# A280 Angmering By-pass West Sussex



# **Post Excavation Assessment**



12th February 2002

#### Client Name: West Sussex County Council

Issue N<sup>O</sup>: 1 OA Job N<sup>O</sup>: 1051 Planning Ref N<sup>O</sup>: A/58/94 and A/34/99 NGR: TQ 0763 0449

#### A280 ANGMERING BY-PASS, WEST SUSSEX

#### Post Excavation Assessment and Updated Project Design

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### A280 ANGMERING BY-PASS, WEST SUSSEX NGR TQ 079 041/045

# POST EXCAVATION ASSESSMENT AND UPDATED PROJECT DESIGN

#### SUMMARY

An evaluation by Oxford Archaeology (OA) in January 2001, of a 2.4 km single carriageway by-pass road around the village of Angmering, West Sussex, revealed evidence for Neolithic, Bronze Age and mid-late Saxon activity in the northern part of the route. A programme of excavation carried out over 9 weeks in July-September 2001 uncovered a mid-late Bronze Age enclosed settlement of a type well known on the South Downs but extremely rare on the coastal plan. Also present was a large ditch (2m deep x 4m wide) of similar date, perhaps forming part of a defensive earthwork. There was little evidence for Iron Age or Roman activity on the site. The Saxon features comprised parts of a large rectilinear ditched enclosure. A quantity of Neolithic flintwork suggests earlier activity at the site, although no pottery or features of this date were discovered. A geological investigation revealed significant potential for understanding the Pleistocene coastal topography in the central part of the by-pass route.

#### **1 INTRODUCTION**

This document forms a Post Excavation Assessment and Updated Project Design for archaeological investigations carried out by Oxford Archaeology (OA) on the site of Angmering by-pass, West Sussex. The document is in accordance with that prescribed by English Heritage MAP 2 (Section 6).

#### **1.1** Site Location (Fig. 1)

The two excavated sites were along the route of the projected by-pass, which lies to the east of Angmering, and comprises a single carriageway, 2.4 km in length, running north-south from the A259 Roundhouse Farm roundabout (TQ 0792 03472) to Manor Nursery (TQ 077 043) and thence to the existing A280 at Water Lane (TQ 0823 0516).

#### **1.2 Background to Project**

Between July and September 2001, Oxford Archaeology undertook a programme of archaeological investigation along two sections of the route of the A280 Angmering by-pass, on behalf of West Sussex County Council.

The excavations followed an initial archaeological and historical background survey, and a field evaluation carried out in January 2001, in order to review the

archaeological potential of the development area (OAU 2001). The evaluation consisted of a total of twenty five 50 m trenches, seven 30 m trenches, a single 10 m trench and a boxed out 8 m x 8 m area around the north of trench 18. There was also a watching brief on geotechnical test pits and boreholes and three purposive geological boreholes, to investigate palaeo-environmental deposits that lie at depth along part of the route of the new road (see Appendix 6). The results of this will be published in a separate report.

The results of the evaluation indicated that the course of the road to the south of Ecclesden Manor had low archaeological potential, whereas to the north up to the present A280 there was a much greater concentration of features, demonstrating the presence of Bronze Age and Saxon activity in the form of ditches.

The remains identified were of local and regional significance, and in accordance with the WSCC brief for the project, required excavation prior to the construction of the by-pass. On the basis of the evaluation, two areas to the north of Ecclestone Manor were therefore selected for open excavation, in order to elucidate the nature and function of the archaeological features (Fig. 1). Area 1 was approximately 40 m wide by 130 m in length, while Area 2 was 38 m wide x 80 m in length. The excavation Area 1 was centred on a potential Saxon enclosure. Just prior to main phase of excavation, a programme of 10 test pit investigations was initiated, for the recovery of flint artefacts that were likely to have been removed from their original contexts and incorporated into the topsoil and ploughsoil (see Appendix 2).

The areas of investigation were constrained by the presence of Foot and Mouth restrictions, which also ensured that direct access between the two sites was prohibited.

A Watching Brief will be undertaken, as the by-pass route is constructed.

#### **1.3** Geology and Topography

The surface geology of the route of the road comprises `head' deposits to the north, with alluvial deposits along the line of Major's Brook, and red-brown silty clay (`brickearth') deposits along the remainder of the route (see Appendix 6 for a fuller geological account of the area).

The route of the new road rises gently between Roundstone Farm Roundabout and Manor Nursery from 9 m to 15 m over a distance of 1100 m. Thereafter it crosses the western extent of Highdown Hill at around 18.5 m OD. The route then descends into a valley running north-east - south-west from Patching to Angmering; this valley becomes a feeder for the river Arun.

#### 1.4 Summary of archaeological and historical background

The general area of Angmering has seen occupation of all main periods, though previous find spots along the route of the new road have been restricted to the area of Ecclesden Manor. A major late Bronze Age - early Iron Age hillfort lies on Highdown Hill, c 1.5 km to the east of the excavation site. The site also had Roman activity from the 1st to 4th century, including a well-constructed bathhouse (Burstow and Wilson 1939), and an extensive 5th - early 7th century Anglo-Saxon cemetery (Welch 1976). A major Roman villa and detached bathhouse were partially excavated to the west at Angmering (Gilkes 1999), and a Roman road is thought to pass across the line of the new road scheme to the south of Ecclesden Manor. However, no evidence for this road was found during the evaluation of the route.

Angmering and Ecclesden were established before the Norman conquest and are mentioned in 9th century charters (Hill 1981 84). They were bequeathed to Osferth by the will of his uncle, King Alfred. By Domesday they had passed to Roger Montgomery, Earl of Shrewsbury and Arundel.

#### 2 ORIGINAL AIMS OF THE EXCAVATION PROJECT DESIGN

The original fieldwork aims of the project were to:

- 1. Determine the nature, function and character of the archaeological remains.
- 2. Establish the date, nature and extent of activity and occupation on the site.
- 3. To investigate any continuity of land-use between historical periods.
- 4. To investigate the relationship of the site with its contemporary landscape.
- 5. Examine structures (if any) within the site.
- 6. Recover artefacts to aid development of type-series within the region.
- 7. Recover palaeo-environmental remains to determine ground conditions.
- 8. Make a full graphic, photographic and written record of the excavation, accurately surveyed and located in three dimensions related to the Ordnance Survey National Grid and Ordnance Datum.
- 9. Communicate the results of the project to the Local Planning Authority by means of a post-excavation assessment and updated project design, and prepare a fully cross-referenced archive to be deposited with the finds at Littlehampton Museum upon completion of analysis and publication of the data.

#### **3 SUMMARY OF EXCAVATION RESULTS**

#### 3.1 Area 1 (South; Fig. 2 and Fig. 4)

#### Middle to Late Bronze Age

The only well-dated feature from the Bronze Age is the large ditch (Group 5210) running east-west across the south of the site. This does not appear to have any associated features with it, and can be assumed to be a significant boundary ditch, probably of late Bronze Age (LBA) date. A similar sized ditch (4 m wide and 2 m deep) is known from the site of the Roundstone pub (John Mills, pers com). Of

the three slots put through it, 5058 appears to have silted up from the south, thus suggesting that any bank would have been to the south. The other two slots 5131 and 5196 have been recorded as silting up from the north. This would possibly indicate a bank on either side, and although feasible, it is suggested that the bank is to the south. Both 5196 and 5131 have deposits of stones against their northern edges. This could represent heavier material moving to the front of any slippage from the bank, and so suggests a bank to the south. The stones may represent ploughed material from the south and, so equally, may suggest the absence of a southern ditch. The density of the stones against the northern edge of the ditch would support the argument for a southerly bank. Section 5058 is the only part of the ditch to show indications of a possible recut (5063), although this may actually represent a period of stabilisation. In either case, a fire pit (5064) was dug within the ditch at this stage.

A series of post holes which appear to form a circular structure to the west of the site may also be dated to the Mid to Late Bronze Age on the basis of pottery finds from one of them (5274). These may well form an animal enclosure or similar structure. Two of the post holes are cut by a pit (5235) which contained late Bronze Age pottery.

On the basis of pottery spot dating, other potential Bronze Age features from Area 1 comprise a number of dispersed and isolated post holes and pits (5268, 5172, 5011), part of an east-west gully (5128), and possibly two sections of a V-shaped ditch (5265, 5136) forming part of an enclosure in the north of the site. However, the dating of these two sections is based upon just eight sherds of middle to late Bronze Age pottery, and so it must remain uncertain.

#### Iron Age

The only evidence for Iron Age activity on the site is an unusual La Tène I brooch recovered from an upper fill of the Bronze Age ditch 5210 (see Appendix 3.2).

#### Roman

Very few sherds of identifiable Roman pottery came from Area 1, and these were confined to the plough-disturbed top layer (5022) of the Saxon ditch 5125 to the north, thus indicating minimal activity during this period. A small amount of clearly residual Roman tile was also found (se Appendix 3.3).

#### Saxon

The well-dated Saxon features are the north-south ditch group 5174 and the east west ditch group 5125. These would appear to meet just to the east of the site and form an enclosure. No Saxon structures were seen so it may be assumed that if any are present they are to the west of the site. Although it appears that the Saxon enclosure truncates the field system ditches, not all the relationships are clear. Group 5269 appears to respect the Saxon enclosure and may well be

contemporary, although it contained no datable pottery. Together with other ditches to the south (5184, 5262, 5238), it could have formed part of an enclosed Saxon field system, although not all the ditches are likely to have been contemporary.

Where the ditches have a relationship with the Bronze Age ditch (group 5210), they appear to cut through it's uppermost fills. This would indicate a long period between the initial excavation of both sets of features, consistent with a Saxon date for the later ditches.

There are several pits and post holes (5024, 5270, 5041, 5096, 5082), mostly within the enclosure, that contained pottery dated to the mid and late Saxon periods. One of the pits outside the enclosure (5096) contained a sheep skeleton, although this may be more recent, as the bone was fairly well preserved (see Appendix 5).

#### *Medieval/post medieval*

There are no certain medieval or post medieval features from Area 1, although pottery and tile from these periods were recovered from some mixed deposits. A north south aligned ditch (group 5263), to the far west of the site was easily seen with a dark fill, and had well preserved bone and fragments of brick retrieved from the top of the upper fill. Late Saxon and medieval pottery was also recovered, and as there were no obviously modern finds from within the fill, it could well be assigned to the medieval period. A single fragment of medieval pottery was the only datable find from East-West ditch group 5266, but if this does indicate the date of the feature - which is highly speculative - it could be related to the north-south ditch 5263 to form part of an enclosed field system.

Other possible medieval or post-medieval features comprise three pits (5166, 5177, 5306).

#### 3.2 Area 2 (North; Fig. 3 and Fig. 5)

#### Middle/Late Bronze Age

This area was the main focus for middle Bronze Age (MBA) or middle/late Bronze Age transition (MBA/LBA) activity. Two sets of ditches were seen. The ditch groups 4527, 4673 and 4670 formed a MBA/LBA enclosure to the south. These enclosed more than ten post holes with no obvious pattern, and no datable pottery. Many artefacts were retrieved from the north-eastern section of group 4527 and southern section of group 4673. This would suggest an entrance to the probable internal structure at this point.

Groups 4539 and the western part of 4673 formed an enclosure to the north, and may be of LBA date, indicating a possible shift in activity. Very few finds were retrieved from these fills. There are eight post holes/pits within the enclosure, which may form the central support for a structure, but no obvious pattern has emerged. It may have been a structure for animals or activities producing little waste or material which survives in the archaeological record. Three of them (4674, 4581, 4557) produced pottery of middle/late Bronze Age date. A shallow pit (4680) of unknown function from the same area also produced Bronze Age pottery.

These two ditched enclosures were probably parts of a small farmstead, which may have shifted slightly over time. Aligned north-south to the south of the enclosures is ditch group 4513. This does have more recent pottery sherds (Roman) in the upper fill, but they are very small and abraded, and their presence may be the result of roots and worm action contaminating the ditch with artefacts from post-medieval pit 4540. Middle/late Bronze Age sherds were found in one of the lower fills. The shape of the ditch and the difficulty in seeing it in plan suggests it may also be related to the enclosures.

A MBA urn (4508), originally thought to have contained a cremation, lay to the north-east of the enclosures, although subsequent analysis did not find any traces of burnt bone. A pit full of burnt flint (4545) was to the south of the enclosures, while further south was part of a small shallow ditch (4602) containing late Bronze Age pottery. The east of the site was nearly devoid of features with the exception of a series of small post holes, of which at least one (4636) is Bronze Age in date.

#### Medieval/post medieval

A pit (4540) was cut through the southern terminus of ditch group 4513, this contained glazed medieval or post medieval pottery. A ditch (4566) and three pits were excavated in the north-east corner of site, one of which (4574) contained medieval pottery. Tile and bone were also retrieved, and they may have been cut through the subsoil. It is thought that they may have been Medieval/post-medieval marling pits.

#### 4 QUANTIFICATION OF EVIDENCE

#### 4.1 Quantification of excavation records (Areas 1 & 2 and Test Pits)

Record Type	Quantity
Context sheets	568
Site plans (A1)	16
Site plans (A4)	5
Sections (A1)	1
Sections (A4)	175
Levels sheets	8
Small Finds sheets	1
Bulk Finds sheets	17
Environmental sample sheets	13

B&W films	16
Colour slide films	16

#### 4.2 Quantification of finds & environmental evidence (Areas 1 & 2 and Test Pits)

Material	Quantity
Pottery	<i>c</i> 1600 sherds (12,333 g)
CBM	76 (2195g)
Clay Pipe	3
Copper alloy	1
Iron	4
Worked Flint	2198
Burnt unworked flint	2731 (48,991g)
Stone	34 (5563g)
Animal bone	145 (657g)
Slag	14 (52g)
Environmental Samples	88

#### 5 ANALYTICAL POTENTIAL OF THE EVIDENCE

#### 5.1 The stratigraphic record

#### 5.1.1 Work to date as part of current assessment

A digital context database has been created, and general matrices produced for areas 1 and 2, although the lack of many inter-cutting features resulted in these being very shallow. Matrices have also been produced for all sub-groups (i.e. ditch/gully features). The matrices have been phased using pottery spot dates. Digital plans have been produced.

#### 5.1.2 Analytical potential

In general, the stratigraphic integrity of the site was high, with archaeological remains surviving directly beneath the topsoil at a depth between 0.25 m and 0.4 m below existing ground level. The majority of features and deposits were lightly affected by ploughing, but nearly all remains earlier than post medieval date survived with minimal truncation. Some difficulties arose in trying to determine the exact dimensions of the cut features, as there was often little differentiation with the brickearth natural. This also resulted in some unclear relationships between features (see below).

A system of ditches and gullies ran through sites 1 and 2, ranging in date from middle Bronze Age to late Saxon, with some probable medieval features. A

number of these features inter-cut, although due to the nature of the brickearth natural, the relationships between them were not always that clear.

The majority of features, including pits and post-holes, were not stratigraphically related, and therefore can only be assigned a phase on the basis of datable pottery and observed spatial relationships.

