ALLUVIATED FEN-EDGE PREHISTORIC LANDSCAPES IN CAMBRIDGESHIRE, ENGLAND

Introduction

Over the past decade, extensive and varied fieldwork in advance of commercial development and drainage programmes has enabled large areas of the Cambridgeshire fen-edge and lower reaches of the river valleys of the Welland and Nene to be examined in great detail using archaeological and environmental techniques. The aim of this paper is to illustrate how the combination of archaeological sites, soil, sedimentological and palynological techniques can combine to interpret an extensive buried prehistoric landscape.

The area chosen for discussion is situated in the northwestern corner of the East Anglian fenland around Peterborough, Cambridgeshire (Fig.1). In particular, the lower reaches of the river valleys Welland and Nene will be examined in some detail. The River Welland runs to the north of Peterborough, and the River Nene meanders through what is now the city of Peterborough. Both rivers emerge from the limestone hills of the East Midlands to the west, and empty out across very broad floodplains into the fen basin to the east. As the floodplains, especially the very wide Welland valley, at present bear little visual relationship to their past aspect, deforestation, alluviation, drainage and modern development tend to make these areas wide, flat, featureless landscapes. This becomes even more marked as one moves eastwards across the fen-edge and into the fen basin. Massive drainage works from the 17th century AD onwards have made a completely artificial and dry landscape by today.

These lowland river valleys, in common with the Thames valley around Oxford, contain the densest areas of prehistoric and Roman cropmark sites in lowland England. During the past decade the archaeological extent and time-depth of these floodplain areas has considerably increased, if not doubled, with the recognition of the sealing effects of the deposition of later river-borne silts and clays, or alluvium.

In the following, I shall attempt to demonstrate some of the methodologies involved, the archaeological discoveries made and the past landscapes revealed in the study area. I shall first attempt to define alluvium and its archaeological importance, before moving on to discuss the main methodologies used, and finally a discussion of recent work.

It perhaps should be pointed out that almost all the sites to be discussed have either been discovered and/or have only been able to be excavated because of development, whether for road construction, drainage, industrial development or sand/gravel extraction. Without these threats and therefore the provision of funding for archaeology as a part of the planning process, many of these sites would have gone undiscovered and unexcavated.

Methodology

DEFINITION OF ALLUVIUM

The appreciation of alluvium is crucial to understanding the changing nature of the Welland and Nene floodplains and the fen-edge, and the preservation of extensive areas of the prehistoric archaeological landscape.

What is alluvium? Alluvium may be any sediment transported downstream by river action. The sediment may vary from course gravels to fine silty clays in composition. Most of the sediment is carried along by overland flow, or is derived from bank scour and collapse, as well as some material from the river bed itself (STRATHAM 1979). A major contributing factor to sediment load in rivers is the material added by a combination of extensive clearance and agriculture by man, especially on
hill-slopes upstream (LIMsReY 1975). Alluvium tends to be deposited in a floodplain of shifting river and stream meanders. In particular, overbank floodwaters containing alluvial material soon become still, and the fine silts and clays settle out of suspension and build-up or aggrade the existing ground surface. Over several hundred years, very small annual amounts of alluvium can amount to considerable thicknesses of aggraded material. Consequently, the apparent lack of archaeological sites in river floodplains may be due to erosion and partial redeposition elsewhere in the valley, or alluvium may bury sites which were situated on the land surface before erosion took place.

DEFINITION OF COLLUVIUM

On the other hand, colluvium is a loose, non-stratified, poorly sorted, heterogeneous mixture of various size grades found on the lower part and base of slopes. It is generated by three modes of transport:
1) overland flow occurs when the saturation capacity of the soil is exceeded during high rainfall;
2) soil movements involving splash creep as a result of rainsplash impact on frost creep; and
3) downslope displacement of soil as a direct result of ploughing (KWAAD and MUCHER 1979; IMESON et al. 1980).

