certainly very unlikely that any major ditched feature, such as a round barrow ditch, escaped notice given both the regularity of the site visits and the co-operation of the team carrying out the site stripping.

Through the watching brief the observed lengths of palaeochannel have been recorded by taking taped or paced measurements to mapped features in the landscape, including quarry buildings, the railway embankment, the preserved barrow, drainage ditches and modern watercourses. The accuracy is therefore variable from within a metre or two to several metres for features away from any mapped points. However, this has been sufficient to trace the general courses of the exposed palaeochannels.

THE GENERAL STRATIGRAPHIC SEQUENCE

While the modern topography is a product of activities dating from the medieval period onward, it is appropriate to describe the sequence of alluvial deposits encountered across the three areas since they define the circumstances within which the watching brief was carried out and also determined the potential for the survival of earlier deposits beneath.

The topography of the study area can be divided into three broad zones, as described below:

PALAEOCHANNELS AND RIVER MARGINS

Much of the study area lay close to the present course of the River Nene (Figs 4 and 6). In these areas natural gravel was deeply buried at a depth of 3.0m or more below ground level, and was often blackened and stained (Fig 5). Above this there was typically a considerable depth of banded grey-black silts, clays and gravels that represent earlier fills of the river channel stranded by minor realignments of the channel system. None of these deposits can be described in detail as they were only briefly seen during machining prior to being lost beneath incoming water and side collapse. In addition, soil stripping only ever exposed the margins of such areas, as the lack of any exploitable mineral beneath meant that they were immediately abandoned and backfilled.

SHALLOW WATER/SEASONAL INUNDATION

The majority of the study area fell within a zone in which clean gravels lay at a depth of 1.0-2.5m below ground level, and were overlain by alluvial clays (Figs 4 and 6). In these areas it appeared that the sands and gravels had been truncated, presumably as a result of scouring relating to the flood conditions that had deposited the clays. To the east of barrow 2 this effect was well evidenced where a shallow minor palaeochannel had been partly lost. The areas affected by this scouring must all have been low-lying in the prehistoric period, perhaps forming marginal wetlands traversed by multiple minor streams, but the earlier deposits had been lost except within the deeper palaeochannels. However, it is likely that this later scouring had also resulted in some remodelling of the prehistoric topography. For instance, while the shallow water zone to the east of Barrow 2 was traversed by prehistoric palaeochannels, there were no palaeochannels in the extensive shallow water zone to the north of the barrow (Fig 4 and Plate 2). This area may therefore have been significantly reduced in level by later scouring, so that the prehistoric northern edge of the Irthlingborough island probably lay further to the north and probably closely coincident with the present river channel.

The overburden in these areas comprised thick homogeneous layers of tenacious clays, free of any stone inclusions, which have been characterised as pelo-alluvial gley soils (Brown in press). The detailed nature of the sequence varies with the depth of the alluvial deposits. In the deeper areas, 2.0m or more below ground level, the basal layer comprised up to 0.50m of dark grey or blue grey silty clays, typically free of inclusions or evident organics (Fig 5). These levels appear to have been permanently waterlogged, and the colour is a product of chemical reaction, in which new minerals are formed by reduction, with sulphates reduced to sulphides by bacterial action, and not by the presence of preserved organics (Brown 1997, 99-100).

The dark basal deposits were overlain by lighter blue-grey clays, and in shallow deposits, bottoming 1.5-2.0m below ground level, blue-grey clays formed the basal layer. The blue colour is again a product of chemical reaction, and is caused by the formation of vivianite (ferrous sulphate). At less than 1.5m below ground level, the clay was typically a light greyish brown and the uppermost 0.6m was light red-brown in colour. In all of these deposits there was patchy mottling, and oxidation caused bright orange halos around the margins of major cracks within the upper levels of the alluvium, which resulted from seasonal drying and resultant cracking, which penetrated to depths of up to 1.0m.

Plate 2 General view during stripping of alluvium to the north of barrow 2

In some sections, at a depth of 0.60-0.80m the brown and greyish-brown deposits were separated by a very distinct horizon of light grey, often slightly sandy, clay (Fig 5, southern area, trench 4). It is unclear whether this denotes part of a stratigraphic sequence of deposition or is perhaps a further effect caused by leaching and/or earthworm action related to the uppermost level of saturation caused by seasonal waterlogging. The dating of the bulk of these alluvial deposits to the 12th century AD is discussed below.

DRY-LAND MARGINS

Within the study area there were only two dry-land zones. These comprised a narrow band within the processing plant surrounding the preserved barrow (Fig 4: barrow 2, SAM 13667) that marks the eastern edge of Irthlingborough ‘island’, and part of the southern area (Fig 6). However, on both of these areas the natural gravel was still directly overlain by from 0.5-1.0m of homogeneous alluvial clay, and any earlier buried soils had been lost. So, even these areas had evidently been subject to scouring during the period, or periods, of flooding that preceded the deposition of alluvial silts. These shallower alluvial clays were light brown in colour, indicating that following deposition they have stood above the level of even seasonal water logging.

THE SITE CHRONOLOGY

The chronological sequence obtained for features examined as part of the watching brief is tabulated below, along with the broadly contemporaneous events detailed by the work of the Raunds Area Project (Harding and Healy in press).

Table 1: The site chronology

Period	**Activity defined in the watching brief**	**Activity defined by the Raunds Area Project**
Late-glacial (c 10000 BP)	Silts accumulate in shallow lake prior to final phase of sand and gravel deposition	
Late 6th/early 5th millennium	(5280-4850 cal BC) Minor channel, east side of Irthlingborough island cut-off, and silting with associated alder growth	Mesolithic: burnt out tree holes Mesolithic and early Neolithic flint deposition
The 4th millennium **Early Neolithic** (The first monuments)	(3380-3010 cal BC) Backswamp channel silting; with Pomoidiae family growth (hawthorn, apple, pear, rowan, service tree and whitebeam)	(3940-3600 cal BC) The Long Mound; The Avenue The Turf Mound (3800-3640 cal BC) construction of Long Barrow (3350-2900 cal BC) The Long Enclosure The Causwayed Ring Ditch The Southern Enclosure
The early to mid 3rd millennium **Later Neolithic**	(2900-2620 cal BC) Alder growth on Irthlingborough island	(cal BC 2870-2470) The Riverside Structure, West Cotton The Cotton 'Henge'
Later 3rd millennium **Early Bronze Age** early-mid 2nd millennium	(2580-2220 cal BC) Silting of oxbow channel; with alder, hazel, oak and blackthorn growth Deposition of aurochs bone (1610-1310 cal BC) Row of oak posts driven into silted oxbow Burnt wood deposited into small pond near Barrow 2 Small ring ditch monument	(cal BC 2140-1600) Multi-ditched Beaker round barrows at Irthlingborough (barrow 1) and West Cotton (barrow 6) Construction and use of round barrows on Irthlingborough island (barrows 2-4)
Later Bronze Age and Iron Age	No evidence	Development of field system followed by dense and extensive Iron Age settlement (on site of later Roman settlement)
Roman	Stone surface of possible ford	Development and growth of Roman settlement, culminating in major late Roman villa complex
Medieval	Truncation of earlier deposits in low-lying areas Deposition of alluvial silts and clays	Mid-10th century, establishment of West Cotton medieval village Mid- to late-12th century AD, demise of watermill and raising of floodbank

A LATE-GLACIAL LAKE

On the eastern margin of Irthlingborough island, immediately east of Barrow 2, there was an oval feature that may be a late-glacial lake (Fig 3). The plan of this feature, as defined by the dark coloured silts filling it, was recorded following the removal of the alluvial clays. Further details were observed and recorded as the fills were dug out by machine prior to gravel extraction.

As typically exposed beneath the alluvial overburden, the gravels comprised variations of clean yellow to orange-yellow sand and gravel. These gravels are of Devensian date, 11000 to 10000 BP, and are fluvioperiglacial deposits dating to the mid- and late Devensian (Brown and Keough 1992 and Brown in press). Work at various locations in the Nene valley has indicated that there was continued deposition and reworking of these gravels into the late Devensian, and the lake would appear to fit within this context. At this time the local environment would have comprised a sparsely-vegetated, unstable, gravel or sandy-loam surface with low clumps of dwarf birch and willow scrub (Campbell and Robinson in press).

