Excavations at Lower Bolney, Harpsden, South Oxfordshire, 1991

By GREGORY CAMPBELL

with contributions by JOHN LETTS and MARK ROBINSON

SUMMARY

A cluster of waterlogged wattle-lined pits under alluvium on the middle Thames floodplain at the edge of a large former channel was radiocarbon-dated to the middle Iron Age. Preserved plant tissue, mollusca and insects indicated that the pits were originally dug to below the water table, in a bank-side environment of grazed floodplain grassland. Observations of earthmoving allowed the reconstruction of deposits in the former channel. The sequence of deposition is discussed and compared with recent archaeological studies of hydrology in the upper Thames.

INTRODUCTION

The Bolney area (OS Grid Reference SU 77/81) lies in South Oxfordshire District between Henley and Lower Shiplake and is bounded on the E. by the River Thames and on the W. by Harpsden Court and Harpsden Wood. At this point the clay-capped flinty chalk of the dip slope of the Chiltern Hills gives way to the middle Thames gravel terraces which spread along the river from Goring to Wraysbury (Fig. 1). Bolney's relatively level fields are the N.E. corner of the broadest area of gravel terrace, at the confluence of the rivers Thames, Kennet and Lodden; here, this deposit consists of gravel islands separated by in-filled former channels. Such a gravel island, approximately 1000 by 500 m., lies E. of Lower Bolney Farmhouse and separates the present floodplain from a channel which has gradually filled with alluvial clay.[1] The unearthing of a large timber during the digging of a drain S. of Lower Bolney Farm prior to 1990 led to the widespread belief in the district that a large ship, possibly abandoned by Vikings during their sack of Reading in A.D. 870, lay in this channel.[2] A programme of landscaping by the present owner made it possible for a small team from Oxford Archaeological Unit, supervised by the author, to investigate the archaeology of the alluvial channel and the site of the 'vessel keel'.

The archaeology of this parish has not been investigated as much as that in Henley or Lower Shiplake, probably because those areas have experienced more development in

[1] Map enclosed in H.G. Squirrel, 'Sand and Gravel Resources in SU 77/81', *Mineral Assessment Report*, xxxii (Inst. Geol. Sciences, 1978).

[2] *Henley Standard*, 16 Nov. 1990.

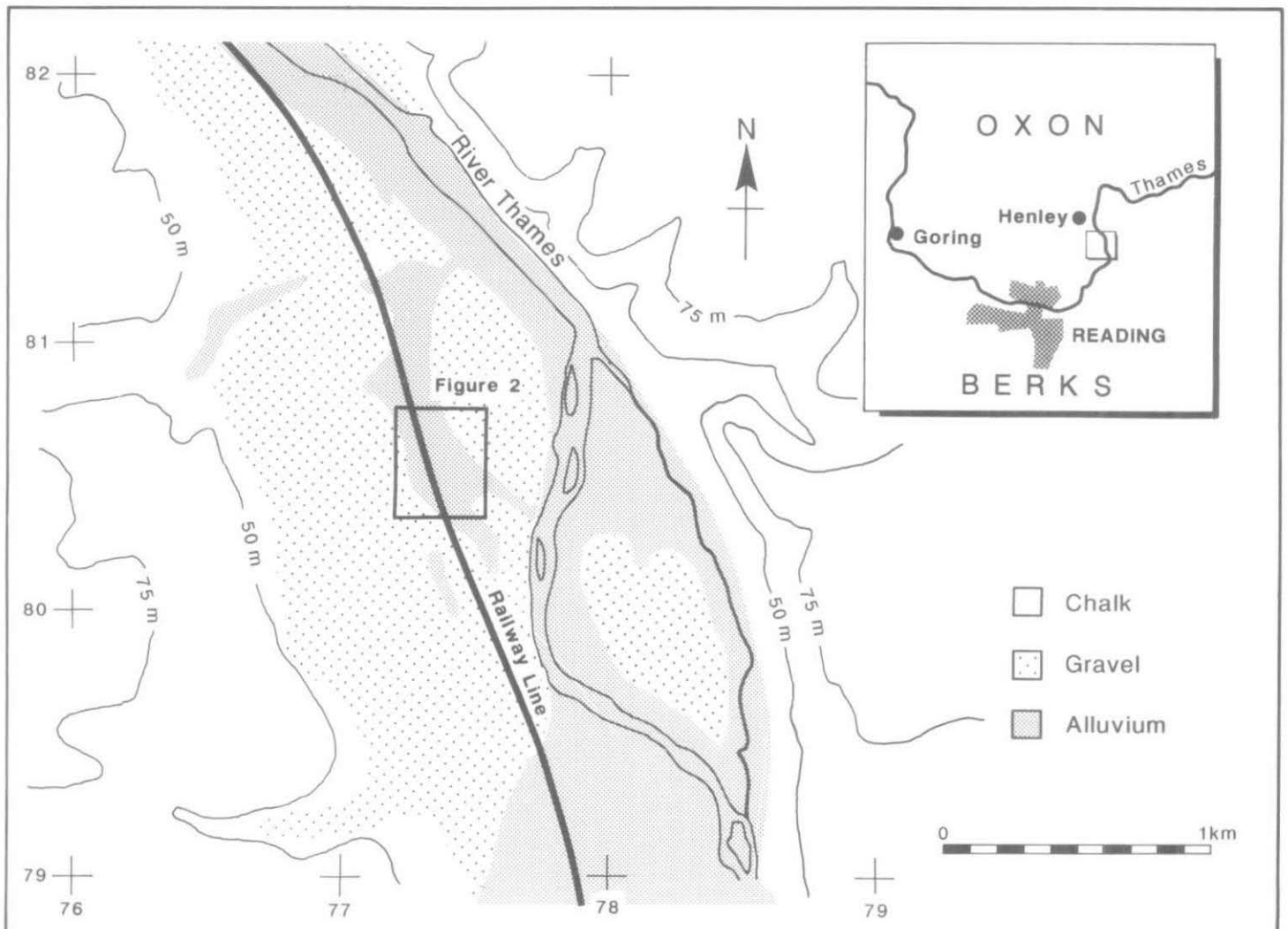

Fig. 1. Lower Bolney, Harpsden, S. Oxon.: Location, Topography and Geology.