Nevertheless, despite this paucity of stratigraphically related features and the limited area of excavation, the data does have potential to address some of the project aims expressed in section 2. Specifically, it should be possible to establish the chronology and nature of occupation to a certain degree (1, 2, 5), and therefore to investigate the relationship of the site with its contemporary landscape (4)

A summary of the archaeological description is in section 3.

#### 5.1.3 Recommendations

A full archaeological description should be generated, and publication standard plans and sections produced, based upon chronological information from the pottery spot dates.

#### **5.2** Summary of Finds Assessments (Full reports in Appendices)

#### 5.2.1 Pottery

#### 5.2.1.1 Summary of results

The pottery assemblage from the Angmering by-pass excavations comprises c 1600 sherds weighing just over 12 kgs. Amongst it there are significant feature assemblages belonging to three broad chronological groups:

- Middle Bronze Age (*c* 1500-1200 BC) and/or transitional Middle Bronze Age/Late Bronze Age (*c* 1200 BC;
- Late Bronze Age (*c* 1100-900 BC);
- Middle Saxon (prior to 900 AD) and/or Late Saxon (*c* 1000 AD).

Roman, medieval and post medieval material is present in insignificant quantities. Sherds belonging to both of the Bronze Age groups occur in both areas of the site but the Bronze Age assemblage from Area 1 appears to be dominated by material belonging to the LBA (pit 5011 and ditch 5210), whereas the Bronze Age assemblage from Area 2 includes significant finds belonging both to the MBA or MBA/LBA transition (pit 4589 and ditches 4527, 4670 and, probably, 4673) and the LBA (ditch 4539). During the LBA site activity involving pottery deposition shifted north from a primary enclosure in Area 2 comprising ditches 4527, 4670 and, possibly, 4673 into a secondary enclosure comprising ditches 4539 and 4673. It also moved into Area 1 for the first time. The bulk of the Saxon material is from Area 1 (pit 5041, gully 5238, and, possibly, ditches 5125 and 5174).

#### 5.2.1.2 Potential

The pottery has the following key areas of potential, relating to different chronological periods:

• Middle Bronze Age or transitional Middle Bronze Age/Late Bronze Age

Angmering is a very rare MBA settlement site in that it lies on the Coastal Plain and had both settlement and 'funerary' (see Appendix 1) type contexts. It therefore provides a unique opportunity to examine the nature and extent of pottery using activity on the Coastal Plain and to compare it with that of the Downs.

• Late Bronze Age

The relatively small LBA assemblage is quite possibly close in date to its predecessor (see Appendix 1) and its immediate context relationships are more extensive than those most frequently associated with LBA assemblages. It may, therefore, offer some new insights into the nature of contemporary settlement form and development.

• Saxon

As a dot on a distribution map, any new Sussex assemblage of this date is important, but owing to its small size, its imprecise date, and lack of internal associations, the present assemblage lacks potential for further detailed research. However, by comparing hand samples of Angmering fabrics to fabrics from better dated assemblages such as those from Chichester and Steyning its dating may be improved.

#### 5.2.1.3 Recommendations

The fabric will have to be quantified and analysed, and stratigraphic analysis of pottery contexts undertaken. The catalogue needs to be prepared, and drawing briefs written for the illustrations (c 20 pots). Finally, the results and discussion will need to be prepared for publication.

#### 5.2.2 Flint

#### 5.2.2.1 Summary of results

The test pits/evaluation trenches and excavation produced a combined total of 2198 worked flints, recovered from 203 individual contexts. A further 2795 pieces of burnt unworked flint weighing 49.9 kg was also retrieved. The largest quantity of both worked and burnt unworked material was recovered in the course of the excavation, which produced 58.1% of the struck component and 78.4% of the burnt unworked flint. In varying quantities, the material represents human occupation from the Mesolithic to late Bronze Age period. A single possible Palaeolithic artefact was recovered from Area 1 of the excavation, which may

indicate earlier activity. The flint work from the test pits formed a relatively lowdensity scatter across the site, with few distinct concentrations. Neolithic and Bronze Age material provided the majority of the diagnostic component, although a smaller quantity of possible Mesolithic flint work was also present. The assemblage from the excavation differed in that the overwhelming majority of the flint work was of a mid or late Bronze date, which occurred as a general spread punctuated by discrete concentrations perhaps resulting from episodes of knapping activity. This material was combined with a sizeable Mesolithic and Neolithic component, the distribution of which appears to have been more diffuse.

#### 5.2.2.2 Potential

The potential of the worked flint assemblage can be divided chronologically.

- *Neolithic* Evidence for Neolithic occupation on the Sussex coastal plain is limited, and thus the Angmering assemblage can thus help in our understanding of the type and scale of such activity. A distribution analysis of the flint work would aid in the identification of possible foci of Neolithic activity at the site.
- *Bronze Age* The later Bronze Age assemblage constitutes the largest quantity of material from the site. These assemblages were retrieved from the later Bronze Age ditches and gully, and contained both evidence of knapping and domestic activity. A refitting and technological analysis performed on the material from these features may be valuable in clarifying patterns of deposition. In combination with this, an analysis of the spatial distribution of all later Bronze Age flint work has potential to enable a more detailed description of the patterning of activity. As later Bronze Age settlement on the Sussex coastal plain is unusual, there is potential to compare the Angmering material with assemblages recovered from other coastal plain sites such as Highdown Hill, Rustington, Yapton and Westhampnett. Comparisons with the Downland enclosed settlements would enable the site to be placed in its regional context, and allow the relationships between place, settlement type and activity to be examined.

#### 5.2.2.3 Recommendations

Distribution analysis is needed of Neolithic and Bronze Age flint work and burnt unworked flint, along with refitting and technological analysis of flints from certain features. A report should be produced, discussing the Bronze Age assemblage with reference to other sites in the region.

#### 5.2.3 Other Finds

*Worked Stone* - Three items of worked stone were recovered from the excavations. A spherical object, probably a sling shot, came from a Saxon context, while a complete saddle quern, and a small fragment either from another

saddle quern or a rubber, came from Bronze Age contexts. The complete saddle quern was of Greensand, probably Lodsworth, and was removed from the upper fill of a ditch (4685). The item had a well worn grinding surface and showed signs of polish, the result of extensive use. The second item also showed signs of polish on it's grinding surface.

No further work is recommended except for basic publication editing and illustration of the saddle quern.

*CBM* - A total of 76 fragments of ceramic building material weighing 2,195g was recovered from the excavations. The assemblage comprises mostly small abraded fragments of tile, the majority of which are classified as miscellaneous as they have no measurable thickness. The larger fragments include Roman floor tile fragments and later medieval/post medieval fragments of roofing material.

There are no recommendations for further work

*Metal Objects* - A small assemblage of metalwork was recovered from the excavations. The assemblage comprises one copper alloy and four iron objects. A fragment from a copper alloy brooch was recovered from a shallow upper fill of a large Late Bronze Age ditch (5210). This type of brooch (La Tène I) dates to the 4th-3rd centuries BC and is mainly a Celtic European type, uncommon in Britain. It is the only Iron Age object recovered from the site. The iron objects are all undiagnostic; they include nails, sheet fragments and a perforated strip.

It is recommended that the brooch has a further x-ray taken to check that there is no decoration present on the front of the bow. It should be illustrated and examined by a specialist.

#### 5.2.4 Environmental

Charred grain was noted in 19 samples, always in low numbers. Cereal remains noted were of *Hordeum vulgare* (barley) or *Triticum* sp. (wheat). Both samples producing *T. dicoccum* were Bronze Age, while the free-threshing wheat was recovered from a Late Saxon deposit. Chaff was present in only one sample and weeds in 6 samples. Charcoal was noted in 60 samples. There was no relationship between feature type and charred seeds or chaff. It is likely that the seeds and chaff represent no more than background scatters of remains of cereal processing or preparation which have become incorporated in the backfill of features. There is limited evidence for different cereal producing activities in the different periods, although it does appear that emmer wheat was being utilized in the Bronze Age and free-threshing wheat in the Saxon period. Barley is present in all periods. Much of the charcoal is likely to have been from similar secondary deposits, with the exception of the four richer deposits all of which appear to contain only oak.

No further work is necessary, although it is recommended that the assessment results are included in the final report.

#### 5.2.5 Animal Bone

A total of 145 fragments (626g) of animal bone was retrieved from the excavations, some of which was re-assembled, reducing the fragment count to 129. With the exception of a single sheep jaw bone from an unstratified deposit, the bone came from two contexts. The majority came from context 5097, a pit containing part of an adult sheep skeleton. The surviving elements included most of the vertebrae, rib cage, and most of the long bones from the left side of the body. It is possible that the body was lain on it's left side and that most of the right side of the body was lost due to plough damage. In the same context were the remains of a juvenile sheep thought to belong to a single individual. Elements included part of the pelvis, the scapula and both tibia and humerus bones. The remaining bone from the site came from Saxon enclosure ditch 5006 and comprised three teeth from a horse. The teeth were in very poor condition.

The small number of fragments from the site and the poor condition of those bones recovered limits interpretation of the diet of the inhabitants and animal husbandry regimes, particularly since the dating for the sheep skeleton is not secure.

It is not recommended that further work be done on this assemblage.

#### 5.3 Assessment of potential for radiocarbon dating

The small amount of animal bone from the excavations was recovered from unstratified or probable mixed later Saxon/medieval contexts and so has no potential for radiocarbon dating. However, there are a number of middle/late Bronze Age contexts with non-oak charcoal and cereal grains which do have potential for such dating, and two samples will be selected (contexts 4500 and 5067). This will be of particular help in refining the chronology of middle to later Bronze Age transition in the two areas of excavation.

#### 5.4 Assessment of potential for popular presentation

The finds assemblage is almost exclusively made up of pottery and flintwork, with only limited potential for display to a non-specialist audience. These artefact types are well-represented in local museums and, in the absence of any complete or near-complete vessels, are unlikely to be considered for display. The only significant metal find is a La Tène brooch, which is incomplete.

Presentation of the stratigraphic data by means of reconstruction artwork or experimental reconstruction is limited by the lack of well-defined structural remains, although it could be attempted for the Bronze Age settlement. However, this sort of reconstruction would only be justifiable as part of a wider interpretation of the Bronze Age landscape of West Sussex, and any such reconstruction would be expected to draw on the better preserved sites such as the nearby Highdown Hill, which is of national importance. The potential for public presentation (as well as research potential) of the by-pass site could be enhanced by future fieldwork designed to establish the extent of the Bronze Age and Saxon ditched enclosures by means of geophysical survey and/or limited trenching. The large, possibly defensive, Bronze Age ditch in Area 1 is particularly interesting in this respect and is likely to be detected by geophysical survey where the less substantial features would not. With agreement of the landowner this project could become a target for a university or local research excavation.

The site also has some of the essential ingredients for a television archaeological programme of the Timeteam format: Highdown Hill provides a ready-made archaeological 'story' with visually impressive earthworks and artefacts, while the by-pass site provides guaranteed new evidence in a completely predictable location.

In conclusion the site in isolation has very limited potential for popular presentation. However, the interest would be substantially enhanced if the data were to be presented as part of a wider popular interpretation, focussing on Highdown Hill, for example. The greatest interest is likely to come from local groups and it is recommended that any presentation should focus on museum display and articles in the local press.

Potential Interest Groups	Possible presentation media	Potential level of interest in the site in isolation	Potential level of interest in the site as part of a a wider interpretation project
Regional population	Local newspapers Leaflet/ Booklet Local TV news Museum display	Moderate	High
Regional schools	Education pack Museum display	Low	Moderate
University archaeology depts. Schools nationally	University, EH, local authority or privately funded research/ training excavation	Low	Moderate
Local/ national media audiences	Local/ national television and radio	Low	Moderate

#### 5.5 Summary of Geological investigation (Appendix 6)

#### 5.5.1 Summary of results

A programme of Quaternary geological fieldwork, comprising a watching brief on geotechnical test pits and boreholes and three purposive geological boreholes, was carried out in order to investigate the Pleistocene coastal topography in the central part of the route and possible Pleistocene/ Holocene valley sediments in the northern part of the route. The Pleistocene results revealed marine sediments in the southern part of the by-pass route, with the presence of molluscs in some sequences, offering the potential for obtaining amino acid ratios as well as

biostratigraphic data. The only test pit to produce potentially significant Holocene deposits was TP312, located to the south of the A280 Water Lane, in a valley bottom area adjacent to a small stream. A thick sequence of probable Holocene sediments was identified in the valley bottom, interpreted as representing former floodplain environments including marshland, channel cut-offs and floodplain surfaces.

In the light of these results a purposive trench was commissioned by West Sussex County Council on the site of TP312, as part of the by-pass environmental mitigation. This failed to encounter the organic horizon seen in the test pit and it is concluded that the discreet pockets of peat were a localised phenomenon.

#### 5.5.2 Potential

The Angmering by-pass geological investigation, in conjunction with work in adjacent areas such as the Angmering Housing Development, has the potential to resolve some of the complex stratigraphic relationships between Pleistocene marine sedimentary sequences on the lower coastal plain of West Sussex.

#### 5.2.3 Recommendations

It is recommended that detailed lithostratigraphic description of the deposit sequences is carried out, followed by comparison and correlation with other potentially related sequences on the West Sussex Coastal Plain. Analysis of palaeoenvironmental and biostratigraphic indicators and scientific dating of the key deposits by means of OSL and Amino acid ratios are required to assist in the interpretation and correlation of the sequences.

#### **6 OVERALL STATEMENT OF POTENTIAL**

The original fieldwork aims of the project have been set out in section 2. An assessment of the stratigraphy and finds (section 5 and appendices) includes statements of potential for answering these aims. An overall statement of potential will now be presented, firstly measuring the results against the original project aims, and then against the national, regional and local research context. This is with a view to presenting revised research aims and objectives for the project in section 7.

#### 6.1 **Results measured against the original project aims**

The majority of the original fieldwork aims of the project were able to be fulfilled to some degree, despite the limited areas of excavation. The general character of the remains was determined, and the main chronological phases established, which enabled the site to be placed within its contemporary landscape. The exact form of the settlement in any of the phases was difficult to establish in detail and no definite structures could be located. As one of the principal artefact classes to be recovered from the site, the pottery assemblage can aid in the development of the type-series within the region. This is especially so with the middle Bronze Age material which was more plentiful. The only other category of find recovered in a significant and meaningful quantity was worked flint. Neither the charred plant or animal bone assessments produced significant results.

#### 6.2 The local, regional and national research context

#### 6.2.1 The national research context

English Heritage has provided a number of recent statements concerned with potential research frameworks for archaeological studies. These include the draft *Research Agenda* for consultation (EH 1997, hereafter *Agenda*) and *Exploring our Past 1998* (1998, hereafter *EOP 98*). These have identified the following broad research priorities which the data from the Angmering by-pass site has the potential to address:

- Processes of change Communal monuments into settlement and field landscapes (c 2000 300 BC) (Agenda PC3, 44); Empire into Kingdom (c 200-700 AD) (Agenda PC5, 44).
- Late Bronze Age and Iron Age landscapes (*Agenda* P7, 47; *EOP* 98, 1.7)
- Settlement hierarchies and inter-action (*Agenda* T1, 51)

#### 6.2.2 Local and regional research context

The OA excavations at Angmering by-pass uncovered features from two main chronological periods - middle/late Bronze Age and mid to late Saxon. There is a dearth of evidence for settlements of these periods on the Sussex Coastal Plain, and therefore the data has high potential for helping to address some key research issues. In addition to the features of this period, there is evidence for Neolithic activity in the form of worked flint, although any possible foci must await distribution analysis. Neolithic flintwork assemblages are known from the Sussex Coastal Plain (e.g. Chidham; Bedwin 1980), and are thought to represent possible seasonable exploitation of a marsh and woodland resource by settled farming communities living on the South Downs (Bedwin 1983, 32).