Colluvial erosion may occur on any slope, and even on wooded slopes. For example, Young (1969) quotes rates of soil loss for areas of moderate relief under natural conditions of 0.0045 kg m-2 per year, 0.045 kg m-2 per year for steep relief, and rates of 4.5 kg m2 to 45 kg m2 per year for agricultural land. For an example of erosion on wooded slopes, a rate of 6 cm per 100 years has been demonstrated for a loessic soil since oak and beech woodland began to be coppiced (IMESON et al., 1980).

Obviously, once colluvial material is within the water system, it may end up in the river system and be transported and deposited as alluvial material.

FIELD METHODS

Fortunately, around the Peterborough city area there has been considerable commercial development over the past two decades which has enabled much archaeological fieldwork. In particular, extensive gravel extraction within the Welland and Nene floodplains, and where these rivers conjoin with the fen basin on the east side of Peterborough, has enabled extensive areas of the landscape to be investigated in detail over lengthy time periods. The construction of new roads, or bypasses, has also been useful, providing linear transects cutting across the landscape. Survey work has largely been restricted to the fen-edge and fen basin areas to the east. Here, the activities of the drainage authorities have enabled the examination of cleaned dykesides, which in effect create random, linear transects across a landscape which is otherwise largely invisible. I shall return to this later when I discuss some of the sites that have been discovered in the dyke survey. The present surface of the fen in Cambridgeshire has also been completely field-walked in 12 years by the Fenland Field Officer, David Hall, with the discovery of hundreds of new sites and the drawing-up of invaluable maps indicating the extent of the fen at each main stage in its development, parish by parish.

ENVIRONMENTAL TECHNIQUES

The most useful environmental techniques for examining the alluviated landscapes are the combination of soil micromorphology, pollen analysis and sedimentology. The micromorphology of soils is a relatively new technique which involves impregnating an intact block of soil or sediment with a crytistic resin, cutting and polishing a thin section and examining the slide using polarised light (COURTY et al. 1989).
Pollen analysis is used to study peat deposits as normal, but we have been trying to use the technique on unconventional matrices, such as buried soils and sediments in ditches and stream channels. The work that I will discuss has been carried out by Dr. R.G. Scaife.

The sedimentological work involves aerial mapping of the former stream channels, followed up by a sampling programme. This involves sampling for chemical and size analyses of sediments in order to discern sediment origins and methods of transportation and deposition; as well as optically stimulated luminescence and archaeomagnetic dating, and radiocarbon dating where possible in order to work out time sequences. This work is being done by Dr. M. Macklin and David Passmore of the University of Newcastle-upon-Tyne, and Romela Parish of the University of Durham. These analyses aim to determine the history and origins of the changing floodplain. Only once this has been done will the monuments and sites of various periods begin to make proper sense in terms of their landscape setting. I shall now turn to the evidence from the two river valleys, and then the fens to the east.

The Peterborough Area

The landscape under investigation comprises the lower Welland river valley to the north and the lower Nene river valley to the south with Peterborough city in between. Essentially, these river valleys are products of late Devensian gravel deposition and erosion, with Peterborough marking the southeastern extremity of the limestone upland which rises to the northwest. The fen basin to the east has been recently infilled with various freshwater and marine deposits as a combination of the result of rising sea levels and rising base groundwater levels, but it is now a completely drained and artificial landscape.

In the lower Welland valley, as viewed from the air, there is a dense concentration of cropmarks (Fig. 2). It is one of the most densely occupied river valleys known in lowland England. What is instantly recognisable is the absence of cropmarks where the landscape is covered by alluvial deposits (the stippled area in Fig. 2). This has been proved to be a completely erroneous distribution of sites and sediments. Firstly, wherever gravel quarrying or road construction has allowed investigation beneath the alluvial overburden, earlier prehistoric sites have been revealed, examples of which will be discussed below. Second, the distribution of alluvium is now known to be much more extensive than the soil/geological survey maps initially indicated. Alluvial aggradation has therefore affected all the lower areas of the floodplain, leaving only the villages like Maxey, Etton and Northborough unaffected as 'islands'.