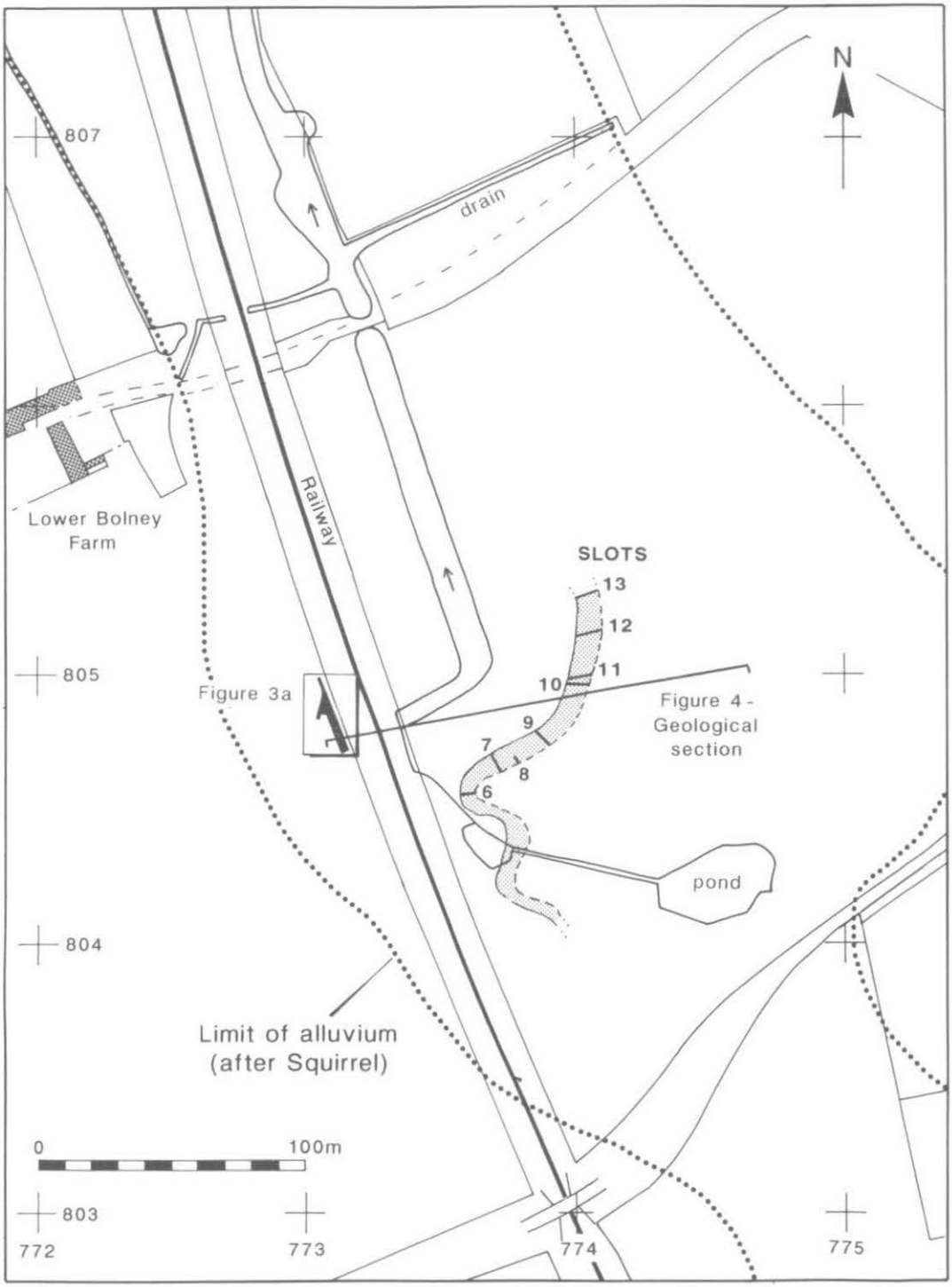

Fig. 2. Lower Bolney: Areas of archaeological investigation.

recent times. Examination of the region's archaeology showed that no period of human activity could be ruled out at Bolney. The range of geology and topography in this small region would have produced a large number of different habitats (from wooded uplands through marshland to river), making it ideal for hunter-gatherer communities. Highlands Farm in Rotherfield Peppard is perhaps the major source of Palaeolithic stone tools in the county,[3] although these are from a gravel terrace much older than that at Bolney. Palaeolithic worked flints have been recovered from the developments around Henley[4] and from an in-filled stream on the floodplain at Goring;[5] Palaeolithic and Mesolithic artifacts have been found in Lower Shiplake.[6] Mesolithic base camps occur on some of the gravel islands on the floodplain of the lower Kennet river, notably at Thatcham[7] and Wawcott.[8]

The wide range of geological deposits in a small region makes Bolney a productive area for mixed agriculture. Settlement by the farmers of the Neolithic period on the floodplain and gravel terraces of the upper Thames is well documented.[9] On the middle Thames, a Neolithic burial at Pangbourne[10] and an enclosure at Sonning[11] have been excavated, and air photographs have revealed probable barrows on the gravels E. of Caversham at Play Hatch, N.E. of Sonning Eye, and between Sonning and Charvil.[12] Flint axes of this period have been found around Henley and in Shiplake parish.[13] Recent excavations at the Thames–Kennet confluence (Reading Business Park,[14] Knights Farm and Aldermaston Wharf[15]) show that during the Bronze Age, small hamlets supported by mixed agriculture had developed along the river and on the gravel terraces. Evidence of clearance, perhaps in advance of arable agriculture, was found at Heron's House, Burghfield.[16]

Robinson and Lambrick have shown that in the upper Thames a rise in the water table began between the late Bronze and middle Iron Ages, and alluvial deposition was under way by the late Iron Age.[17] Several Iron Age hillforts and possible hillforts form a line along the top of the Chilterns: Bozedown (above Whitchurch on Thames), Woodcote, and New Copse W. of Sonning Common are separated from hillforts overlooking the Thames at Medmenham and Danesfield in Bucks. by the linear earthwork, Grims Ditch.

[3] J.J. Wymer, 'Paleoliths from the Gravel of the Ancient Channel between Caversham and Henley at Highlands', *Proc. Prehist. Soc.* xxii (1956), 29–36.

[4] Map 1 in G. Briggs, J. Cook and T. Rowley (eds.), *Archaeology of the Oxford Region* (Oxf. Univ. Dept. Ext. Stud., 1986).

[5] T.G. Allen, 'Goring: Gatehampton Farm', *South Midl. Arch.* xix (1989), 51–2.

[6] Briggs, Cook and Rowley, op. cit. note 4, maps 1 and 2.

[7] J.J. Wymer, 'Excavations at the Maglemosian Sites at Thatcham, Berks.', *Proc. Prehist. Soc.* xxviii (1962), 329–61.