The comparative lack of any Roman material is perhaps unusual in this area, where many villas and other settlement sites have been located (Rudling 1998).

#### Bronze Age Settlement on the Sussex coastal plain

Until quite recently, evidence of actual middle to late Bronze Age settlement on the Sussex Coastal Plain was almost non-existent (Bedwin 1983 34). Activity from this period was confined in the most part to chance finds of metalwork and pottery, including a looped Palstave from Brookside Avenue, Rustington, and a small late Bronze Age hoard from Ferring (Rudling 1990 18). The striking

exception to this was the late Bronze Age high status enclosed settlement on Highdown Hill near to Angmering, although this was on an isolated chalk hill top, and Bedwin considered it to be part of the Downland settlement pattern (Bedwin 1983 34). Nevertheless, it was clear to him that the surrounding coastal plain must have been settled during this period, and more recent archaeological discoveries have confirmed this. Excavations between 1986 and 1988 at Rustington revealed a LBA settlement site with evidence for structures (Rudling 1990), while other settlements have been located at Yapton (Rudling 1987) and Westhampnett (Fitzpatrick 1998 12). However, such sites are still rare compared to the Downland region, where there are many enclosed settlements such as Chanctonbury, Ditchling and Harrow Hill (Hamilton and Manley 1997 96). The site at Angmering by-pass is more unusual in that it appears to have been an enclosed settlement of a type found on the Downs, but very rarely on the Coastal Plain. It is unfortunate that the course of the significant east-west boundary ditch in Area 1 could not be traced further, as this could have provided vital information on the overall spatial layout of the settlement. This ditch seems to have been LBA in date, but there is also a significant MBA pottery assemblage from the site, being concentrated for the most part in Area 2. This is highly significant, given that the known settlement sites of this period are geographically restricted to the chalk Downs (see Appendix 1).

#### Anglo-Saxon settlement

Evidence for Anglo-Saxon settlement on the West Sussex Coastal Plain in very limited, although stray finds have been discovered, and a small 5th - 7th century cemetery excavated at the Westhampnett by-pass (Fitzpatrick 1997 293). A possible Anglo-Saxon settlement has also recently been excavated by Wessex Archaeology at Westhampnett in 2001, with evidence for two sunken floored buildings. This site also contained Bronze Age cremations and trackways.

The nearest early Anglo-Saxon site to the Angmering by-pass is the rich inhumation and cremation cemetery on Highdown Hill, dating to the 5th - early 7th century. This is very likely to have had an associated settlement - as was the case with Bishopstone in East Sussex (Bell 1979) - and it has been suggested that the remains of wooden buildings found nearby in 1939 were of Anglo-Saxon date, an argument strengthened by a quantity of pottery from that period found in the vicinity (Bell 1978 66). The ditches at Angmering by-pass would seem to belong to a period after the Anglo-Saxon cemetery, in the 9th and early 10th centuries. Evidence from charters indicate that Angmering and Ecclesden were established at this time, and according to an 8th century charter, a monastery was founded at Ferring, immediately south of Highdown Hill (Welch 1983, 271). However, in spite of such documentary evidence for mid-late Saxon period settlement in this area, there is very little corroborating archaeological evidence, and therefore despite the relatively limited quantity of material of this date, the Angmering by-pass excavations are of particular significance.

#### 7. REVISED AIMS AND OBJECTIVES

The excavations at Angmering by-pass revealed a multi-period settlement site of particular intrinsic research value. It's significance lies primarily in the chronology and geography of occupation, as in both the mid-late Bronze Age and mid-late Saxon period, there is a dearth of settlement evidence from the Sussex Coastal Plain. The following revised research aims and objectives reflect this situation, and are based upon the current assessment of the excavation data.

#### 1. Neolithic

• *The nature of site activity:* Can analysis of the distribution of Neolithic flintwork shed light on the nature and extent of activity on or near the site?

#### 2. Middle Bronze Age and Late Bronze Age

- *Settlement form and development:* Is the activity in Areas 1 and 2 representative of single contemporary settlement, or one which was accretional or shifting?
- *The nature of site activity:* Can the overall material culture assemblage and its patterns of deposition shed light onto the exact nature of occupation at the site?
- *Site in the landscape:* How does the chronology and form of the settlement compare with contemporary sites on the Downs and Coastal Plain?
- *The nature of the material culture assemblage*: How far is the material culture assemblage and its associated patterns reflective of wider patterns in the region?
- *Continuity of occupation:* How far does the form and nature of the settlement and it's material culture indicate continuity of occupation from the MBA to LBA?
- 3. Saxon
  - *Site in the landscape:* How does the form and nature of occupation relate to other known contemporary sites in the Downs and the Coastal Plain?

#### 8. METHOD STATEMENT

The following methods are required to fulfil the revised research aims outlined in section 7 above.

#### 8.1 Stratigraphy

- 1. Generate full archaeological description
- 2. Produce phased publication plans and sections, based upon chronological information from the pottery spot dates.

#### 8.2 Finds

#### 8.2.1 Pottery

- 1. Fabric analysis and quantification.
- 2. Stratigraphic analysis of pottery contexts.
- 3. Examine assemblage alongside contemporary local assemblages.
- 4. Produce drawing briefs for c 20 pots with pictorial and textual layout and check resultant illustrations.
- 5. Finalise text for publication with results/discussion of foregoing analyses.

#### 8.2.2 Flint

- 1. Conduct distribution analysis of Neolithic and Bronze Age flint work and burnt unworked flint.
- 2. Number flints for refitting and technological analysis.
- 3. Undertake refitting and technological analysis of 302 flints from features 4520, 5014, 5058/5063 and 5128.
- 4. Produce discussion of Bronze Age assemblage with reference to other sites in the region.

#### 8.2.3 Worked Stone

- 1. Undertake basic editing for publication.
- 2. Produce and check illustration of saddle quern.

#### 8.2.4 Other finds

- 1. Undertake basic editing for publication.
- 2. Report upon and illustrate Iron Age brooch.

#### 8.3 Faunal and Environmental

#### 8.3.1 Carbonised plant remains

1. Undertake basic editing for publication.

#### 8.3.2 Animal bones

1. Undertake basic editing for publication.

#### 8.4 Synoptic overview for publication

- 1. Produce overall discussion of site evidence, in accordance with the research aims outlined in section 7.
- 2. Produce comparative analysis of site in its local and regional setting.

#### 8.5 Geotechnical and Geoarchaeological borehole analysis and report

- 1. Produce description of geotechnical borehole and test pit and purposive geoarchaeological boreholes (CAP).
- 2. Cut Core samples from geoarchaeological boreholes, clean, describe and subsample.
- 3. Sieve bulk samples for molluscs (MRB).
- 4. Conduct assessment of Formanifera/ostracoda.
- 5. Conduct assessment of molluscs.
- 6. Obtain 2 OSL dates and 3 Amino Acid Ratios.
- 7. Preparation of publication report figures.
- 8. Preparation of text for publication.

#### 8.6. Health and Safety statement

All OA post-excavation work will be carried out under relevant Health and Safety legislation, including the Health and Safety at Work Act (1974). A copy of the OA Health and Safety Policy can be supplied. The nature of the work means that the requirements of the following legislation are particularly relevant:

Workplace (Health, Safety and Welfare) Regulations 1992 - offices and finds processing areas

Manual Handling Operations Regulations (1992) - transport: bulk finds & samples

Health and Safety (Display Screen Equipment) Regulations (1992) - use of computers for word-processing and database work

COSSH (1988) - finds conservation and environmental processing/analysis

### 9. PUBLICATION SYNOPSIS

It is anticipated that the report be included in the Sussex Archaeological Collections (SAC).

# EXCAVATIONS AT ANGMERING BY-PASS: A BRONZE AGE AND SAXON SETTLEMENT ON THE WEST SUSSEX COASTAL PLAIN

SUMMARY	c 200 words
INTRODUCTION	c 700 words
Site location and project background	
Geology, geography and topography	
Archaeological background	
Excavation methodology	
ARCHAEOLOGICAL DESCRIPTION	c 1600 words
Area 1	
Bronze Age	
Saxon	
Medieval - post medieval	
Area 2	
Bronze Age	
Saxon	
Medieval - post medieval	
FINDS	
Pottery	c 3000 words
Flint	c 1800 words
Other finds (including La Tène I brooch)	c 350 words
ENVIRONMENTAL	
Charred plant remains	c 350 words
Animal bone	c 250 words
GENERAL DISCUSSION	c 750 words
THE SITE IN IT'S LOCAL AND REGIONAL CONTEXT	c 1000 words

TOTAL: c 10,000 words

#### **Illustrations:\***

Figure 1: Site Location
Figure 2: Site 1
Figure 3: Site 2
Figure 4: Phased features in site 1
Figure 5: Phase features in site 2
Figure 6: Sections
Figure 7: Pottery illustration
Figure 6: Distribution of worked flint
Figure 8: Small finds (Quernstone and Iron Age Brooch)

\* The illustrations (Fig.1-5) produced for the current assessment can be adapted with minimal effort for use in the final published report.

#### 10. PROGRAMMING AND RESOURCES

#### 10.1 Personnel

10.2 Task Lists

10.2.1: Task list for production of archaeological report for SAC

10.2.2: Task list for Geotechnical and Geoarchaeological borehole analysis and report

#### 10.3 Costings

10.3.1: Costings for production of archaeological report for SAC

10.3.2: Costings for Geotechnical and Geoarchaeological borehole analysis and report

#### **11. BIBLIOGRAPHY**

- Bedwin, O 1980 Neolithic and Iron Age material from a coastal site at Chidham, West Sussex, 1978, *Sussex Archaeological Collections* 118, 163-70
- Bedwin, O 1983 The development of prehistoric settlement on the West Sussex Coastal Plain, *Sussex Archaeological Collections* 121, 31-44
- Bell, M 1977 Excavations at Bishopstone, Sussex Archaeological Collections 115
- Bell, M 1978 Saxon Sussex in P Drewitt (ed.) Archaeology in Sussex to AD 1500, CBA Res. Rep. 29, 64-69
- Burstow, G P and Wilson, A E 1939 A Roman Bath, Highdown Hill, *Sussex Archaeological Collections* 80, 62-87
- English Heritage, 1991, Management of Archaeological Projects (2nd ed.), English Heritage
- English Heritage, 1997. Research Agenda (draft), English Heritage
- English Heritage, 1998. Exploring our Past 1998 Implementation Plan, English Heritage
- Fitzpatrick, A P 1997 Archaeological excavations on the route of the A27 Westhampnett by-pass, West Sussex, vol.2 The cemeteries. Wessex Arch Rep. 12, Salisbury
- Gilkes, O 1999 The bathhouse of Angmering Roman villa, *Sussex Archaeological Collections* 137, 59-69
- Hamilton, S and Manley, J 1997 Prominent enclosures in 1st Millenium BC Sussex, Sussex Archaeological Collections 135, 93-112
- Hill, D 1981 An Atlas of Anglo-Saxon England 700-1066, Blackwells, Oxford
- OAU 2001 A280 Angmering by-pass, Angmering, West Sussex: Interim Archaeological eval. rep. OAU
- Rudling, D 1987 The excavation of a late Bronze Age site at Yapton, West Sussex, 1984, Sussex Archaeological Collections 125, 51-68
- Rudling, D 1990 Archaeological Finds at Rustington, West Sussex, 1986-8, Sussex Archaeological Collections 128, 1-19
- Rudling, D 1998 The development of Roman villa in Sussex, *Sussex Archaeological Collections* 136, 41-65
- Welch, M G 1976 *Highdown and its Anglo-Saxon cemetery*, Worthing Museum and Art Gallery Pub. 11
- Welch, M G 1983 Early Anglo-Saxon Sussex, British Archaeological Rep. 112, Oxford

#### APPENDICES

#### **APPENDIX 1: POTTERY**

#### By Sue Hamilton and Mike Seagar-Thomas

#### 1. Introduction

The pottery assemblage from the Angmering by-pass excavations comprises *c* 1600 sherds weighing just over 12 kgs. Amongst it there are significant feature assemblages belonging to three broad chronological groups: firstly, Middle Bronze Age (*c* 1500-1200 BC) (*hereafter* MBA) and/or transitional Middle Bronze Age/Late Bronze Age (*c* 1200 BC) (*hereafter* MBA/LBA), secondly, Late Bronze Age (*c* 1100-900 BC) (*hereafter* LBA), and, thirdly, Middle Saxon (prior to 900 AD) (*hereafter* MS) and/or Late Saxon (*c* 1000 AD) (*hereafter* LS). Roman, medieval and post medieval material is present in insignificant quantities.

#### 2. Typological Context

#### 2.1 Middle Bronze Age or transitional Middle Bronze Age/Late Bronze Age pottery

The MBA or transitional MBA/LBA pottery from Angmering comprises primarily types belonging to the Deverel-Rimbury (hereafter DR) pottery tradition. The exact chronology of the Angmering assemblage is uncertain. The types present would be consistent with a MBA occupation of the site, but the co-occurrence of MBA and later types and fabrics in individual features (notably ditch 4673) suggests that they may comprise a transitional group. Most typical of the DR tradition in Sussex are sherds from two large, straightsided bucket urns from ditch 4673 (fill 4683), one with an applied, finger-tip impressed cordon and one with a simple finger-tip impressed cordon, a bossed jar from pit 4589 (fill 4588), a barrel-shaped jar from ditch 4527 (fill 4685), and two large, slightly should ered urns, one with a finger-tip impressed shoulder angle from ditches 4673 (fill 4500) and 4670 (fill 4668). All of these pots are tempered with coarse burnt flint. Both the pot types and the fabrics are paralleled in MBA assemblages from the nearby site of Roundstone Lane, Angmering (Archaeology South-East's ANG 01) (Seager Thomas and Hamilton 2001), Steyning Round Hill (Burstow 1958), New Barn Down (Curwen 1934) and Varley Halls, Brighton (Hamilton 1997a), and typologically none need be later than the MBA proper. Radiocarbon-dated associations for similar pots elsewhere would place them between c 1500 and 1150 Cal BC (Needham 1996; Hamilton 1997a). Assuming that no later mixing has taken place, however, the aforementioned (LBA) associations suggest a date towards the end of this period. A new addition to the corpus of Sussex DR pottery are coarseware sherds from a convex jar with a tool impressed rim from ditch 4527 (fills 4531).