The Lower Welland Valley

Narrowing the focus down to the area of former Welland floodplain between the villages of Maxey and Etton, it has been possible to investigate this area in some detail over the past decade. The principal sites include the middle Neolithic causewayed enclosure at Etton, the Etton Woodgate middle Neolithic ditched settlement site, several late Neolithic and Early Bronze Age midden deposits, numerous late Neolithic henge monuments and Bronze Age barrows (Fig. 3).

Although some of the former stream channels are sketched on Figure 3, they represent only part of a much more complex system which is still in the process of being mapped and deciphered. But the preliminary sequence of river/stream development is outlined as follows:
1) a substantial Ipswichian, or last interglacial period, channel which is an early precursor of the River Welland (FRENCH 1982);
2) an early Post-Glacial anastomosing pattern of streams, or a 'ladder-like' pattern of streams, which is a type of river system now being widely recognised in lowland English river valleys;
3) a meandering system of streams which certainly existed during the Neolithic and Bronze Age periods and probably continues throughout the next millennia until the canalisation of the present day, although exhibiting many different courses.

All of these channels contributed to the process of alluvial aggradation and erosion in the river valley
during the late Flandrian and Post-Glacial periods, especially in the past four millennia. Essentially, the material becomes finer and thicker as the stream channels become younger. Infills range from peat in cut-off channels to locally-derived colluvial material from the immediate higher ground, to calcareous silts off the limestone hills c. 5 km to the west to clay and silt off the hinterland upland at 5 km to the west.

ETTON WOODGATE

This site was discovered during topsoil stripping operations of the adjacent quarry, and first revealed itself as an extensive linear spread of dark grey to black 'midden-like' material, some 150 + m in length and 5-10 m in width, all sealed beneath the post-Roman alluvium. Subsequently, the excavations revealed a large middle Neolithic ditch following and defining the contour of the southeastern euge of Maxey 'island' (Fig. 3), perhaps as a catchwater drain, which was broken by a single entranceway facing out across the contemporary stream channel towards the adjacent causewayed enclosure. Just within the entranceway was a rectilinear arrangement of pits/post-holes which are suggestive of a contemporary structure. After the stream became infilled and the ditch was out of use, a huge complex of pits was dug in the Early Bronze Age (Beaker) period, probably associated with the production of oak charcoal (PRYOR et al. 1985a).

The soil sequence initially suggests the presence of a once-wooded brown forest soil. In the later Neolithic the soil became subject to the addition and incorporation of locally derived colluvial material, which also infills the basal half of the adjacent stream channel. Then the natural depression formed by a combination of the contour, infilled stream and ditch was infilled with redeposited soil mixed with abundant charcoal and burnt pebbles, fragments of pottery, bone and flint (FRENCH 1988a). At the time of discovery, its significance was not fully appreciated, as it was the first evidence of human occupation of this later Neolithic/Early Bronze Age period to go with the extensive ceremonial use of this same landscape. It is suggested that this linear spread of 'midden' material is domestic rubbish material which had accumulated adjacent to an as yet undiscovered occupation site(s), which was later re-deposited in an area of low marshy ground which became established in the infilled linear zone of the former stream channel.

The Etton causewayed enclosure

Crossing southeast across the contemporary stream channel, the middle Neolithic causewayed enclosure was located in a northward stream meander (Fig. 3). The interrupted ditch enclosure is 'egg-shaped' and encloses some 2.5 ha, and two-thirds of the site was available for excavation (PRYOR et al. 1985a).

