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INVESTIGATION OF A LATE MESOLITHIC SITE AT LITTLE PILL FARM, STICKLEPATH HILL, NEAR BARNSTAPLE

By MATT LEIVERS

And

IRON AGE TO SAXON LANDSCAPE AND LANDUSE CHANGE IN THE TAW VALLEY: EVIDENCE FROM AN INFILLED RIVER CHANNEL AT LITTLE PILL FARM, STICKLEPATH HILL, NEAR BARNSTAPLE

By CATHERINE BARNETT (NEÉ CHISHAM), ROB SCAIFE and NICHOLAS COOKE

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INVESTIGATION OF A LATE MESOLITHIC SITE AT LITTLE PILL FARM, STICKLEPATH HILL, NEAR BARNSTAPLE

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Evaluation and excavation by Wessex Archaeology in 2003-4 on land at Sticklepath Hill encountered a lithic scatter overlooking the north bank of a relict channel of the River Taw. The assemblage is predominantly of Late Mesolithic character and includes a small number of microliths. Although the flint was considered not to be in situ *because of localised disturbance, it was possible to suggest the former presence of knapping stations and hearths from the density of the flintwork and calcined flint. Palaeo-environmental remains recovered from the site are likely to include intrusive material of a later date. The site is likely to represent the remains of a short stay camp that was occupied on one or more occasions. Later flintwork and pottery indicate subsequent use of the locale albeit on a much smaller scale in the Neolithic and early Bronze Age.*

INTRODUCTION

A late Mesolithic site was investigated on land at Sticklepath Hill prior to the construction of the Barnstaple Western Bypass (Wessex Archaeology 2004, 2005; Cotswold Archaeology 2005) (Fig. 1). Significant archaeological remains were concentrated towards the south end of the proposed route, in the vicinity of Little Pill Farm, Sticklepath Hill. The discovery of a scatter of Late Mesolithic worked flint near the northern side of a relict channel of the river Taw in the evaluation (Wessex Archaeology 2004) was followed by a programme of excavation. The palaeochannel was exposed in machine-excavated trench 51 and the route of the hollow way was examined to determine the nature of the feature and any associated activity (see Chisham *et al*., this vol.). The flint scatter was investigated in an area designated trench 54.

INVESTIGATION

Lithic Scatter

The investigations of the predominantly Mesolithic flint scatter involved the hand-excavation of a series of test-pits within a roughly triangular area measuring 715 m^2, centred on NGR 255848 131694, approximately 180 m west of the Taw's present west bank (Figs 2-3). The site was situated on high ground overlooking the north bank of a former palaeochannel, sloping down to the south and east within the site, from *c.* 6.25 m to 5.0 m above Ordnance Datum.

The test pit area was initially machine stripped of topsoil, prior to the excavation of 29 1 m^2 test pits on a regular Ordnance Survey (OS) aligned grid of predominantly 5 m spacing. The grid was disrupted in several locations to avoid evaluation trench 28 (Wessex Archaeology 2004) and the route of a live gas main. On the basis of the results obtained from these test pits, a further stage of detailed test-pitting was commissioned, specifically examining 48 m^2 of the south-west corner of the examined area (Fig. 3).

All test pits were hand-excavated to the surface of *in situ* geology, with none exceeding 1 m in depth. All excavated deposits were sieved through a 10 mm mesh to facilitate the recovery of artefacts. A proportion of all material excavated was retained as environmental and artefact samples, and subsequently processed at the offices of Wessex Archaeology for the extraction of both micro-debitage and palaeo-environmental remains.

Stratigraphy

The underlying weathered parent material (context 5405: bedded Upper Carboniferous (Crackington Formation- BGS sheet 293) shale in a yellow brown clay) was exposed in the majority of test pits. In the south-western corner of the site, this material was overlain by a fine silty clay (context 5406) consisting of waterlain sediments including weathered parent material. The waterlain material was similar in terms of particle size and sorting to the Romano-British alluvium forming Unit 3 of the palaeochannel (Chisham *et al*., this vol.). This could indicate overbank sedimentation during flood events, but given the variation in height between the test-pitting area and lower palaeochannel, and degree of post-depositional weathering and oxidation, any correlation on visible sedimentological characteristics is tentative. Indeed, 5406 may represent erosion and run-off from the interfluves. Observed changes to these waterlain sediments indicate both drying out and extensive bioturbation after deposition.

Above 5405 and 5406, contexts 5404 and 5403 were suggested on site to be a palaeosol, associated with Mesolithic material remains. However, examination of the recovered sediments suggest these layers were not a well-developed buried soil as first believed. There were, however, some signs of post-depositional soil formation process, particularly evidence of rooting in the form of fine macropores and manganese-filled root pseudomorphs, which had occurred prior to formation of the modern soil profile above.

All of the above layers (including the weathered parent material) contained a range of artefacts. Most of these were flints (approximately 600 pieces) of mainly Late Mesolithic date (Table 1), but also including a few Neolithic and Bronze Age pieces as well. The entire artefact scatter had been conflated and spread throughout the soil profile, and showed no correlation between stratigraphy and chronological type.

Preliminary distribution analysis, based on absolute quantities of worked flint (all types) recovered from 5404 and 5403 per test-pit, demonstrated that concentrations of material were located within the south-west corner of the test pit area, in two distinct clusters (Fig. 4). On this basis, the concentration within the south-west corner of the trench was fully excavated, again on an OS-aligned grid, comprising 48 1 m^2 conjoining test-pits. To expedite this process, the overlying plough and topsoil (5402 and 5401 respectively; previously demonstrated to be of relatively modern origin) were removed by machine under constant archaeological supervision.

LITHIC ASSEMBLAGE

Raw Material

In total, 621 pieces of struck lithic material (one piece appears to be a quartzite, and a few others have a cherty appearance although only one is definitely a chert) were recovered from the site, most of it distributed throughout 5403 and 5404, with much smaller quantities from higher and lower layers. The quality of the raw material is varied: some is of good quality, while there is a component that is quite poor, often with inclusions, incipient thermal fractures and a thin worn cortex. This difference is likely to relate to source, with the latter probably derived from marine or fluvial nodules collected locally, and the former possibly from Orleigh Court (Newberry 2002). Newberry and Pearce note that material similar to Orleigh Court flint has been found at considerable distance from the source (2005, 23). The site at Sticklepath Hill lies well within the area of suggested distribution. The predominant colours of the visible surfaces are greys and browns, with some reddish-brown pieces. A few pieces have a grey or cream/white patina. The predominance of flint as a raw material with very small quantities of chert is typical of north Devon assemblages (Newberry and Pearce 2005).

Technology

In each identifiable instance the flaking mode is soft hammer. Butts are predominantly plain, although there is a small number of winged, faceted, linear and punctiform examples.

Debitage and cores

There are 535 pieces of unretouched debitage (flakes, blades, bladelets, chips, preparation/rejuvenation pieces and irregular fragments) together with 44 cores and core fragments (Table 1). The flake element is notable for the very small number of chips (flakes with a length of <5 mm), of which there are only nine. The flake element is relatively large, but technologically consistent with the identifiably Mesolithic material. Flake-dominated Late Mesolithic assemblages are not uncommon (Harding 2000; Leivers, *et al.* forthcoming; Newberry and Pearce 2005), and are often an effect of raw material constraints.

Of the 44 cores and fragments 24 are complete classifiable cores (Fig. 5.1 – 5.4). Of these most are blade/bladelet cores, ranging from 12 mm to 56 mm long, and the remainder are flake cores between 21 mm and 37 mm long. The blade/bladelet cores are predominantly single-platform types (only four have two or more platforms), whereas the flake cores are mostly two or multi-platformed (only one has a single platform). Over 80% of blade/bladelet cores and 62% of flake cores show platform abrasion and/or isolation. Two-thirds of the total complete cores have no attention paid to the backs. Only one core with an identifiable back shows any modification, in the form of a keel.

Core preparation, maintenance and rejuvenation are attested by crested pieces, trimming flakes and core tablets. There are six crested pieces, which seem to originate in initial core preparation. Later maintenance is visible in platform rejuvenation flakes and mistake rectification through the removal of hinge/step terminations (often from an opposed platform) and in *flancs de nucléus* which remove the whole flaking surface, either from the original platform or at 90°.

Discard of cores occurred for a variety of reasons: several have hinge terminations disrupting flaking surfaces; some of the very small bladelet cores were simply exhausted; others were abandoned before exhaustion and without obvious knapping errors, some perhaps due to low-quality raw material.

The retouched tool assemblage

Table 1 shows the occurrence of tools in the assemblage. Scrapers are the most significant component, followed by microliths.

Scrapers

The nine scrapers encompass a range of types. All are fairly expedient (cortex is present on the dorsal surface of the two best examples; one is on a core tablet; one on a core fragment), and there are none on specially prepared blanks. A piece from 327903 (Fig. 5.5) is a well-made end scraper on the distal end of a secondary blade, the left dorsal margin of which shows signs of utilisation. A piece from 428501 is a portion of a second end scraper on a blade, from 378302 is a third, and from an unstratified position is a complete and burnt example. All of these are forms that could belong to the Mesolithic. Two pieces are expedient scrapers. One (from 307903) is made on the distal end of a short high triangular profiled tertiary flake and is at best doubtful. The second (from 8202: Fig. 5.6) has been made on the previously worked edge of a core rejuvenation flake. Both this example and the second piece on a core fragment from 8302 are from cores which appear to have been worked for bladelets, suggesting a probable Mesolithic date. The other complete example (from 7903: Fig. 5.7) is a typical, if crude, thumbnail scraper. These are generally of Late Neolithic/ Early Bronze Age date. One burnt piece from 358102 is too fragmentary to identify to type.

Microliths

Following Clark (1934), the microliths consist of an obliquely blunted point (Type A2a) from 448602 (Fig. 5.8), a crescent (Type D 2ai) from 5902 (Fig. 5.9), and three Type B (a B1 from 307902, a B3 from 6502 and a B4 from 348201: Fig. 5.10). One from 438702 is unclassifiable, as it is unfinished. The B1 and B4 types are small and narrow, and both suggest a Later Mesolithic date. Obliquely blunted points are common throughout the period: Reynier analysed the examples from a variety of sites in south-east England and concluded that it is possible to distinguish between an earlier component with an average length of 40 mm, and a later component on average 22 mm long (Reynier 1994). Although it would be imprudent to generalise on the basis of a sample of one piece, the obliquely blunted point from 448602 has a length of 26 mm.

Manufacture using the microburin technique appears to have been practised exclusively; six were recovered, along with one piece that appears to be a microlith in the process of manufacture.

Piercers

One piercer has a very short asymmetrical point on the distal end of a tertiary blade, formed by the intersection of two very heavily damaged margins (from 328001: Fig. 5.11). The second (Fig. 5.12) example is very different: made on a true blade 83 mm long the point itself is 27 mm long and formed by a crude retouch on the right dorsal and both ventral margins. The right dorsal margin above the point has a maximum thickness of 8 mm and is retouched and battered along its length, recalling a 'fabricator'. The right ventral margin has extensive edge damage. Neither piece is an obvious chronological indicator. The first is reminiscent of the 'spurred implements' of later Neolithic date from Windmill Hill and West Kennet Avenue (Smith 1965), Thickthorn Down (Drew and Piggott 1936) and Grimes Graves (Saville 1981).

Burins

There are two burins. One (from 8203) *may* be a small dihedral burin on a secondary flake, although the removal may be fortuitous. The second (from 448702: Fig. 5.13) is a dihedral burin on a tertiary core-trimming flake. Neither would be out of place in a Mesolithic tool kit. There are no burin spalls.

Projectile Points

The tip of an early Neolithic leaf-shaped arrowhead came from 7601 (Fig. 5.14). A Type G (Clark 1935) *petit tranchet* derivative arrowhead of later Neolithic date (Green 1984) was recovered from 428601 (Fig. 5.15).

Other Tools

There is a very limited range of other tools. Two truncations (from 378302 and 448602) have linear retouch on the distal and proximal ends of a secondary and tertiary flake respectively. A composite tool from 388302 has an end scraper on the distal end of a tertiary blade of dark grey chert. The left dorsal margin has use damage, and the right margin a burin removal struck from the scraper edge. The remaining miscellaneous retouched pieces need no discussion, except to note that two may be gunflints.

MISCELLANEOUS FINDS *By* Lorraine Mepham

A quantity of other material was recovered, predominantly from medieval ploughsoil 5402 and topsoil 5401, although some were intrusive in lower levels. The material is only summarised here (Wessex Archaeology 2005); full details are held in the project archive.

Pottery was recovered in some quantity. Apart from a single sherd from the evaluation which was probably Bronze Age (on the basis of the grog-tempered fabric), the assemblage consists entirely of medieval coarse jars and bowls and fine sandy wares (perhaps jugs) and post-medieval wares (dishes and bowls), dominated by local products. Ceramic building materials included brick, roof tile and field drain, almost entirely of post-medieval date. Other finds comprise small quantities of iron (largely nails), animal bone, fired clay, glass (all post-medieval vessel glass), roofing slate, clay pipe (including one bowl of later 17th century type), slag, burnt (unworked) flint, a worked bone knife handle and oyster shell.

ENVIRONMENTAL EVIDENCE *By* Chris J. Stevens

Charcoal occurred in the vicinity of the concentrations of Mesolithic flint, although it should be noted that there was charcoal in these locations in higher layers of more recent date and it is by no means certain that the material had not been worked down through the soil profile. It is noteworthy that the greatest concentration of charcoal occurred in the medieval ploughsoil in the north-east corner of the test pit area. It is therefore likely that a high proportion of the charcoal is not contemporaneous with the Mesolithic flintwork.