#### 2.2 Late Bronze Age pottery

The LBA material from Angmering belongs to the post Deverel-Rimbury (*hereafter* PDR) pottery tradition. The range of PDR pot sizes and fabric types is wider than that of

site's DR pottery but comprises a small selection only of the known PDR repertoire. Most typical of Sussex PDR pottery traditions are the slightly out-turned rim of a bipartite bowl from ditch 5210 (fill 5208), the rim of a ?hemispherical bowl from ditch 4539 (fill 4561) (both finewares), and three body sherds from different coarse and intermediate ware shouldered jars from ditch 5210 (fills 1537-1539). Ditch 5210 (fill 5138) also yielded a fragment of heavily-gritted base. All of these are tempered with burnt flint. Both pot types and fabrics are broadly paralleled in LBA assemblages from Ford (which yielded a fabric identical to that of the shouldered jar from fill 5139) (Hamilton 2001), Yapton (Hamilton 1987; 1993), Selsey (Seager Thomas 2001) and Knapp Farm, Bosham (Hamilton 1997b), all, like Angmering itself, situated on the Coastal Plain. A PDR type which is uncommon in Sussex is a fineware handle from ditch 4673. Parallels occur in an unpublished LBA assemblage from Downsview, north of Brighton (Hamilton forthcoming a), but they are both better and more frequent in assemblages from outside the county such as those from St Mary's Hospital, Carshalton (Adkins and Needham 1985), and Runnymede Bridge (Needham and Spence 1996). The assemblage as a whole is undecorated, suggesting an earlier rather than later LBA date for it. This is consistent with the evidence for a transitional MBA/LBA occupation of the site. Radiocarbon dated associations place undecorated PDR assemblages between c 1150 and 850 Cal BC (Barrett 1980; Hamilton forthcoming c; Needham 1996).

#### 2.3 Roman pottery

There are no feature sherds in Roman fabrics and it is impossible to place the Roman occupation of the site precisely.

#### 2.4 Later Saxon pottery

The dating of later Saxon pottery in Sussex is imprecise. The Angmering assemblage is distinguished primarily by three distinct fabrics associated with later Saxon settlement elsewhere in the county. These incorporate crushed, unburnt flint, chalk, and coarse coloured quartz sand. A few sherds incorporating finer quartz sand are likely to be of the same date but the overlap between them and earlier (Roman) and later (medieval) fabrics is too pronounced for featureless sherds in them to be chronologically useful. In total the site yielded four Saxon feature sherds. Two everted rims from ditch 5125 (fill 5108), one in a flint-tempered and one in a sandy fabric, are roughly paralleled in the Middle Saxon (hereafter MS) assemblage from Selsey (White 1934) and may belong to this period. The other two, both widely flared necks, are later. They come from ditches 5174 (fill 5007) (quartz sand-tempered) and 5238 (fill 5323) (flint and ?chalk-tempered) and are paralleled in Sussex Late Saxon (hereafter LS) assemblages from Botolphs (Gardiner 1990), Chichester (Down 1981), Steyning (Gardiner 1993), and Old Erringham (Holden 1980). Fabric dating is much more difficult. On site the flint-tempered and coarse quartz sand-tempered fabrics which comprise the principal evidence for a Saxon assemblage at Angmering are associated with both MS and LS types (in ditches 5125 and 5238) and elsewhere they span the later Saxon/Saxo-Norman period (Gardiner 1990). Chalktempered fabrics, which in Sussex are restricted to LS assemblages (Gardiner 1990; 1993) occur in ditch 5262 only.

#### 2.5 Later pottery

The site yielded a few later, mostly sand-tempered sherds. These occurred in ones and twos only and were mostly abraded making precise dating impossible. A single green-glazed sherd from fill 4062, however, resembles West Sussex ware dateable to the 14 century and there are some internally and externally glazed post medieval sherds.

#### 3. Spot dating

The spot dating of the pottery from Angmering is presented below (Table 1). Owing to the small numbers of sherds comprising many context groups exact dating of individual features is problematic. Terminus post quem dates are based upon the assessment of individual context assemblages and their immediate stratigraphic relationships. Where a range of possible dates is suggested for the most recent find within an assemblage, the earliest possible date for the context is given. Individually few of these can be relied upon as guides either to the date of the assemblages or the features which yielded them. Collectively, however, they give a fair indication of the chronology of activity in different areas of the site. Feature dates based on large individual context assemblages or combinations of smaller, related context assemblages are more reliable. Owing to uncertainties regarding the associations and longevity of some of the fabrics represented (see above) the absolute date range given is sometimes broad. This applies in particular to those attributed to the later Bronze Age (undifferentiated MBA or transitional MBA/LBA and LBA) and later Saxon (undifferentiated MS and LS) periods. Detailed fabric analysis and fabric contextualization will be required if the exact extent and dating of these are to be resolved. For the present, however, the authors feel – intuitively – that most of the material described below as later BA should be assigned to the earliest occupation of the site (i.e. MBA or transitional MBA/LBA), and that most of the material described below as later S should be assigned to the LS period.

Table 1. Spot dating of pottery from AT485 (Key: MBA = Middle Bronze Age; MBA/LBA = transitional Middle Bronze Age/Late Bronze Age; later BA = later Bronze Age (undifferentiated Middle Bronze Age or transitional Middle Bronze Age/Late Bronze Age and Late Bronze Age); LBA = Late Bronze Age; MS = Middle Saxon; LS = Late Saxon; later S (undifferentiated Middle and Late Saxon); E MED = Early Medieval; MED = medieval; P MED = post medieval; MOD = modern).

Fill	Cut	Feature	Dating evidence			Context TPQ	Feature date
			Fabric	Qty	Typology		
TEST P	ITS	1					
4010			Medieval sandy	1		MED	
4013			Later BA coarse flint	1		Later BA	
4021			Medieval grog and sand	1		MED	
4022			Post medieval	1		P MED	
4023			LBA intermediate flint	1		LBA	

Fill	Cut	Feature	Dating evidence	Context TPQ	Feature date	
4030		LBA intermediate flint Modern	2		MOD	
4031		?Later Saxon sandy	1		?LS	
4033		LBA-type fine flint	1		LBA	
4034		LBA-type fine flint ?Later Saxon sandy	2		?LS	
4035		LBA intermediate flint	2		LBA	
4042		Medieval sandy (?West Sussex ware)	1		MED	
4044		LBA intermediate flint	1		LBA	
4051		Late Saxon or Early medieval shelly ?Later Saxon sandy Medieval sandy Modern	4		MOD	
4053		LBA intermediate flint	4		LBA	
4070		Medieval sandy Modern	3		MOD	
4071		?Medieval intermediate flint Modern	2		MOD	
4072		LBA intermediate flint Undated fine sandy Late Saxon or Early medieval shelly Medieval sandy	13		MED	
4073		LBA intermediate flint ?Later Saxon sandy	8		?LS	
4074		LBA intermediate flint	8		LBA	
4080		Modern	1		MOD	
4081		Later BA intermediate flint LBA intermediate flint	10		LBA	
4082		Late Saxon intermediate flint	5		LS	
4090		Modern	1		MOD	
4100		?Later Saxon sandy	2		?LS	
4102		Late Saxon intermediate flint	2		LS	

AREA	1						
5003	5011		Later BA intermediate flint LBA intermediate flint LBA fine flint	55		LBA	LBA
5004	5006		LBA-type fine flint Late Saxon intermediate flint ?Later Saxon sandy	3		?LS	
5005	5006		Medieval sandy	2		MED	
5007	5006	5174	Late Saxon or Early medieval sandy	1	Flared neck with externally expanded rim	LS	
5016	5014		Later BA intermediate flint	4		Later BA	
5018	5017	5125	LBA intermediate flint Later Saxon intermediate flint ?Later Saxon sandy	15	?MS Everted rim ?MS Everted rim	?MS	
5019	5017	5125	LBA intermediate flint Later Saxon intermediate flint	15		Later S	
5022	5104		LBA intermediate flint Roman Later Saxon intermediate flint ?Later Saxon sandy	28		Later S	
5023	5024		Later Saxon intermediate flint	3		Later S	

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Fill	Cut	Feature	Dating evidence			Context TPQ	Feature date
5029	5027	5210	LBA intermediate flint	2		LBA	
5031	5030		Later Saxon intermediate flint ?Later Saxon sandy	2		Later S	
5032	5030		Later Saxon intermediate flint	2		Later S	
5033		5030	LBA intermediate flint Later Saxon intermediate flint	4	Base sherd	Later S	
5040	5041		Late Saxon intermediate flint	9		LS	LS
	5041		LBA fine flint	5		LS ( <i>see</i> above)	LS
5043	5042	5125	Later Saxon intermediate flint ?Later Saxon sandy	4		LS	
5061	5058	5210	Later BA coarse flint	8		Later BA	
5062	5058	5210	Later BA intermediate flint	6		Later BA	
5067	5063	?5210	MBA coarse flint	14		Later BA (above 5062)	
5068	5063/5 068	?5210	Later BA intermediate flint	2		Later BA	
5072	5069		Late Saxon intermediate flint	5		LS	
5073	5069		Medieval sandy	2		MED	
5079	5078		LBA intermediate flint	1		LBA	
	5082		LBA intermediate flint ?Later Saxon sandy	2		?LS	
5083	5082		LBA intermediate flint	1		?LS ( <i>see</i> above)	
5097	5096		Late Saxon chalk	1		LS	
5100	5098		Late Saxon intermediate flint	1		LS	
5103	5101		Later Saxon intermediate flint ?Later Saxon sandy	4		Later S	
5105	5104	5125	LBA intermediate flint Later Saxon intermediate flint Undated fine sandy	15		Later S	
5109	5110		Medieval sandy	1		MED	
5112	5111		LBA intermediate flint Medieval sandy	7		MED	
	5115		LBA intermediate flint	1		LBA	
	5128		LBA intermediate flint	1		LBA	
5133	5132		LBA intermediate flint ?Early medieval sand and flint	3		?E MED	
5137	5131	5210	LBA intermediate flint LBA fine flint	7	Shoulder of PDR shouldered jar	LBA	LBA
5138	5131	5210	LBA coarse flint LBA intermediate flint	36	Shoulder of PDR shouldered jar Heavily-gritted base	LBA	LBA
5139	5131	5210	LBA intermediate flint	33	Shoulder of PDR shouldered jar	LBA	LBA
5140	5131	5210	LBA fine flint LBA intermediate flint	4		I D A	I D A
5140		5210	LBA fine flint			LBA	LBA
5157	5156		Later Saxon intermediate flint	2		Later S	
5167	5166		Medieval sandy	2		MED	
5173	5127		Later BA intermediate flint	2		Later BA	
5178	5177		LBA intermediate flint Medieval sandy	4		MED	

Fill Cut Featu		Feature	Dating	Context TPQ	Feature date		
5188	5190	5238	LBA or Early medieval intermediate flint Late Saxon intermediate flint Late Saxon or medieval sandy	3		LS	LS
5192	5191	5174	LBA intermediate flint Later Saxon intermediate flint ?Later Saxon sandy	3		?LS	?LS
5193	5191	5174	Chaff Late Saxon intermediate flint ?Later Saxon sandy	18		LS	?LS
5195	5191	5174	Late Saxon intermediate flint ?Later Saxon sandy	3		LS	?LS
5208	5196	5210	Later BA coarse flint LBA intermediate flint	2	Rim of PDR bi-partite bowl	LBA	LBA
5209	5196	5210	LBA intermediate flint	14		LBA	LBA
5216	5215		?Later Saxon sandy	2		?LS	
5236	5235		LBA intermediate flint	1		LBA	
5246	5244		LBA intermediate flint ?Later Saxon sandy Medieval grog and sandy	3		MED	
5253	5252		Later Saxon intermediate flint	1	Flared rim	Later S	
5267	5268		LBA intermediate flint	1		LBA	
5271	5271		LBA intermediate flint Later Saxon intermediate flint	3		Later S	
5275	5274		LBA intermediate flint	1		LBA	
5295	5294		LBA intermediate flint	2		LBA	
5297	5268		Later BA coarse flint Later BA intermediate coarse flint	2		Later BA	
5301	5366		Later Saxon intermediate flint Medieval sandy	3		MED	
5305			Later Saxon intermediate flint	2		Later S	
5307	5306		Medieval sandy	3		MED	
5308	5306		Later Saxon intermediate flint	3		Later S	
5315	5165		LBA intermediate flint	2		LBA	
5318		5174	LBA intermediate flint Later Saxon intermediate flint	9		Later S	?LS
5322		5262	Late Saxon chalk Mid or Late Saxon or medieval sandy	15		LS	LS
5323		5238	LBA intermediate flint Late Saxon intermediate flint and decalcified ?chalk	4	Very flared neck of large jar	LS	LS

AREA	2						
4500	4520	4673	MBA coarse flint	270	Rim of DR bucket urn	MBA and	MBA and
			Later BA intermediate flint			LBA or	LBA or
			LBA-type fine flint			MBA/LBA	MBA/LBA
4501	4520	4673	Later BA intermediate flint	36		MBA and	MBA and
			EBA or LBA-type grogged			LBA or	LBA or
						MBA/LBA	MBA/LBA
4503	4520	4673	Later BA intermediate flint	2		MBA or	MBA or
						MBA/LBA	MBA/LBA
4508	4509		Later BA intermediate flint	70		MBA or	MBA or
						MBA/LBA	MBA/LBA
4510	4512	4673	Later Saxon intermediate flint	1		Later S	

Fill	Cut	Feature	Datin	ng evideno	ce	Context TPQ LBA	Feature date
4515	4514	4513	Later BA intermediate flint LBA intermediate flint	3			Post-Roman
4517	4516	4513	Later BA intermediate flint Roman (1 sherd only)	32		Roman	Post-Roman
4528	4529	4527	Later BA intermediate flint	2		MBA or MBA/LBA	MBA or MBA/LBA
4531	4530	4527	Later BA intermediate flint	9	DR convex jar with tool- impressed rim	MBA or MBA/LBA	MBA or MBA/LBA
4541	4540		Medieval sandy	1		MED	
4542	4540		Medieval sandy Post medieval	2		P MED	
	4548	4673	Later BA coarse flint LBA-type fine flint	41	Base of large jar Handle of probable PDR jar	MBA and LBA or MBA/LBA	MBA and LBA or MBA/LBA
4559	4557		Later BA intermediate flint	2		Later BA	
4561	4560	4539	LBA intermediate flint	2	Rim of PDR ?hemispherical bowl	LBA	LBA
4562	4560	4539	Later BA intermediate flint	5		LBA (above 4561)	LBA
4576	4574		Medieval sandy	1		MED	
4582	4581		LBA intermediate sandy	5		LBA	
4588	4589		MBA coarse flint Later BA intermediate flint	100	DR bossed-jar	MBA or MBA/LBA	MBA or MBA/LBA
4599	4598	4513	Later BA intermediate flint	7		Later BA	
4603	4602		LBA intermediate flint	2		LBA	
4625	4624	4513	LBA intermediate flint Medieval sandy	3		MED	Post-Roman
4637	4636		Later BA intermediate flint	2		Later BA	
4651	4650	4539	LBA intermediate flint	2		LBA	LBA
4660	4661		Later BA intermediate flint ?LBA-type fine flint	6	Dot-impressed sherd of unknown type	?LBA	
	4668	4670	Later BA coarse flint	62	Finger-tip impressed shoulder of DR bucket urn	MBA or MBA/LBA	MBA or MBA/LBA
4675	4674		MBA coarse flint	1		MBA or MBA/LBA	MBA or MBA/LBA
4679	4680		Later BA intermediate flint LBA intermediate flint	2		LBA	
4683		4673	MBA coarse flint Later BA intermediate flint	443	DR bucket urns with fingertip-impressed and fingertip-impressed, applied cordons	MBA/LBA	MBA and LBA or MBA/LBA
4685		4527	MBA coarse flint Later BA intermediate flint	67	DR barrel-shaped jar	MBA or MBA/LBA	MBA or MBA/LBA

#### 4. Distribution

MBA or transitional MBA/LBA activity focused on Area 2. Most pottery of this date came from ditches, two of which apparently formed part of a sub-circular enclosure (ditches 4527 and 4673), and it was present in one post-hole (4557) and two pits (4589 and 4674). Several of these features also yielded finds of struck flint, artefactual and/or burnt stone. This is characteristic of domestic/settlement rather than 'funerary' activity.