The lake was roughly oval in plan, measuring *c*160m north-east to south-west by 100m wide, and was aligned along the floodplain. It comprised a shallow bowl-shaped depression in the top of the main mass of the gravels, with very shallowly-sloping

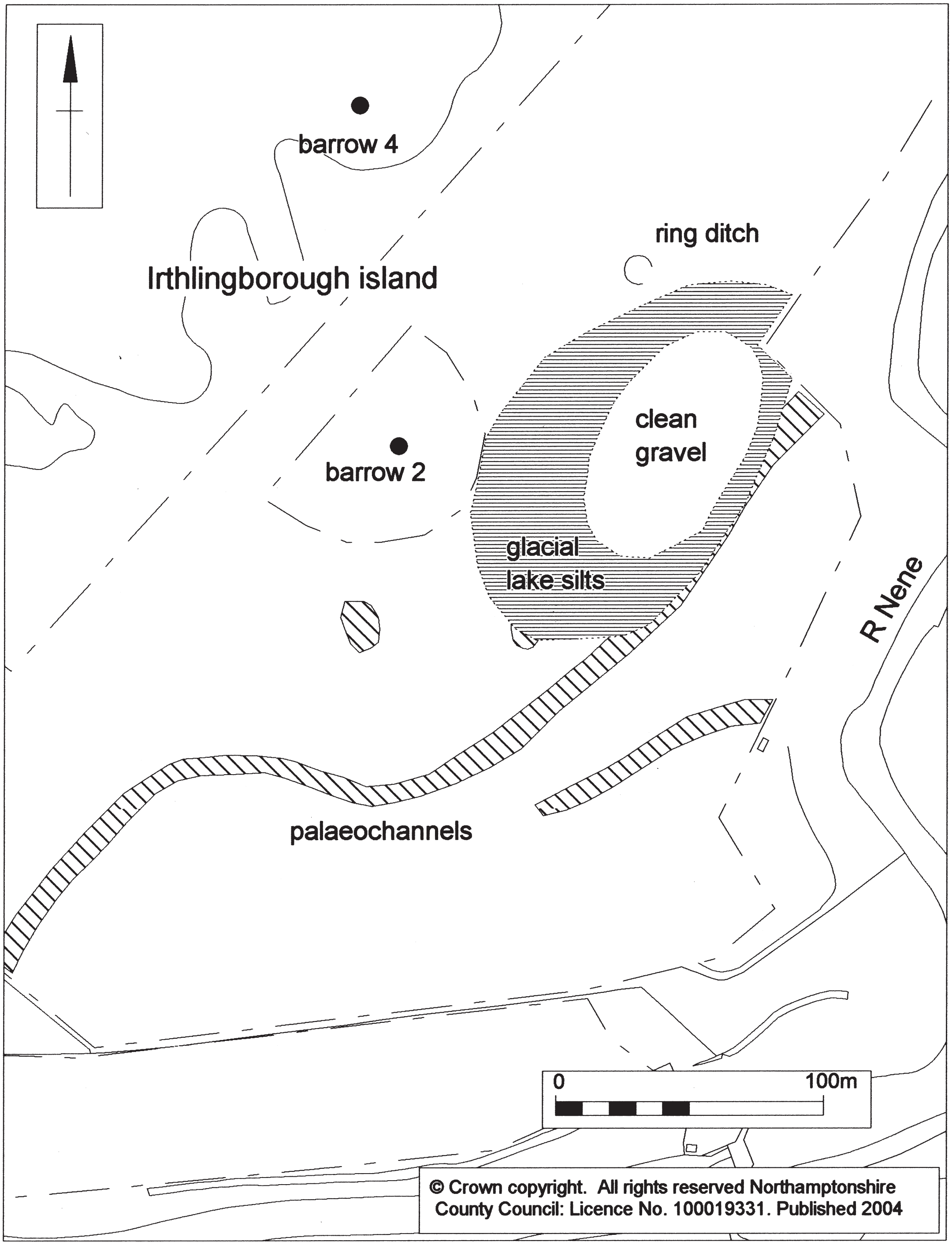


Fig 3 Irthlingborough Island: the late glacial lake

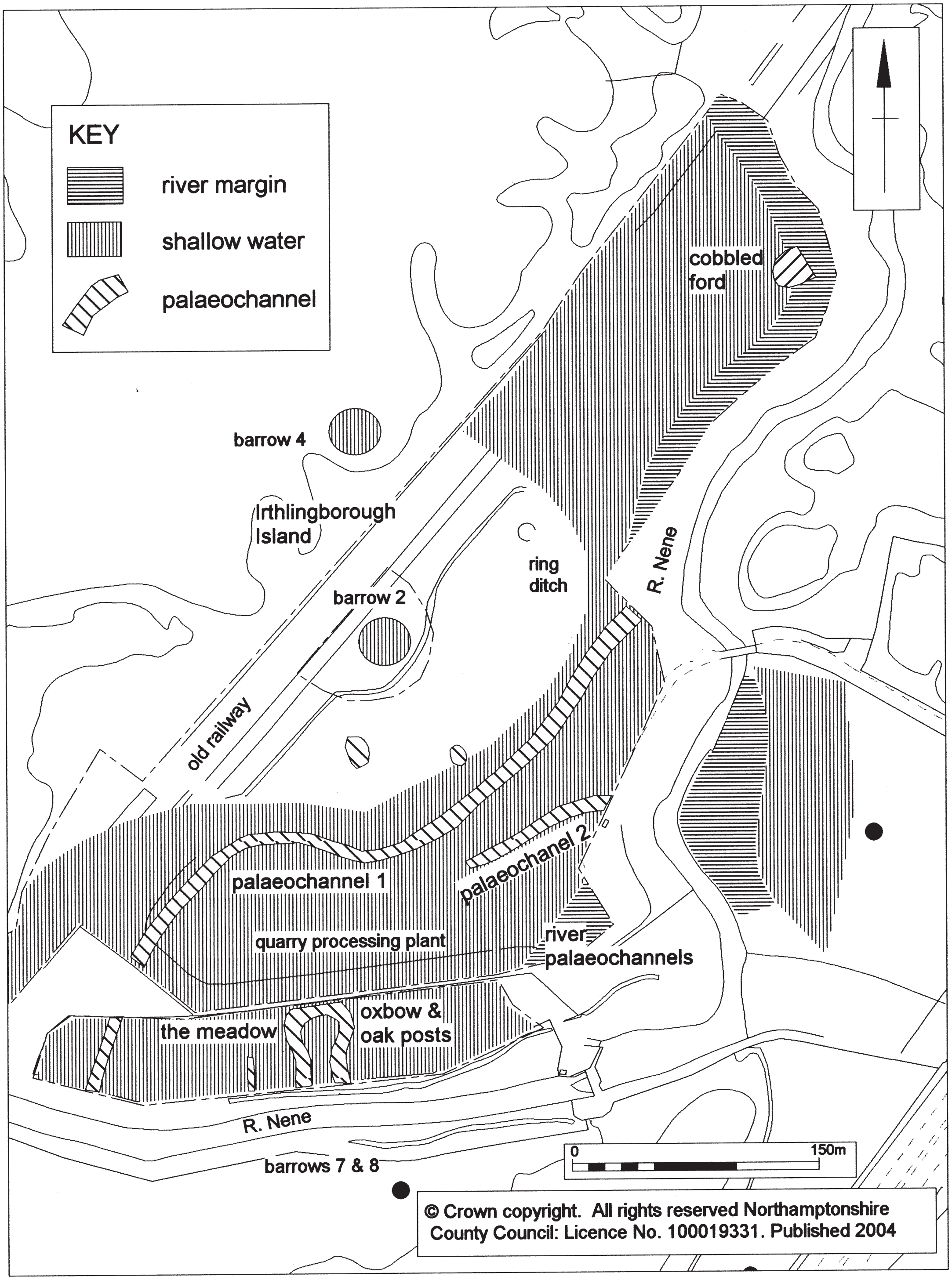


Fig 4 The Meadow and Irthlingborough Island

sides and was no more than *c*1.0m deep. It was filled with very mixed deposits of mottled dark grey to grey-black coarse gritty sand containing varying amounts of gravel pebbles, but always with a less dense gravel component than the surrounding clean gravels. These distinctive dark, coarse silts were exposed around the margins of the feature, and defined its limits. Across the central area the dark silts had been sealed by a final deposition of clean orange sand and gravel, up to 0.30m thick and at least 90m long.