[8] F.R. Froom, *Wawcott III. A Stratified Mesolithic Succession* (BAR xxvii, 1976), passim.

[9] H. Case in Briggs, Cook and Rowley, op. cit. note 4, 18–35.

[10] S. Piggott, 'Neolithic Pottery and Other Remains from Pangbourne, Berks. and Caversham, Oxon.', *Proc. Prehist. Soc. East Anglia*, vi (1929), 30–9.

[11] C.F. Slade, 'A Late Neolithic Site at Sonning, Berks.', *Berks. Arch. Jnl.* lxi (1963/4), 4–19.

[12] T. Gates, *The Middle Thames Valley: An Archaeological Survey of the River Gravels* (Berks. Arch. Comm. i, 1975), 37–9.

[13] Briggs, Cook and Rowley, op. cit. note 4, map 4.

[14] J. Moore and D. Jennings, *Reading Business Park: a Bronze Age Landscape* (in press).

[15] R. Bradley, S. Lobb, J. Richards and M. Robinson, 'Two Late Bronze Age Settlements on the Kennet Gravels – Aldermaston Wharf and Knights Farm, Burghfield, Berks.', *Proc. Prehist. Soc.* xlvi (1980), 217–95.

[16] R. Bradley and J. Richards, 'The Excavation of Two Ring Ditches at Heron's House, Burghfield', *Berks. Arch. Jnl.* lxx (1980), 1–7.

[17] M. Robinson and G. Lambrick, 'Holocene Alluviation and Hydrology in the Upper Thames Basin', *Nature*, cccviii (1984), 809–14.

Enclosures visible on air photographs on the E. bank of the Lodden at Borough Marsh, E. of Sonning, and in the field S. of Lashbrook House in Lower Shiplake may be of this period.[18] A Roman villa was partially excavated at Harpsden,[19] but the organisation of the landscape of this period is not clear.

A cremation cemetery from early in the Saxon period was discovered in Lower Shiplake.[20] There are two warrior burials, one at Reading[21] and a double interment at Sonning,[22] which are likely to be Viking, and a late Saxon spearhead was found by dredging at the river lock upstream from Henley.[23] Bolney is listed in Domesday as a small village of 13 households called 'Bollehede'.[24] Bolney lies within Binfield Hundred, a Saxon administrative unit.[25] Parishes in the Hundred are generally narrow and stretch from the riverside to the top of the Chilterns. It seems likely that the early parish of Bolney would have extended from Bolney Court uphill between Harpsden and Shiplake parishes, including Upper Bolney Farm, to the Hundred boundary along the Chiltern ridgeline.

The history of the parish has been summarised by Pearman.[26] Bolney seems to have undergone gradual desertion in the Middle Ages, and in 1453 Bolney was subsumed into Harpsden parish.[27] A very detailed map of Harpsden parish by Blagrau in 1586[28] does not include Bolney; this indicates that Bolney may still have been a community separate from Harpsden at that time. The 1586 map shows that the fields had been enclosed, and that field uses and boundaries have changed very little. The similarities between the modern map, the tithe map dated 1842,[29] and the 1586 map are striking. Both earlier maps show rough pasture or meadow over the channel and arable fields on the gravel. The precise location of Bolney village is not known, but is likely to lie near the site of the former church and manor house. The present Bolney Court is not on the site of the original manor house, which is slightly to the N.E. according to the 1842 map, but was constructed about 1850.

THE EXCAVATIONS

Archaeological investigations were carried out in two areas (Fig. 2). In a marshy area W. of the railway line from Henley to Shiplake and S. of Lower Bolney Farmhouse, a roughly linear area of recent reed growth was tentatively identified by Major John Howard of the Henley Archaeological and Historical Group as the drainage ditch abandoned on the discovery of the 'vessel keel'. To the E. of the railway line, excavations to deepen and widen a pond into a small ornamental lake were cut into the infilled channel. The period of temporarily-lowered water table due to the dewatering programme for the ornamental lake's excavation was seen as the ideal time to investigate the waterlogged deposits surviving at the site of the possible ship and across the in-filled channel.

[18] Gates, op. cit. note 12.
[19] C.N. Rivers-Moore, 'Further Excavations in the Roman House at Harpsden Wood, Henley-on-Thames', *Oxoniensia*, xvi (1951), 23–7.
[20] Briggs, Cook and Rowley, op. cit. note 4, map 11.
[21] J.Y. Ackerman, *Antiq. Jnl.* 2nd Ser. I (1867), 321–2.
[22] V. Evison, 'A Viking Grave at Sonning, Berks.', *Antiq. Jnl.* xlix (1969), 330–45.
[23] Oxon. SMR No. 3047.
[24] *DB* f. 161a; J. Morris (ed.), *D.B. Oxon.* 59, 1.
[25] *V.C.H. Oxon.* i. 374.
[26] M.T. Pearman, 'Notes on Bolney Church and Manor', *Oxon. Arch. Soc.* xxxix (1900), 1–9.
[27] Ibid. 7.
[28] Oxon. R.O., MS. Cooper and Caldecott, formerly Bodl. Misc 17:49, 129.
[29] Oxon. R.O., tithe map 203.

Excavations west of the rail line (OS Grid Ref. SU 77308/80486)

In mid-April 1991, a mechanical excavator was used to cut down to the archaeological deposits in a broad trench about 3 m. wide S.E. of Lower Bolney Farmhouse, parallel to and W. of the Shiplake–Henley rail line, 120 m. S. of the level crossing to the E. of the farmhouse. The trench was extended to the W., along what appeared to be the line of a recent excavation which was hoped to be the abandoned ditch which originally revealed the 'vessel keel' (Fig. 3). Further excavation of the archaeology was by hand and was kept to a minimum, since preservation by waterlogging would be re-established after the dewatering programme ended.

Under the topsoil 100 were found two thick layers, a brown iron-stained clay 101 above a pale grey clay 102, judged to be alluviation deposits. Under 102 was a thin possible buried soil 103 of greenish grey clay sealing orange brown sand clay 123. A deep excavation at the S. end of the trench, where machining began, showed that 123 overlaid a series of thin layers of pale orange silt interleaved with thin strata rich in carbonates, which continued down to the surface of the gravel at approximately 2 m. below the present ground surface.

Layers 101 and 102 were cut by a broad trench 118 gradually deepening to the E., not fully infilled and containing brick rubble and a heavy growth of reeds. This is likely to be the trench which revealed the timber. The trench excavated W. of and at an angle to the main trench was just N. of the line of trench 118. Layer 101 seemed to overlie, and layer 102 seemed to be cut by, the linear feature 115, although the section is too oblique to be clear. The unwaterlogged and loamy nature of the fill 116 in 115 argues for a late date for this feature, and it may be a ditch marked on the 1842 tithe map.