Only one feature which yielded pottery of this date was originally identified as a cremation, although subsequent analysis revealed that this was not the case. LBA pottery was wider-spread, occurring across Areas 1 and 2, again associated with struck flint, artefactual and/or burnt stone. Most LBA pottery from Area 1 came from ditch 5210. It also occurred in pit 5011 nearby. In Area 2 significant finds come from ditch 4539, which references the MBA or transitional MBA/LBA enclosure immediately to the south of it in the form – possibly – of a secondary enclosure ditch, ditch 4602 and post-hole 4581. The feature and artefactual associations of the LBA assemblage are also characteristic of domestic/settlement activity. Saxon activity focused on Area 1. Significant assemblages of Saxon pottery came from pit 5041, gullies 5238 and 5262, and ditches 5125 and 5174. Stratigraphically the two gullies overlies LBA ditch 5210.

#### 5. Research potential

Interpretatively the key characteristics of the assemblage are its date range, its geographical location (on the Sussex Coastal Plain), its distribution in terms of feature type, its distribution spatially, and the range of types and sizes represented by it. To answer the questions posed below, direct comparison of its typology, size, fabrics and feature relationships with other, contemporary Sussex assemblages is needed.

#### 5.1 Middle Bronze Age or transitional Middle Bronze Age/Late Bronze Age pottery

Recent distribution maps of MBA activity in Sussex show settlement to be restricted to the chalk/Downs (Greatorex 1999), whereas so-called 'funerary' assemblages, comprising DR pots apparently buried whole and sometimes associated with cremations, are widespread on both the Downs and on the Coastal Plain. Angmering does not fit into this pattern. It is on the Coastal Plain and had both settlement and 'funerary' type contexts, although it must be noted there was no actual evidence of cremation material. As such it should provide a unique opportunity to examine the nature and extent of pottery using activity on the Coastal Plain and to compare it with that of the Downs. The following themes are of particular relevance to the study of the later Bronze Age pottery from Angmering.

- *Site deposition practices.* What is the nature of the MBA or transitional MBA/LBA pottery from Angmering? Does its deposition reflect everyday activity be it functional or ritual comparable to that which occurred on MBA sites locally, or does it reflect a unique event/situation which rules out meaningful comparison with other assemblages?
- *Pot diversity.* Are current distribution maps of the period a true representation of the period or not? Do the pot types and feature relationships of the Angmering assemblage differ from those associated with contemporary Coastal Plain 'funerary' contexts or should the identification of the latter be re-assessed?
- *Settlement form and development*. How does the dating of the MBA or transitional MBA/LBA pottery from Angmering (both sites) square with our knowledge of contemporary settlement on the Downs? Is the pottery (and the activities represented

by it) the same and do the two assemblages relate to a single, contemporary settlement, or one which was accretional or shifting?

#### 5.2 Late Bronze Age

In terms of the vessel types identified, the Angmering LBA assemblage bears a close resemblance to other Coastal Plain sites of similar date. Owing to its relatively small size, it offers little potential for research into themes such as *site deposition practices* and *pot diversity*. However, there is a possibility that it is close in date to its predecessor (*see* above) and its immediate context relationships are more extensive than those most frequently associated with LBA assemblages, and it may, therefore, offer some new insights into the nature of contemporary settlement form and development. Questions of interest are:

• Is the PDR assemblage wholly LBA or, like the Roundstone Lane assemblage, does it incorporate a later, LBA/EIA element? Do the identified feature relationships indicate settlement continuity or not? What new feature types are dated by the assemblage? Are these the same as or different from LBA features elsewhere? (The assemblage invites direct comparison with those from three downland sites which yielded both MBA and LBA pottery (Varley Halls and Downsview, north of Brighton, and Mile Oak, Shoreham: Hamilton 1997a; forthcoming a and b).

#### 5.3 Saxon

As a dot on a distribution map, any new Sussex assemblage of this date is important, but owing to its small size, its imprecise date, and lack of internal associations, the present assemblage lacks potential for further detailed research. However, by comparing hand samples of Angmering fabrics to fabrics from better dated assemblages such as those from Chichester and Steyning its dating may be improved.

#### 6. References

- Adkins, L and Needham, S 1985. New research on a Late Bronze Age enclosure at Queen Mary's Hospital, Carshalton. *Surrey Archaeol Coll* 76, 11-50
- Barrett, J C 1980. Pottery of the later Bronze Age in Southern England, PPS 46, 297-319
- Burstow, G P 1958. A Late Bronze Age urnfield on Steyning Round Hill, Sussex. *PPS* 9, 158-164
- Curwen, E C 1934. A Late Bronze Age Farm and a Neolithic pit dwelling on New Barn Down, Clapham, near Worthing, *SAC* 75, 136-170
- Down, A 1981. Chichester Excavations 5, Chichester: Phillimore
- Gardiner, M 1990. An Anglo-Saxon and Medieval settlement at Botolphs, Bramber, West Sussex, *Archaeol J* 147, 216-275
- Gardiner, M 1993. The excavation of a Late Anglo-Saxon settlement at Market Field, Steyning, 1988-1989, *SAC* 131, 21-67

- Greatorex, C 1999. Emerging hierarchies and the rise of the individual, in *An Historical Atlas of Sussex* (eds K Leslie and B Short), 18-19, Chichester: Phillimore
- Hamilton, S 1987. Late Bronze Age pottery, in The excavation of a Late Bronze Age site at Yapton, West Sussex, 1984 (D. Rudling), *Sussex Archaeol Collect*, 125, 53-63
- Hamilton, S 1993. *First Millennium BC Pottery Traditions in Southern Britain*, unpublished Ph.D thesis, University of London
- Hamilton, S 1997a. East Sussex later Bronze Age pottery traditions, in Excavations of a Bronze Age settlement at Varley Hall, Coldean Lane, Brighton, East Sussex (I Greig), SAC 135, 31-42
- Hamilton, S 1997b. Late Bronze Age pottery traditions in West Sussex: the Knapp Farm assemblage and its regional context, in Knapp Farm, Bosham. A significant find of Bronze Age Pottery (M Gardiner and S Hamilton), Sussex Archaeol Collect, 135, 78-85
- Hamilton, S 2001. Early first millennium BC pottery of the West Sussex Coastal Plain: the pottery assemblage from Ford Aerodrome, West Sussex. Unpublished report prepared for RPS Consultants
- Hamilton, S forthcoming a. The Downsview pottery with specific reference to the Bronze Age assemblage: its forms, dating and regional implications, in *Downland Settlement and Landuse: The Archaeology of the Brighton by-pass* (ed D Rudling)
- Hamilton, S forthcoming b. The Mile Oak pottery assemblage: its stratigraphic context, forms, fabrics, chronology and regional significance, in *Downland Settlement and Landuse: The Archaeology of the Brighton by-pass* (ed D Rudling)
- Hamilton, S forthcoming c. Sussex not Wessex, in *The Archaeology of Sussex to AD2000* (ed D Rudling)
- Holden, E 1980. Excavations at Old Erringham, Shoreham, West Sussex: part 2; the 'chapel' and the ringwork, *SAC* 118, 257-297
- Musson, R C 1954. An illustrated catalogue of Sussex Beaker and Bronze Age pottery, *SAC* 92, 106-124
- Needham, S 1996. Chronology and periodisation in the British Bronze Age, Acta Archaeologica 67, 121-140
- Needham, S P and Spence, A J 1996. *Refuse and Disposal at Area 16 East Runnymede*, Runnymede Bridge research excavations, vol.2, London: BMP
- Seager Thomas, M 2001. Two early first millennium BC wells at Selsey, West Sussex and their wider significance, *Antiq J* 81, 15-50
- Seager Thomas, M and Hamilton S 2001. Research assessment and provisional dating of the prehistoric pottery from Roundstone Lane, Angmering. Unpublished report prepared for Archaeology South-East
- White, G M 1934. A settlement of the South Saxons, Antiq J 14, 393-400
## 7. Further Work

### **APPENDIX 2: WORKED FLINT**

# By Kate Cramp

#### 1. Introduction

The test pits and excavation produced a combined total of 2183 worked flints (Table 1), recovered from 200 individual contexts, while an additional 15 worked flints came from three contexts within two of the earlier evaluation trenches. A further 2795 pieces of burnt unworked flint weighing 49.9 kg was also retrieved. The largest quantity of both worked and burnt unworked material was recovered in the course of the excavation, which produced 58.1% of the struck component and 78.4% of the burnt unworked flint. In terms of weight, the excavation produced 86.6% of the total quantity of burnt unworked flint recovered.

In varying quantities, the material represents human occupation from the Mesolithic to late Bronze Age period. A single possible Palaeolithic artefact was recovered from Area 1 of the excavation, which may indicate earlier activity. The flint work from the evaluation formed a relatively low-density scatter across the site, with few distinct concentrations. Neolithic and Bronze Age material provided the majority of the diagnostic component, although a smaller quantity of possible Mesolithic flint work was also present. The assemblage from the excavation differed in that the overwhelming majority of the flint work was of a mid or late Bronze Age date, which occurred as a general spread punctuated by discrete concentrations perhaps resulting from episodes of knapping activity. This material was combined with a sizeable Mesolithic and Neolithic component, the distribution of which appears to have been more diffuse.

		Excavati	on:		
	Test pits/trenches:	Area 1	Area 2	Excavation total:	Test pits/trenches and Excavation total:
Number of worked flints:	922	778	498	1276	2198
Number of burnt unworked:	603	1404	788	2192	2795
Weight of burnt unworked: (g)	6691	27634	15548	43182	49873

Table 1: Quantity of worked and burnt unworked flint from the test pits/trenches and excavation

### 2. Methodology

The same method of assessment was applied to both the assemblage from the test pits and that from the excavation, in order to allow for the integration and comparison of the data.

The struck flints were individually examined, and identified according to a technotypological classificatory scheme. The number of burnt, broken and utilised pieces were also counted. Technological and dating information was recorded where appropriate, particularly where such data contributed to the characterisation of the assemblage. Further observations with regard to the condition, degree of cortication and type of raw material were commented on throughout the assessment. Cores and tested nodules were identified according to the organisation and types of removal exhibited, and were individually weighed. Diagnostic technological attributes, such as the inferred mode of percussion and the presence of platform edge abrasion, were also recorded. Burnt flint was quantified by piece and by weight. Additional information, such as the degree of calcination, was recorded where relevant. The data was initially compiled as a paper record, and subsequently entered onto an Access database.

#### 3. The Test Pits: Introduction and quantification

A total of 922 worked flints were recovered from ten test pits and two trenches, deriving from 42 individual contexts. The site produced a further 603 pieces of burnt unworked flint, which collectively weighed 6.7kg. The composition of the assemblage is shown in Table 2.

Category:	Total:
Flake	557
Blade-like	34
Blade	22
Bladelet	15
Irregular waste	25
Spall	233
Single platform flake core	1
Multi-platform flake core	8
Core on a flake	3
Tested nodule/bashed lump	9
Unclassifiable/fragmentary core	1
Retouched flake	4
Notch	1
Serrated flake	1
Backed blade	2
End scraper	1
End and side scraper	1
Scraper on a non-flake blank	1
Thumbnail scraper	1
Unclassifiable/fragmentary scraper	2
Burnt unworked flint	603
Total:	1525

 Table 2: Number of flints by type from the evaluation

A considerable proportion of the struck flint assemblage is undiagnostic. It has only been possible to ascribe a broad late Neolithic or Bronze Age date to this component, which consists mainly of unretouched flakes in poor condition. It appears, however, that the majority of the diagnostic component of the assemblage dates broadly to the Neolithic period. More specifically, the analysis identified considerable quantities of material of a

probable Late Neolithic date. The Mesolithic and Bronze Age are represented in smaller proportions. No artefacts of unequivocally Palaeolithic origin were identified.

# 3.1 Condition

Only a relatively small percentage of the material was in a fresh condition. Most pieces exhibited a moderate or heavy degree of post-depositional damage, consistent with a plough-soil derivation. Numerous pieces were rolled, with several possessing a resultant gloss. The degree of edge damage made the identification of genuine retouch problematic. As a result, the proportion of retouched tool-types within the assemblage is relatively low, represented by 14 pieces, (2% of the total assemblage size, excluding spall).

Despite the generally poor condition of the flint, a limited number of contexts were found to contain material in a reasonably fresh condition. In particular, small assemblages in good condition were recovered from contexts 4024, 4035, 4045, and 4053 (from test pits 2, 3, 4 and 5, respectively). Taken together with the observed technological coherence of the flint work from these contexts, it is possible that *in situ* or minimally disturbed assemblages have been detected.

The majority of flints within the assemblage were uncorticated. A number of pieces displayed a light degree of cortication, and a few appeared heavily corticated. A frequent correlation between condition and cortication was noted, with the more heavily damaged and rolled pieces tending to be more densely corticated.

# 3.2 Raw material

For the most part, the raw material employed for the production of the flint work appears to have been gravel flint, presumably collected from relatively local river gravel deposits or surface deposits in the Sussex Downs. This flint is characterised by an abraded, often stained cortex and the frequent occurrence of thermal fractures within the interior. Colouration varies from grey to dark brown. A small number of pieces displayed a light iron staining. The gravel flint found at the site itself is of a poor quality and occurs in very small, frost-shattered pieces. It is therefore unlikely that this immediately available source was exploited.

In addition to the gravel flint, several pieces of possible chalk flint manufacture were identified. These tended to be of a grey or grey-white colour, and possessed a thicker, less abraded cortex. These nodules may have been collected from surface deposits of derived chalk flint, as opposed to mined.

# 3.3 The Assemblage

The flint from the evaluation will be dealt with initially by a description of the assemblages recovered from the individual test-pits, following which will be a discussion attempting to identify overall patterns of distribution.

### Test Pit 1

Test pit 1 contained a total of 40 flints (Table 3), which was recovered from contexts 4010, 4011, 4012, 4013 and 4014. A further 14 pieces of burnt unworked flint were recovered (Table 4), weighing 140g. None of the contexts contained a significant concentration of burnt flint.