Charred plant remains recovered from samples included fragments of hazelnut shell (*Corylus avellana*) and several cereal grains, of which only wheat (*Triticum* sp.) could be identified from test pit 76 and rye (*Secale cereale*) from the basal deposit of test pit 79. Goosefoot (*Chenopodium* sp.) and ribwort plantain (*Plantago lanceolata*) were the only wild species recovered. The charred cereal grains indicate post-Mesolithic activity (rye in particular is largely unknown before the Saxon period) and any direct association between the plant remains and the Mesolithic flints is highly tentative. The high numbers of roots and presence of both modern seeds and leaves indicate that this material is likely to have been brought through the profile by root action, within natural cracking and/or through soil micro-faunal and earthworm activity. Similarly the mollusc shells recovered may be much more recent than the lithics.

It is likely, although by no means certain, that the fragments of hazelnut are contemporaneous with the late Mesolithic flintwork as such wild plant remains are common on sites of this date (Zvelebil 1994, 41).

SPATIAL ANALYSIS OF THE LITHIC ASSEMBLAGE

Spatial analysis of the flint assemblage by square metre was undertaken in an attempt to identify and characterise any foci of activity (Fig. 4), with distinctions being made between the distributions of the assemblage as a whole and of specific types separately (in particular cores and microliths).

The analysis of lithics from the initial test pitting indicated two clear concentrations of worked flint in the south-western part of the site. The material from the detailed excavation within this area forms three diffuse clusters which may represent individual knapping stations (stations 1-3; 1 and 2 coincide with the south-western-most concentration, station 3 with the north-eastern). The largest material categories (flakes, irregular debitage, bladelets, broken bladelets and bladelet cores) are spread reasonably evenly across the excavated area and show no significant clusters. Knapping evidence (flake and blade cores, crested pieces and rejuvenation tablets) tends to be grouped around stations 1 and 2, with only one bladelet core and two broken cores in the vicinity of station 3. It is therefore possible that core preparation and reduction were predominantly undertaken at stations 1 and 2; less so if at all at station 3. Microliths, microburins and scrapers cluster around all three stations, but other types show more distinction. Truncations occur at stations 1 and 2 while station 3 has burins. Utilised flakes and blades are noticeably more common at stations 2 and 3 than at station 1. The lack of associated organic evidence (entirely typical for sites of this period) precludes any detailed identification of site function(s) in the Mesolithic, but tasks generally associated with the acquisition and processing of plant and animal resources for food and the production of tools or clothing may be postulated on the basis of the lithic typologies present.

It is tempting to view these stations as hearths, and while the burnt flint distributions do compare to those of worked flint, quantities are too low (no cluster has more than five fragments of burnt flint) to identify these locations as such. Furthermore, because the burnt flint is undated, it is not possible to associate it specifically with the Mesolithic flints. Nonetheless, the coincidence of the burnt and worked flint, together with the general absence of burnt flint in other test pits, indicates a possible relationship.

DISCUSSION

The majority of the diagnostic lithic pieces can be assigned to the Later Mesolithic (6500-4000 BC). This industry was intended to produce blades and bladelets for microlith manufacture and there is evidence that manufacture took place on site. The recovery of burnt flint and charred hazelnut shell fragments indicate that hearths were once present, despite the absence of *in situ* remains. It seems most probable that the site represents a campsite overlooking the confluence of a small stream with the River Taw, occupied for a short period and/or for a number of short episodes.

It can be noted that flintwork was only found in the vicinity of the excavated site (evaluation trenches 23, 26 and 28) (Wessex Archaeology 2004, 11; Cotswold

Archaeology 2004) and beyond the road scheme there is little contemporary evidence for Mesolithic activity. However, there are a number of other sites around the Taw estuary and Barnstaple Bay (Fig. 1) providing broadly comparable lithic data: at Westward Ho! (Rogers 1946; Churchill and Wymer 1965; Balaam *et al.* 1987), Yelland (Rogers 1946), Braunton (Young 1906), Orleigh Court (Simpson and Rogers 1937), and Abbotsham Court (Newberry and Pearce 2005). Several of these sites have similar Late Mesolithic material, including lithic technologies predominantly concerned with bladelet production for microlith manufacture in assemblages which contain scrapers and occasional other tools, suggesting a wider range of activities (Jacobi 1979; Balaam *et al*. 1987).

The condition of the Sticklepath Hill assemblage indicates that the material was not *in situ*, since it had undergone some evident vertical and probable horizontal disturbance. There was no stratigraphic separation between Mesolithic and later forms, and while the concentration of material at the southern end of the site may indicate activity foci, it is possible that the higher densities of material here were a result of down-slope movement. That this may not be the case is perhaps indicated by the lack of lithics from evaluation trenches 24 and 25, and trench 51 (Wessex Archaeology 2004).

Although the make-up of the assemblage clearly indicates that knapping took place on the site, the almost total absence of smaller debitage elements and particularly chips demonstrates that an unknown proportion of the assemblage is absent. Down-slope movement (perhaps water-borne) is again the most likely mechanism, as the very small number of chips recovered from processed samples suggests that such pieces were not merely overlooked in the field. Consequently, the material recovered through evaluation and excavation represent the vestigial traces of activity which are too incomplete to allow firm conclusions regarding either site layout or use to be drawn.

The lithic evidence as a whole suggests intermittent use of the site over several millennia. Beyond the isolation of diagnostically later prehistoric tool types, it is not possible to identify individual episodes of activity over that period, although it is likely that these were few in number. It may be the case that the Mesolithic assemblage derives from a single event or short sequence. The very small quantities of burnt flint dictate that there is no definite association between the concentrations of worked flint and any postulated hearth location.

Diagnostically later material (Neolithic and Early Bronze Age) is very restricted and limited to a pair of projectile points, a piercer and a single scraper (although there may be an unidentified later element to the flake and flake core assemblage). This situation is a common one amongst predominantly Mesolithic assemblages (Newberry and Pearce 2005). This limited evidence is unlikely to represent anything other than individual episodes of short-lived activity on the river margins.

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BIBLIOGRAPHY

Balaam, N.D., Bell, M.G., David, A.E.U., Levitan, B., Macphail, R.I., Robinson, M. and Scaife, R.G. 1987 'Prehistoric and Romano-British sites at Westward Ho!, Devon: Archaeological and palaeo-environmental surveys 1983 and 1984' in Balaam, N.D., Levitan, B. and Straker, V. (eds.) *Studies in palaeoeconomy and environment in South West England* Brit. Archaeol. Rep. Brit. Ser. **181**, 163-264 (Oxford).

Chisham, C., Scaife, R. and Cooke, N. 2007 Iron Age to Saxon landscape and landuse change in the Taw Valley: evidence from an infilled river channel at Little Pill Farm, Sticklepath Hill, near Barnstaple, *Proc. Devon Archaeol. Soc* 65, xx-xx.

Churchill, D.M. and Wymer, J.J. 1965 'The Kitchen Midden site at Westward Ho!, Devon, England: ecology, age, and relation to changes in land and sea level', *Proc. Prehist. Soc.* **31**, 74-84.

Clark, J.G.D. 1934 'The classification of a microlithic culture: the Tardenoisian of Horsham', *Archaeol. Journ.* **90**, 52-77.

Clark, J.G.D. 1935 'Derivative forms of the *petit tranchet* in Britain', *Archaeol. Journ*. **91**, 32-58.

Cotswold Archaeology 2005 Barnstaple Western Bypass, Barnstaple, North Devon. Archaeological Watching Brief and Recording of Seawall. Unpublished client report prepared for Halcrow Group Ltd on behalf of Edmund Nuttall Ltd. Ref. No. CA05076.

Drew, C.D. and Piggott, S. 1936 'The excavation of long Barrow 136a on Thickthorn Down, Dorset', *Proc. Prehist. Soc.* **2**, 77-96.

Green, S. 1984 'Flint arrowheads: typology and interpretation', *Lithics* **5**, 19-39.

Harding, P. 2000 'A Mesolithic site at Rock Common, Washington, West Sussex', *Sussex Arch. Colls.* **138**, 29-48.

Jacobi, R.M. 1979 'Early Flandrian hunters in the South-West', *Proc. Devon Archaeol. Soc.* **37**, 48-93.

Leivers, M., Chisham, C. and Harding, P. in press 'Excavations at Tank Hill Road, Essex', *Essex Arch.*

Newberry, J. 2002 'Inland flint in prehistoric Devon: sources, tool-making quality and use', *Proc. Devon Archaeol. Soc.* **60**, 1-36.

Newberry, J. and Pearce, N. 2005 'A Mesolithic lithic scatter from Abbotsham Court, North Devon', *Proc. Devon Archaeol. Soc.* **63**, 1-32.

Reynier, M.J. 1994 'A statistical analysis of ten early Mesolithic sites in south-east

England' in Ashton, N. and David, A. (eds) *Stories in Stone* Lithic Studies Society Occasional Paper **4**,199-205 (London).

Rogers, E.H. 1946 'The Sites at Westward Ho! and Yelland', *Proc. Devon Archaeol. Explor. Soc.* **3.3**, 109-35.

Saville, A. 1981 Grimes Graves, Norfolk Excavation 1971-72: Volume II the Flint Assemblage, HMSO, Dept. Environ. Archaeol. Rep. **11** (London).

Simpson, B. and Rogers, I. 1937 'A chipping-floor at Orleigh Court, North Devon', *Antiq. J.* **17**, 299-309.

Smith, I.F. 1965 Windmill Hill and Avebury excavations by Alexander Keiller 1925-1939 (Oxford).

Wessex Archaeology 2004 Barnstaple Western Bypass, Devon. Archaeological Evaluation Report. Unpublished client report prepared for Chris Blandford Associates on behalf of Devon County Council. Ref. No. WA54511.001.

Wessex Archaeology 2005 Barnstaple Western Bypass, Devon. Archaeological Excavation Assessment and Updated Archaeological Design. Unpublished client report prepared for Chris Blandford Associates on behalf of Devon County Council. Ref. No. WA56500.101.

Young, T. 1906 'Pigmy flint implements in North Devon', *Devonshire Ass. Rep. Trans.* **38**, 261-9.

Zvelebil, M. 1994 Plant use in the Mesolithic and its role in the Transition to Farming, *Proc. Prehist. Soc* **60**, 35-74.

Table 1 Worked Flint – assemblage composition

Flint types	No.	% of assemblage	% of retouched
Debitage:			
Flakes (including broken)	378	60.33	
Blades (including broken)	17	3.58	
Bladelets (including broken)	64	9.76	
Chips	9	0.98	
Irregular debitage	55	8.78	
Utilised flakes, blades, bladelets	*70*	*11.06*	
Core preparation / rejuvenation pieces	12	2.28	
Cores / core fragments	44	7.80	
Microburins	6	0.98	
Retouched tools:			
Microliths (Clark 1934)	6	0.81	14.71
Type A	*1*		*2.94*
Type B	*3*		*8.82*
Type D	*1*		*2.94*
Unclassified	*1*		*2.94*
Scrapers	9	1.30	23.53
Burins	2	0.32	5.88
Piercers	2	0.32	5.88
Projectile points	2	0.32	5.88
Miscellaneous retouched pieces	15	2.44	44.12
Retouched tools sub-total	*36*	*5.51*	
Total	621	100%	100%

Figure captions

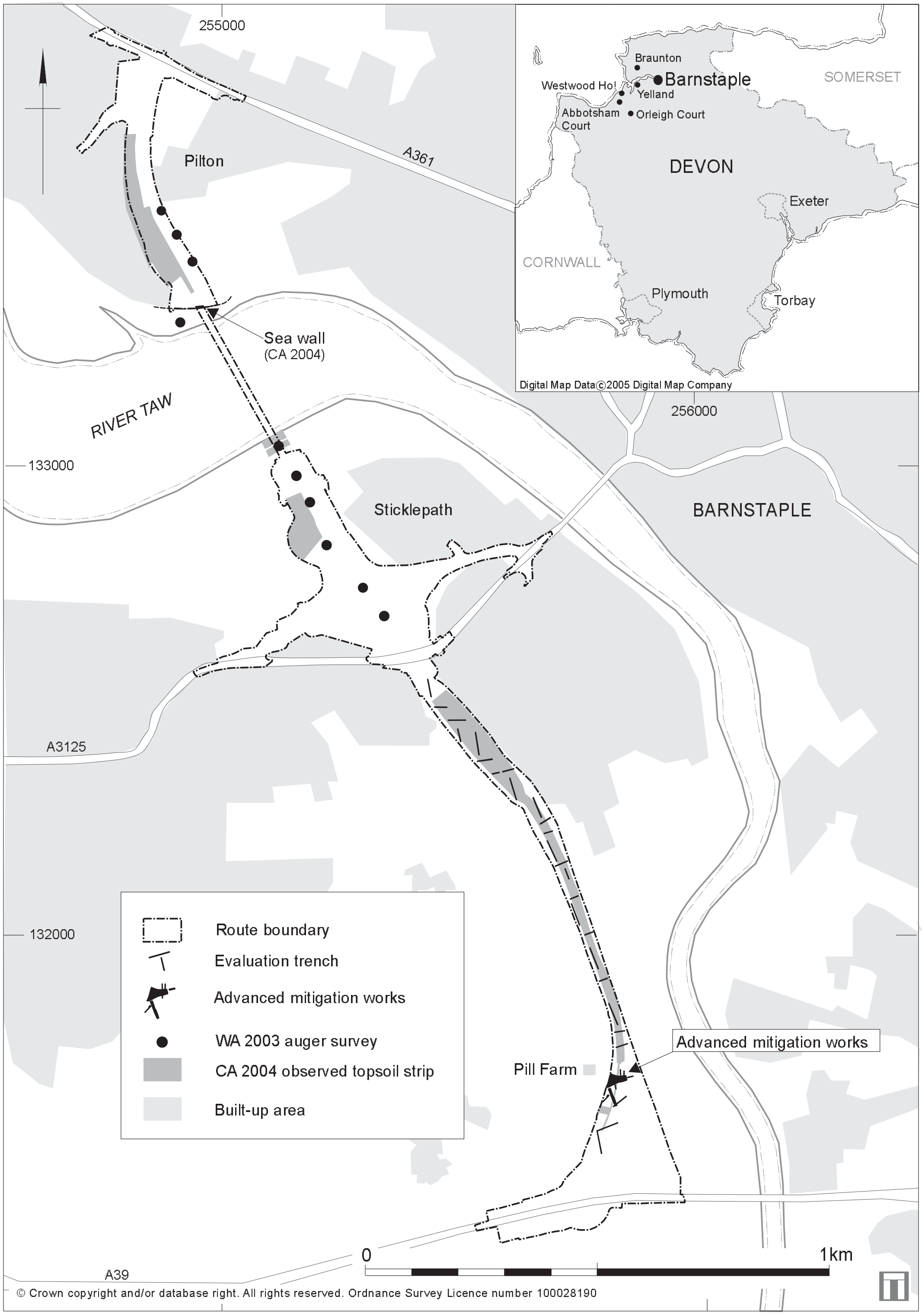
Fig. 1 Route location, evaluation trenches and advanced mitigation works. Location of other sites discussed in the text.