Layer 103 was cut by three pits (104, 108 and 112); the upper portion of each pit had eroded to produce wide flaring upper edges. Layer 103 and the upper fills in these pits were sealed under the lower alluvium 102.

Pit cut 104 contained an upper fill 120 above a clay layer 105, sealing a loamy layer 106; the surface of 106 was covered by apparently randomly-placed fragments of wood of various sizes, many of them worked. These pieces of wood are probably demolished building material or firewood. Under 106 was a sand layer 107. The cut 104 was not bottomed. Cut 118 had terminated in the fill 105 at a point where a large timber lying in this feature had been sheared away. Pit 108, which was not bottomed, contained dark grey clay fills 109 above 121 in its eroded upper part, over a central brown-grey sand clay fill 110 separated from a more loamy fill around its edges by a wattle lining 111. Cut 112 filled with grey clays 113 above 114 was not excavated.

Two poorly preserved pieces of pottery were recovered; one, from lower alluvium 102, was a Roman local greyware, probably of the 2nd century A.D. The other, a small body sherd from layer 109 in the erosion cone of pit 108, is either Saxon or Iron Age, probably the latter.[30] The only other find is half of a small chalk spindle whorl [small find 1] from fill 105 of pit 104 (Fig. 4b, and see below).

The Ornamental Lake (OS Grid Ref. SU 774/805)

A mid-February site visit during the early stages of the excavation of the ornamental lake revealed that, on the E. edge of the lake, topsoil overlay a layer of very flinty silt clay, which sealed a brown sandy silt above the flinty gravel. A feature that could not be defined exactly due to heavy frost, but cut into the flinty clay deposit, contained six large fragments of a single vessel of the 12th or 13th century A.D. (Fig. 4c and below). To the W. and S., the gravel dipped away to be overlain by pale grey clay alluvium under a layer of dark organic peat, marking the E. edge of the channel. The upper flinty clay thins out to the W., and the topsoil changes from gravelly to buttery clay.

In May 1991, following the excavation W. of the railway line, the exposed part of the infilled channel on the W. edge of the new ornamental lake was examined (Fig. 2). The sides of the lake were battered at about 45° to limit future erosion, and the W. edge was particularly sinuous to avoid an existing pond. As well as a rough sketch to record approximately the filling of the channel, 13 narrow slots about 0.4 m. in width were cleaned by hand at various points along the edge of the pond to identify the channel deposits in detail (Fig. 2). The level of the base of each deposit revealed in the hand-cleaned slots was measured in relation to the nearest Ordnance Survey benchmark, and this level converted into metres above mean sea level (m. O.D.). The deposit base levels of the last eight of these slots (Nos. 6–13) were combined with observations made in the excavation W. of the railway line and in February to reconstruct a notional section of the deposits in the channel approximately at right-angles to its course (Fig. 4a).

[30] Pottery from this trench examined by P. Booth, Oxford Arch. Unit.

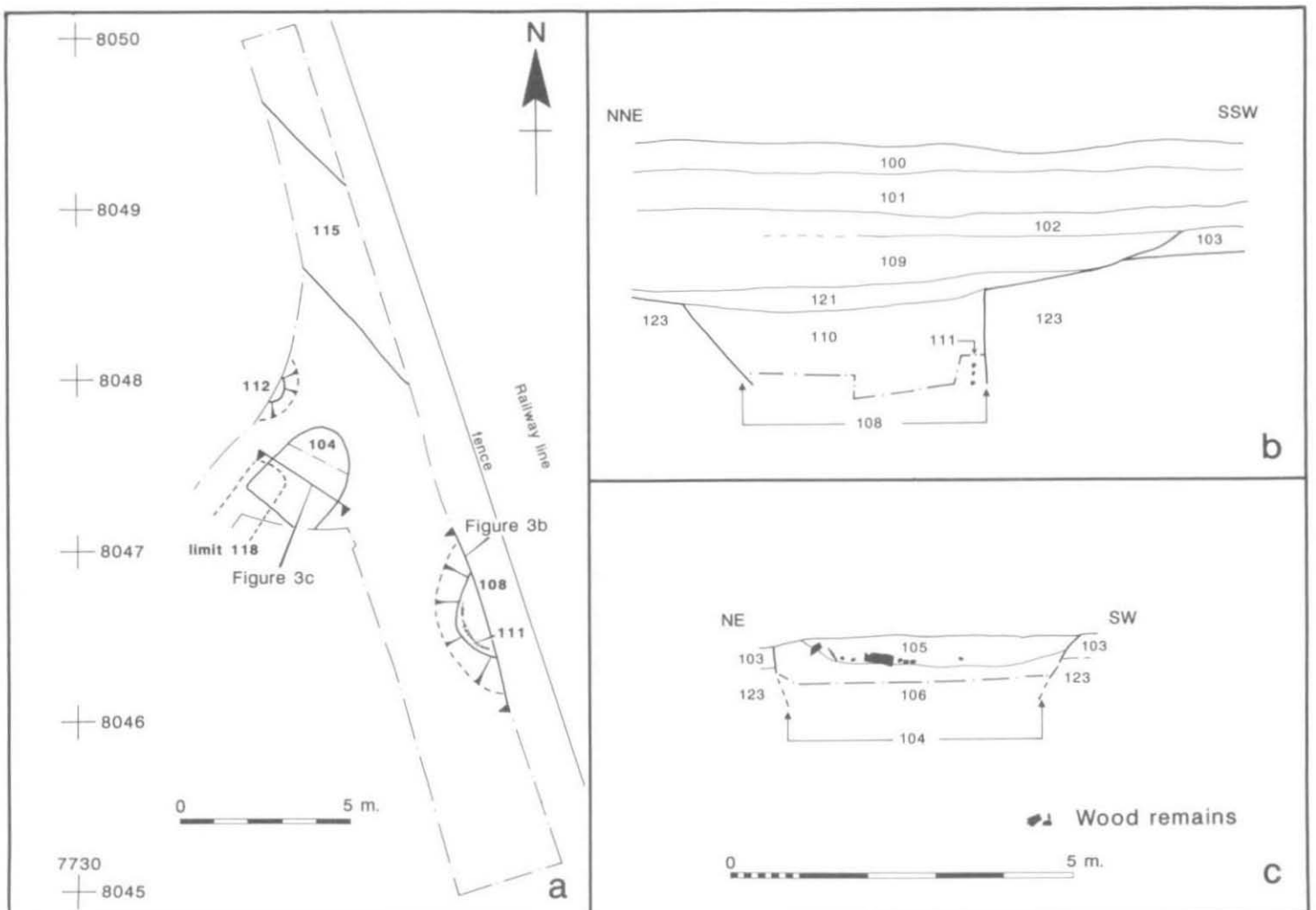

Fig. 3. Lower Bolney: Excavations W. of railway. 3a: Plan of trench; 3b: Section of Pit 108; 3c: Section of Pit 104.