The majority of the flints were in a poor condition, exhibiting a moderate or heavy degree of post-depositional damage. The assemblage consisted mainly of flake material, with smaller quantities of blades and blade-like pieces. Most flakes were undiagnostic, and probably date broadly to the late Neolithic or Bronze Age. No retouched types were identified. On the basis of condition, it is unlikely that the test-pit encountered any *in situ* scatters.

Contexts 4010 and 4013 together produced a total of three blades in poor condition, of possible Mesolithic date. Probable Neolithic pieces were recovered from contexts 4011, 4013 and 4014. These consisted of flakes or blade-like flakes, which exhibited diagnostic technological traits such as platform-edge abrasion and finely flaked dorsal scars. A small number of flints appeared to have been struck from chalk flint nodules.

	Test	pit:									Tren	ch:	
Category:	1	2	3	4	5	6	7	8	9	10	18	30	Total:
Flake	28	66	83	48	33	14	65	77	89	45	4	5	557
Blade-like	2	5	3	7	1	3	3	2	2	5		1	34
Blade	3	4	1	3	2		1	6	2				22
Bladelet		2	1		1	1	1	3	3	2		1	15
Irregular waste	4		5				4	3	7	2			25
Spall	2	25	15	7	12	2	33	38	60	35		4	233
Single platform flake core										1			1
Multi-platform flake core			3		1		3			1			8
Core on a flake					1		2						3
Tested nodule/bashed lump	1	1	2				2		2	1			9
Unclassifiable/fragmentary core								1					1
Retouched flake		1	2		1								4
Notch				1									1
Serrated flake			1										1
Backed blade				1						1			2
End scraper										1			1
End and side scraper			1										1
Scraper on a non-flake blank		1											1
Thumbnail scraper							1						1
Unclassifiable/fragmentary scraper				2									2
Total:	40	105	117	69	52	20	115	130	165	94	4	11	922

 Table 3: Number of flints by type and by test pit / trench

	Test	Pit:							Trench:				
	1	2	3	4	5	6	7	8	9	10	18	30	Total :
Number of worked flints:	40	105	117	69	52	20	115	130	165	94	4	11	922
Number of burnt unworked:	14	67	65	56	19	3	150	128	67	34	0	0	603
Weight of burnt unworked (g):	140	521	964	703	316	29	234 7	108 3	376	212	0	0	6691

Table 4: Quantity of worked and burnt unworked flint by test pit / trench

### Test Pit 2

A total of 105 flints was recovered from contexts 4021, 4022, 4023 and 4024 of TP2. An additional 67 pieces of burnt unworked flint weighing 521g was also retrieved from the test pit. The largest quantity of burnt flint was produced by context 4021, which provided 31 pieces (46%) of the total.

The majority of the material was undiagnostic and in poor condition, probably dating broadly to the late Neolithic or Bronze Age. Context 4023 produced two blades of possible Mesolithic date, one in relatively fresh condition. Context 4021 contained a distinctive Neolithic component, consisting of a small number of fine tertiary flakes and blade-like flakes. A few possessed platform abrasion, and appeared to have been struck using a soft-hammer percussor. Two retouched pieces, including a scraper and a retouched flake, were also recovered from this context. Given the damaged and rolled condition of these pieces, however, it is unlikely that they represent *in situ* material.

Context 4024 contained a relatively large, fresh assemblage of a probable late Neolithic date. The majority consists of flake material, with smaller quantities of blades and blade-like pieces. The use of soft-hammer percussion was represented by several pieces, and a few exhibited platform edge abrasion. High proportions of regularly shaped tertiary removals were noted. A small number of flakes displayed macroscopically detectable traces of use-wear, indicating that the assemblage contains an utilised component. In addition, the presence of two or more flakes that probably originally derived from the same nodule suggests that the material may contain a certain quantity of knapping débitage. From the condition and composition of the assemblage, it is possible that the test-pit has encountered a late Neolithic feature.

### Test Pit 3

Contexts 4030, 4031, 4032, 4033, 4034 and 4035 from TP 3 yielded a total of 117 pieces of flint and a further 65 pieces of burnt unworked flint weighing 964g. A concentration was noted in context 4030, which contained 33% of the struck flint assemblage and 34% of the burnt material.

With the exception of context 4035, the majority of the material recovered from the testpit is undiagnostic and in poor condition. A small Neolithic component is nonetheless present, represented by several flakes, a possible retouched piece and a serrated flake. Context 4032 produced a probable Mesolithic tertiary blade, displaying a small amount of use-wear to the right-hand side lateral margin. In general, the poor condition of these flints implies their residuality.

Context 4035 contained a small, relatively fresh assemblage of possible late Neolithic date. The assemblage is flake-based in nature, and contains several pieces possessing platform abrasion. A number of flakes have probably been struck using a soft-hammer percussor. The presence of three or four flakes of a similar flint raises the possibility that the deposit contains a certain amount of knapping débitage, although this interpretation is not borne out by the quantity of spall recovered. The reasonable condition and technological coherence of the material suggests that it has been subjected to a minimal amount of post-depositional disturbance, and as such it is possible that the test pit has detected a late Neolithic deposit.

# Test Pit 4

Contexts 4041, 4042, 4043, 4044 and 4045 from test pit 4 produced a total of 69 pieces of worked flint and a further 56 pieces of burnt unworked flint weighing 703g. The largest struck assemblage was recovered from context 4043, which contained 24 pieces. Small concentrations of burnt flint were noted in contexts 4041 and 4043.

Although much of the flint work recovered was undiagnostic and in poor condition, a small number of Mesolithic pieces were identified. Context 4043 contained two blades, which are likely to date broadly to the Mesolithic. A backed blade, tentatively dated to the late Mesolithic, was recovered from context 4042.

The test pit also produced numerous pieces of Neolithic date. Contexts 4043, 4044 and 4045 contained particularly high proportions of flakes and blade-like flakes of probable late Neolithic origin. Diagnostic pieces appeared to be concentrated in context 4045, which contained a technologically coherent assemblage in good condition, although of limited size. Several pieces displayed use-wear.

# Test Pit 5

A total of 52 flints was recovered from contexts 4051, 4052, 4053 and 4054. A further 19 pieces of burnt flint weighing 316g were also recovered, forming a slight concentration in context 4051. This context also contained the largest quantity of struck flint within the test pit.

With the exception of context 4053, the majority of the material is in a poor condition and probably dates between the late Neolithic and Bronze Age periods. Context 4053, however, contained a reasonable number of flakes, blade-like flakes and blades that are broadly later Neolithic in date. In general, the material from this context is in a relatively fresh condition, suggesting that it may form part of an *in situ* scatter. It is possible that the blades recovered from the context represent residual Mesolithic pieces.

#### Test Pit 6

Contexts 4060 and 4061 from test pit 6 produced a total of 20 flints, and a further 3 pieces of burnt unworked flint weighing 29g.

In general, the material from the test pit is probably residual and consists mainly of undiagnostic flake material in poor condition. Two blade-like flakes were recovered that are both of a possible later Neolithic date.

### Test Pit 7

Contexts 4070, 4071, 4073 and 4074 contained a total of 115 flints and 150 pieces of burnt unworked flint weighing 2.3kg.

The majority of the flint recovered from the test pit exhibits considerable edge damage, suggesting that most of the material has been subjected to a certain amount of post-depositional disturbance. A small quantity of Mesolithic and Neolithic material was recovered, again in generally poor condition. Context 4074 yielded a small Neolithic or early Bronze Age thumbnail scraper. Three multi-platform flake cores of probable Bronze Age date were also recovered, although the majority of the assemblage is composed of undiagnostic flake types.

### Test Pit 8

Contexts 4080, 4081 and 4082 from TP 8 produced a combined total of 130 worked flints, and a further 128 pieces of burnt unworked flint weighing 1083g. The largest quantity of material derived from context 4081, which yielded 63% of the struck flint assemblage and 57% of the burnt flint total.

The test pit assemblage is largely composed of undiagnostic flake material in poor condition. Several Mesolithic and Neolithic pieces were noted, however. Context 4080 contained two blades and a blade-like flake of possible Mesolithic date. In addition, context 4081 appeared to contain a small, residual Mesolithic component, which was represented by three blades of variable condition. The assemblage from this context also contained a collection of fine, broad flakes that may tentatively be attributed to the later Neolithic. Several large and irregular hard-hammer flakes were present in the assemblage that probably represent Bronze Age activity. No retouched tool types were recovered from the test pit.

In summary, the lithic assemblage from the test pit appears to contain residual quantities of flint work from the Mesolithic, Neolithic and Bronze Age, in addition to a considerable number of undiagnostic flakes. In comparison to the composition of the other test pit assemblages, there appears to be a slight but distinct concentration of diagnostically Mesolithic material from TP 8.

#### Test Pit 9

A total of 165 flints was recovered from contexts 4090, 4091 and 4092. An additional 67 pieces of burnt unworked flint were retrieved, weighing a total of 376g. A concentration in context 4090 was noted. The struck flint from this deposit provided 75% of total assemblage size.

Several blades and blade-like flakes of broadly Mesolithic or earlier Neolithic date were recovered from the test pit. These pieces tended to be soft-hammer products, commonly exhibiting platform abrasion. A couple of the blades possessed dorsal blade scars. The rolled condition of the pieces suggests they form a residual component. The assemblage also contained a small number of flakes of probable late Neolithic date, several of which were in a reasonably fresh condition. The remaining flints from the test pit are probably Bronze Age in date, given the observed predominance of hard-hammer percussion and the generally thick and angular shape of the pieces

#### Test Pit 10

Contexts 4100, 4101 and 4101 from TP 10 contained an assemblage of 94 flints, in addition to a further 34 pieces of burnt unworked flint weighing 212g. The majority of the burnt flint was recovered from contexts 4100 and 4101, which together produced a total of 32 pieces weighing 174g.

The majority of the material from the test pit consisted of undiagnostic pieces in poor condition, presumably residual. A small number of diagnostically Mesolithic pieces were recovered, including several blade-like flakes and a backed blade. The latter probably dates to the later Mesolithic. The end-scraper from context 4100, made on a regular tertiary flake of possible chalk flint, may date broadly to the Neolithic. The single-platform flake core from context 4102 is likely to be early Neolithic in date, possessing several small removals of bladelet-like appearance.

#### Trench 18

Context 1804 from trench 18 contained four flakes in variable condition. With the exception of a single hard-hammer preparatory flake of probable Bronze Age date, the majority was undiagnostic. No burnt unworked flint was recovered from the trench.

#### Trench 30

A total of 11 worked flints were recovered from contexts 3003 and 3007 within trench 30. No burnt unworked flint was retrieved. The struck component consists of five flakes, four chips, a single bladelet and blade-like flake. The majority exhibited post-depositional damage, which was occasionally heavy. The flake material may broadly be dated to the later Neolithic or Bronze Age. The bladelet and blade-like flake contained within context 3007 may tentatively be dated to the earlier Neolithic.

#### 3.4 Discussion and potential

The Mesolithic component of the assemblage appears to represent a low-density background scatter of material, with a relatively uniform distribution across the site. Given the high proportions of rolled and damaged blades, it is probable that the majority is residual. A slight concentration was detected in the adjacent test pits 8 and 9, although given that this 'concentration' is represented by an additional five or so pieces, it may not provide a reliable reflection of more intensive Mesolithic activity in this area.

A relatively high quantity of Neolithic material was recovered from the site. Most test pits contained a small proportion of diagnostically Neolithic material, and it is probable that many of the undiagnostic pieces also date to this period. In addition to a general spread of residual Neolithic flint work, it was found that four contexts contained small concentrations of late Neolithic material in a reasonably fresh condition. These assemblages occurred in test pits 2, 3, 4 and 5 and are located in relatively close proximity, suggesting the possibility of a concentration of later Neolithic activity in this area.

Evidence of Bronze Age occupation as reflected by the lithic record again takes the form of an overall distribution. Three flake cores of probable Bronze Age date were retrieved from test pit 7, context 4073, which may imply the existence of a knapping scatter in the vicinity. However, the general condition of the flint work attributed to the Bronze Age period suggests that the majority is residual.

Many of the flints were broadly dated to the late Neolithic / Bronze Age period, as the absence of diagnostic technological traits has precluded a more precise date for these pieces. It is likely, however, that this material contains an invisible Mesolithic and earlier Neolithic component that it has not been possible to distinguish.

The potential of the material recovered from the test pits and evaluation trenches lies in a comparison with the excavated flint work. It would be of value to compare the character and distribution of the test pit and evaluation trench assemblage with that recovered from the excavation, in order to clarify and explain possible differences or similarities in the nature and spatial patterning of the two groups of material.

#### 4. The Excavation: Introduction and quantification

A total of 1276 worked flints were recovered from Areas 1 and 2 of the excavation (Table 5). Area 1 produced a slightly larger quantity of material, a total of 778 pieces that provide 61% of the assemblage. An additional 2192 pieces of burnt unworked flint were recovered, weighing a total of 43.2kg. Again, the majority was contained within Area 1, which provided 1404 pieces or 64.1% of the total. The composition of the assemblage is shown in Table 6.

	Area 1	Area 2	Total:
Number of worked flints:	778	498	1276
Number of burnt unworked:	1404	788	2192
Weight of burnt unworked (g):	27634	15548	43182

Table 5: Quantity and weight of worked and burnt unworked flint from the excavation

The flint assemblage from the excavation consists mainly of Neolithic and Bronze Age material, combined with a small, later Mesolithic element. A single possible Palaeolithic or early Mesolithic blade was recovered.

Technologically, the majority dates to the mid or late Bronze Age. Coherent, fresh assemblages were recovered from both areas, although Area 1 contained a slightly higher quantity of diagnostic Bronze Age material. The presence of both knapping débitage and high numbers of utilised pieces implies that production and domestic activities were carried out at the site.

Significant quantities of Neolithic flint work were also present in the assemblages from the excavation. Again, these pieces occurred with slightly greater frequency in Area 1. The fresh condition of numerous pieces implies that some of the earlier flint work has been minimally disturbed, and as such a distribution analysis of the material may be revealing. In a number of cases, it is conceivable that later Bronze Age features disturbed earlier deposits of flint work.