Fig. 2 General view of the Mesolithic site during excavation.

Fig. 3 Test pit and evaluation trench layout.

Fig. 4 Worked flint distribution (density plot). Location of flint knapping stations.

Fig. 5 Lithics: cores, 1-4; scrapers, 5-7; microliths, 8-10; 11-12, piercers; burin, 13; leaf-shaped arrowhead, 14; and petit tranchet derivative arrowhead, 15.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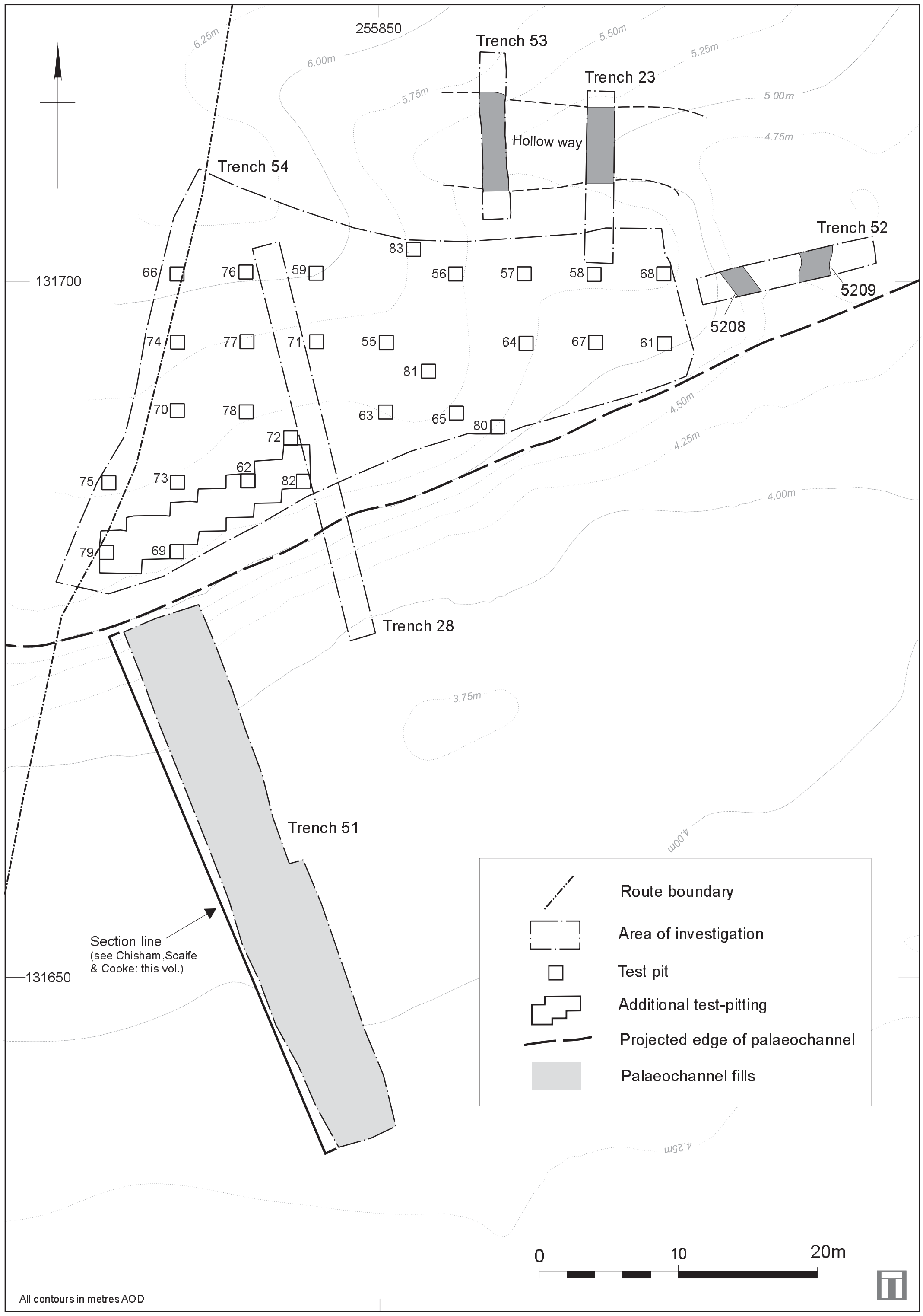
Pilton
A361
Braunton
Westwood Ho!
Barnstaple
Yelland
SOMERSET
Abbotsham Court
Orleigh Court
DEVON
Exeter
CORNWALL
Plymouth
Torbay
Digital Map Data © 2005 Digital Map Company
Sea wall
(CA 2004)
RIVER TAW
256000
133000
Sticklepath
BARNSTAPLE
A3125
132000
Route boundary
Evaluation trench
Advanced mitigation works
WA 2003 auger survey
CA 2004 observed topsoil strip
Built-up area
Advanced mitigation works
Pill Farm
0
1km
A39
© Crown copyright and/or database right. All rights reserved. Ordnance Survey Licence number 100028190

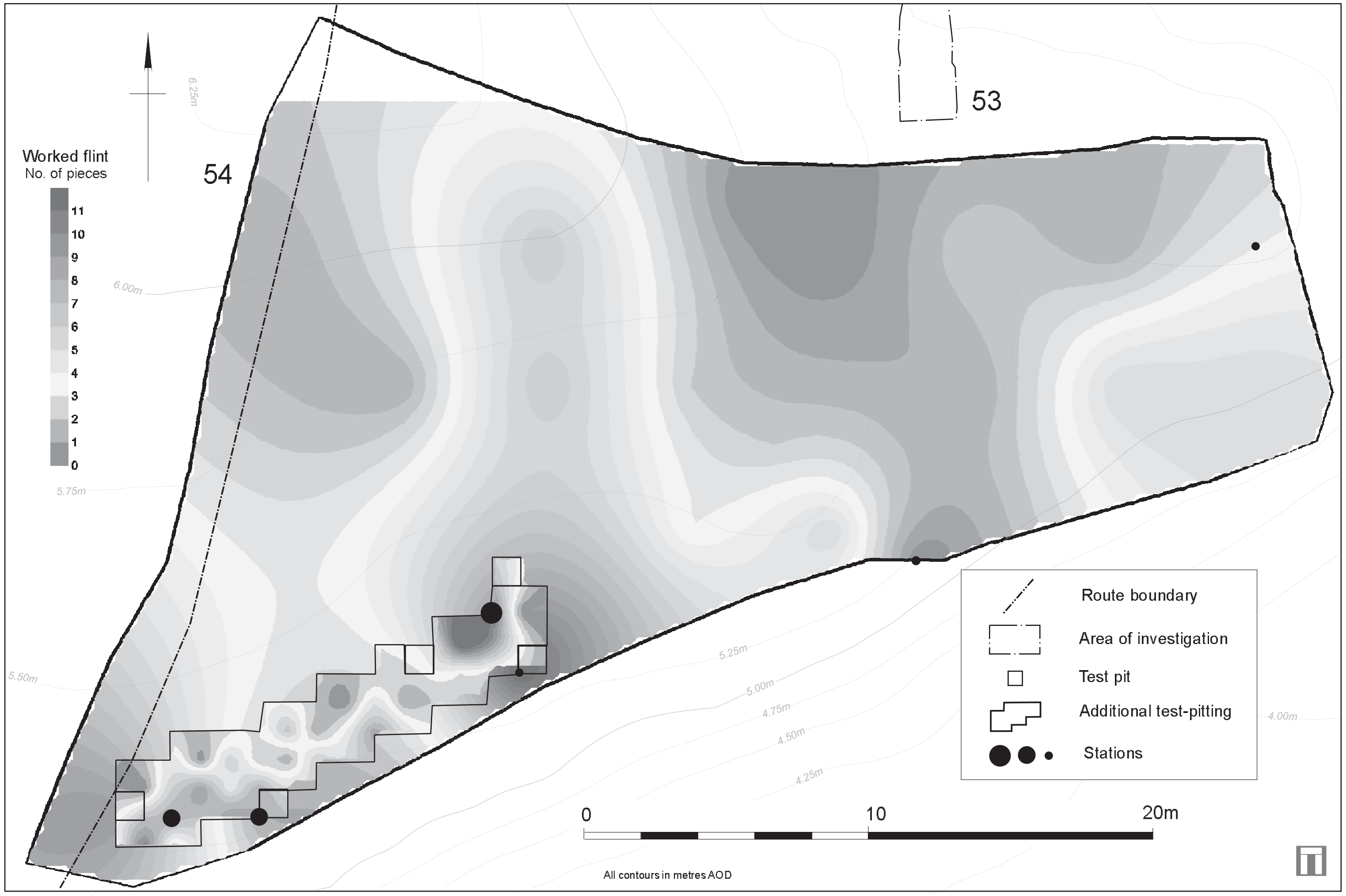
Figure 1

Figure 2



255850
131700
131650
6.25m
6.00m
5.75m
5.50m
5.25m
5.00m
4.75m
4.50m
4.25m
4.00m
3.75m
Trench 53
Trench 23
Hollow way
Trench 54
Trench 52
5209
5208
Trench 28
Trench 51
66
76
59
83
56
57
58
68
74
77
71
55
64
67
61
81
70
78
63
65
80
72
62
82
75
73
79
69
Section line
(see Chisham ,Scaife & Cooke: this vol.)
Route boundary
Area of investigation
Test pit
Additional test-pitting
Projected edge of palaeochannel
Palaeochannel fills
0
10
20m
All contours in metres AOD

Figure 3



Worked flint
No. of pieces
11
10
9
8
7
6
5
4
3
2
1
0
54
53
6.25m
6.00m
5.75m
5.50m
5.25m
5.00m
4.75m
4.50m
4.25m
4.00m
Route boundary
Area of investigation
Test pit
Additional test-pitting
Stations
0
10
20m
All contours in metres AOD

Figure 4

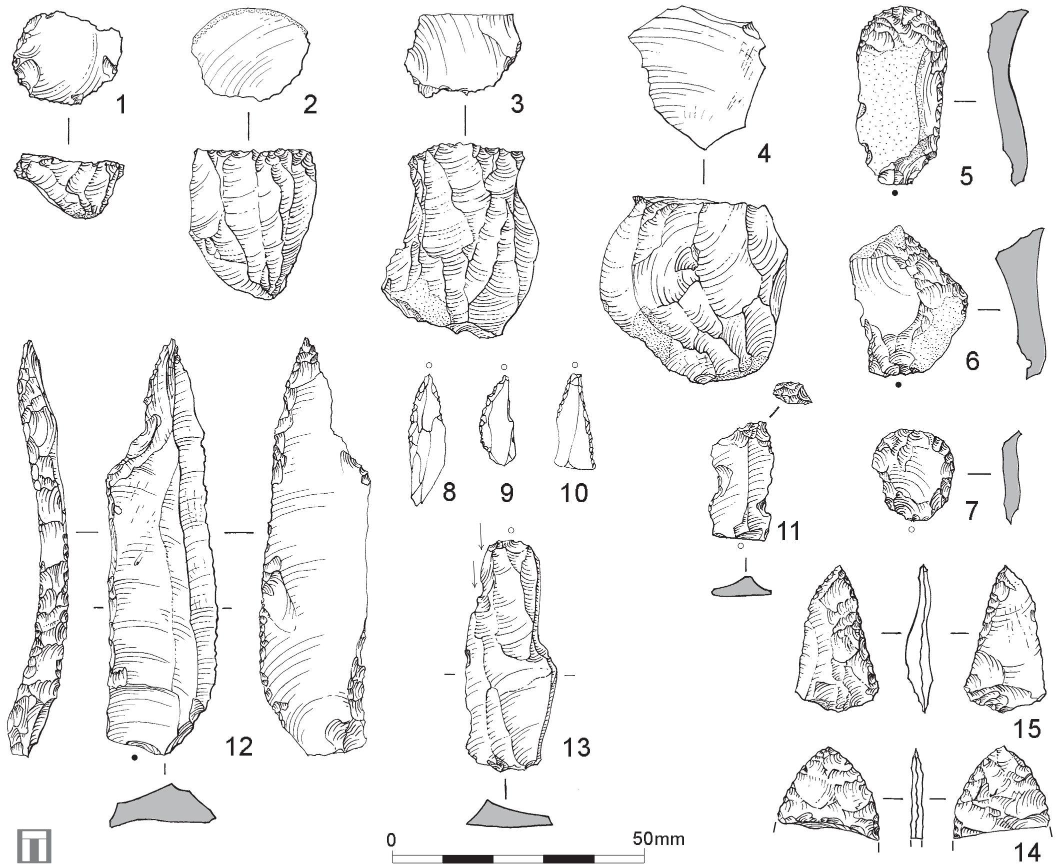


Figure 5

IRON AGE TO SAXON LANDSCAPE AND LANDUSE CHANGE IN THE TAW VALLEY: EVIDENCE FROM AN INFILLED RIVER CHANNEL AT LITTLE PILL FARM, STICKLEPATH HILL, NEAR BARNSTAPLE

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Excavation of a palaeochannel on the line of the Barnstaple Western revealed a deep, well-stratified sequence of deposits. Radiocarbon dating has established that these alluvial deposits and peat were formed from the Early Iron Age to Late Saxon period. Analysis of ecofacts recovered clearly demonstrates the gradual clearance of woodland and alder fen carr, believed to be associated with mixed agriculture, probably in the Late Iron Age and Roman-British period. This continued into the Late Saxon period, with the immediate surroundings becoming a more open grass-sedge fen and with pasture dominant in the local area. Evidence was recovered for rising sea levels and increasing marine influence on the channel in the Late Saxon period, which may have had an effect both on the immediate area and the wider Taw estuary. This data adds significantly to a small body of evidence for landscape and estuarine evolution and for human activity for this period in the area.