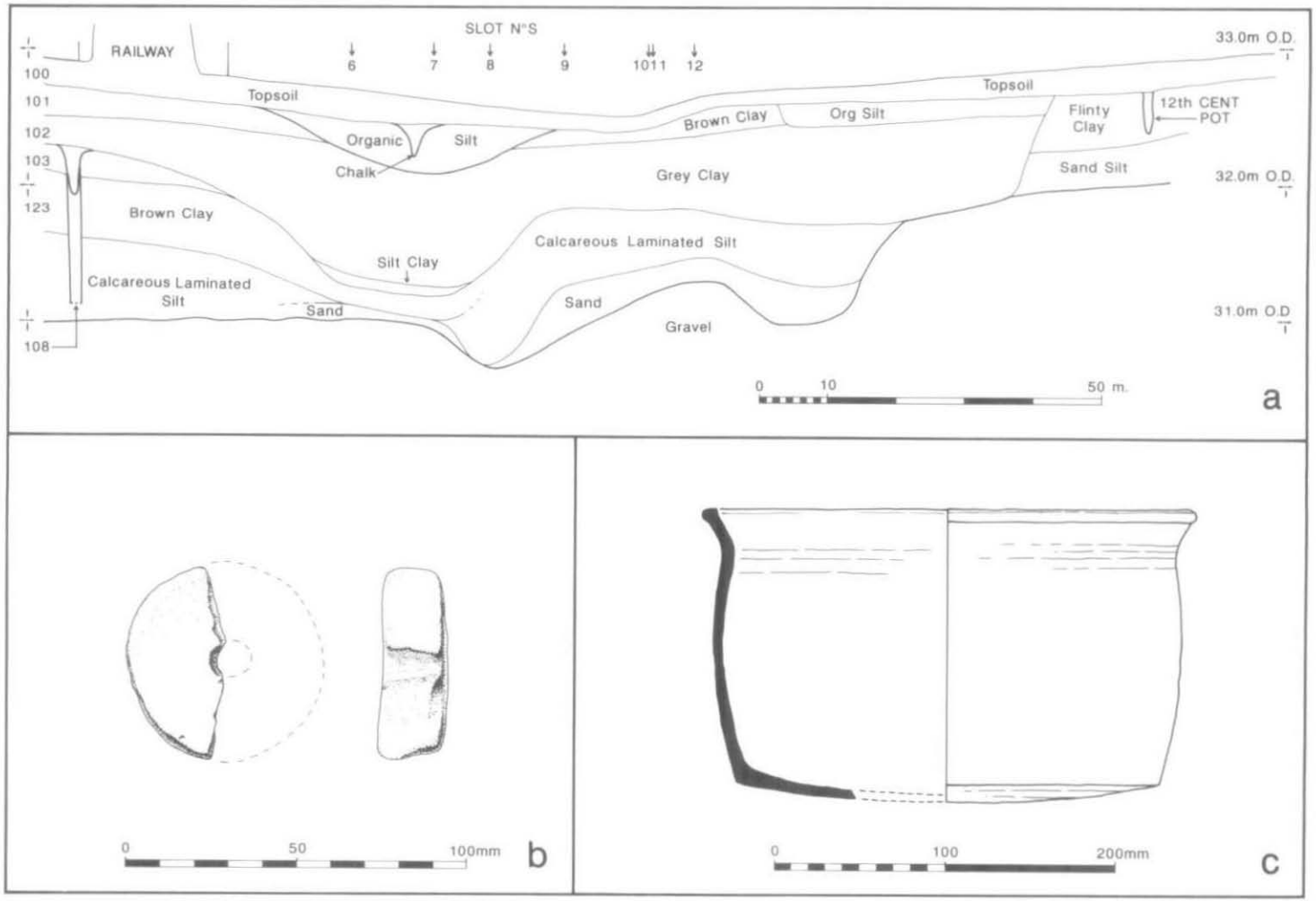

Fig. 4a: Lower Bolney: Section reconstructed across former channel; 4b: chalk spindle whorl (SF 1, pit 104); 4c: 12th- or 13th-cent. pot from salvage.

THE MEDIEVAL POT (Fig. 4c)

Analysis by Maureen Mellor of the six sherds (160 g.) recovered from the feature cut into the flinty clay E. of the ornamental lake showed them to form the complete profile of a 12th- or 13th-century A.D. Oxfordshire type 25 cooking pot in fabric OX 162, a fabric typical of S.E. Oxfordshire although the pot is unusually small for its type.

SPINDLE WHORL (Fig. 4b)

One half of a disc-shaped chalk spindle whorl (small find 1, weight 48 g.) came from fill 105 of pit 104. Chalk is the basal geology of the region and is widely available in the immediate area. The form of the whorl is not characteristic of a particular period, but chalk whorls are relatively common finds in S.E. British hillfort excavations.[31]

WATERLOGGED WOOD

Wooden objects recovered from Bolney were identified by Gillian Campbell at the Environmental Archaeology Laboratory, University Museum, Oxford. Two of the several loose pieces from the surface of deposit 106 in the upper part of pit 104 were collected for examination. Sample 4 was several pieces of an 11-year-old stake of hazel (*Corylus*), ellipitical in cross-section (43 × 34 mm.) with bark intact, the sharp end cut or chopped rather than sawn and the tip rounded and charred, perhaps to harden the tip or from its use as a poker. Sample 6 was a short piece chopped from a mature oak (*Quercus*) cleft trunk (18.8 × 8.6 × 33 cm.), debarked and roughly squared but with waney edges. There was no evidence of charring, and waterlogged oak's characteristic degradation of the softer tissue leaving the rays raised had resulted in the loss of potential cut or saw marks.