Category:	Area 1	Area 2	Total:
Flake	483	308	791
Blade-like	31	14	45
Blade	28	10	38
Bladelet	2	1	3
Irregular waste	59	47	106
Spall	70	76	146
Rejuvenation flake - core face/edge	4	1	5
Flake from ground implement	1	1	2
Single platform flake core	6	3	9
Multi-platform flake core	17	8	25

Keeled non-discoidal flake core	1		1
Unclassifiable blade core	1		1
Core on a flake	8	5	13
Tested nodule/bashed lump	20	6	26
Unclassifiable/fragmentary core	5	2	7
Hammerstone	1		1
Retouched flake	24	9	33
Serrated flake	2	3	5
Notch	1		1
Piercer	1		1
Denticulate	3		3
Backed bladelet		1	1
Side scraper	3		3
End scraper	2	1	3
End and side scraper	4	1	5
Unclassifiable/fragmentary	1	1	2
scraper			
Burnt unworked	1404	788	2192
Total:	2182	1286	3468

 Table 6: Quantities of flint by type from the excavation

#### 4.2 Condition

In comparison to the generally poor condition of the flints recovered from the test pits, the majority of the flint work from the excavation was in a good condition. A total of 441 flints (34.6% of the total assemblage) were considered to be fresh, whilst a further 549 flints (43%) only exhibited slight post-depositional edge damage. Several contexts contained relatively large assemblages of fresh material, including contexts 5067, 5068, 5128, 5140, 5141 and 5209 from Area 1, and contexts 4500, 4501, 4503, 4625 and 4683 from Area 2. Only 286 flints (22.4%) were in poor condition; these pieces tended to occur as isolated, residual finds in later contexts. Many of these had been rolled and glossed. Modern trowel or plough-nicks were occasionally noted on the edges of both fresh and otherwise damaged pieces. The presence of greater numbers of fresh pieces within the assemblages recovered from the excavation immediately suggests the potential survival of *in situ* assemblages, the existence of which is less certain for the test pit material.

The vast majority of the flint work was uncorticated, represented by 1233 pieces or 96.6%. A small number of flints (22 pieces or 1.7%) possessed a light, speckled cortication. Very few were heavily corticated, one significant exception being the possible Palaeolithic blade from context 5040. Where a heavy cortication occurred, it tended to take the form of a relatively thin, superficial patination, and rarely consisted of a deep band.

#### 4.3 Raw material

The raw material used for the manufacture of the tools and débitage types consists of a good quality gravel flint, comparable to that represented by the evaluation assemblage. Again, the source of the nodules was probably relatively local, although it is unlikely that the immediately available gravel flint was exploited due to its unsuitability for flaking.

The gravel flint varies in colour and, to some degree, in quality. The majority is finegrained and of a mid or light brown colour, although numerous pieces contain lighter coloured cherty inclusions. As reflected in the test pit assemblage, approximately 70 pieces (5.5%) were manufactured from a grey coloured gravel flint. Where present, the cortex is generally thick and cream or buff coloured. The cortical staining and abrasion indicates that the flint was probably collected from superficial deposits, rather than mined. This is confirmed by the frequent occurrence of thermal fractures in the flint, which probably inhibited flaking success. It is conceivable that the high numbers of tested nodules and irregular waste are a product of the difficulties that arose when thermal flaws were encountered. Irregular waste accounts for 9.4% of the assemblages (excluding spall), whilst tested nodules provide 31.7% of all core types. These nodules were probably subjected to a cursory assessment before being abandoned as unsuitable.

A small number of possible chalk flint pieces were present in the assemblage. In particular, the two flakes from polished implements that were recovered from contexts 4501 and 5236 are almost certainly of chalk flint manufacture. This flint type is light grey in colour, and is of a fine-grained, homogenous composition. The serrated flake from context 4517 and the unretouched flake from context 4562 may also be chalk flint products. It is likely that the proportion of chalk flint has been under-represented, as a result of the difficulty of attributing non-cortical pieces to a chalk flint source.

In terms of raw material, the composition of the test pit assemblage parallels that of the excavated assemblages. Both reflect the predominant exploitation of a similar source of non-local gravel flint, which is supplemented by the less intensive use of a chalk flint source.

### 4.4 The Assemblages

The assemblages will be discussed by order of phase (Table 7 and Fig.1), to enable a description of the nature and extent of human activity at the site prior to and including the mid-late Bronze Age. Given the quantity of late Bronze Age flint work recovered and the regional significance of the late Bronze Age enclosure, this component will be discussed in greater detail.

Phase:	Area 1	Area 2	Total:	Grouped Total:
Palaeolithic	1		1	1
Early Mesolithic		1	1	
Mesolithic		3	3	
Late Mesolithic	2	1	3	7

Late Mesolithic-early Neolithic	14	3	17	
Early Neolithic	36	9	45	
Neolithic	21	15	36	
Late Neolithic	5		5	
Late Neolithic-early Bronze Age	11	5	16	
				119
Neolithic-Bronze Age	75	36	111	111
Early Bronze Age	1		1	
Bronze Age	187	72	259	
Late Bronze Age	96	78	174	434
Undiagnostic	329	275	604	604
Total:	778	498	1276	1276

Table 7: Spot-dated flint from the excavation



Fig. 1: Spot-dated flint from Areas 1 and 2 of the excavation

#### The Palaeolithic

The single possible representative of the Palaeolithic period is a large side-trimming blade recovered from context 5040. This piece, which is in relatively poor condition, may date to the long-blade industries of the upper Palaeolithic or early Mesolithic. It possesses a simple platform with an abraded platform edge, and was probably soft-hammer struck. The blade is characterised by a deep, chalky cortication not present on any of the other material from the site. No Palaeolithic flint work was conclusively identified in the test pit assemblage, and on the basis of one artefact it is not possible to generalise about Palaeolithic activity at the site.

#### The Mesolithic

The Mesolithic period is represented by a total of seven flints, providing 0.5% of the assemblage. These pieces were recovered from contexts 4500, 4503, 4517, 4605, 4686, 5022 and 5029.

Category:	Total:
Blade	3
Retouched flake	2
Backed knife	1
Notch	1
Total:	7

 Table 9: The Mesolithic assemblage

The group includes two retouched blades, a backed bladelet, three unretouched blades and a notched piece, (Table 9). The majority was in a fresh or slightly damaged condition, and five were broken. Four pieces exhibited use-wear damage to their edges. Technologically, the flints represent a controlled, blade-based industry. Several possessed platform edge abrasion and appeared to have been struck using a soft-hammer percussor. Most displayed regular dorsal blade scars.

The assemblage, although small, appears to contain components of both early and late Mesolithic date. The broad, soft-hammer blades from contexts 4517 and 4686 may be earlier Mesolithic, as might the retouched blade from context 4500. It is possible that the irregular backed bladelet from context 4605 represents a narrow-blade microlith of later Mesolithic date, although it is uncertain whether the bulb has been deliberately removed. The blade from context 5029 possesses a neat notch to the left-hand side of the striking platform, which may represent an unfinished attempt at microlith manufacture using the microburin technique.

### The Neolithic

The Neolithic period is represented by 119 pieces (Table 10), or 9.3% of the total assemblage. These were recovered from 63 contexts. A considerable quantity of the material appears to date to the earlier Neolithic, although it is possible that numerous later Mesolithic pieces have been subsumed by the earlier Neolithic, which may in part account for the under-representation of the former.

The Neolithic material forms a relatively low-density spread across the site comparable to that described for the test pits. Most contexts with a Neolithic element only contained between one and three diagnostic pieces. Despite the thin distribution of the material, the Neolithic assemblage as a whole is fairly sizeable and a few contexts contained five or more pieces. These include contexts 5015, 5019, 5023, 5040 and 5105. The distinct

concentration of Neolithic material in Area 1 suggests that activity in this period was more intensive in this part of the site.

Category:	Total:
Flake	48
Blade-like	28
Blade	20
Rejuvenation flake core	1
face/edge	
Flake from ground implement	2
Single platform flake core	1
Keeled non-discoidal flake	1
core	
Unclassifiable/fragmentary	1
core	
Unclassifiable blade core	1
Retouched flake	9
Piercer	1
Serrated flake	4
Side scraper	1
End and side scraper	1
Total:	119

Table 10: The Neolithic assemblage

Blades and blade-like flakes were well represented, providing a combined total of 40.3% of the Neolithic assemblage. These pieces tended to be soft-hammer struck, and often exhibited platform edge abrasion. The high proportion of blades and blade-like flakes suggests that much of the material is earlier Neolithic in date, and may include numerous later Mesolithic pieces. Many of the flakes appeared to have been struck using a soft-hammer percussor, and tended to be regularly shaped with finely flaked dorsal scars.

Diagnostic Neolithic pieces include the two flakes from polished implements, which were recovered from contexts 4501 (fill of M/LBA ditch 4520) and 5236 (tertiary fill of LBA pit 5235). These pieces probably date to the early or middle Neolithic. The flake from context 4501 is particularly large, and has incorporated much of the polished butt-end of an axe. Other diagnostic tool-forms include four serrated flakes, two scrapers, a piercer, and a keeled core.

The assemblage from context 5015 consisted mainly of later Bronze Age flake material, combined with a fresh, earlier Neolithic component consisting of six or more diagnostic pieces. These included blades and blade-like flakes, several of which possessed platform edge abrasion and appeared to have been struck with a soft-hammer percussor. It is possible that the Bronze Age ditch (5014) disturbed an earlier Neolithic feature, the contents of which have become incorporated into its fill.

Context 5019 (backfill of ditch 5017), context 5023 (fill of MS pit 5024) and context 5105 (secondary fill of Medieval ditch 5104) also contained small Neolithic assemblages,

consisting of around five pieces, which were combined with later Bronze Age material. Context 5040 (fill of ?LS pit 5041) contained ten diagnostic Neolithic pieces, including a serrated flake and two blades. These assemblages probably form part of a general residual spread.

#### The Bronze Age

The Bronze Age assemblage from the excavation is composed of the largest quantity of material, a total of 434 pieces (Table 11). A further 111 pieces were broadly dated to the Neolithic and Bronze Age, and it is likely that much of the undiagnostic component is also of Bronze Age origin. Most of the material was in a fresh condition, and several probable *in situ* assemblages were noted.

Category:	Total:
Flake	306
Blade-like	3
Blade	4
Irregular waste	26
Rejuvenation flake core face/edge	1
Single platform flake core	8
Multi-platform flake core	22
Core on a flake	12
Tested nodule/bashed lump	23
Unclassifiable/fragmentary core	6
Retouched flake	11
Side scraper	2
End scraper	2
End and side scraper	3
Denticulate	3
Unclassifiable/fragmentary	2
scraper	
Total:	434

 Table 11: The Bronze Age assemblage

Whilst a small number of flints are probably earlier Bronze Age in date, most of the assemblage can be attributed to the middle or later Bronze Age. The industry is characterised by thick, hard-hammer flakes. Most of the flakes were of squat, angular form. Evidence of deliberate platform edge abrasion was absent. One rejuvenation flake was recorded, although this piece was probably earlier Bronze Age in date. In general, there was little evidence to suggest a controlled knapping strategy involving platform preparation and maintenance, and in this respect the material differed from the Mesolithic and Neolithic components.

Flakes provided the largest proportion of the assemblage, accounting for 70.5% of the total. Although seven blades/blade-like flakes (1.6%) were recovered, these tended to be

irregular in form and often entirely cortical. When compared to the quantity of blades contained within the Neolithic assemblage, it is evident that the later Bronze Age knapping strategy was not directed towards the controlled production of flakes with blade-like dimensions.

Diagnostic tool forms included three denticulated scrapers, which were recovered from contexts 5020, 5067 and 5140. The most common core types were multi-platform cores and tested nodules, which constituted 31% and 32.4% respectively of the total number of cores. Cores based on large hard-hammer flakes were also relatively common. The high proportion of tested nodules is probably related to the frequent incidence of thermal fractures within the flint, which led to their abandonment. That the nodules were imported to the site before being tested for suitability may imply they were not transported over a significant distance.

The average weight of the 61 complete cores recovered is 108.3g. The smallest core, made on a flake, weighed 7g. The largest was a multi-platform flake core and weighed 432g. There was a distinct difference in the number of cores recovered from each of the two excavated areas. Area 1 produced 48 cores, which is more than double the 23 cores from Area 2. This may be related to the size of the areas excavated, or may be a reflection of a concentration of knapping activity in Area 1.

Several concentrations of fresh, later Bronze Age flint work were noted. These occurred in features 4520, 5014, 5058/5063 and 5128. The majority of these larger assemblages occurred in Area 1, which again suggests that activity in this area was more intensive. With one exception, these assemblages were recovered from mid or late Bronze Age ditch features, which reveals something of later Bronze Age depositional practices.

Relatively large assemblages of flint work were also contained as residual finds in Saxon features. In general, the condition of these pieces was not as fresh as those recovered from the later Bronze Age features. Two of the larger residual assemblages, both comprising 63 flints, were recovered from features 5017 and 5104 in Area 1.

### Middle/Late Bronze Age ditch features

### 4520

The mid-late Bronze Age ditch from Area 2 produced an assemblage of 168 flints, including 27 spalls (Table 12). The material is in extremely fresh condition, and represents a coherent mid or late Bronze Age assemblage containing a high proportion of knapping débitage. A small number of residual pieces of probable Neolithic date were also recovered.

Category:	4500	4501	4503	Total:
Flake	44	25	31	100
Blade-like	1	2		3
Blade			2	2
Bladelet			1	1
Irregular waste	6	7	5	18

Spall	18		9	27
Flake from ground		1		1
implement				
Single platform flake core	1		1	2
Multi-platform flake core	1			1
Core on a flake	2	1	1	4
Tested nodule/bashed lump			3	3
Unclassifiable/fragmentary	1		1	2
core				
Retouched flake	1	1	1	3
End and side scraper			1	1
Total:	75	37	56	168

Table 12: Flint from 4520

The ditch contexts contained large amounts of knapping waste, including spalls, irregular waste and cores. In context 4500, two refitting flakes were recovered. Context 4503 contained a flake that refitted to a tested nodule. Several further groups of related flint were noted that appeared to have been struck from the same core. The presence of refits and débitage implies that the assemblage was deposited in the context of knapping activity.

The contexts contained a small number of retouched pieces, which provide 2.8% of the total (excluding spall). Macroscopically visible use-wear was noted on 18 flakes (12.8%). This figure would presumably increase given a microscopic analysis.

#### 5014

Contexts 5015 and 5016 contained a total of 30 flints in fresh condition (Table 13). The majority of the material was recovered from 5015, and included a large later Bronze Age assemblage combined with a small, earlier Neolithic element.

Category:	5015	5016	Total:
Flake	19	1	20
Blade-like	2	1	3
Blade	2		2
Chip	3		3
Unclassifiable/fragmentary	1		1
core			
Retouched flake		1	1
Total:	27	3	30

Table 13: Flints from 5014

Flakes were the dominant débitage type. The low number of spalls, irregular waste and cores recovered suggests that the assemblage does not contain a significant knapping component. A single retouched flake was recovered, and 11 flakes (40.7%) had been utilised. Unlike the flint assemblage from 4520, it appears that the material from 5014 was deposited primarily in the context of domestic activity. This is reflected in the high number of utilised pieces and the paucity of knapping waste.

#### 5058/5063

Three contexts from ditch feature 5058/5063 produced flint (Table 14). The majority was contained within 5067 and 5068. With the exception of a small number of residual pieces, the material is of mid or late Bronze Age date and is in fresh condition.