The coarse silts would appear to have been deposited by an incoming body of water containing reworked sands and some gravel. The absence of any finer silt, which would be expected to have accumulated above the coarser component within such a lake, can only be accounted for by assuming a further stage of reworking that truncated the upper levels and culminated in the deposition of the final deposit of clean gravels. These events are undated, but by analogy with work elsewhere in the Nene valley the process had probably been completed by around 10000BP (Brown and Keough 1992).

In one small area within the top of the lake silts, 1-2m in diameter, there was a concentration of pieces of roundwood that was sampled in an attempt to date the final silting of the lake. However, the radiocarbon date of 2900-2620 cal BC (95% confidence, 4200+/-50BP, Beta-188365) indicates that this was an alder tree that was growing during the Neolithic, presumably within the more water retentive silts of the former glacial lake.

A final point worth noting is that the exposed surface of the gravels and the glacial lake deposits sloped down to the south-east as they dipped towards the palaeochannel defining the eastern edge of Irthlingborough island. This indicates that there was discontinuity and an episode of remodelling between the final phase of Devensian gravel deposition and the establishment of the overlying Flandrian river channel system.

THE DEVELOPMENT OF THE PALAEOCHANNELS

As summarised by Robinson (in press) and Brown (in press), the establishment of a relatively stable river channel system along this stretch of the Nene valley had probably occurred by about 10000BP, at around the start of the Flandrian period. It can be characterised as an anastomosing system: a relatively stable complex of multiple cross-linked channels. This involves little lateral channel migration or sudden shifts in channel courses, and the main process of evolution has been the simplification to a single channel system by siltation and channel abandonment. In particular, the number of small channels would have been reduced, offsetting the increase in channel size as the flow was concentrated in the remaining channels. The watching brief has provided further illustration of this process in action as radiocarbon dates have been obtained for the final silting of a series of palaeochannels, enabling the development of parts of the system to be defined.

Another significant aspect is that during the prehistoric period the areas of raised gravel, such as Irthlingborough island, would have provided a well-drained environment, drier than at present, and there has been no evidence for contemporary flooding at any of the excavated prehistoric monuments. The prehistoric landscape was not therefore a wetland landscape, but a landscape dissected by river channels. The lowest areas of gravel, those sealed beneath considerable depths of gleyed soils, were probably wetlands throughout the prehistoric period, and the results of the present study throw some further light on their evolution.

IRTHLINGBOROUGH ISLAND

THE EASTERN RIVER CHANNEL

Today, the eastern limit of Irthlingborough island is defined by a main channel of the River Nene that runs eastward along the southern side of the island before turning abruptly northward and following a sinuous course that eventually takes it back across the floodplain to rejoin the western channel, partly canalised, that flows along the western margin of the floodplain. In the archaeological work in the 1980s, a former northward continuation of the eastern channel was located during quarry working (Figs 1 & 2), running past the medieval hamlet of West Cotton, where it was shown to have been active in the Neolithic period, and presumably long before this, and to have become redundant in the later 12th century AD.

The longevity of this eastern channel is evident in the broad swath of river margin deposits flanking its present course. These were first seen in the mid-1980s at the very earliest stage of archaeological work, the investigation of Iron Age settlement remains to the east of the river during the digging out of the quarry silt lagoon (Fig 4; Jackson 1985). Here there was a sequence of dry-land archaeology to the east, flanked to the west by deepening alluvial silts, the shallow water zone as defined in this report, and further west a river margin zone that extended up to 40m east of the present river. In the current watching brief the western limit of the river margin zone was observed at the northern end of the area and also in a small area to the south-east of the palaeochannels 1 and 2. To the north these deposits extended around 40m west of the present river. The present active channel is some 10m wide and lies centrally within a zone about 90m wide containing river margin deposits, with this defining the area within which the channel has been confined. To the south-east, at the sharply angled turn in the present river channel, there is evidence for channel reworking across a much wider zone. To the south-east of palaeochannel 2 a broad river palaeochannel and an adjacent narrower channel show the western limit of the river at this turn, indicating that at some stage in its history the turn was less abruptly angled, and across this corner the river margin deposits probably span a total width of some 160m. The present channel therefore appears to lie to the east of earlier channels and, if left to take its own course, might be in the early stages of the process of forming an oxbow channel at this corner. However, given the presence of a former watermill adjacent to this turn, human engineering of the channel system may well have been a major influence on the formation of the present channel system.

IRTHLINGBOROUGH ISLAND:

THE EASTERN STREAM CHANNELS (5280-4850 CAL BC)

The eastern edge of Irthlingborough island was defined by a minor palaeochannel system (1) that branched off from the main channel to the south-west and ran for some 500m before linking back into the main river channel to the east of the preserved barrow (Fig 4). The palaeochannel was first seen during 2002, where it crossed the western end of the former meadow to the south of the processing plant. It was relocated in 2003 in the area of the former processing plant, and was traced across most of this area. The ground level by the pond to the south of barrow 2 dropped by 1.0m across the 40m length of slope running down

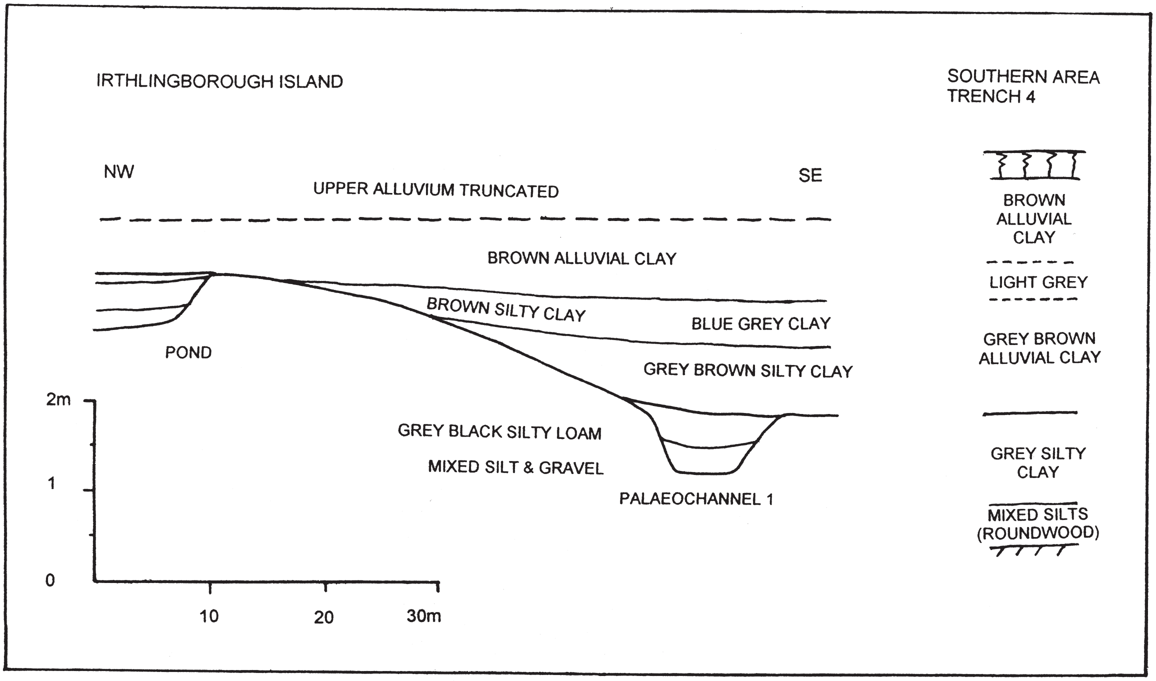


Fig 5 The eastern edge of Irthlingborough Island and the southern area

to the edge of the palaeochannel (Fig 5), and the extent of the gray basal layer to the later alluvium ran half way between these features. This indicates that the area immediately around the barrow had probably stood at least 0.5m above the highest seasonal water levels, and at least 1.0m above the palaeochannel. This emphasises the point that the prehistoric landscape comprised a series of dry gravel islands that stood well above the water levels of the contemporary river channels.