A small portion of the upper part of wattle lining 111 of pit 108 was collected for examination and radiocarbon dating. The block removed consisted of a single upright composed of five side-by-side sails within 18 tight-woven rods. Each of these elements was uncleft and retained its bark. The five sails were all hazel (*Corylus*), four years old except for a single three-year-old example, elliptical in cross-section (12.4±2.2×10.3±1.8 mm.). The long axes are parallel with the line of the rods, making it probable that the shorter axes (83.3±2.1% of the long axis) of the sails were the result of mechanical pressure. It is not clear if this arrangement of several sails for each upright is typical of the lining construction; some or all of the pieces may be the layings-in or the layings-off of rods.

All 18 of the rods were measured and ring-counted. Ten had their genus confirmed by high-magnification microscopic examination, while the remaining eight were examined at low magnification only. A single three-year-old rod was too poorly preserved to be identified; one eight-year-old ash (*Fraxinus*) rod and a five-year-old dogwood (*Cornus*) rod were identified. The 15 other rods were hazel (*Corylus*). All the rods were elliptical in cross-section (11.1±2.5 × 9.8±2.2 mm.) with the long axis vertical; the reduction (short axis 87.6±2.5% of long axis) is probably due to mechanical compression of the rods by the weight of pit fill. The age of the rods excluding the ash ranged from 3–5 years (average 4.1±0.8 years). The rods were closely spaced, but the weaving was not simple: while there were the same number of rods in the sample passing over the sails as under, they were not alternate, with up to three rods being woven at once. This accords with the observed nature of the wattle remaining in the pit.

Along with other trees, hazel has been a managed resource since at least the Neolithic.[32] In his discussion of Neolithic woodland management in the Somerset Levels, Rackham[33] notes that the usual medieval and modern practice is to coppice hazel, and to harvest an entire coppice stool at once, producing a number of rods of different diameters but with the same ring-count. While none of the cut butts diagnostic of coppicing were recovered, the virtually constant age of the rods strongly argues for the wattle being the product of managed woodland.

[31] L. Brown in B. Cunliffe, *Danebury: an Iron Age Hillfort in Hampshire*, ii (CBA Res. Rept. lii, 1984), 425.
[32] J.M. Coles and B.J. Orme, 'Neolithic Hurdles from Walton Heath, Som.', *Som. Levels Papers*, iii (1977), 23.
[33] O. Rackham, 'Neolithic Woodland Management in the Somerset Levels', *Som. Levels Papers*, iii (1977), 67.

RADIOCARBON DATING

A portion of a single rod from the wattle lining 111 of pit 108 submitted to the Scottish Universities Research and Reactor Centre, East Kilbride (SURRC Number GU–3108) produced an uncalibrated date of 2180±80 years b.p. Calibration of the resulting uncorrected date range 2260–2100 years b.p. from the curve constructed by Pearson et. al.[34] gives a date range of 380–110 B.C., within the span of the middle Iron Age period for central southern England.[35]

PLANT REMAINS by JOHN LETTS

Four soil-samples were examined in the Environmental Archaeology Laboratory at the University Museum, Oxford; Sample 1 from fill 106 in pit 104, Sample 2 from buried soil 103, Sample 3 of the lower alluvium 102, and Sample 7 of fill 110 of pit 108. A 0.2-kg. subsample of each of these samples was gently disaggregated in warm water and washed over a 0.25 mm. mesh sieve in order to recover charred and waterlogged plant remains. Each subsample's residue was washed over a 0.5 mm. mesh sieve, dried and sorted for dense plant tissues not recovered by the suspension-flotation procedure.

No remains were recovered from the subsample of buried soil 103. An additional 1.3 kg. of each of the other three samples was processed in the same way as the subsamples. Sample 3 of alluvium 102 contained a small quantity of comminuted charcoal, but no other charred or waterlogged remains. The waterlogged seeds recovered from the 1.5 kg. of soil examined in total from each of the two pit samples form the basis of this report. Specimens were identified at 4–40× magnification by comparison with reference material held in the Elton-Robinson Seed Collection at the University Museum, and botanical nomenclature follows Clapham, Tutin and Moore.[36]

Seeds of water crowfoots (*Ranunculus* sbgn. *Batrachium*), starwort (*Callitriche* sp.) and duckweed (*Lemna* sp.) in sample 7 strongly suggest that pit 108 held shallow, but permanent, eutrophic water at the time of deposition.[37] The presence of duckweed, which requires high levels of illumination in order to set its seed, along with the paucity of scrub or hedge taxa in both samples, indicates an open environment with little woody vegetation.

Other taxa recovered from the pits may be classed as marginal and shallow water species typical of the herbaceous vegetation along the muddy shores of ponds and streams. These include marsh yellow-cress (*Rorippa palustris*), celery-leaved crowfoot (*Ranunculus sceleratus*), lesser spearwort (*Ranunculus flammula*), water dock (*Rumex hydrolapathum*), willow herb (*Epilobium* sp.), yellow flag (*Iris pseudacorus*), spike rush (*Eleocharis* sp.) and the *Juncus effusus* group of rushes, sedge (*Carex* sp.), club rush (*Isolepis setaceae*) and sweet grass (*Glyceria* sp.). Several of these species, for example *Rorippa palustris* and *Ranunculus sceleratus*, are characteristic of seasonally exposed mud, whereas others such as *Rumex hydrolapathum* and *Iris pseudacorus* are plants of well-stratified bankside vegetation.

The remaining taxa in the Bolney assemblage are less easy to classify ecologically, but recent archaeo-botanical work on Iron Age and Roman sites in the Upper Thames provides a template for comparison.[38] Floodplain grassland is thought to have contained several of the species listed above (such as *Ranunculus flammula, Eleocharis* sp. and the *Juncus effusus* group of rushes) in addition to a core of grassland species also found at Bolney which include the buttercups *Ranunculus acris* and *R. repens*, silverweed (*Potentilla anserina*), dock (*Rumex* sp.), wild carrot (*Daucus carota*), self-heal (*Prunella vulgaris*), mint (*Mentha* sp.), hawkbit (*Leontodon* sp.), and various rushes (*Juncus* sp.) and grasses (Gramineae). In this seasonally dry grassland, soil disturbance (possibly caused by human or animal activity) would have allowed the establishment of annual species that

[34] G.W. Pearson, J.R. Pilcher, M.G.L. Baillie, D.M. Corbett and F. Qua, 'High-precision C-14 Measurement of Irish Oaks to Show the Natural Variation from A.D. 1840–5210 B.C.', *Radiocarbon*, xxviii, 2b (1986), 911–34.

[35] B. Cunliffe in B. Cunliffe and D. Miles (eds.), *Aspects of the Iron Age in Central Southern Britain* (Oxf. Univ. Comm. Arch. 1984), 13.

[36] A. Clapham, T. Tutin and D. Moore, *Flora of the British Isles* (3rd edn. 1989), passim.