INTRODUCTION

Investigation of a relict channel and its deposits provided a rare and important opportunity to explore the low-lying coastal wetlands of north Devon during the later prehistoric to late Saxon periods. The previous body of evidence for landscape change in this inland area is relatively small, due in part to a concentration of development and of research efforts into deposits at the coast and estuary mouth. Useful data has, however, been presented for the prehistoric-Romano-British periods for the wider region, for example, by Rippon (1997) and Bell *et al.* (2000) for the Severn Estuary and by Balaam (*et al.* 1987) for Westward Ho!

The programme of trial trenching in advance of the construction of the Barnstaple Western bypass identified three areas of archaeological significance: evidence for Mesolithic flint working, a medieval or post medieval hollow way and the line of a relict watercourse (Wessex Archaeology 2004, 2005). These lay just west of the modern River Taw at NGR 255800 131700 and to the east of Little Pill Farm, in the parish of Tawstock to the south-west of Barnstaple (Fig.1), and were all subject to detailed archaeological excavation.

The excavated area lies at *c*. 4 m OD on a complex local geology, with a number of solid and drift types mapped in close proximity. The palaeochannel occurs at the boundary of alluvium associated with the modern River Taw and an outcrop of shale from the Lower Carboniferous Pilton Shales (Geological Survey of Great Britain 1982 sheet 293). Patches of shale from the Lower Carboniferous Codden Hill Chert occur along with more extensive bodies of Upper Carboniferous sandstone from the Crackington Formation, and Pleistocene drift deposits of Boulder Clay and pebbly clay and sand lie to the northwest, west and south. Soil types vary with these geologies but on the floodplain of the Taw at Sticklepath were reported as pelo-alluvial grey soils of the Wallasea 1 Association (1: 250 000 Soils of England and Wales, Sheet 5, South West England; Findlay *et al.* 1984; Wessex Archaeology 2003a).

The results from an archaeological evaluation and excavation focussing on the scatter of Mesolithic flint are detailed elsewhere in this volume (Leivers, this vol.). This report concentrates on the results of the archaeological investigation of the former river channel in Trench 51, and a summary of the hollow way excavation can be found below (Fig. 2). Trench 51 was sited on the northern edge of the mouth of a wide shallow valley to the south of Little Pill Farm. A shallow fast flowing stream, now largely canalised in the immediate area, runs parallel to the modern field boundary to the south before joining the River Taw to the east. This stream rises from springs close to West Lodge in the parish of Hele, and runs through the village of Lake before passing to the south of Pill Farm and Little Pill Farm before joining the Taw to the east. This is shown on numerous historic maps, and is known as Pill Stream. Indeed, the use of ‘Pill’ or ‘Pil’ in a place name can be taken to denote the proximity of a small stream or creek (Miles and Miles 1975, 271).

Trench 51 sectioned the line of the palaeochannel (Fig. 2). It was 40.1 m long and 6.4 m in plan and machine excavated to a depth of up to 3 m under constant archaeological supervision (Fig. 3). All subsequent cleaning, excavation, sampling and recording was undertaken by hand.

METHODS

The palaeochannel sediments were recovered as continuous monolith samples (Figs 4-5), described following Hodgson (1976), and sub-samples taken for the recovery of environmental remains (detailed in Appendix 1). Seven bulk samples were processed to 500 μm and assessed for waterlogged plant remains, molluscs and other macrofossils. Three samples of waterlogged wood were recovered. A fine slice was taken from each fragment along three planes, the pieces mounted in water on a glass microscope slide, and examined under bi-focal transmitted light microscopy at magnifications of up to x400. Identification was undertaken according to the anatomical characteristics described by Schweingruber (1990) and Butterfield and Meylan (1980) to the highest taxonomic level possible, usually genus. Standard techniques were used for the extraction of the sub-fossil pollen and spores (Moore and Webb 1978; Moore *et al.* 1991) with taxonomy according to Stace (1997) modified according to Bennett *et al.* 1994. Pollen counts of 500 to 1100 grains per level were made at magnifications of x400 and x1000 for a series of eight samples. A pollen diagram has been constructed using the following sums:

Sum =	% total dry land pollen (tdlp);
Marsh/aquatic =	% tdlp + sum of marsh/aquatics (including alder);
Spores =	% tdlp + sum of spores;
Misc. =	% tdlp + sum of misc. taxa.

The same eight levels were also examined for their diatom content. Diatoms were extracted used digestion of humic/organic material using Hydrogen Peroxide. Samples were dried on microscope cover slips and mounted using Naphrax mounting medium. Identification was carried out at high power x400 and x1000 using a biological microscope with phase contrast, aided by the diatom flora of Hartley (1996). Three discrete waterlogged plant remains of terrestrial origin (*Phragmites* sp.) were taken from the base of the sequence and top and bottom of the main peat body (sedimentary unit 2c) and submitted to the Rafter Radiocarbon Dating Facility for AMS dating. The results returned were calibrated using OxCal v3.9 (Bronk Ramsey 2003).

THE FLOODPLAIN AND CHANNEL STRATIGRAPHY

The sequence is described in detail in Appendix 1, is shown in Figure 4 and is summarised in Table 1 and in the section that follows:

{Table 1 Summary of the Palaeochannel Sedimentary Units}

Fluvial sands and gravels (unit 4) occur at the base of the channel which cut into the underlying geology, observed in the field as a yellow clay containing sub-angular cobbles, probably weathered Boulder Clay. The sands and gravels indicate high-energy river flow conditions but emergent vegetation communities established quickly in the immediate area, with *in situ* accumulation of a thin layer of organic matter on the gravel top. This suggests that the river gravels were of interglacial (Holocene) rather than Devensian date and is supported by an Iron Age date on organic matter at its top (see Table 2). A single, probably Mesolithic, bladelet was recovered from unit 4 to the north-west and adjacent to the edge of the excavated dryland site, it is suggested this had been eroded and washed in.

Fining upwards to the gleyed silty clay alluvium of unit 3 indicates a decrease in energy of flow or a lateral shift in the channel after the Iron Age, allowing deposition of fine overbank sediments at times of flood, indeed three bands of coarser material near the top of this unit represent flood events of greater magnitude. A relatively abrupt boundary was noted to the highly organic alluvium (unit 2d), indicating relatively rapid in-wash of organic material and possible truncation of unit 3.

Organic matter increases up the profile with increased *in situ* accumulation of remains, becoming, more gradually, fibrous, moderately humified fen peat (unit 2c). A relatively rapid drop in water levels is indicated for the Romano-British period (see Table 2), most likely due to further channel shift to the south. The peat was formed in a marginal/ river edge environment, leaving well-vegetated marsh at the Site. The peat (2c) was up to 0.83 m thick and contained well-preserved herbaceous plant material. Fine laminations of in-washed silt/ clay observed at the base of the peat in the field show some fluctuation and flood events in this emergent, marginal area, while occasional, apparently eroded, large horizontal wood pieces may represent drift wood. If so, they indicate some peat accumulation took place under shallow water or support that this marginal area was subject to flooding. Accumulation continued into the Late Saxon period (see Table 2).

A gradual resurgence of channel influence on the sequence is represented by the increasing addition of fine minerogenic alluvium (units 2b-a). The upper portion of the alluvium (unit 1) contains fine rootlets, it is mottled with iron staining and nodules of iron are common. From 0.35 m upwards, a well-developed alluvial gley soil was observed (units A and B), formed on the alluvium, with some minor colluvial input possible. Extensive and extended leaching through this profile caused substantial accumulation of iron at its base, approaching an iron pan.

A second, U-shaped channel (cut 3019) cut through the main channel sequence into the alluvium of unit 3 to a depth of 2.42 m, having removed the peat to the left of the section. A substantial body of coarse sands and gravels filled the lower portion of this channel, indicating high-energy flow, with fining upwards through units C1-5 indicating decreasing energy up the profile as the cut infilled. The fill of this channel cut is therefore more recent than the majority of the main palaeochannel sequence, being of Late Saxon or later date, however, the modern soil unit was traceable across the transect, showing contemporary (recent) pedogenic alteration across the area.

DATING THE SEQUENCE

Of the three samples of identifiable plant matter submitted (Table 2: KIA-25384-6), the *Phragmites* from top and bottom of the peat (unit 2c) are assumed to have been growing *in situ* in this peat. The sample from the incipient peaty horizon developing on and in the basal sands and gravels (unit 4) might contain fluvially derived debris, although the item selected was from the *in situ* fine root-mat. The result (KIA-25386 800-410 cal BC) indicates the date by which the basal horizon started to stabilise and a minimum time between basal stabilisation and the inception of the main peat. The radiocarbon determinations are given in Table 2.

{Table 2 Radiocarbon Determinations Tr 51}

The sample from the base of the peat at 1.61 m proved too small and degraded for a reliable measurement. The age calculated from the measurement of 2200±250 years BP (KIA-25385 900 cal BC – 400 cal AD) gives only a rough indication of the probable age of the sample and may be too low/young. The *Phragmites* leaf at the top of the sequence at 0.81 m gave a result of 1117±25 BP (KIA-25384) giving a Late Saxon (cal AD 880-990).

The results indicate peat formation commenced in the Iron Age/Romano-British period, and at this location continued until the Late Saxon period at least, results which are consistent with peat formation in the main Taw valley to the west of Barnstaple (Allen *et al.* 2004).

THE ENVIRONMENT

Pollen

Botanical changes in the sequence allow the creation of four local pollen assemblage zones, as shown in Fig 6a-b. These are characterised from the base of the profile upwards as follows:

l.p.a.z. 1 2.38-1.9 8 m, base of alluvium units 2d-3 and fluvial sand and gravel unit 4. Quercus-Corylus avellana type-Alnus. This basal zone is characterised by dominance of trees and shrubs with few herbs. *Quercus* (oak) (to 38%), *Corylus avellana* type (hazel) (56%) and *Alnus glutinosa* (alder) are the dominant taxa. *Hedera helix* (ivy) (3%) and *Viburnum lantana* (wayfaring tree) are present. There are few herbs with only Poaceae (grasses) (to 8%) and Cyperaceae (sedges) (6%) having constancy. Spores of ferns include highest values of *Polypodium* (6%) and *Dryopteris* type (monolete forms to 20% at the base).

l.p.a.z. 2 1.98-1.66 m, alluvium unit 2d. Quercus-Corylus avellana type-Alnus-Poaceae. Quercus and *Corylus avellana* type remain important but decline through the zone. *Alnus glutinosa* has the highest values at 1.92 m. Herbs become increasingly important with Poaceae expanding (to 35%). Herb diversity increases with *Plantago lanceolata* (ribwort plantain) (2%) and cereal pollen is of note at the base of this zone. Marsh/fen taxa include *Alnus*, *Salix* (willow), *Chrysosplenium oppositifolium* (golden saxifrage), Cyperaceae, and *Iris*. There is a substantial peak of Apiaceae (cow parsley) across the upper zone boundary, which may be from one of the fen taxa (e.g. *Oenanthe,* water dropworts). Spores of *Pteridium aquilinum* bracken become important while values of *Polypodium* and *Dryopteris* type ferns are reduced.

l.p.a.z. 3 1.66-1.18 m, lower portion peat unit 2c. Quercus-Poaceae. Quercus continues to decline with *Corylus avellana* type constant at *ca.* 10%. *Alnus* decreases markedly to 15-20%. There are occasional *Betula* (birch), *Ulmus* (elm) and *Fraxinus excelsior* (ash). Herbs continue to become important with increasing diversity and Poaceae are dominant (peaking to 80% at 1.44 m) while Apiaceae declines. Marsh taxa are characterised by a marked decline in

Alnus glutinosa and some expansion of Cyperaceae (10%). *Pteridium aquilinum* remains important, peaking to 28%.

l.p.a.z. 4 1.18-0.68 m, upper portion peat unit 2c and peaty alluvium 2b. Poaceae. In this uppermost zone Poaceae and *Plantago lanceolata* attain their highest values (85% and 8% respectively) whilst trees and shrubs are at their lowest levels. *Quercus* and *Corylus avellana* type remain the most important tree and shrub taxa but with relatively small values (down to 5% and 2%). Within the marsh taxa, *Alnus glutinosa* declines from previously high values to only sporadic occurrences. Cyperaceae are the most important fen type (peaking to 13%). Other fen taxa include occasional *Salix*, *Hydrocotyle vulgaris* (marsh pennywort), *Potamogeton* type (pondweeds) and *Osmunda regalis* (royal fern).