Palaeochannel 1 was consistently around 10m wide by up to 1.0m deep. The bottom 0.30-0.50m of the channel fill comprised mixed silts and gravel (Fig 5). Above this there was a grey/black firm silty loam, with a buttery texture. This material ran slightly over the channel edge, where the upper levels were seen to contain fresh water mollusc shells, including swan mussels. Quantities of waterlogged wood were present in the upper fills of this palaeochannel at some observed locations, while in other lengths such deposits were absent, suggesting that wood debris had accumulated in discrete areas of tree growth along the silted-up channel, possibly in and around a chain of shallow ponds within the former channel. The only identified species from the samples was alder, indicating that alder carr had developed along the water retentive deposits of the silted palaeochannel. A sample of bark has been radiocarbon dated to the late 6th/early 5th millennium (5280-4850 cal BC, 95% confidence, 6140+/-60 BP, Beta-188366), suggesting that this channel had fully silted well before the advent of the first Neolithic monuments.

A second shallower palaeochannel (2) lay to the east of palaeochannel 1, and was buried beneath up to 2.0m of alluvial clays. The western end had been lost, presumably as a result of later water action prior to the deposition of the alluvium, but it would appear to have branched from the corner of the dog-legged turn in palaeochannel 1. It then ran more directly eastward to link back with the main palaeochannel to the south-east of barrow 2. At the western end it became visible as a band of dirty gravel, but steadily broadened and deepened to the east, where it reached 10m wide by up to 1.0m deep as it approached the main river channel. It was filled with mixed grey black clayey silts. The chronology of this channel is unknown. It may have been a contemporary side channel to paleochannel 1, but it is also possible that it may have taken the full water flow following the silting of the northern half of palaeochannel 1, to the south-east of barrow 2. As it was generally shallower than channel 1, there would have been a reduced water flow, perhaps reflecting the progressive process of silting and reduced water flow along this minor channel system. By the time barrow 2 was constructed, it is likely that there was no surviving channel system, but the area was evidently low lying and presumably still a wet river margin at least 100m wide and probably covered with alder carr.

A BACKSWAMP CHANNEL (3350-3100 CAL BC)

Prior to stripping, much of the southern half of the southern area spent the greater part of the year as a shallow water lake and it had not been possible to excavate any pre-emptive archaeological trial trenches (Fig 6). The northern half of the area was only slightly less wet and a series of drainage and archaeological trenches were excavated as part of the process of de-watering prior to stripping for extraction (trenches 1-5). The 2.0m wide trenches exposed a sequence of alluvial clays typically 2.0-2.4m thick, with a minimum thickness of 1.5m over the eastern half

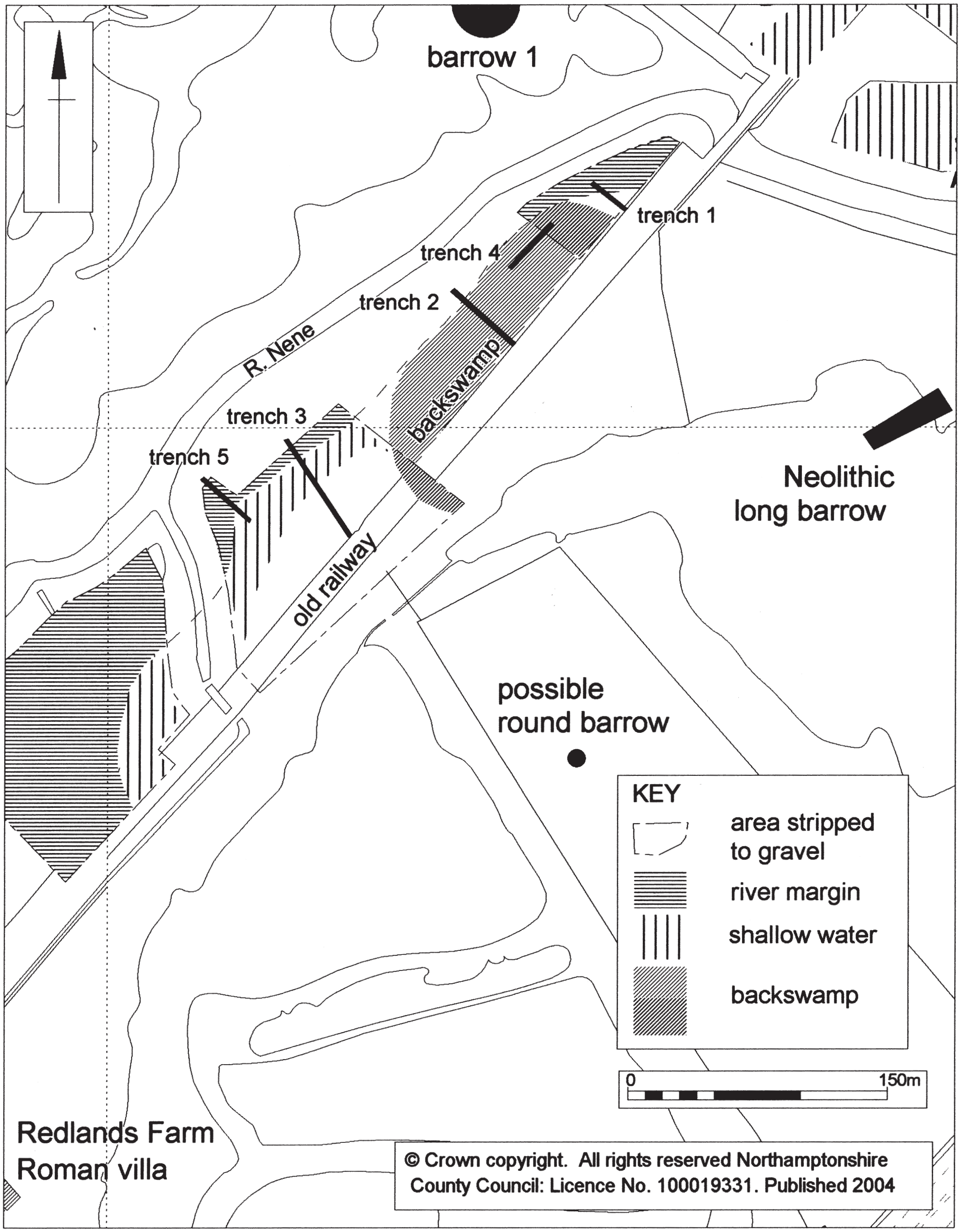


Fig 6 The southern area and the backswamp

of Trench 3, where there was a small area of raised gravel. In all trenches the depth of alluvium increased towards the present course of the river channel, with the upper layers of brown tenacious clays sealing an increasing depth of blue to dark grey silty to gritty clays deposited by a more vigorous water flow. In these deeper areas the underlying gravel was typically stained dark grey. This sequence indicates that the course of the river in this area has been fairly static, with the present channel flanked by eroded areas filled with coarse silts and clays and sealed by the later alluvium.

In trenches 4 and 2 there were similar deep river margin deposits, but these extended a greater distance from the present channel and the grey black silts at the base of the alluvium were peaty in texture. The deposit was 1.0m deep in trench 4, where it also contained quantities of wood debris (Fig 5). This mainly comprised small pieces of unworked roundwood, less than 70mm in diameter, with occasional pieces from larger branches or even parts of small trunks. These have been identified as being from the Pomoidiae family, which includes hawthorn, apple, pear, rowan, service tree and whitebeam. In the subsequent stripping for gravel extraction, the northern and southern ends of the area were exposed, but the central part was not stripped due to the evident poor quality and quantity of the gravel beneath, and it is therefore preserved as part of a reinstated area. At the northern end the area exposed contained wood debris, but there was none in the silts at the southern end. In total these deposits were spread over a roughly oval area extending 200m north-south and at least 80m eastward from the edge of the river margin deposits. It therefore appears to have formed a distinctive pond-like oval area adjacent to the main palaeochannel. One possibility is that this may have formed around an oxbow channel that was cut off and then slowly silted up.