[37] S. Haslam, C. Sinker and P. Wolsely, 'British Water Plants', *Jnl. Field Studies*, iv (1975), 248–351.

[38] G. Lambrick and M. Robinson, *Iron Age and Roman Riverside Settlements at Farmoor Oxon.* (1979, CBA Res. Rept. xxxii), 111–8; G. Lambrick and M. Robinson, 'The Development of Floodplain Grassland in the Upper Thames Valley', in M. Jones (ed.), *Archaeology and the Flora of the British Isles* (1988), 64–8; M. Robinson, 'The Iron Age to Early Saxon Environment of the Upper Thames Terraces', in M. Jones and G. Dimbleby (eds.), *The Environment of Man: the Iron Age to the Anglo-Saxon Period* (1981, BAR Brit. Ser. lxxxvii), 251–277.

TABLE 1. PLANT REMAINS FROM LOWER BOLNEY, HARPSDEN

SPECIES (numbers refer to seeds unless specified)	COMMON NAME	SAMPLE NUMBER	
		1	7
Ranunculus cf. *acris* L.	meadow buttercup	1	5
R. acris/repens L.	buttercup	7	1
R. sceleratus L.	celery leaved buttercup	1	
R. flammula L.	lesser spearwort	2	
R. sbgn. *Batrachium* (DC) A. Gray	water crowfoots		5
Papaver argemone L.	long prickly-headed poppy		13
P. rhoeas/hybridum L.	field poppy		2
P. somniferum L.	opium poppy		4
Papaver sp.	poppy	1	
Rorippa palustris (L.) Besser	marsh yellow-cress	2	
Viola sp.	violet		1
Reseda luteola L.	dyer's rocket	4	
Hypericum sp.	St. John's wort		1
Linum usitatissimum L. (seed)	cultivated flax	2	15
L. usitatissimum L. (capsule tips)		1	16
L. usitatissimum L. (capsule frag.)		2	8
Montia fontana L.	blinks		5
Silene latifolia ssp. *alba* (Miller) Gr. & Burdet	white campion	1	
Sagina sp.	pearlwort		6
Minuartia sp.*	sandwort		8
Arenaria sp.*	sandwort		32
Cerastium sp.	chickweed	1	
Cerastium cf. *glomeratum* Thuill.*	mouse-ear chickweed	8	17
Stellaria media (L.) Vill.	chickweed		1
CARYOPHYLLACEAE indet.		2	2
Chenopodium album L.	fat hen	4	10
Atriplex sp.	orache	1	2
CHENOPODIACEAE indet.			1
Aphanes arvensis Hudson	parsley piert	4	14
Potentilla anserina L.	silverweed	20	29
Crataegus monogyna Jacq.	hawthorn	1	
Rubus fruticosus s.l.	blackberry	1	
Rubus sp.		1	
Callitriche sp.	starwort		19
Anthriscus caucalis Bieb.	bur chervil	1	4
Daucus carota L.	wild carrot	1	
Rumex cf. *hydrolapathum* Hudson	water dock		1
Rumex sp.	dock	13	1
Polygonum aviculare L.	knotgrass	2	
P. persicaria L.	red shank	24	
Corylus avellana L. (charred shell frags.)	hazel	4	
Anagallis arvensis L.	scarlet pimpernel	1	
Galeopsis cf. *tetrahit* L.	hemp nettle	1	
Galeopsis sp.			1
Mentha sp.	mint	3	1
Calamintha/Mentha sp.		2	
Prunella vulgaris L.	self-heal		3
Plantago major L.	plantain	1	2
Campanula sp.*	bellflower		8
Epilobium sp.*	willow herb		8
Leontodon sp.	hawkbit	1	
Valerianella cf. *carinata* Loisel.	corn salad		5
Tripleurospermum inodorum (L.) Schultz Bip.	scentless mayweed		2

SPECIES (numbers refer to seeds unless specified)	COMMON NAME	SAMPLE NUMBER	
Senecio sp.	ragwort	1	
Lemna sp.	duckweed		2
Iris pseudacorus L.	yellow flag	1	
Juncus effusus L. (group)*	tussock rush	1,820	2,312
Juncus articulatus L. (group)*	jointed rush	60	112
Juncus bufonius L. (group)*	toad rush	180	200
Eleocharis sp.	spike rush	1	
Isolepis setacea (L.) R.Br.	club rush	2	24
Carex sp.	sedge	4	5
Glyceria sp.	sweet grass	1	27
Avena sp. (charred)	oat	1	
Triticum sp. (charred) frags.)	wheat	1	
cereal indet. (charred)		2	
GRAMINEAE	grasses	3	22
Pteridium aquilinum (L.) Kuhn. (frag.)	bracken fern		6
twig		3	
comminuted wood charcoal		X	X

* denotes values corrected for subsampling of 0.25 mm. seed fraction

had an alternate niche as arable weeds. The poppies (*Papaver* sp.), chickweeds (*Stellaria media* and *Cerastium* sp.), plantain (*Plantago major*), fat hen (*Chenopodium album*), parsley piert (*Aphanes arvensis*), knotgrass and red shank (*Polygonum aviculare* and *P. persicaria*), hemp nettle (*Galeopsis* sp.), corn salad (*Valerianella* sp.) and scentless mayweed (*Tripleurospermum inodorum*) are characteristic of this ecological group. Most of these species will grow in a wide range of soil conditions, but a few (e.g. poppies) favour light soils.

The absence of nettle (*Urtica* sp.) from the samples is significant; nettle thrives in nutrient-rich soil around human settlements and is usually common in plant assemblages from settlement sites.

The single charred oat grain (*Avena* sp.) may be the only species that fits the arable weed category, although no diagnostic floret bases were recovered. There is nothing in the samples to indicate the processing of cereal at the site, and the charred wheat grain (*Triticum* sp.), cereal and hazel shell (*Corylus avellana*) fragments recovered might indicate importation of food. The bracken (*Pteridium aquilinum*) fragments may also indicate import; bracken is usually restricted to acidic soils of woodland, heath and grassland. There is some suggestion that in prehistoric times the fronds of bracken may have been used as bedding or possibly even fodder.[39] Opium poppy (*Papaver somniferum*) may have been grown in the area for either culinary or medicinal purposes, but the cultivated subspecies, introduced at least as early as the Bronze Age,[40] can persist for some time as an arable weed. The four specimens of dyer's rocket (*Reseda luteola*) in sample 1, a biennial plant of disturbed ground that has been cultivated and gathered from the wild for use as a dye since at least the medieval period, are amongst the earliest records of this species in the British Isles.