Although the chronological development associated with the construction of the ditch is open to discussion and the radiocarbon dates are not yet available, the western arc of the causewayed ditch appears to have been waterlogged and contained various 'placed' deposits of artefacts, and to have been recut on several occasions. The eastern arc of the ditch does not appear to have been waterlogged, but was deliberately back-filled, first with turves and topsoil, then recut and then back-filled with sand and gravel subsoil, uniformly around this arc of the ditch. Later in the Neolithic, the ditch was again recut in the eastern arc and 'placed deposits', mainly of animal bone, put in discrete groups along its length. In the area of the western arc of the ditch, the stream channel migrated southwards and overwhelmed the ditch. This led to its abandonment, and a subsidiary ditch was dug to cut off this marshy part of the site.

The interior of the enclosure is dominated by some 800 small pits. Most of these contained nothing that has survived, but about 25 pits contained 'odd' collections of material which were similar to the 'placed deposits' in the ditch. Significantly, there is nothing suggestive of any long-lived occupation within the interior area. Other features within the interior include the southern ditch of the Etton
cursus (late Neolithic), and a variety of Bronze Age, Iron Age and early Roman ditches and pits. The buried soil was examined in detail, as were the back-fill deposits in the ditch. The soil had developed (as at Etton Woodgate) into a brown forest soil. Pollen analysis (by R.G. Scaife) provided corroborative evidence for the former presence of a mixed deciduous woodland, which by the time the enclosure was constructed about 2500 BC was cleared and damp, open ground.

The upper half of the profile is dominated by intercalated silts and clays. This fine material is the result of the slaking of clay which was deposited by floodwater action. Similar soil features within the dumped topsoil within the enclosure ditch strongly suggest that the soil was subject to limited alluvial aggradation over a considerable time period by the middle Neolithic (FRENCH 1990).

Alluviation in this period elsewhere in lowland England is not unknown, but it has changed our impression of this part of the lower Welland valley. It implies that we are dealing with an alluviated river valley bisected by numerous meandering streams, rather than a dryland valley subject to later burial by alluvium. This situation has considerably changed our interpretative viewpoint and framework for the other prehistoric sites in the floodplain.

*Etton Landscape A15 Bypass*

Moving eastwards some 500m, the construction of a new bypass enabled a transect to be cut across the alluviated floodplain (Fig. 3). Here on the edge of the higher part of the terrace were a succession of prehistoric ditches running downslope and at right angles to the stream channels of the day. The earliest of these ditches is dated to 4320 +/-70 BP (Q-3095) or the middle Neolithic. Contemporary with these were linear 'midden' areas, which were very similar in character to the later Neolithic/Early Bronze Age midden observed and excavated at Etton Woodgate, with a date range of 4425-3860 BP (Q-3093, Q3094, Q-3096, Q-3099, Q-3100) (Switsur, pers.comm.).

The midden material itself is probably composed of the rake-out of low heat domestic fires. The charcoal and ash from these fires was probably initially piled elsewhere, presumably adjacent to a settlement in the vicinity. There it received the addition of other domestic refuse such as pottery, animal bone and flint prior to being re-deposited at the edge of a contemporary stream channel, just as people tip household refuse in fen dykes today. By 3875 +/-50 BP (Q-3149) the stream channel migrated northwards and covered the midden area.

*The Etton Landscape Henge Monuments*

During the same late Neolithic period, numerous henges were constructed on slightly higher ground to the north of the contemporary floodplain. They take various forms from large, circular and open ditched areas to settings of posts and pits within smaller circular ditches. Their position mirrors the meandering course of the contemporary river, approximately 100-150 m to the south (Fig. 3). It is suggested that these ceremonial sites are situated on unenclosed land which was relatively flood-free, but this land soon became subject to seasonal flooding and the aggradation of small amounts of alluvial fines (silt and clay). It is probable that the magnitude of freshwater flooding gradually intensified as the amount of run-off increased because of the continuing clearance of woodland upstream, with its coincident increase in sediment load. Consequently, more and more of the terrace became part of the developing floodplain.