A piece of Pomoidiae (hawthorn, apple etc) roundwood from the deposit has been radiocarbon dated to 3350-3100 cal BC (68% confidence, 4515+/-59BP, Wk-10432), indicating that the final filling of this area occurred in the Neolithic, contemporary with parts of the second phase of development of the monument complex. In particular, the long barrow, which had been constructed before the middle of the 4th millennium (3800-3640 cal BC), lay only 100m to the east. While this was constructed in an immediate open landscape, environmental material from the lower ditch fills indicate that its background was of woodland, including oak, lime, alder and hazel (Campbell and Robinson in press), which is consistent with the presence of Pomoidiae family species around the silting backswamp area.

To the immediate south of the backswamp there was an area of higher gravel, but no cut features were observed in this area. To the south the river margin deposits deepened and extended across the full width of the stripped area. Due to the lack of any good quality gravel, stripping was not extended further southward. This extensive area of deeper river margin deposits indicates either that there had been a more extensive system of river palaeochannels or that there had been migration of channels across this area. It was not possible to obtain any more detailed information as much of the area was usually at least partially under water even with constant pumping and it could not be entered for any closer examination.

AN OXBOW CHANNEL (2550-2300 CAL BC)

Machine stripping of the alluvial clays along the former meadow to the south of the processing plant exposed two lengths of river palaeochannel running roughly south to north and near parallel (Fig 4 and Plate 3). The northern ends of these channels was not seen prior to gravel extraction, but observation of the section along the northern side of the meadow showed inclined tip lines indicating that the channels had looped round to form the northern side of an oxbow channel.

Plate 3 The eastern arm of the oxbow channel in the former meadow

The two arms of the oxbow channel were 10-14m wide (Fig 7). A total depth was not established, as only the upper silts were seen in section prior to extraction and following extraction the area was immediately allowed to flood. However, they are likely to have been at least 1.5m deep and perhaps more. The uppermost 0.3-0.4m of the main channel fill comprised grey/black gritty silt containing numerous fresh water mollusc shells and scattered unworked wood debris. Above this there was 0.2m of clean yellow brown finely banded water deposited silts, which ran onto the eroded upper edge of the channel. The wood from the grey black silts was examined on site and sampled. It comprised small roundwood and occasional pieces from more substantial branches of up to 200mm diameter, and it all appeared to be unworked debris frequently with the bark still present. The 11 sample lengths recovered come from hazel (and hazel nut shells were also recovered), alder, blackthorn and oak. A sample of hazel has been dated to 2550-2300 cal BC (68% confidence, 3930+/-60 BP, Beta-175257). This would place the silting of this oxbow channel slightly later than the riverside alder platform at West Cotton, but pre-dating the appearance of the earliest round barrows, although the long barrow was still standing on the opposite bank of the river, some 250m to the south-west.

While the oxbow channel was observed in plan when there was only limited disturbance of its silts. It was subsequently largely dug-out when there was not an archaeological presence, to permit the passage of machinery for gravel extraction in the adjacent areas. From examination of the dumped silts from this process, three pieces of animal bone were recovered. The pieces are all cattle bone and from the excessive size of the scapula they clearly derive from an aurochs and not from domesticated cattle. In addition, the machine driver had collected, and retained for himself, a large horn, which based on his description also seems likely to have been an aurochs horn. The bone all came from the within the same area of dumped silts, and so has come from a single deposit and perhaps a single animal. As the material was all unstratified its relationships are uncertain. It may have been

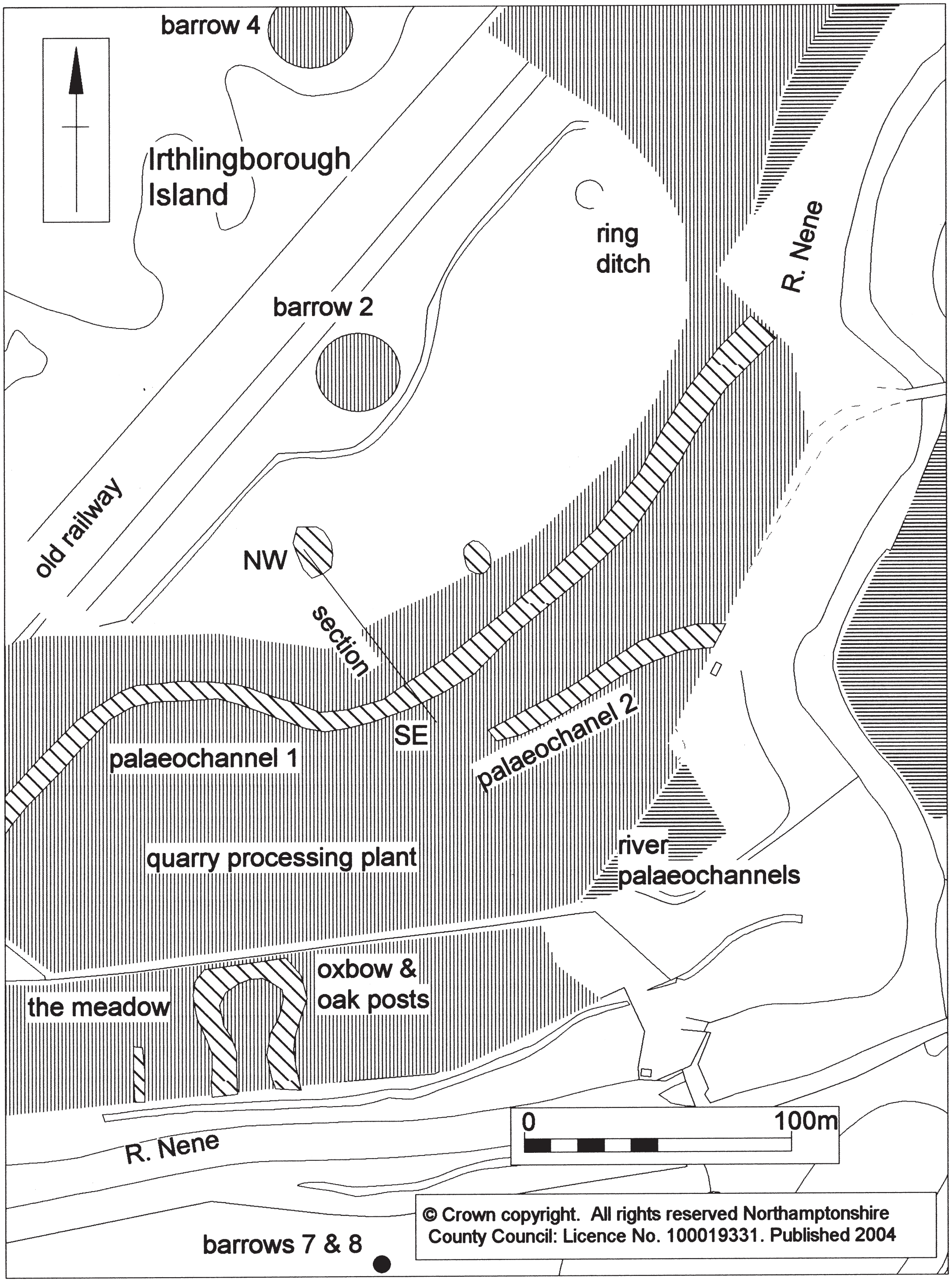


Fig 7 Irthlingborough island

deposited during the final silting of the channel in the later-3rd millennium, but it might have been associated with the insertion of the oak posts in the mid-2nd millennium (see below). The oxbow channel lies 400m east of the Raunds Area Project Barrow 1, where the primary Beaker burial was sealed beneath a limestone cairn that in the later-3rd millennium was also covered with the skulls of some 185 cattle, together with scapula and pelves, and at least one aurochs skull and two scapulae (Harding and Healy in press).

NEOLITHIC AND BRONZE AGE ACTIVITY

While the watching brief produced considerable evidence relating to the prehistoric palaeochannel system, in only two instances was direct evidence of contemporary human activity recovered. One of these relates to the oxbow channel in the former meadow and the other to the dry-land area that was examined on the edge of Irthlingborough island to the east of the preserved barrow.