Like most cultigens, flax (*Linum usitatissimum*) has lost its natural seed dispersal mechanisms and is unlikely to have grown in the vicinity of the features as a relic of cultivation. At the very least, flax was processed near the features either to recover its oil seeds or as a prelude to the retting of its stems for fibre production. The presence of relatively large numbers of seeds and capsule fragments in what was probably an ideal feature for retting strongly suggests that the remains represent residue from the retting process itself. Although some arable weed seeds may have been introduced to the pit with the flax, no distinctive weeds of flax cultivation were recovered.[41]

The pit samples from Bolney are noteworthy for the diversity of taxa recovered, even though seeds are not exceptionally abundant. Sample 7 contains more aquatic and marginal species than sample 1, as would be expected in shallow-water conditions which seem to have prevailed in pit 108 at the time of deposition. Disturbed ground and grassland taxa appear in approximately equal diversity and abundance in both samples, but it may be significant that all of the charred material was recovered from sample 1.

[39] M. Robinson, op. cit. note 38, 261.

[40] M. Robinson in P. Ashbee, M. Bell and E. Proudfoot (eds.), *Wilsford Shaft: Excavations 1960–62* (Engl. Her. Arch. Rept. xi, 1989), 78–90.

[41] J. Pals and M. van Dierendonck, 'Between Flax and Fabric: Cultivation and Processing of Flax in a Medieval Peat Reclamation Settlement near Midwood', *Jnl. Arch. Sci.* xv (1988), 237–51.

MOLLUSC AND INSECT REMAINS FROM PIT 108, BOLNEY by MARK ROBINSON

After Sample 7 from layer 110 from pit 108 had been analysed for macroscopic plant remains, the organic fraction which had been washed onto the sieves and the mineral fraction which remained were scanned for mollusca and insect remains.

Shells of *Anisus leucostoma* and *Sphaerium lacustre* were identified. Both are aquatic species which usually occur in stagnant water and would have been able to live in the pit. There was no evidence from riverine aquatic molluscs for flooding.

The insects included both aquatic and terrestrial species. The water bettles, *Colymbetes fuscus, Agabus bipustulatus, Helophorus brevipalpis* gp. and *Laccobius* sp. could all have lived in stagnant water in the pit. The majority of the terrestrial beetles were species which can occur in dung, particularly members of the Scarabaeidae which are indicative of the droppings of large herbivores on pastureland. The following scarabs which live in such a habitat are present: *Aphodius contaminatus, A. granarius, A.* cf. *sphacelatus* and *Onthophagus ovatus*. The other beetles, which can live in dung but occur in a wide range of decaying organic material were: *Megasternum obscurum, Anotylus sculpturatus* gp. and *Philonthus* sp. The remaining beetles recorded (*Bembidion guttula, Lesteva longoelytrata, Lathrobium* sp. and *Xantholinus linearis*) would be consistent with somewhat muddy pasture.

The high proportion of dung beetles from the Bolney sample is similar to the results which have been obtained from other Iron Age sites on the Thames floodplain.[42]

DISCUSSION

The gravel of the floodplain is material from late Pleistocene periglacial terrace deposits reworked in the late Devensian by rapid water movement into a series of bars, banks and small channels.[43] The channel observed at Bolney (Fig. 4a) is one of these. The undulating top of the gravel and its sandy capping show the unstable nature of, and the rapid water flow in, the early channel. This was followed by a period of gradual accumulation of material from much slower water, indicated by thin silt layers with highly calcareous interleavings (although post-depositional transformation may be responsible for the carbonate); this silt is more likely to be the product of the sorting of material which was locally re-eroding from the gravel than from a general increase in the sediment load in the drainage basin. The subsequent accumulation of fine sediment to form the brown clay (context 123) under the trench to the W. of the railway line would appear to be overbank alluvium, and it is tempting to associate this with increased sediment load due to agricultural intensification in the late Neolithic or Bronze Age, but the date when this deposit began to accumulate is not securely fixed. The stone-free silt to the E. of the channel is very similar to deposits immediately over the gravel elsewhere, particularly in the upper Thames, where it is regarded as the result of pre-Iron Age pedological processes in relatively dry environments.[44]

The early alluviation which created the clay layer 123 either stopped or became slow enough in the middle Iron Age for the channel to support a well-stratified waterside flora, and the surface of the drier land developed a topsoil (layer 103) with a floodplain grassland flora in which human activity (although not necessarily arable cropping) and animal grazing (as shown by the dung beetles recovered) may have produced an environment suitable for annuals of disturbed ground. The complete range and intensity of this human activity is not clear from the small-scale investigations reported here.

[42] G. Lambrick and M. Robinson, 'The Development of Floodplain Grassland in the Upper Thames Valley', in M. Jones (ed.), *Archaeology and the Flora of the British Isles* (1988), 64–8.

[43] Squirrel, op. cit. note 1, 4–6.

[44] Robinson and Lambrick, op. cit. note 17, 810.

What is clear is that a number of closely-spaced pits were excavated near the channel, and at least one was lined with wattle to prevent collapse. It seems reasonable to assume the pits were at least broadly contemporary, although not all were necessarily in use at the same time. It also seems reasonable from the flora in and around the pits that their bases would have been below the water table of the time. A lined waterlogged bankside pit containing seeds of flax in surprising quantities for the period[45] strongly favours the belief that the pits had at least a secondary use for flax retting, although the pits' initial fills were not examined.

There is clear evidence for other human activity in the vicinity and in the wider landscape. The consistent age and species in the wattle indicates woodland management. The imported bracken shows exploitation of a diversity of habitats. It seems likely that the set of bankside pits are peripheral to a contemporary human settlement on the floodplain, but close enough for small amounts of charcoal, charred foodstuffs and waste wood to be deposited in them, especially after their abandonment.

General alluvial deposition began again on the floodplain after this period, in agreement with the conclusions reached by Robinson and Lambrick for the upper Thames.[46] The alluviation may have forced an end to middle Iron Age activity on this part of the floodplain. The contrast in colour between upper clay 101 and the lower clay 102 is probably due to permanent waterlogging of the lower clay. The gravelly deposit below the topsoil to the E. of the channel may be the result of gravel incorporation by ploughing. A feature containing a well-preserved 12th- or 13th-century A.D. pot cut into this layer implies that the topography approximated its modern form by the medieval period, and the cartographic evidence confirms the continuity in landform.

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[45] M. Robinson, pers. comm.
[46] Robinson and Lambrick, op. cit. note 17.