The pollen profile shows significant change from a wooded habitat on and near the site to one of open aspect between the Iron Age to Late Saxon periods. The basal zone 1 (unit 2d-4) show the dominance of oak and hazel on adjacent interfluves and possibly drier areas of the fen. The on-site vegetation comprised alder fen carr with a ground flora which included sedges and golden saxifrage. Presence of pond weed/ arrow grass suggests that areas of open water may also have been present. This basal zone has been dated to the Early Iron Age and as such provides a useful record of remaining woodland in the region.

In zone 2, the carr remained important but a general reduction in trees (oak and hazel) occurred. This may feasibly have been driven in part by natural succession towards a wet fen environment due to water level rise, however, the associated expansion of herbs including ribwort plantain, cereals and small numbers of weeds (e.g. *Artemisia*, mugworts) is strongly suggestive of increasing human activity. Given the age range of the peat, it is plausible that this major landscape change occurred as a result of increasing Romano-British activities within the region.

Once initiated, woodland clearance was progressive and in zone 3, oak and hazel continued to be removed with a corresponding expansion of herbs dominated by grasses. Significantly, alder, important throughout the lower profile, declined as a result of clearance, either for direct use or as part of the continued clearance of interfluve woodland. This could have had the effect of further raising the local water table within the fen especially during winter, which in turn would have impacted on the alder since it would not have been tolerant of root flooding for longer than two months. A substantial peak of cow parsley associated with the decline in alder is probably due to opening of the floodplain woodland and consequent establishment and/or expansion of species such as hemlock water dropwort. The decline of woodland through clearance culminates in zone 3/4 dated to the late Saxon period, after which there is an open herbaceous, agricultural environment both on surrounding drier land and in the fen.

From the start of zone 2, (Iron Age - Romano-British), there is continued evidence of agricultural activity, with incoming of cereal pollen and herbs such as ribwort plantain often regarded as being an indication of grassland/pasture. The former (cereal pollen) is subordinate to pastoral types and whilst this is clear indication that arable cultivation was taking place this was probably at some distance from the sample site on the better-drained soils of the interfluves. It is, however, possible that the density of the alder carr floodplain woodland may have had a filtering/reducing effect on pollen from surrounding areas. Whilst this may be applicable in the lower zones 1 and 2, the more open fen habitat of the upper zones fails to show any substantial increase in cereal pollen. Thus, it is concluded that the clearance of woodland resulted largely in a largely pastoral habitat at least in proximity to the site. This may have been floodplain pasture.

Diatoms

Diatom frustules were recovered in varying frequencies becoming especially abundant between 1.42 m and 0.82 m (the fen peat unit 2c). Table 3 lists the range of diatoms observed. *Nitzschia* sp. is abundant and the dominant taxon between 1.42 m and 0.94 m, occurring with smaller numbers or occasional occurrences of the other taxa listed. These include taxa indicative of freshwater but also saline/brackish water environments such as the diagnostic centric, *Paralia sulcata.* Other brackish water indicators include *Nitzschia navicularis, N. pusilla, Rhopalodia muculus* and *Navicula pusilla.* From *ca.* 0.90 m, the upper part of the peat unit 2c and peaty alluvium unit 2b, there is some increase in these halophytes especially *Paralia sulcata* and *Diploneis interupta,* a mesohalabous taxon of brackish water habitats occurs.

{Table 3 List of diatoms flora}

Waterlogged plants

Chenopodium seeds, suggestive of a disturbed and open local environment, occurred in the basal sample, unit 4 while seeds of open riverine edge/wetland species such as sedges (*Carex* sp., *Eleocharis* sp.), rushes (*Scirpus* sp.) and club rushes (*Isolepis*) occurred at and below 1.52 m (units 2c-4) along with roots and stems most probably of *Phragmites* (Table 4). Only well-preserved but unidentifiable herbaceous matter occurred in the upper units except for remains of alder (*Alnus glutinosa*) in the organic alluvium of unit 2a. Rare charcoal <2 mm was noted in the lower samples from the alluvium of units 2d and 3.

{Table 4 Macrofossil remains}

No mollusc, ostracod or foraminiferal remains were found in the palaeochannel sequence samples, it is believed the sediments are not sufficiently alkaline to allow their preservation.

Waterlogged wood

The wood was described and identified as detailed in Table 5 below.

{Table 5 Waterlogged wood identifications}

The presence of wood of alder agrees well with the pollen evidence from the palaeochannel and the presence of a substantial stump here indicates the tree was growing *in situ* on the incipient peat surface (unit 4). The immediately local presence of *Quercus,* though a common woodland taxa and one well represented in the pollen assemblage, is somewhat surprising given the saturated wetland environment highlighted by the macrofossil and sedimentary analyses. It is suggested the wood sampled did not come from a tree growing immediately on the floodplain, rather on the interfluves or raised dryland edge and may have been transported from upstream as driftwood.

HOLLOW WAY

The route of the hollow way was investigated in two hand-excavated trenches (Fig. 2).These were situated on the basis of a topographic survey that suggested the feature ran eastwards from Pill Farm, before turning south towards the northern edge of the relict palaeochannel. Investigations recorded a section across the east-west aligned portion of the hollow way, confirming the presence of a crude gravel surface at the base (Fig. 7). Dating evidence could not confirm that the feature was any earlier than post-medieval, although considerable quantities of medieval pottery were recovered from the general area. The apparent turn to the south towards the palaeochannel was shown to consist of a pair of ditches aligned approximately north to south (but not parallel), rather than being a continuation of the hollow way route. It was not possible to confirm whether the ditches were contemporaneous or not, although both produced sherds of medieval pottery from their upper fills. The intersection between these ditches and the hollow way and its relationship to the palaeochannel was not observed.

DISCUSSION: THE LANDSCAPE AND CHANGING FLOODPLAIN ENVIRONMENT

The excavations revealed a deep, well-stratified, waterlogged sequence of palaeochannel and floodplain deposits. The radiocarbon dates obtained through the sequence of silting in the main channel have established that these deposits formed between the Early Iron Age and the Late Saxon period. A later channel, cut through these deposits, was not closely dated, but was probably cut in the early medieval or medieval period. It certainly post dates the deposits formed in the Late Saxon period.

The dating of the stratigraphic sequence enables the detailed information recovered regarding the development of the channel and its environs to be viewed within a chronological framework. No direct relationship between the location of the adjacent Mesolithic activity and the channel deposits was found. However, it is likely that a precursor of this channel ran in the shallow valley cut by Pill Stream, and was a factor in the choice of the site by the Mesolithic hunter-gatherers, who often favoured sites overlooking or adjacent to junctions between watercourses (see Leivers, this volume). The single bladelet recovered from the stratigraphic sequence was clearly residual in the context in which it was found, and probably eroded out of the adjacent Mesolithic flint scatter.

The channel began to infill in the later prehistoric period (Early Iron Age: 800-400 cal BC) following initial deposition of sands and gravels under high-energy river flow (unit 4). The local environment of the wetland edge and interfluves at this time was one of mixed deciduous woodland with oak, hazel and alder important. It is suggested that a substantial decrease in woodland cover had not occurred in the local area up to the Iron Age or that regeneration of any previously cleared woodland had taken place by this time. Over time, these basal sediments partially stabilised, due to colonisation of emergent wetland plants such as reeds and rushes. The pollen spectrum and waterlogged wood recovered from the remains provide a useful record of Early Iron Age woodland persisting in the area. We have little direct evidence for Iron Age settlement and activity in the surrounding area, although the univallate enclosure at

Roborough Camp near Pilton to the north of Barnstaple may have its origins in the Iron Age (Miles and Miles 1975, 267).

The alluvial sediments in the sequence fined progressively as the fluvial regime decreased in energy though interrupted by three significant flood events (unit 3). The channel continued to infill and shifted to the south-east over time at this location, enabling colonisation of the floodplain by herb and woodland taxa culminating in the formation of fen peat (unit 2c), probably during the Late Iron Age or Romano-British period (50 cal BC onwards).

The development of this peat coincides with a wider opening up of the landscape. There is considerably less evidence for local woodland at this time, whilst a diverse array of grasses and herbs dominate the pollen assemblage. Although local hydrological factors may have played a minor role, the herbaceous pollen assemblage indicates this corresponds to clearance of the landscape for agricultural purposes in the Late Iron Age or Romano-British period. The immediate locality was dominated by areas of pasture, whilst there is also evidence for arable farming in the form of cereal pollen, although this may have been some distance away. The continued presence of pollen from tree species may indicate some surviving woodland patched in the area as well, potentially including trees and shrubs forming boundary hedges. Whilst we have little direct evidence for Late Iron Age or Romano-British activity in the immediate area (Wessex Archaeology 2005), it is clear that there were substantial changes to the local environment at this time with the clearance of areas of land and the development of a mixed farming regime.

This pattern of clearance continued into the Late Saxon period, with the last remnants of the alder carr fen environment replaced by a more open grass-sedge fen, probably as a result of a locally higher ground water table. The change in water table and conditions may have been prompted in part by clearance but the diatom findings are significant in indicating that the freshwater fen habitat was subject to progressive marine incursion, with the spread of brackish then saltmarsh influence inland. Though suggested to be at the edge of the tidal range, direct marine influence this far upstream in the River Taw is of note. The changes manifested in the gradual submergence of the dominantly terrestrial wet fen environment and the deposition of minerogenic alluvial sediments once more (units 1-2b) at the end of the Late Saxon period. The incursion was driven by positive eustatic change and its timing is in accord with sea-level change data for the South West of England (Kidson and Heyworth 1972; Heyworth and Kidson 1982).

The immediate Late Saxon landscape appears to have been dominated by pasture, probably used for grazing livestock. Mixed agriculture is likely to have remained important however – the Domesday Book for Tawestock mentions land for 80 ploughs, 7 pigmen who paid for 35 pigs, 12 acres of meadow, 20 acres of woodland and pasture 1 league long and another wide (Thorn and Thorn 1965).

The diatom record provides evidence for increased sea levels in the Late Saxon period, a phenomenon which may have impacted on the wider landscape. Late Saxon activity in the area focussed on the *burh* at Pilton and Barnstaple, on the other side of the Taw. The 'Burghal Hidage' of AD 913 lists settlements conferred with burghal status, and includes 'Pilletune with (or opposite) Beardastapol', which required 360 hides of land, as one of four *burhs* in Devon (Lamplugh, 1983, 4 – 5). It is unclear whether this indicates that the two settlements were conferred joint burghal status or whether Barnstaple was of secondary importance. However, Barnstaple rapidly became the ascendant, being granted the right to mint coins – a coin of Eadwig (955 -959) recovered from a hoard in Chester was minted at Barnstaple (Lamplugh, 1983, 5), and ultimately developed into an important medieval port. One factor in the rise to prominence of Barnstaple may have been that it was better positioned to act as a port at a time of fluctuating sea levels than Piton.

The latest phase of the excavated palaeochannel deposits, represented by a second, gravel filled cut is, due to its minerogenic nature, poorly dated. The presence of these high-energy river channel deposits does, however, indicate conditions of increased water flow and landscape instability at or after the end of the Late Saxon period.

Alluvial sedimentation and peat formation has been demonstrated to have commenced in the Iron Age to Romano-British period at this site and continued into the Late Saxon period. The associated environmental record contributes significantly to our understanding of the transformation of the local landscape from the Early Iron Age to the Late Saxon period. In view of the recorded archaeology in the vicinity, and the major palaeoenvironmental sequences of prehistoric date at further down river at Westward Ho! (Balaam *et al.* 1987) it is perhaps surprising that no significant prehistoric sequences seem to be preserved here. However, this relates well with recent results from the Taw floodplain at the Downstream Bridge and western bypass (Allen *et al.* 2004; Wessex Archaeology 2003b), where the entire Holocene floodplain sediments are principally Romano-British and later and provides important new evidence for increased marine influence in the Late Saxon period.

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BIBLIOGRAPHY

Allen, M.J., Moore, C. and Scaife, R.G. 2004. The geoarchaeology of the alluvium in the Taw Valley west of Barnstaple, Devon, *Proc. Devon Archaeol. Soc* .**62**, 41-51

Balaam, N.D., Bell, M.G., David, A.E.U., Levitan, B., Macphail, R.I., Robinson, M. and Scaife, R.G. 1987. Prehistoric and Romano-British sites at Westward Ho!, Devon: archaeological and palaeo-environmental surveys 1983 and 1984. In Balaam, N.D., Levitan, B. and Straker, V. (eds.) *Studies in palaeoeconomy and environment in South West England*. BAR 181, 163-264, (Oxford).

Bell, M., Caseldine, A. and Neuman, H. 2000. Prehistoric Intertidal Archaeology in the Welsh Severn Estuary. CBA Research Report 120: CBA

Bennett, K.D., Whittington, G. and Edwards, K.J. 1994. Recent plant nomenclatural changes and pollen morphology in the British Isles. *Quaternary Newsletter* **73**, 1-6.

Bronk Ramsey C., 2001, Development of the Radiocarbon Program OxCal, *Radiocarbon*, **43** (2A) 355-363.

Butterfield, B.G. and Meylan, B.A. 1980. *Three-Dimensional Structure of Wood. An Ultrastructural Approach*. (London).

Findlay, D.C., Colbourne, G.J.N., Cope, D.W., Harrod, T.R., Hogan, D.V., and Staines, S.J. 1984. *Soils and their use in South West England.* Rothampsted: Soil Survey of England and Wales, Bulletin **14**.

Hartley, B. 1996. *An Atlas of British Diatoms.* Arranged by B. Hartley based on illustrations by H.G. Barber and J.R. Carter. Edited by P.A. Sims. (Dorchester).

Heyworth, A. and Kidson, C. 1982. Sea-level changes in southwest England and Wales. *Proceedings of the Geologists Association* **93**, 91-111.