AN EARLY BRONZE AGE POST ALIGNMENT (1600-1410 CAL BC)

During gravel extraction the quarry plant was used to dig out the palaeochannel deposits in the oxbow channel. Several oak posts with their bases embedded in concreted gravel were noticed in the machine bucket and the quarry staff retained these for later archaeological examination (Plate 4). Given the circumstances of their recovery, the exact location of these posts is unknown, although they certainly came from the eastern arm of the oxbow channel.

Their upper parts had been encased in grey/black palaeochannel silts while the clean concreted gravels around their bases suggest that they had been driven into clean natural gravels and not palaeochannel silts. This would indicate that they had stood near the edge of the palaeochannel, and they had presumably been driven into the margins of the silted up, but still visible channel, which may well have been wet swampy ground at this time. The disposition of the individual posts is unknown, but the consistent appearance of the concreted gravel around their bases suggests that they had probably stood in a line running along the eastern margin of the oxbow channel. It was noted by the driver that six posts had been dug out in a length of *c*10m, suggesting that they may have been closely spaced at intervals of only *c*1.6m. Whether there was only a single short length, or whether this may have been the only recognised part of a more extensive line of posts is unknown. The machine driver's attention had been particularly attracted by the concreted gravels around the bases of the posts, and so it is possible that further examples without such concretions may have been missed.

The blocks of concreted gravel stood up to 0.76m high and 0.75m in diameter, with the posts encased by a layer of gravel 0.1-0.20m thick. It would appear that these had been concreted by the action of acids from the wood reacting with the iron minerals in the gravel to iron-pan the gravel directly around the post. In all cases the posts were semi-decayed, and all sapwood had been lost, so no surface features survived. As a result, they were all loose within the concreted gravel that partly encased them. This shrinkage was probably a result of de-watering of the area during the quarrying of the surrounding areas over the preceding 20 years.

The posts were all of the oak roundwood. They ranged from 1.0-1.5m in length and up to 0.20-0.30m in diameter. In all instances the upper end was irregular as a result of decay, indicating that the upper ends of the posts had once stood above water level. The bottom 0.4-0.6m of each post had been trimmed to a blunt point. The posts themselves were too decayed to retain any trace of how these points had been worked, but the inner surfaces of the casts formed by the concreted gravels showed that they had comprised several flat facets, typically five or six.

Plate 4 Gravel concretions and oak posts

A sample from the outermost heartwood has been radiocarbon dated to 1600-1410 cal BC (68% confidence, 3220+/-70 BP, Beta-175526). This indicates that the post line was constructed in the early Bronze Age, some centuries after the demise of the palaeochannel and broadly contemporary with the early Bronze Age round barrows. In particular, they would have stood to the immediate north of barrows 7 and 8, which lay to the east of, and in line with, the long barrow, which was still respected and re-used into the early Bronze Age.

THE POND AND RING DITCH (1600-1410 CAL BC)

The single unexcavated round barrow (Fig 7, barrow 2) lay towards the eastern edge of Irthlingborough island, adjacent to the old railway embankment and it had been preserved between this and the quarry processing plant. To the immediate east there had been an extensive late glacial lake and within these silts an area up to 2.0m in diameter held a concentration of pieces of alder roundwood, possibly an *in-situ* alder stool. The wood has given a radiocarbon date of 2900-2620 cal BC (95% confidence, 4200+/-50BP, Beta-188365) indicating that this was an alder tree growing during the Neolithic, presumably within the more water retentive silts of the former glacial lake, and perhaps an outlier to alder growth along the nearby length of the silted palaeochannel. It would have pre-dated barrow 2 by several hundred years.

To the south of barrow 2, a small oval pond lay on a dry-land area at the top of the slope that ran down towards palaeochannel 1 (Figs 5 and 7). The feature was perhaps some 15m in diameter and up to 0.6m deep, with a shallow, bowl-shaped profile. The primary silt was of mixed sands, silts and gravel and above this there was grey/brown silty clay and blue tenacious clay. The upper fill was fine light brown sand. No organic material had survived, but a single length of partially carbonised blackthorn roundwood has given a radiocarbon date of 1600-1410 cal BC (68% confidence, 3220+/-60 BP, Beta-188364). There is no apparent reason why there should be a natural hollow in this area, and it must be assumed that a large pit had been dug out sometime in the early Bronze Age. The nature of the pit fills shows that it had subsequently held water for some considerable time, presumably after an initial accumulation of eroded silts and silty clays had effectively created an impervious layer within the pit. No other evidence was obtained as to the function of this pit, which is likely to have been at least broadly contemporary with barrow 2, and may have directed related to it in some fashion. A further possibly similar small pond lay to the east, but on the margin of the shallow water area and at the southern end of the glacial lake in an area of complex deposits, and so was less clearly defined.

The only earth-cut monument to be located during the watching brief was a small ring ditch. It lay 90m to the north-east of Barrow 2, and near the northern-eastern end of Irthlingborough island (Fig 7 and Plates 5 and 6). The deposition of later alluvial clays, the shallow water zone, began almost immediately beyond the ring ditch, suggesting that it lay at the very margin of the prehistoric dry-land area. The ring ditch was closely circular in plan, with an internal diameter of 10.5m. It was observed after machine stripping down to clean gravel, which had clearly involved the removal of the upper disturbed ballast, which may have truncated as much as 0.40m from the top of the ditch. As a result, around the western half of the circuit it survived to a maximum width of only 0.25m, with a V-shaped profile, and was no more than 0.1m deep. To the north and south it survived either as a truncated ditch bottom or as a stain on the gravel where it had been fully removed, and part of the eastern side had been totally lost due to the machine removal of a greater depth of disturbed ballast on the margin of the glacial lake.

Plate 5 The truncated remnant of the ring ditch

Plate 6 The ring ditch and barrow 2 on Irthlingborough island

Only the primary ditch fill survived, and this comprised dark grey gritty silt, with occasional gravel pebbles. A bulk soil sample was wet sieved, but it contained no organic or carbonised material, and so no material suitable for radiocarbon dating. The monument is therefore undated, although it seems most likely to date to the early Bronze Age, and was probably broadly contemporary with Barrow 2.

THE ROMAN, MEDIEVAL AND MODERN LANDSCAPE

A RIVER FORD?

At the northernmost end of Irthlingborough island, a localised deposit of large cobbles lay at the base of the alluvial clays (Fig 4). This was first recorded in a test pit excavated in April 2002 and was also seen in plan during soil stripping in 2002.

The natural gravel lay at a depth 2.2m below ground level, although this would equate to *c*2.7m below ground level allowing for the removal of the upper part during the setting up of the processing plant and storage area. Above the gravel there was a layer of light blue-grey clay, 0.7m thick, which probably represents an early accumulation of silts along the margin of a major palaeochannel. These deposits deepened to the east at they approached the present river channel.

Above these silts there was a patchy layer, surviving only one stone thick, comprising scattered large cobbles and limestone blocks, measuring up to 0.3m in diameter. In plan, the area of stone was seen to extend for at least 20m in all directions, but to the east it terminated and did not continue into the area of deeper river margin silts, although it may have been truncated by later water action on this side. The stone surface is undated, but it was sealed by 1.3m of homogeneous orange-brown mottled alluvial clays.

The presence of limestone indicates that this was a laid surface and not a natural accumulation, and it seems likely to have formed part of a surfaced river ford providing access onto Irthlingborough island. It is tempting to associate it with the occupation of the Roman settlement and villa complex, which lay on the opposite bank of the river. However, a limestone trackway further to the north, which was seen in a watching brief during the 1980s (Parry in press), was radiocarbon dated to the mid- to late Saxon period from underlying wood recovered from where it crossed a minor palaeochannel. This ford could therefore date to anywhere between the Roman period and the commencement of the major episode of medieval alluviation in the 12th century.