On the high ground of Maxey 'island' about 1 km to the northwest, examination of the soils associated with the Maxey great henge revealed evidence of continuity in this low-lying gravel terrace landscape. As elsewhere in the lower parts of the river terrace, the soils had previously supported woodland, which was well deforested by the late Neolithic. It was only very rarely ploughed, and was probably largely established pasture (PRYOR and FRENCH 1985; FRENCH 1988a). Pollen analysis of late Neolithic Grooved Ware pits within the Etton causewayed also portrays a similar picture (SCATFE in PRYOR et al., in prep.).
The Etton Landscape Barrows

The position of the earlier Bronze Age barrow mounds and ring ditches on the higher parts of the terrace mirrors the siting of the henge sites to a large extent. The soils sealed by the barrow mounds appear to have remained non-waterlogged prior to the construction of the monuments. The mounds preserve buried soils which are 'frozen in time' as compared to the surrounding alluviated areas, that is less affected by contemporary water action. Nevertheless, the suite of information remains remarkably consistent. Well developed brown forest soils are found on the higher parts of the terrace, which have been deforested prior to barrow construction and have rarely been ploughed (FRENCH 1988a; FRENCH and PRYOR, forthcoming).

The Lower Nene Valley

Moving southwards into the Nene valley, the urban agglomeration of Peterborough makes investigation of large parts of the floodplain very difficult. Accordingly, the main sites investigated lie to the west and east of the city.

THE A605 BYPASS

The route of the A605 bypass to the west of Peterborough crossed from the Nene valley over the boulder clay hills and back into the Nene valley, between 11 and 6 km from the city centre (FRENCH, forthcoming) (Fig. 4). At its western (or Elton) end, the bypass route passed across a small infilled dry valley, a former tributary of the River Nene (Figs.4 & 5). As this area is unsuitable for aerial photographic detection because of the combination of boulder clay subsoil and pasture fields, the detection of archaeology is extremely difficult. But geophysical and field-walking survey on the Elton estate suggested the presence of prehistoric activity in this small valley.

Extensive open area excavation revealed a small, sub-circular enclosure, about 14 m in diameter, with a wide entranceway to the west, set within a small rectilinear field system aligned at a right angle to the relic stream (Fig. 5). The enclosure is believed to be middle Neolithic in date, and domestic in function. The presence of numerous small abraded pieces of pottery and animal bone, plus numerous very small flint flakes within the enclosure ditch, are probably indicative of the 'sweepings' of a floor area. The absence of any internal features would appear to negate this, but why not a turf-built house or 'tipee-like' structure within the enclosure instead which is only in use for a few seasons, rather than an established structure which was used continuously over a period of years.

Subsequently, the land to either side of the stream was subject to the deposition of c. 20-50 cm of colluvium, a fine sand/coarse silt containing flint artefacts ranging in date from the Mesolithic to Early Bronze Age. AltUough the origin of this material is as yet unknown, it may represent the erosion of recently deforested soils from the high ground some 400 m to the south and upstream.

Subsequently, the stream channel became infilled with clay and went out of use. This material is undoubtedly derived from the erosion of the boulder clay subsoils uphill and upstream, perhaps associated with intensive deforestation and arable cultivation. Although an exact date for tLis event is not yet available, the construction of a Saxon bank or parish boundary on the infilled channel suggests that tLis colluvial infilling occurred in Iron Age or Roman times.

At the eastern (or Haddon) end of the bypass, a large Roman farmstead was set just above the base of a slope of boulder clay hills on the southern side of the Nene valley. Preliminary soil and pollen analysis (R.G. Scaife, pers.comm.) is indicative of extensive areas of surrounding pasture. The uppermost part of the site is covered by up to 50 cm of colluvially derived silts. This material is probably associated with the medieval cultivation of the hillslopes immediately behind the site to the south.
THE ORTON LONGUEVILLE BARROWS