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

Kidson, C. and Heyworth, A. 1973. The Flandrian sea-level rise in the Bristol Channel. *Proceedings of the Ussher Society* **2**, 93-167.

Lamplugh, L. 1983. *Barnstaple. Town on the Taw* Phillimore, Chichester

Leivers, M. 2007. Investigation of a Late Mesolithic site at Little Pill Farm, Sticklepath Hill, near Barnstaple. *Proc. Devon Archaeol. Soc* 65, xx-xx.

Miles, T. and Miles, H. 1975. Pilton North Devon Excavation within a medieval village in *Proceedings of the Devon Archaeological Society* **33**, 267-296

Moore, P.D. and Webb, J.A. 1978. *An Illustrated Guide to Pollen Analysis*.

(London).
Moore, P.D., Webb, J.A. and Collinson, M.E. 1991. *Pollen analysis.* Second edition. (Oxford).
Rippon, S. 1997. *The Severn Estuary: Landscape Evolution and Wetland Reclamation*. London: Leicester University Press
Schweingruber, F.H. 1990. *Microscopic Wood Anatomy*. Third Edition. Birmensdorf: Swiss Federal Institute for Forest, Snow and Landscape Research
Stace, C. 1997. *New flora of the British Isles*. (Cambridge).
Stuiver M., P.J. Reimer, E. Bard, J.W. Beck, G.S. Burr, K.A. Hughen, B. Kromer, G. McCormac, J. van der Plicht and M. Spurk 1998 INTCAL98 Radiocarbon Age Calibration, 24000-0 cal BP *Radiocarbon* **40**(3) 1041-1083
Thorn, C. and Thorn, F. 1965. *Domesday Book 9, Devon I & II,* Phillimore, Chichester
Wessex Archaeology 2003a. *Barnstaple Downstream Bridge and Western Bypass, Geoarchaeology of the Alluvium in the Taw Valley West of Barnstaple.* Unpublished Client Report for Chris Blandford Associates Report Ref. WA53746.01
Wessex Archaeology 2003b. *Barnstaple Downstream Bridge and Western Bypass Auger Survey.* Unpublished Client Report For Chris Blandford Associates. Report Ref. WA53746.01
Wessex Archaeology 2004. Barnstaple Western Bypass, Devon. Archaeological Evaluation Report. Unpublished client report prepared for Chris Blandford Associates on behalf of Devon County Council. Ref. No. WA54511.001.
Wessex Archaeology 2005. Barnstaple Western Bypass, Devon. Archaeological Excavation Assessment and Updated Archaeological Design. Unpublished client report prepared for Chris Blandford Associates on behalf of Devon County Council. Ref. No. WA56500.101.

APPENDIX 1: SEDIMENT DESCRIPTION

Trench 51 (NW end)
Monoliths <3603-3604> earlier palaeochannel section <3603> 0-1.12m, <3604> 1.12-2.44m below ground surface
0cm= 3.94m aOD

Depth(m)	*Pollen & diatom samples*	*Context*	*Description*	Unit
0-0.09		3001	10YR 3/3 dark brown crumbly organic clay loam, no inclusions, modern vegetation to the top. Diffuse boundary Alluvial soil A horizon	A
0.09-0.35		3002	10YR 4/2 dark greyish brown silty clay, increasingly organic and crumbly to the top of the unit. No defined structure evident in monolith but large columnar (prismatic) structure observed in the field. Numerous fine rootlets and macropores. Gradual boundary Alluvial soil B horizon	B
0.35-0.60		Base of 3002 3003 Top of 3004	0.35-0.42m As 0.47-0.60m, common macropores 0.42-0.47m As 0.47-0.60m but with increased Fe deposition, with common strong medium Fe mottles and nodules 0.47-0.60m 10YR 4/1 dark grey stiff grey silty clay, occasional strong fine Fe mottles. Fine rootlets to 0.53m. Gradual boundary Oxidised Alluvium	1
0.60-0.69	0.66m	Base of 3004	10YR 3/2 very dark greyish brown slightly organic silty clay, occasional fine Fe mottles (7.5YR 4/6 strong brown). Gradual boundary Organic alluvium	2a
0.69-0.79		Top of 3005	10YR 3/3 dark brown peaty silty clay, no inclusions. Gradual boundary Peaty alluvium	2b
0.79-1.62	0.82m 0.94m 1.10m 1.26m 1.42m 1.58m	3005	10YR 2/2 very dark brown moderately humified compact silty clay peat containing numerous discernible herbaceous plant fragments, including *Phragmites,* and fibres in horizontal layers, excellent preservation by waterlogging. Diffuse boundary Humified (fen) peat 56500 <3603-4> at 0.81m Sample of leaf fragments (Phragmites) dated to cal AD 880-990 (1117±25 BP, KIA-25384) 56500 <3603-4> at 1.61m Sample of stem and leaf fragments (Phragmites) dated to 900 cal BC-cal AD400 (~2200 ± 250 BP, KIA-25385)	2c
1.62-2.08	1.74m 1.90m 2.06m	3006	10YR 3/4 dark yellowish brown sticky fibrous peaty clay containing well preserved plant remains including *Phragmites.* Increasing organic content, decreasing minerogenic up the profile. Abrupt boundary Highly organic alluvium	2d
2.08-2.345	2.22m	3007 and 3014	10YR 4/1 dark grey silty clay including c.20% fine sand and rare fine sand, decreasing up the unit. Clear boundary. Three defined bands of Gley 1 4/1 N very dark grey hard, concreted fine sand slanting left to right at 2.13-2.14m, 2.18-2.19m and 2.19-2.20m, sharp boundaries with the intervening silty clay. Clear boundary Alluvium with periods of coarser input (flood/ higher energy events)	3
2.345-2.44	2.38m	3008 Natural	10YR 3/1 very dark grey, 70% coarse sand and gravel in silty clay matrix. Slightly fibrous, including occasional *Phragmites.* Fluvial sands and gravels with possible *in situ* organic/ peat accumulation 56500 <3603-4> at 2.37m Sample of herbaceous stem fragments (*Phragmites*) dated to 800-410 cal BC (2500±34 BP, KIA-25386)	4

Trench 51 (SE end)

Monoliths <3601-3602> later palaeochannel section

<3601> 0-1.12m, <3602> 1.60-2.42m below ground surface (gap between not sampled, coarse gravels represented in top of 3602 and base of 3601 Lower monolith from LHS palaeochannel section, below and just into cut of later channel cut). 0cm= 4.04m aOD

Depth(m)	*Pollen Samples*	*Context*	*Description*	Unit
0-0.12	None	3001	10YR 3/3 dark brown crumbly organic clay loam, common sub-angular gravel <0.5cm, modern vegetation to the top. Diffuse boundary Alluvial soil A horizon	A
0.12-0.31		3002	10YR 4/2 dark greyish brown silty clay, increasingly organic and crumbly to the top of the unit. No defined structure evident in monolith but large columnar structure observed in the field. Gradual boundary Alluvial soil B horizon	B
0.31-0.39			10YR 5/2 greyish brown smooth silty clay, common faint Fe mottles, no inclusions. As unit C3 but occasional macropores. Diffuse boundary Alluvium (likely overbank sedimentation)	C1
0.39-0.48		3003	10YR 4/6 dark yellowish brown, heavily Fe stained silt. No inclusions, faint horizontal bedding. Diffuse boundary Alluvium	C2
0.48-0.76		3011	10YR 5/2 greyish brown smooth silty clay, common faint Fe mottles, no inclusions. Clear boundary Alluvium	C3
0.76-0.92		3012	10YR 3/4 dark yellowish brown coarse clay silt, common fine medium Fe mottles. 2mm charcoal fragment at 0.77m, no other visible inclusions. Clear-diffuse boundary Alluvium	C4
0.92-1.10			0.92-0.97m 2.5Y 5/2 greyish brown clay silt with occasional strong medium Fe stains, c.10% sub-angular gravel <5mm. Darker organic silty clay horizontal band <5mm to base. Clear-abrupt boundary 0.97-1.01m 10YR 4/2 dark greyish brown silty sand. Clear boundary 1.01-1.04m 80% fine gravel (0.2-1cm) and coarse sand in silty clay matrix. Strong Fe staining forming unit colour of 10YR 4/6 dark yellowish brown 1.04-1.10m 10YR 4/2 dark greyish brown silty clay, common fine medium Fe and rare Mn mottling. Clear boundary Alluvium, alternating energy of flow	C5
1.10-1.785		3013	1.10-1.12m 10YR 5/4 yellowish brown 90% angular-rounded (the latter dominant) gravel, 2-30mm in coarse sandy silt matrix, common Fe staining increasing upwards. Abrupt (erosional) boundary 1.12-1.64m Not recovered, step in excavation of continued fluvial sands and gravels as above and below, 4cm also missing from top of <3602> 1.64-1.785m As 1.10-1.12m Fluvial sands and gravels forming lower fill of channel cut	C6
1.785-2.42		3017	Gley 1 4/1 10Y dark greenish grey gleyed, odourous smooth alluvium. Relatively fibrous and with numerous small plant remains including roots of relatively fresh appearance (recent or very good preservation?), common fine black organic matter and occasional lenses/ pockets of medium dark grey sand (2.5Y 4/1 dark grey) from 2.18-2.42m. 1 angular black flint max 30mm at 2.15m (not worked) Alluvium	3

Table 1. Summary of the Palaeochannel Sedimentary Units.

Depth(m)	*Summary Description*	Unit
0-0.09	Organic clay loam modern alluvial soil A horizon	A
0.09-0.35	Silty clay modern alluvial soil B horizon with large columnar (prismatic) structure	B
0.35-0.60	Grey silty clay oxidised alluvium with strong fine Fe mottles	1
0.60-0.69	Slightly organic silty clay alluvium	2a
0.69-0.79	Peaty silty clay alluvium	2b
0.79-1.62	Humified compact fibrous silty clay fen peat	2c
1.62-2.08	Sticky fibrous peaty clay alluvium with well-preserved plant remains including *Phragmites.* Increasing organic content up the profile.	2d
2.08-2.345	Silty clay alluvium with fine sand decreasing up the unit. Three defined bands of dark grey hard, concreted fine sand represent flood/ higher energy events	3
2.345-2.44	70% coarse fluvial sand and gravel in a silty clay matrix. Slightly fibrous, including occasional *Phragmites,* possible *in situ* organic/ peat accumulation	4

Table 2. Radiocarbon Determinations Tr51.

Sample no.	*Depth*	*Sediment unit*	*Context*	*Material*	*Result no*	*δC^{13} ‰*	*Result BP*	*Cal date*
mono 3603-4	0.81m	2c	3005	*Phragmites* leaf in top of humified peat	KIA-25384	-27.92 ± 0.16	1117±25	AD 880-990 (Late Saxon)
mono 3603-4	1.61m	2c	3005	*Phragmites* stem and leaf at base of humified peat	KIA-25385	Poor result due to decomposition	~2200 ± 250	900BC-AD400 (Iron Age-Romano-British)
mono 3603-4	2.37m	4	3008	*Phragmite*s stem top of incipient peat on sand/gravel	KIA-25386	-25.88 ± 0.13	2500±34	800-410 BC (Early Iron Age)

Atmospheric data from Stuiver *et al*. (1998); OxCal v3.9 Bronk Ramsey (2003); cub r:4 sd:12 prob usp[chron]

Table 3. List of diatom flora.

Achnanthes sp.
Amphora libyca
Diploneis interrupta
Caloneis silicula
Caloneis formosa
Gomphonema ?clavatum
Navicula peregrina
Navicula pusilla
Nitzschia sp./Hantzschia sp.
Nitzschia obtusa
Nitzschia navicularis
Paralia sulcata
Pinnularia viridus
Pinnularia major
Rhopalodia musculus
? Rhopalodia (gibberula)
cf. *Scoliopleura tumida*
Thalassiosira sp. (fragment only)

Table 4. Macrofossil remains.

Sample	***Sediment unit***	***Context***	***Sediment***	***Depth (m)***	***Vol. L.***	***Comments***
3613	2a	3005/ 3004	Alluvium/ peaty alluvium interface	0.64-0.70 m	10	*Alnus glutinosa* male catkin/anther material. Fine stem/root material possibly from modern vegetation. Many beetles.
3612	Top unit 2c	3005	Humified fen peat	0.79-0.92 m	10	Mainly stem/root. No seeds or other remains seen.
3609	2c	3005	Humified fen peat	0.97-1.03 m	10	Mainly stem/root. No seeds or other remains seen.
3608	2c	3005	Humified fen peat	1.30-1.41 m	10	Stem/root material. Worm cocoons. No charcoal seen.
3607	Base unit 2c	3005	Base of humified fen peat	1.52-1.62 m	10	Seeds of *Mentha* cf. *palustris* and *Scirpus/Eleocharis/ Isolepis*. Stem/rooty material. Some beetles and worm cocoons.
3606	2d	3006	Highly organic alluvium	1.62-2.08 m	10	Charcoal. Stem/root material (*Phragmites/Typha*?). Some beetles.
3605	3	3007	Alluvium with fine sand	2.08-2.345 m	10	Charcoal. *Chenopodium* sp. Stem/root material. Some beetles.

Table 5. Waterlogged wood identifications.