THE ALLUVIAL DEPOSITS

The sequence of alluvial deposits has already been described in the introduction to the description of the prehistoric landscape. The sequence seen in the watching brief is closely comparable to the sequence seen further to the north above the silted palaeochannel adjacent to the medieval hamlet of West Cotton, where it was shown that the commencement of the major phase of alluviation occurred around the middle of the 12th century AD, with this length of the eastern palaeochannel system becoming fully redundant by the end of that century (Chapman forthcoming). It was at this time that the West Cotton watermill system was abandoned. To enable the hamlet to survive a substantial flood embankment was constructed around the settlement using redeposited alluvial clays. The end result of this process was that the ground level within the hamlet lay a metre below the level of the adjacent floodplain, illustrating the dramatic transformation of the river valley topography that the alluviation of the valley floor produced. At West Cotton there was also a deposition of alluvium in the later 14th/15th centuries, but this may have been a localised event related to the desertion of the settlement and a consequent lack of control and maintenance of the stream system.

In the Raunds/Stanwick area the presence of any earlier episodes of alluviation is difficult to document, partly because the 12th century episode was so extensive that it would have largely removed any earlier deposits. However, there was evidence of overbank alluviation at Redlands Farm Roman villa at the southern end of the area, and there is more extensive evidence of flooding and alluviation during the Roman period from further downstream, in the Peterborough area, at sites such as Aldwincle and Fengate (Brown 1997, 226).

A further difficulty is the lack of dating evidence, except in specific locations where alluvial deposits can be related to dated settlements, and while the current watching brief has seen the exposure and removal of extensive areas of alluvium, no dating evidence has been obtained to confirm the date of deposition of any of the alluvial deposits observed.

With the deposition of the alluvium the valley floor was transformed from the complex prehistoric topography of dry gravel islands, on which the prehistoric monuments were constructed, between a braided river channel system, to an extensive level surface that formed the river floodplain in the high and late medieval periods, with the utilisation of this landscape as meadow land forming an integral part of the medieval agricultural regime.

In the post-medieval to modern period the topography remained much the same, and most of the floodplain continued to be uncultivated pasture and meadow until the commencement of gravel extraction in the mid-1980s.

THE RAILWAY EMBANKMENT

The Northampton to Peterborough railway line, which ran along the Nene valley, was closed in the early 1960s as part of the nationwide line closures carried out by Dr Beeching. Across the stretch of valley between Stanwick and Raunds the line was on an embankment, with substantial drainage ditches to either side.

As observed during machine stripping, these ditches had originally been cut down through the 2.0-2.5m of alluvial clays so that they bottomed on or just into the permeable gravel beneath, no doubt to facilitate drainage. Of course, they had long-ago silted to no more than a half of this depth, and were therefore permanently waterlogged.

As part of the final phase of quarrying some lengths of the railway embankment were removed, so that the aggregate beneath could be extracted. In the course of this work a number of partial sections of the embankment were exposed, enabling the construction method to be examined. In these sections there was a well-preserved, in fact a text-book, turf line, indicating that the embankment was thrown-up onto an undisturbed ground surface. The body of the embankment was made up of the same alluvial clays as those that lay beneath it. It is therefore evident that across the valley floodplain the simple upcast alluvial clay obtained from the digging of the drainage ditches was used to form the main body of the embankment, without the need for any imported materials.

ENVIRONMENTAL EVIDENCE

THE ANIMAL BONE
by Karen Deighton

Three animal bones were recovered from dumped spoil derived from the fill of the oxbow palaeochannel in the meadow. These have been identified as follows:

A large *Bos* sp. scapula with possible knife marks.
A large *Bos* sp. distal metacarpal with black staining
A *Bos* sp. tibia shaft with possible knife marks.

The measurement of the scapula (Table 2) can be compared with

Table 2: Measurements for Bos species scapula (after Von den Driesch 1976)

SLC: smallest length of scapula neck	GLP: greatest length of glenoid process	LG: length of glenoid cavity	BG: breadth of glenoid cavity
90.5mm	103mm	84mm	73mm

data compiled from the analysis of the cattle bone deposit at the Irthlingborough barrow (Davis 1989, barrow 1), which lay 400m to the west, and also with data from Denmark. At barrow 1 the LG measurements for two possible aurochs scapulae are 68.8mm and 67.6mm. The LG measurement of 84mm for the Stanwick quarry scapula shows that this was an even larger animal, leaving no doubt that it was an aurochs. The SLC measurement for this scapula would also seem to be congruent with the largest Danish examples (Davis 1989, fig 10). In addition, a machine driver at the quarry had recovered a large horn from the same deposit, which he had retained himself, which also seems likely to have been from an aurochs. It is possible that these remains are all from a single animal.

THE WOOD SPECIES
by Rowena Gale

Thin sections were removed from the transverse, tangential and radial surfaces using a double-sided razor-blade, and mounted in 70% glycerine on microscope slides (Gale and Cutler 2000). The anatomical structures were examined using transmitted light on a Nikon Labophot-2 microscope at magnifications up to x400 and matched to reference slides of modern wood. When possible, the maturity, age and stem diameters were recorded.

WATERLOGGED WOOD FROM THE BACKSWAMP

The sample consisted of three pieces of degraded roundwood infiltrated with fungal hyphae (bark absent) from the basal organic silts in trench 4:

Roundwood, diameter 20mm, 6 annual rings- Pomoideae which includes *Crataegus* spp., hawthorn; *Malus* sp., apple; *Pyrus* sp., pear; *Sorbus* spp., rowan, service tree and whitebeam

Roundwood, diameter 20mm, c. 10 annual rings- Pomoideae which includes *Crataegus* spp., hawthorn; *Malus* sp., apple; *Pyrus* sp., pear; *Sorbus* spp., rowan, service tree and whitebeam
(C14: Wk-10432)

Roundwood, diameter 60x40mm, 13 annual rings- Pomoideae which includes *Crataegus* spp., hawthorn; *Malus* sp., apple; *Pyrus* sp., pear; *Sorbus* spp., rowan, service tree and whitebeam

WATERLOGGED WOOD FROM THE OXBOW CHANNEL

10 pieces of roundwood of varying diameters were submitted, along with associated hazelnut shells. The condition of the wood varied from firm to soft and degraded:

Hazel (*Corylus avellana*), diameter 45mm, bark absent, 18? growth rings

Hazel (*Corylus avellana*), diameter 25mm, bark absent, 11 growth rings

Hazel (*Corylus avellana*), min. diameter 35mm, bark absent, 7 growth rings

Alder (*Alnus glutinosa*), diameter 45mm, some bark retained, 35+ growth rings

Alder (*Alnus glutinosa*), diameter 8mm, bark *in situ*, wood very degraded

Alder (*Alnus glutinosa*), diameter 8mm, bark *in situ*, wood very degraded

Alder (*Alnus glutinosa*), diameter 10mm, bark *in situ*, wood very degraded

Blackthorn (*Prunus spinosa*), diameter 22mm, bark *in situ*, wood very degraded

Oak (*Quercus* sp.), diameter 45mm, wood slow grown, 37 growth rings

Hazel (*Corylus avellana*), diameter 45mm, bark absent, 10 growth rings (C14: Beta-175257)

A single section from one of the oak posts was submitted for examination:

Oak (*Quercus* sp.) heartwood from a radial fragment from wide roundwood measuring at least 110mm. Sapwood absent. Outer surface abraded. (C14: Beta-175526)

WATERLOGGED WOOD FROM IRTHLINGBOROUGH ISLAND

Pit in top of the late-glacial lake:

Context 503, [Sample 03/3], 2 x roundwood, diameters 40mm: alder (*Alnus glutinosa*) (C14: Beta-188365)

Irthlingborough island palaeochannel:

1 x roundwood, diameter 8mm, alder (*Alnus glutinosa*)

1 x roundwood, diameter *c.* 15mm, alder (*Alnus glutinosa*)

2 x bark, unidentified but probably from fairly mature trees (C14: Beta-188366)

1 x structure too degraded to identify

Small pond:

1 x roundwood, diameter 25mm, partially carbonised: blackthorn (*Prunus spinosa*) (C14: Beta-188364)