Moving closer to Peterborough itself at Orton Longueville, some 4 km west of the city centre, a series of former River Nene cut-off channels have been examined. Here, a series of substantial and complex late Neolithic barrows lie to either side of a substantial meander of the River Nene (FRENCH 1983; MACKRETH and O'NEILL, forthcoming). By the late Iron Age, this meander was cut off and a new channel cut to the north of the barrows. This cut-off meander was infilled with a 3-4 m depth of alternating peat and organic silt deposits, all suggestive of relatively quiet, marshy and quiet open water conditions, respectively, of deposition. Even without overbank flooding, the deposition of these deposits indicates the increasing amount of fine (silt and clay) sediment that was finding its way into the river system by the later Iron Age and Roman periods. This is undoubtedly associated with the intensification of forest clearance and arable cultivation upstream.

THE FENGATE AREA

Moving downstream to the fen-edge on the eastern side of Peterborough (Fig. 1), the Fengate area has revealed a huge complex of sites whose excavation has been made possible by commercial development (Fig. 6).

Initial discoveries revealed the presence of an extensive rectilinear field system defined by ditches and banks, divided by major double-ditched droveways, all aligned at right angles to the fen-edge of the day (PRYOR 1978, 1980). This field system was dated to the 2nd millennium BC, and was believed to be areas of flood-free enclosed winter pasture, mainly for cattle.

Recently, we were able to trace this field system eastwards towards the fen-edge (Fig. 6). Indeed, the ditches in one case narrow and become fence lines and end at about the 3 m contour, and in another case turn through a right angle, leaving the droveway inbetween opening out towards the fen. Pollen analytical work (R.G. Scaife) suggests that the area of land fringing these fields exhibited a water meadow environment by the later Bronze Age, subject to seasonal freshwater flooding. It is therefore possible to envisage this land as open, fen-edge pasture in the spring, summer and autumn, with a shallow reed fen about 150-200 m to the southeast, and permanent, floodfree enclosed winter pasture inland to the west.

It is also possible that there was a seasonal watercourse following the natural contour at this time (Late Bronze Age) along the fen euge. Geological borehole work has indicated the presence of an underlying, probably late Glacial, stream channel of up to 5 m in depth following the fen-edge. When the Late Bronze Age avenue of wooden posts was constructed across the contour at about 900 BC, two long and thin sand banks formed to either side of the structure. Sedimentological analysis suggests that this deposit may be associated with a locally migrating river channel (PASSMORE and MACKLIN, pers.comm.). Therefore, it is very possible that the wooden avenue was crossing a small river channel before going eastwards across the fen reedswamp. This may therefore explain the position and concentration of votive metal objects deposited to either side of the avenue.

Subsequent fen development here involves further encroachment by reedswamp as a result of generally rising base water levels in the fen to the east. This represents local environment stability, which was punctuated by the inwash of coarser sediments (alluvium), with conditions generally becoming wetter throughout the Iron Age. During the later Roman and early medieval periods there was the deposition of silty clays with some organic content, which are derived from eroded topsoils. This feature undoubtedly reflects further intensification of deforestation and cultivation upstream, a process also seen at the other Nene valley sites of Elton, Haddon and Orton Longueville.

The Fen-Edge/Fen Basin

The fen-edge area between the Fengate/Nene valley and Maxey/Welland valley is essentially an area of gravel terrace/fen gravels on the extreme northwestern edge of the fens which is covered by a
variety of fen deposits (Figs.1 & 7).
Although a whole separate paper could easily be written on this area alone, a summary of its landscape development and archaeology is appropriate here because it is essentially a conjoined extension of both river valleys.
The gravel terraces of the Nene extend northeastwards in a great 'hand' shape to form the Eye peninsula (Figs. 1 & 7). This in turn acts as the southern side of a fen basin to the northwest, with its northern boundary defined by the River Welland and its western boundary defined by an extensive gravel flat in the Peakirk-Newborough area.
The well-known tri-partite sequence of fen deposits (peat/marine silts and clays/peat) only affects the eastern area of this Borough/Newborough Fen. Here a basal peat formed in the Neolithic period, drowning the mixed deciduous woodland. Towards the end of the Neolithic/beginning of the Bronze Age, this area was subject to marine inundation which deposited silty clay in a tidal saltmarsh environment. This was followed by further peat growth from the Bronze Age until drainage began in the 17th century AD. All of these deposits thin and peter out westwards: the lower peat to the east of Newborongh, the marine silts and clays just west of Newborough and the upper peat at PeaLirk. The Peakirk-Newborough area is also covered by a broad alluvial fan, essentially conjoining with the alluvial fan occupying the whole breadth of the Welland valley between Northborough and Peakirk.
Below, I shall examine three examples of important prehistoric sites found by dyke survey in this fen-edge area (FRENCH and PRYOR, in press).