Sample no.	***Sediment***	***Sediment unit***	***Excavators description of sample***	***Identification***	***Comments***
3610	Fluvial sands and gravels	4	Small upright timber in base of trench 51. Probable *in situ* tree stump	*Alnus glutinosa* (alder)	Mature, distorted, possible drying since deposition
3611	Fluvial sands and gravels	4	Fairly large timber in natural. Probable *in situ* tree stump	*Quercus* sp. (oak)	Mature, heavily humified

Figure captions

1 Route location, evaluation trenches and advanced mitigation works. Location of other sites discussed in the text.

2 Trench location

3 General view of the palaeochannel section in trench 51

4 Section through Trench 51 showing Units 1-4 and the position of the various sampling points

5 Section through the channel deposits at sampling points 3604 and 3608

6a-b Pollen diagram

7 View of the hollow way with the Mesolithic site beyond

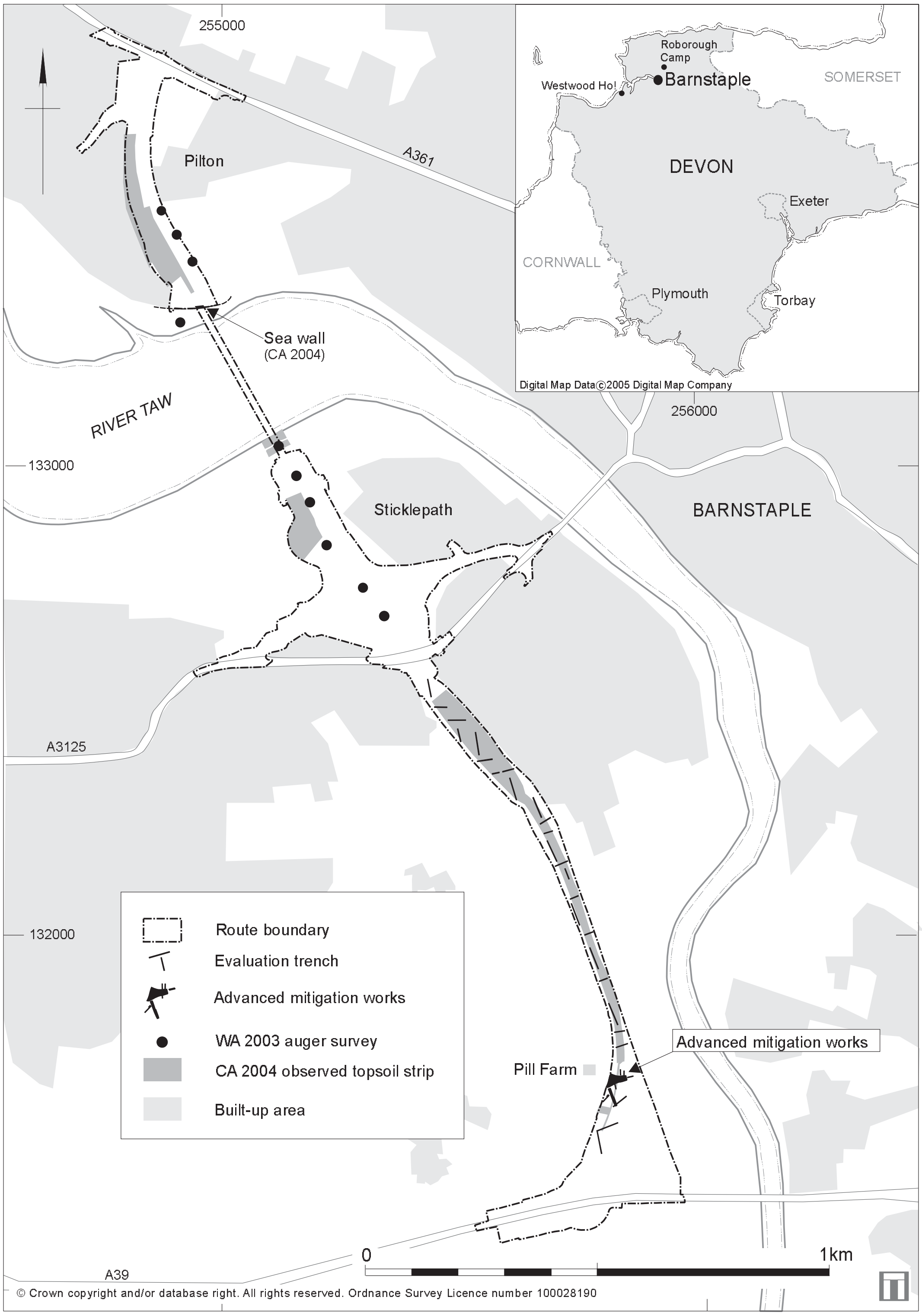
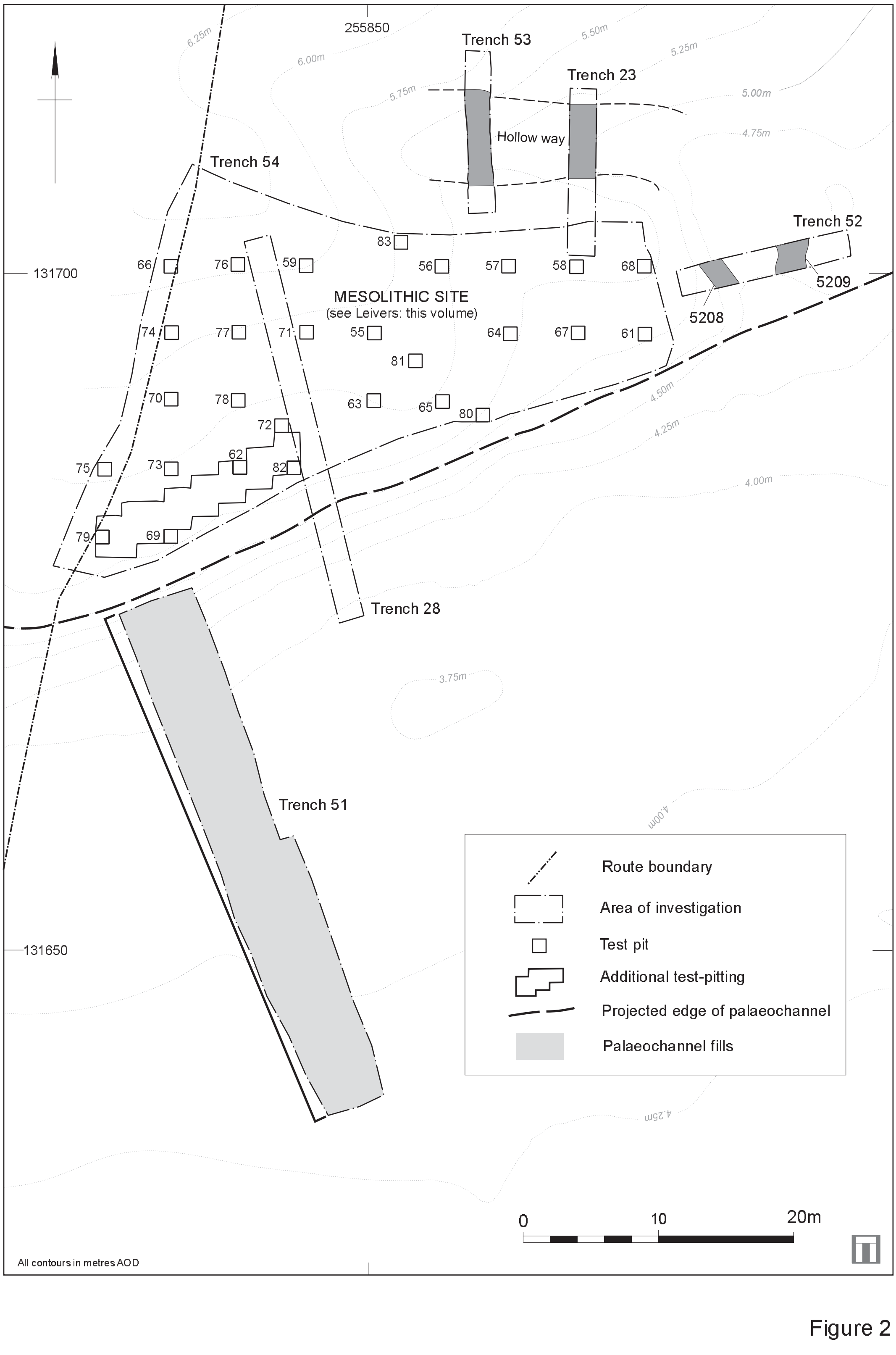

255000
A361
Pilton
Roborough Camp
Westwood Ho!
Barnstaple
SOMERSET
DEVON
Exeter
CORNWALL
Plymouth
Torbay
Digital Map Data © 2005 Digital Map Company
Sea wall
(CA 2004)
RIVER TAW
256000
133000
Sticklepath
BARNSTAPLE
A3125
132000
Route boundary
Evaluation trench
Advanced mitigation works
WA 2003 auger survey
CA 2004 observed topsoil strip
Built-up area
Advanced mitigation works
Pill Farm
0
1km
A39

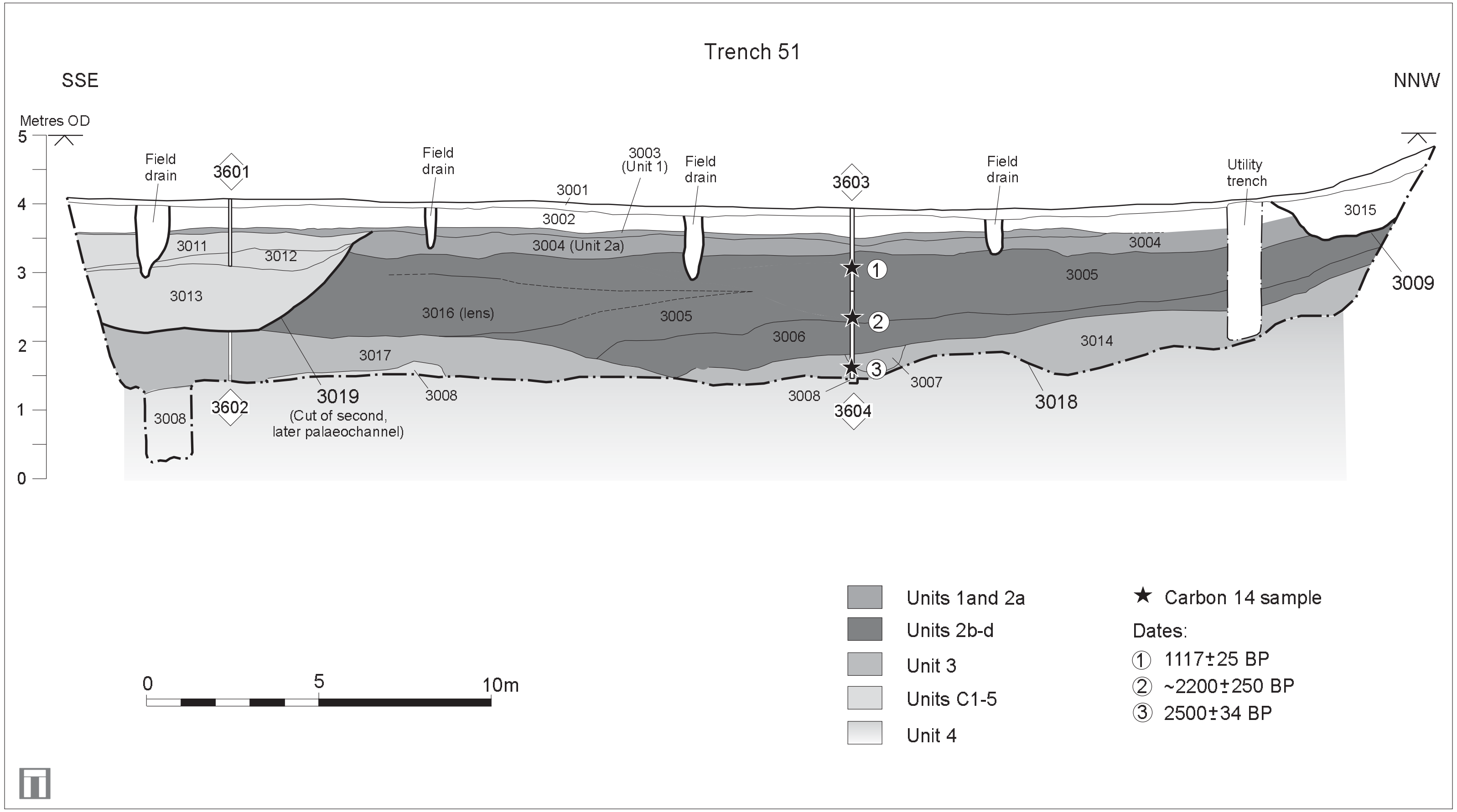
Figure 1



255850
6.25m
6.00m
5.75m
5.50m
5.25m
5.00m
4.75m
Trench 53
Trench 23
Hollow way
Trench 54
Trench 52
5208
5209
131700
MESOLITHIC SITE
(see Leivers: this volume)
66
76
59
83
56
57
58
68
74
77
71
55
64
67
61
81
70
78
63
65
80
72
62
82
75
73
79
69
4.50m
4.25m
4.00m
Trench 28
3.75m
Trench 51
4.00m
131650
4.25m
Route boundary
Area of investigation
Test pit
Additional test-pitting
Projected edge of palaeochannel
Palaeochannel fills
0
10
20m
All contours in metres AOD

Figure 2

Figure 1



Trench 51
SSE
NNW
Metres OD
5
4
3
2
1
0
Field drain
3601
Field drain
3001
3003 (Unit 1)
Field drain
3603
Field drain
Utility trench
3015
3002
3004 (Unit 2a)
3004
3011
3012
3013
3005
3009
3016 (lens)
3005
3006
3014
3017
3019 (Cut of second, later palaeochannel)
3008
3008
3007
3018
3008
3602
3604
Units 1and 2a
Units 2b-d
Unit 3
Units C1-5
Unit 4
★ Carbon 14 sample
Dates:
① 1117±25 BP
② ~2200±250 BP
③ 2500±34 BP
0
5
10m