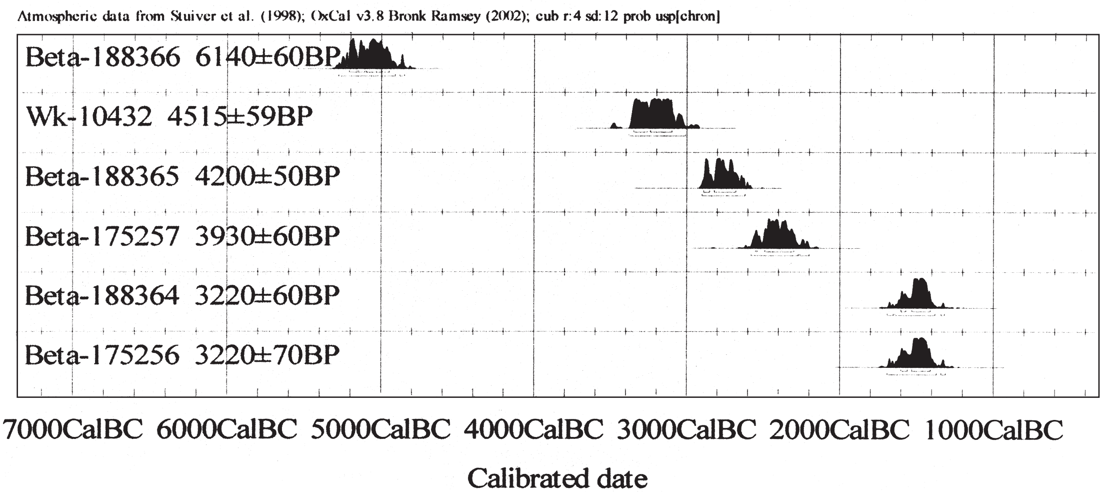
RADIOCARBON DATING

Radiocarbon dates have been obtained from waterlogged wood samples from the southern area, the palaeochannels in the meadow and the palaeochannel and pond on the eastern side of Irthlingborough island.

Radiocarbon Dating Laboratories: Beta Analytic, Miami, Florida, USA (Beta) & The University of Waikato, New Zealand (Wk). Calibration: OxCal v3.8 Bronk Ramsey (2002).

Table 3: The radiocarbon determinations

Lab. No.	Context details	Sample Details	d13C	Conventional radiocarbon age BP	cal BC 68% confidence 95% confidence
Beta-188366	Irthlingborough Island. Palaeochannel	Wood bark	-27.8	6140 +/-60	5210-4950 5280-4850
Wk-10432	Southern area. the backswamp (Trench 4)	Wood, pomoideae (hawthorn, apple, pear, rowan, service tree or whitebeam)	-29.1	4515 +/-59	3350-3100 3380-3010
Beta-188365	Irthlingborough Island. Top of late glacial lake	Wood, alder	-30.0	4200 +/-50	2890-2680 2900-2620
Beta-175257	The meadow. Palaeochannel	Wood, hazel Roundwood (10 growth rings)	-27.9	3930 +/- 60	2550-2300 2580-2220
Beta-188364	Irthlingborough Island. Small pond	Wood, blackthorn (prunus spinosa)	-28.5	3220 +/-60	1600-1410 1690-1320
Beta-175526	The meadow. Post in palaeochannel	Wood, oak post Outer heartwood, sapwood missing.	-28.8	3220+/-70	1600-1410 1690-1310



CONCLUSIONS

Given the background of the detailed survey and excavation work of the Raunds Area Project, the intermittent watching brief carried out at Stanwick Quarry during the final phase of extraction has provided valuable further details that enhance some aspects of the story derived from the much larger and more extensive investigations and 1980s and early 1990s. Of particular interest are the new discoveries relating to the form and evolution of the prehistoric palaeochannel system that was contemporary with the development of the Neolithic and Bronze Age monument complex (Harding and Healy in press).

It has been shown that while the modern eastern limit of Irthlingborough island is a single major river channel, the system was once far more complicated. Perhaps as late as the beginning of the 5th millennium, when human activity in the area is only evidenced in the deposition of quantities of Mesolithic flints and some burnt debris in tree holes, the edge of the island was formed by a stream that branched off from the present main channel and then rejoined it several hundred metres further to the north, and what is now the main channel may only have been of similar dimensions at this date. A second smaller palaeochannel that branched off and rejoined the main channel further to the south may be a further stage in the evolution of this system, with the braided minor channels becoming redundant one by one as the water flow along them decreased as a main channel became more dominant. Once these channels had fully silted the slope running down to the former stream would still have formed the edge of the dry-land island, with an extensive area between this and the main channel presumably comprising wet ground with alder carr. This sequence also provides a clear illustration of how in a multiple-channel (anastomosing) river system the individual channels can be quite small, and through time there is channel siltation with the end result being the evolution of a more simple system of larger channels. The presence of the gravel islands as dry-land zones dissected by these multiple channels has also been clearly illustrated along the eastern margin of Irthlingborough island.

In the later 4th millennium, perhaps as much as 500 years after the construction of a long barrow to the east, a backswamp immediately adjacent to the river, perhaps originally an oxbow channel, was silting up. The mixed wood from these silts has only been broadly identified to the Pomoideae family, which includes a range of smaller trees including hawthorn, apple, pear, rowan, service tree and whitebeam. There was therefore at least shrubby woodland within sight of the nearby long barrow.

In the early 3rd millennium there was also alder growth on the margins of the dry-land area, but perhaps favouring a damper area of soils over the silts filling a former glacial lake. In the mid-later 3rd millennium an oxbow channel was silting up, and the presence of alder, hazel, oak and blackthorn show the diversity of species growing in the immediate area, and confirm the evidence of pollen analysis from a contemporary channel at Wellingborough which shows the same range of species (Brown and Meadows 1996-97, 190). The aurochs bones recovered from this oxbow channel are of uncertain association, but it seems most likely that they are from a single deposit, perhaps a single animal, deposited either while the channel was silting or perhaps when the oak-post structure was built in the early Bronze Age.

The only dry-land monument was a small ring-ditch, only 10.5m in diameter, which lay 90m to the north-east of barrow 2, and on the very northern margin of Irthlingborough island, and is assumed to date to the early 2nd millennium BC. While this may have been a small burial mound, it is perhaps more likely to be associated in form with small ring ditch monuments recorded in the West Cotton complex, such as the double ring-ditch that lay immediately west of the large Beaker barrow (Windell et al 1990, fig 4). They may therefore be seen as ancillary structures appearing in the vicinity of major round barrows, but the exact function that they served remains unknown given the absence of finds or other deposits.

The post structure within the silted palaeochannel is only known from the collection of several displaced oak posts dragged out of the palaeochannel silts, so little can be said about its form. However, the consistent appearance of the concreted gravels around the sharpened bases of the posts suggest that they were all driven into the margins of the silted oxbow channel, so that the posts were secure in natural gravel, while some 0.5-1.0m of the upstanding posts was encased in the waterlogged channel silts. The posts were relatively slender, at 0.20-0.3m diameter, and may have formed a linear alignment on a north-south axis.

The post alignment is dated to the mid-2nd millennium and was probably related to the two round barrows that lay to the south, near the southern bank of the river channel, either as a contemporary feature or as a later feature respecting the barrow mounds, which were themselves aligned on the axis of the even earlier Neolithic long barrow.

It has been noted by Healy and Harding (in preparation) that both this post alignment and a line of postholes alongside the nearby long barrow, that ran for at least 50m, may be examples of an increasingly recognised phenomena of mid to later 2nd millennium linear alignments of ditches or posts. These appear to be more than simple linear boundaries and it has been argued that they may denote a new form of monumental landscape definition that shows respect for the upstanding earlier monuments and preceded the appearance of the demarcated field systems and associated settlements that are more usually thought to characterise this period. The transition from the monumental landscapes of the Neolithic and early Bronze Age to the subsequent regime dominated by the practicalities of stock control may therefore be far more complex than previously envisaged.

There is little evidence relating to later periods of activity, apart from the cobble and limestone ford at the northern end of the island, that is likely to date to sometime between the Roman and late Saxon periods.

Finally, the ubiquitous alluvial clays have shown a consistent pattern of deposition that confirms the more limited exposures observed in earlier works, particularly as examined in relation to the palaeochannel at West Cotton (Chapman forthcoming). However, while no further dating evidence for the chronology of deposition has been obtained, the broad sequence of events as interpreted at West Cotton has not been contradicted.

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