CROWTREE FARM

During the Neolithic period, the bulk of the confluence of the lower Welland and fen basin gravels were dry land, with basal peat/drowned Atlantic period woodland only to the east of Newborongh village. Just on the edge of the Neolithic fen were a series of small gravel peninsulas or 'islands' on which are found evidence of Neolithic occupation. In the dyke survey, the 'sites' reveal themselves as a well developed buried soll containing flint artefacts, with or without features visible in section (FRENCH 1988b & c).
Test excavation enabled environmental samples to be taken, and the buried soll to be excavated and sieved in detail. The soil revealed minute flint flakes which are indicative of the making of flint tools in situ. The micromorphology and pollen analysis (R.G. Scaife) of the buried soil indicate that the area had previously been wooded with deciduous trees, dominated by lime and to a lesser extent oak. Peat formation around the peninsula was well advanced by 3660 +/-60 BP (Har-8513) or the later Neolithic, and clearance had occurred on the peninsula itself. Sometime after 3190 +/-90 BP (Har8913), the peninsula had been inundated by fen clay and a salt marsh environment established. It is suggested that this part of the Neolithic fen edge and the 'islands' just off-shore were used as a temporary encampments from time to time, perhaps for hunting/fishing/fowling, by groups of people taking advantage of the fens' natural resources. Two similar sites have been found in this northwestern part of the Cambridgeshire fens, c. 2 km to the east (Oakhurst Farm) and c. 5 km to the northeast (Morris Fen), and another site in the southern Cambridgeshire fens (Broadpiece Farm, Mepal), all situated on small gravel 'islands' c. 150 m across within the peat fen.

THE BOROUGH FEN RING-FORT

Moving westwards from the Crowtree Farm site and Neolithic fen-edge about 1.5 km to the later Iron Age fen-edge, an extensive ring-fort is situated on a promontory of Welland First Terrace gravels at c. 3 m OD. The ringfort is approximately circular and encloses about 3.8 ha, and may be of two phases of construction. The first phase consists of an outer ditch and internal bank some 280 m in diameter, which survives only as soil marks. The second phase consists of an outer ditch about 4-6 m in width and c. 2-3 m deep, c. 220 m in diameter, with an internal bank surviving up to c. 1.5 m in height, which is broken by two possible entranceways (HALL 1988).
Beneath the overlying desiccated peat and alluvium, there was a well preserved buried soil. Charcoal from this horizon gave a radiocarbon date of 2090 +/−80 BP (Har-8511), and pottery from the same horizon suggests a later middle Iron Age date (eg. 3rd to the later 1st century BC). The occupation horizon is in fact the upper A horizon of the soil into which is incorporated considerable quantities of wood ash and dumped occupation debris. The heterogeneous mixture of the two fabrics suggests that this soil was in fact a ploughsoll. This soll later became subject to waterlogging as a combination of a rising groundwater table and alluvial aggradation (FRENCH 1988c; FRENCH and PRYOR, in press).