Figure 4

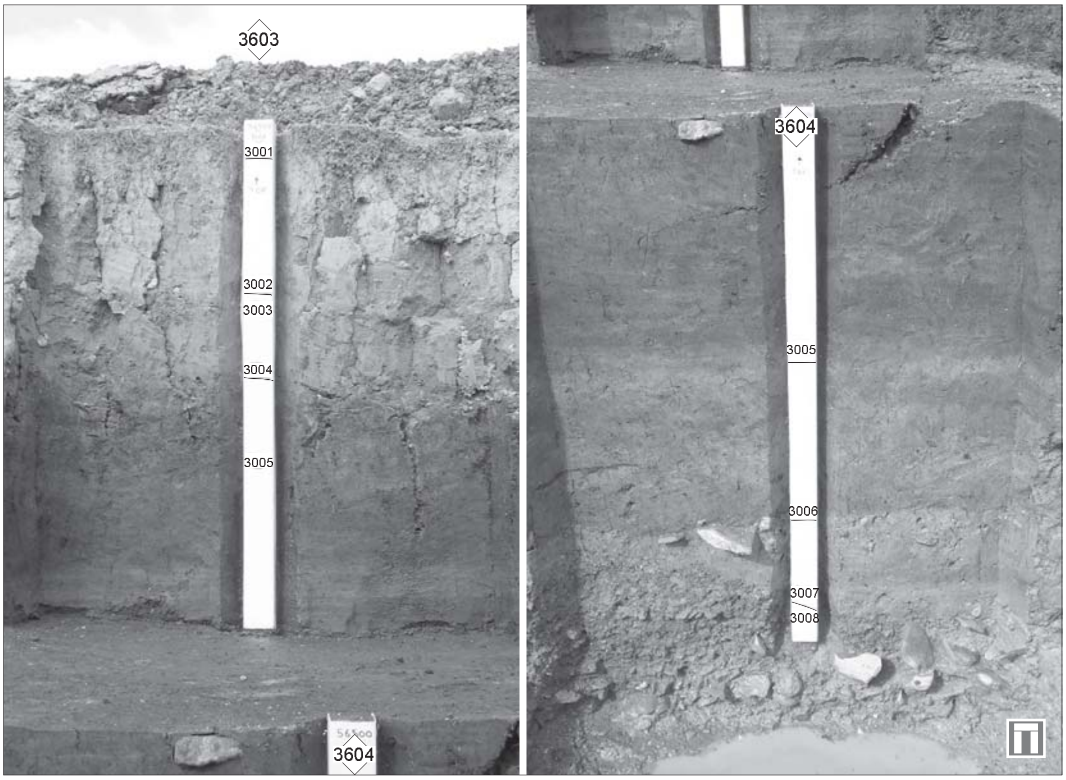


Figure 5

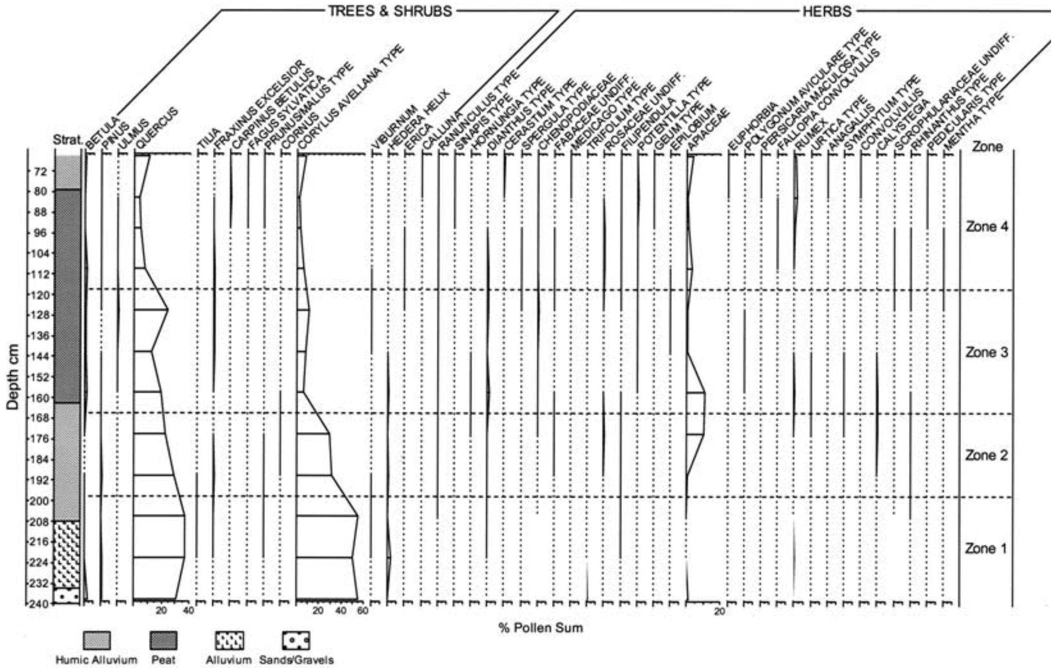

TREES & SHRUBS
HERBS
Strat.
BETULA
PINUS
ULMUS
QUERCUS
TILIA
FRAXINUS EXCELSIOR
CARPINUS BETULUS
FAGUS SYLVATICA
PRUNUS/MALUS TYPE
CORNUS
CORYLUS AVELLANA TYPE
VIBURNUM
HEDERA HELIX
ERICA
CALLUNA
RANUNCULUS TYPE
SINAPIS TYPE
HORNUNGIA TYPE
DIANTHUS TYPE
CERASTIUM TYPE
SPERGULA TYPE
CHENOPODIACEAE
FABACEAE UNDIFF.
MEDICAGO TYPE
TRIFOLIUM TYPE
ROSACEAE UNDIFF.
FILIPENDULA
POTENTILLA TYPE
GEUM TYPE
EPILOBIUM
APIACEAE
EUPHORBIA
POLYGONUM AVICULARE TYPE
PERSICARIA MACULOSA TYPE
FALLOPIA CONVOLVULUS
RUMEX
URTICA TYPE
ANAGALLIS
SYMPHYTUM TYPE
CONVOLVULUS
CALYSTEGIA
SCROPHULARIACEAE UNDIFF.
RHINANTHUS TYPE
PEDICULARIS TYPE
MENTHA TYPE
Zone
Zone 4
Zone 3
Zone 2
Zone 1
Depth cm
72
80
88
96
104
112
120
128
136
144
152
160
168
176
184
192
200
208
216
224
232
240
20
40
20
40
60
20
% Pollen Sum
Humic Alluvium
Peat
Alluvium
Sands/Gravels

Figure 6A

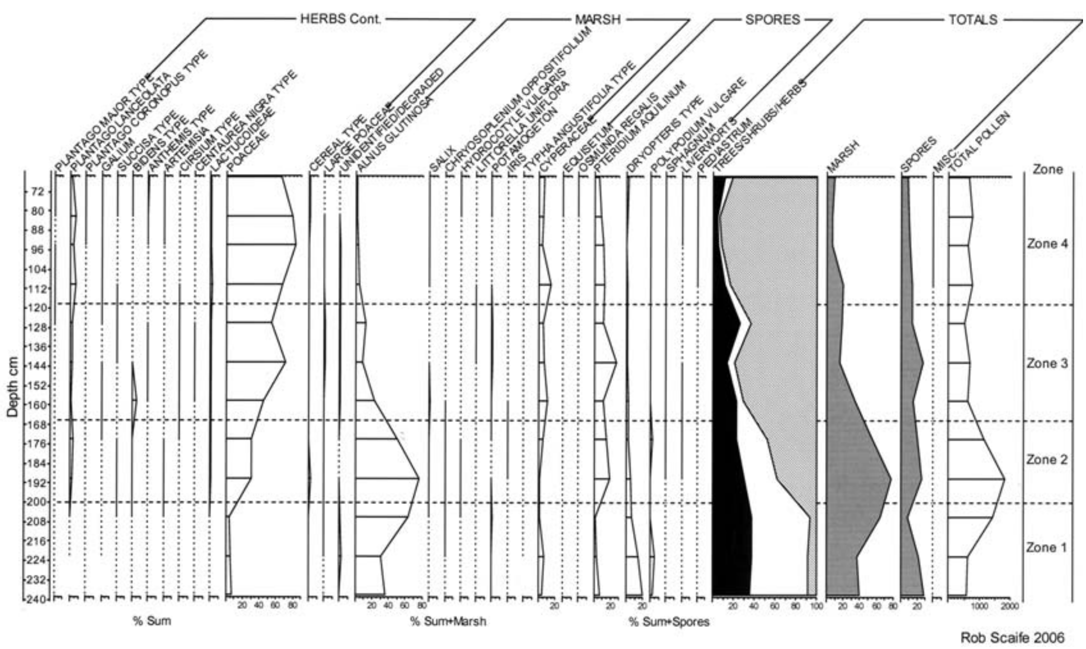
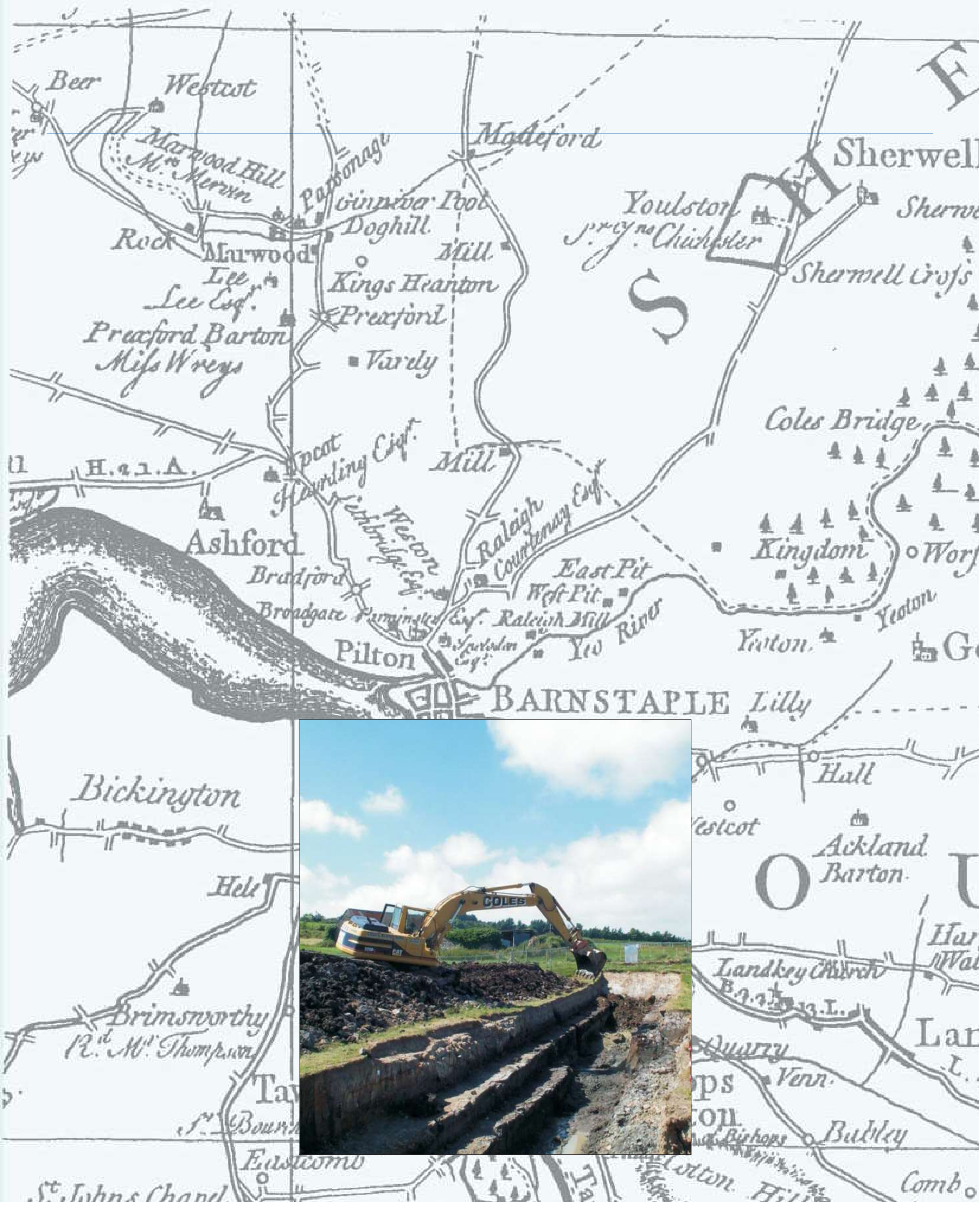

HERBS Cont.
MARSH
SPORES
TOTALS
PLANTAGO MAJOR TYPE
PLANTAGO LANCEOLATA
PLANTAGO CORONOPUS TYPE
GALIUM
SUCCISA TYPE
BIDENS TYPE
ANTHEMIS TYPE
ARTEMISIA
CIRSIUM TYPE
CENTAUREA NIGRA TYPE
LACTUCOIDEAE
POACEAE
CEREAL TYPE
LARGE POACEAE
UNIDENTIFIED/DEGRADED
ALNUS GLUTINOSA
SALIX
CHRYSOSPLENIUM OPPOSITIFOLIUM
HYDROCOTYLE VULGARIS
LITTORELLA UNIFLORA
POTAMOGETON
IRIS
TYPHA ANGUSTIFOLIA TYPE
CYPERACEAE
EQUISETUM
OSMUNDA REGALIS
PTERIDIUM AQUILINUM
DRYOPTERIS TYPE
POLYPODIUM VULGARE
SPHAGNUM
LIVERWORTS
PEDIASTRUM
TREES/SHRUBS/HERBS
MARSH
SPORES
MISC.
TOTAL POLLEN
Zone
Zone 4
Zone 3
Zone 2
Zone 1
Depth cm
% Sum
% Sum+Marsh
% Sum+Spores
Rob Scaife 2006

Figure 6B

Figure 7



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