THE FLAG FEN BASIN

Returning to the Flag Fen basin immediately east of Peterborough, the Late Bronze Age wooden platform was situated in a reed fen mid-way between the Fengate fen-edge and the fen 'island' of Northey to the east at the neck of a small basin extending to the south (PRYOR et al. 1985b) (Figs. 6& 7). From dyke survey work there is every reason to believe that this plat form is an integral part of the contemporary landscape. To the east and west it is linted, at least symbolically, by the avenue of posts to dry land. In addition, Northey 'island', only c. 75 m to the east of the platform, exhibits contemporary use including extensive field systems and occupation areas, with soil evidence of ploughing and the dumping of occupation debris (GURNEY 1980; FRENCH and PRYOR, in press).

Throughout the earlier Bronze Age, the fen basin would have gradually increased in extent. The dryland edges were gradually encroached upon, leading to a change in environment from water meadow to fen carr/reed swamp, with the depth of freshwater gradually increasing from a few centimetres to 40-50 cm over a period of several hundred years. This situation pertained into the Iron Age, with the occasional influx of brackish water, presumably associated with overbank flooding from the River Nene immediately to the south. By the early Roman period, the peat surface was sufficiently dry to enable the construction of the fen causeway or gravel roadway across the fen basin formerly occupied the Flag Fen platform in the 1st century AD. Peat growth, interrupted by alluvial aggradation from time to time, continued until drainage occurred in the 17th century AD.

Conclusions

In conclusion, why are these alluviated and fen-edge landscapes so important?
First, they seal and protect landscapes from earlier prehistoric to Roman times, more or less undisturbed by recent intensive arable cultivation.
Second, as these landscapes were at either the river's edge or fen-edge of the day, the archaeological contexts are more likely to be waterlogged and therefore of greater archaeological, value in terms of the amount of archaeological evidence available for study by archaeologists and environmental archaeologists.
Third, as the landscapes are sealed relatively intact, they allow the best version of the complete picture of human land-use to be discovered in one area—that is their fields, settlements, burials and temples.
Forthrightly, it must be said that the story of human land-use discerned for these two lowland river valleys and fen-edge region only apply to these geographical areas. Each topographical unit, however small, holds its own sequence and its own implications for human use in each time period.
Through a combination of large scale excavation and survey projects combined with targeted environmental analyses, it has been possible to give detailed regional archaeological studies of the lower reaches of the Nene and Welland river valleys and the immediate fen to the east. In our case, the extra preservation of the deposits necessary for the environmental work is the result of the alluvial 'blanketing' of the pre-Roman landscape, both in the lower river valleys and on the fen-edge to the east. The alluviation of the fen edge is one of the last phases of deposition in the fen sequence of freshwater peats and marine silts and clays.
Originally, it was believed that we could simply ‘roll back’ the alluvium and reveal the dryland landscape, undisturbed. In practice, this has not happened, rather it is a completely different and unexpected landscape which has undergone its own types of transformation.

Each area of the floodplain has been an active an continually changing floodplain landscape since at least the earlier Neolithic period. Once clearance had begun in the earlier Neolithic, relatively widespread colluviation and alluviation processes began to affect the floodplain/terrace edge areas of the day. It gradually encroached onto the higher parts of the terrace during the later Neolithic and Bronze Age periods, until by the post-Roman period, major blanket alluviation of the area began and continued to dominate the landscape until recent times.

On the fen-edge, a combination of rising base water levels and sea-level rise in the North Sea gradually caused flooding and deposition episodes at locations further and further inland, and at higher and higher levels. There is little doubt, however, that the terrace/fen gravels around the eastern side of Peterborough city are an integral part of the lower river valley systems. Indeed, large areas of the fen-edge were available and open land during the Neolithic and Bronze Age, which gradually became subject to rising base water levels and a combination of peat formation and alluvial aggradation.

It is possible that the prehistoric population using these floodplain terrace and fen-edge areas is a mobile and transitory one using several zones of the landscape—floodplain, terrace/fen-edge/island edge and upland hinterland, but in an established and long-lived way, within a small geographical area of no more than 5-10 km in diameter.

CHARLES A.I. FRENCH

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