Category:	5062	5067	5068	Total:
Flake	4	14	24	42
Blade-like		3		3
Blade		1		1
Irregular waste	1	2		3
Rejuvenation flake core face/edge		1		1
Multi-platform flake core	1	2	3	6
Core on a flake	1		1	2
Tested nodule/bashed lump		1	1	2
Unclassifiable/fragmentary core	1	1		2
Retouched flake			1	1
End and side scraper	1			1
Denticulate		1		1
Unclassifiable/fragmentary scraper		1		1
Total:	9	27	30	66

Table 14: Flint from 5058/5063

Irregular, hard-hammer flakes form the largest component of the assemblage. A total of 28 pieces (42.4%) had been utilised, a figure based on a macroscopic examination and therefore probably an underestimation. A small retouched component was present, consisting of 4 pieces (6.1%). Cores and tested nodules were relatively numerous, represented by a total of 12 pieces or 18.2%. A cursory refitting analysis was performed on the flints from context 5068. Although no refits were found, numerous flakes were noted that probably came from the same core. This implies that the assemblage contains a knapping component. A greater quantity of spalls would normally be expected in support of this interpretation, however it is possible that the paucity of micro-débitage reflects sampling strategies.

Other Bronze Age features

5128

Gully feature 5128 contained a small assemblage of later Bronze Age flint work (Table 15). The material was in extremely fresh condition, suggesting very little post-depositional disturbance.

Category:	5128	Total:
Flake	19	19
Blade-like	1	1
Blade	2	2
Irregular waste	2	2
Single platform flake core	1	1
Multi-platform flake core	2	2
Tested nodule/bashed lump	1	1
Total:	28	28

Table 15: flint from 5128

The assemblage contained several flints that appeared to have been struck from the same nodule, and a single knapping refit was found between two hard-hammer flakes. Compared to the ditch assemblages, the material from the gully did not contain many utilised pieces. A total of four flakes (14.3%) exhibited use-damage on their edges. No retouched pieces were recovered. These results suggest that the flints were deposited principally in the context of knapping activity.

#### Saxon features

5017

Contexts 5018, 5019, 5021 and 5020 from the middle Saxon ditch 5017 contained a relatively large assemblage of 63 flints. The material is mainly later Bronze Age in date, although several earlier pieces were also noted. The poor condition of the majority of the flints implies their residuality, and the material should not be considered as a coherent assemblage. Nonetheless, the quantity of flint work recovered may indicate that the later feature disturbed an existing concentration of later Bronze Age material.

#### 5104

A total of 63 flints were recovered from the middle Saxon ditch feature 5104. The majority was contained within contexts 5022 and 5105. Many of the flints, particularly those from context 5022, were in a poor, residual condition. Context 5105 contained a sizeable later Bronze Age assemblage, which had survived in a relatively fresh state and may represent a disturbed knapping deposit.

#### 4.5 Discussion and potential

The flint work from the test pits/evaluation trenches and excavation represents a long period of human activity at the site, potentially beginning in the upper Palaeolithic. The small Mesolithic assemblage, which contained pieces of both earlier and later Mesolithic date, forms a general low-density scatter of material with few discernible concentrations. The Neolithic period is well represented in terms of the number of diagnostic pieces recovered. Whilst these flints occurred as residual pieces in later features, several contexts were noted to contain high proportions of Neolithic flint work. It is therefore possible that in a number of cases the later features disturbed earlier scatters. A distribution analysis of the flint work would aid in the identification of possible foci of Neolithic activity.

The later Bronze Age assemblage constitutes the largest quantity of material from the site. Features containing notable amounts of flint work in fresh condition include 4520, 5014, 5058/5063 and 5128. These assemblages were retrieved from the later Bronze Age ditches and gully, and contained both evidence of knapping and domestic activity. A refitting and technological analysis performed on the material from these features may be valuable in clarifying patterns of deposition, and to refine the dating. In combination with this, an analysis of the spatial distribution of all later Bronze Age flint work would enable a more detailed description of the patterning of activity.

As later Bronze Age settlement on the Sussex coastal plain is unusual, it would be interesting to compare the Angmering material with assemblages recovered from other coastal plain sites such as Highdown Hill, Rustington, Yapton and Westhampnett. Comparisons with the downland enclosed settlements would enable the site to be placed in its regional context, and allow the relationships between place, settlement type and activity to be examined.

### 5. Further work

# **APPENDIX 3: OTHER FINDS**

# 3.1 Worked Stone by Ruth Shaffrey

#### Methodology

All stone was examined with the aid of a x10 magnification hand lens.

#### Results

The majority of the retained stone were small chunks of ironstone; two larger samples indicated that these were fragments from waterworn cobbles. All the stone retained would have been locally available and none was found to have been imported to the site.

One item of worked stone was recovered from a Saxon context; this was a spherical object, probably a sling shot.

Two items of worked stone were recovered from Bronze Age contexts. The first of these was an almost complete saddle quern of Greensand, probably Lodsworth, removed from the upper fill of a ditch (4685). The item had a well worn grinding surface and showed signs of polish, the result of extensive use. The second item was a very small fragment either from a saddle quern or from a rubber. This too showed signs of polish on it's grinding surface.

Context	Description	Notes	Measurements	Lithology	Illust?	Phase
4082	Sphere / possible sling shot	Sphere	Approx. 43mm diameter	Possibly flint	No	Late Saxon
4073	Possible rubber or saddle quern fragment	One flat side which shows distinct signs of polish. It is a small fragment so not possible to reconstruct dimensions and could be from either a rubber or a saddle quern		Ironstone	No	LBA
4685	Almost complete saddle quern	Moderately concave grinding surface showing signs of polish and very smooth all over the grinding surface.	220mm long x 190mm wide x 40mm thick approx.	Greensand, probably Lodsworth	Yes?	MBA

### Catalogue

### Further work

- There was insufficient description of the recovery of the saddle quern to interpret its deposition (i.e. deliberately placed or just thrown into the ditch). Recovery of any complete vessels might help interpretation.
- No further work is recommended except for basic publication editing.
- The saddle quern is complete and therefore worth an illustration.

#### 3.2 Metalwork by Leigh Allen

A small assemblage of metalwork was recovered from the excavations at Angmering bypass, West Sussex. The assemblage comprises one copper alloy and four iron objects. The assemblage has been x-rayed

A fragment from a copper alloy brooch was recovered from context 5137, a shallow upper fill of a large late Bronze Age ditch (5210). The fragment comprises a thick highly arched bow with part of the spring attached. There appears to be the remains of a bar through the surviving coil of the spring. The bow does not appear to have any decoration on it. This type of brooch (La Tène I) dates to the 4th-3rd centuries BC and is mainly a Celtic European type, uncommon in Britain, although some are found here and undoubtedly made here (Hattatt 1982, 54-55). It is the only Iron Age object recovered from the site.

The iron objects are all undiagnostic; they include nails, sheet fragments and a perforated strip. A nail head, distorted by corrosion was recovered from context 4551; a second domed head from a small nail and a fragment from a nail shank with a rectangular section (SF 5001) were recovered from an unstratified context; various small miscellaneous fragments of iron sheet (SF 5003) came from context 5138 and a curved strip with a rectangular perforation through one end (SF 5000) from context 5022.

### Further work

Only the brooch warrants further attention

- Further x-ray of the front of the bow to check that there is no decoration present
- Obtain specialist report on the brooch. The bar through the spring is a potentially a rare feature.
- Produce illustration for final report

### Bibliography

Hattatt, R, 1982, Ancient and Romano-British Brooches

# **3.3** Ceramic building material by Leigh Allen

A total of 76 fragments of ceramic building material weighing 2,195g was recovered from the excavations at Angmering by-pass, West Sussex. The assemblage comprises mostly small abraded fragments of tile, the majority of which are classified as miscellaneous as they have no measurable thickness. The larger fragments include Roman floor tile fragments and later medieval/post medieval fragments of roofing material.

Ceramic building material (weighing 1273g) dating to the Roman period was recovered from four contexts; fragments of floor tile or brick from contexts 5040 and 5216; two fragments of plain flat tile from context 5308 (in a characteristic soft soapy Roman fabric) and a third fragment of plain flat tile from context 4070. This small amount of Roman material could have derived from any one of a number of Roman sites known in the locality.

There were 25 fragments (weighing 681g) of late medieval/post medieval roof tile. These were mostly recovered from contexts containing medieval and later pottery with the exception of a single fragment of peg tile (with traces of a perforation through it) which came from context 4100 containing late Saxon pottery.

There are no recommendations for further work

#### **APPENDIX 4: ENVIRONMENTAL REMAINS**

## **By Ruth Pelling**

#### 1. Introduction

During archaeological excavations at the site of Angmering By-Pass, West Sussex, a sampling programme was implemented for the recovery of biological remains. Samples were taken for the extraction of charred plant remains from a range of features of both Bronze Age and Anglo-Saxon or medieval date. Feature types included several postholes, pits, ditches, gullies and tree-throw holes. Samples of between 7 and 40 litres were processed by bulk water flotation using a modified Siraf type machine at Oxford Archaeology. Flots were collected on a 250µm mesh, while residues were retained on a 2mm mesh. A total of 81 dried flots were submitted for assessment of the quality and quantity of macroscopic plant remains and for their potential for further analysis.

#### 2. Assessment methods

Each dried flot was put through a stack of sieves down to  $500\mu$ m in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at magnification of x10 to x20. Any seeds or chaff and charcoal were provisionally identified and an estimate of abundance was made. Abundance is recorded on a four point numerical scale for seeds and chaff (1-10; 11-50; 51-100 and >101) and a four point scale of relative abundance for charcoal retained in the 2mm sieve (present, common; frequent; abundant).

### 3. Results

### Quantification

The assessment results were entered into an Excel spreadsheet. Generally all flots were moderately small (less than 50ml) and contained frequent modern rootlets. Charred grain was noted in 19 samples, always in low numbers (1-10). Chaff was present in only one sample (sample <4532>) and weeds in 6 samples. Cereal remains noted were of *Hordeum vulgare* (barley) or *Triticum* sp. (wheat). While most of the *Triticum* grains were not identifiable to species, two types were distinguishable: *Triticum dicoccum* or *Triticum* cf. *dicoccum* (emmer wheat) in samples <4532> and <4510>, and free-threshing wheat in sample <5008>. Both samples producing *T. dicoccum* were Bronze Age, while the free-threshing wheat was recovered from a Late Saxon deposit. Weed species noted included *Galium aparine* and *Raphanus raphanistrum*, both arable weeds.

In addition to the cereal remains, fragments of *Corylus avellana* (hazel) nut shell, were noted in two samples (samples <5033> and <4521>). In both cases the number of fragments was very low, representing less than one nut. Both samples were from Bronze Age postholes.

Charcoal was noted in 60 samples. Generally the quantities were low (present or frequent), while larger amounts were noted in 4 Bronze Age samples (samples 5004,

5040, 4509, 4508). The larger charcoal samples consisted entirely of *Quercus* sp. charcoal. Of the six samples assessed from the MBA urn thought originally to have been a cremation vessel (4508), only two produced charcoal and in very small quantities.

#### Provenance

There was no relationship between feature type and charred seeds or chaff. All types of feature produced both samples with no remains, and samples with occasional grain, with the exception of MBA urn deposits which produced no seeds or chaff. It is likely that the seeds and chaff represent no more than background scatters of remains of cereal processing or preparation which have become incorporated in the backfill of features. There is limited evidence for different cereal producing activities in the different periods, although it does appear that emmer wheat was being utilized in the Bronze Age and free-threshing wheat in the Saxon period. Barley is present in all periods. There is no evidence of deliberately dumped material. Much of the charcoal is likely to have been from similar secondary deposits, with the exception of the four richer deposits all of which appear to contain only oak. It is possible that the charcoal in each of these deposits derives from single pieces of oak timber or branch/trunk wood.

### **3.** Potential for further work

The range and quantity of charred seeds and chaff within the samples is such that further analysis is unlikely to extend the species. While no further work is necessary it is recommended that the assessment results are included in the final report.

#### **APPENDIX 5: ANIMAL BONE**

### by Bethan Charles

#### **1.** Introduction and Quantification

A total of 145 fragments (626g) of animal bone was retrieved from excavations at Angmering By-Pass by Oxford Archaeology. Some of the bone was re-assembled reducing the fragment count to 129.

### 2. Methodology

The calculation of the species recovered from the site was done through the use of the total fragment method. All fragments of bone were counted including elements from the vertebral centrum, ribs and long bone shafts. It was attempted to separate the sheep and goat bones using the criteria of Boessneck (1969), Prummel and Frisch (1986) in addition to the use of the reference material housed at OA. However, since no goat bones were positively identified all caprine bones have been recorded as sheep. The ageing of the animals was based on tooth eruption and epiphyseal fusion. Silver's (1969) tables alone were used to give timing of epiphyseal closure for the sheep bones (this information can be found in the primary record sheets). Sheep's tooth eruption and wear was measured using a combination of Payne (1973) and Grants (1982) tables. Metrical data was recorded on all suitable complete and fragmented bones as defined by von den Driesch (1976). All information is stored in the primary recording data in the archive.

### 3. Condition

The condition of the bone was poor due to the acid nature of the soil. As a result it is likely that the majority of the animal bone remains from the site have not survived. The majority of the bone recovered came from one skeleton which may have been of later date than the current date assigned to the feature since very little bone from earlier deposits survived. None of the bones recovered had been burnt or had signs of gnaw damage from scavengers. None of the bones had butchery marks.

### 4. **Results and recommendations**

The small amount of animal bone from the site came from two contexts. A single sheep jaw bone was also identified from an unstratified deposit. The majority of bone came from context 5097 (fill of pit 5096; see Fig. 2). Only part of the skeleton remained including most of the vertebrae, rib cage, and most of the long bones from the left side of the body. It is possible that the body was lain on it's left side and that most of the right side of the body was lost due to plough damage.

The animal was at least 3-3.5 years of age or older. Pathological changes on the bones indicated the animal was arthritic. Evidence included eburnation marks on the articulation

between the metacarpal and the proximal phalanx as well as on the proximal articulation of the humerus. Two of the thoracic vertebrae had fused completely.

Also found with the adult sheep skeleton were the remains of a juvenile sheep thought to belong to a single individual. Elements included part of the pelvis, the scapula and both tibia and humerus bones. However, the bones were poorly preserved and much of the remains are unlikely to have survived.

The remaining bone from the site came from Saxon enclosure ditch 5006 and comprised three teeth from a horse. The teeth were in very poor condition.

Unfortunately the small number of fragments from the site and the poor condition of those bones recovered limits interpretation of the diet of the inhabitants and animal husbandry regimes, particularly since the dating for the sheep skeleton is not secure. It is not recommended that further work be done on this assemblage.

### 5. References

- Boessneck, J. 1969 Osteological Differences in Sheep (*Ovis aries* Linné) and Goat (*Capra hircus* Linné), in D. Brothwell and E. Higgs (eds.) *Science in Archaeology*, Thames and Hudson, 331 358
- Grant, A. 1982 The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates, inB. Wilson *et al.* (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites*,BAR British Series 109, Oxford
- Payne, S. 1973 Kill-Off Patterns in Sheep and Goats: The Mandibles from Asvan Kale. Anatolian Studies, *Journal of the British Institute of Archaeology at Ankara*. Vol XXIII, 281 - 303
- Prummel, W and Frisch, H-J. 1986 A Guide for the distinction of species, sex and body size in bones of sheep and goat, *Journal of Archaeological Science XIII*, 567 77
- Silver, I.A. 1969 The Ageing of Domestic Animals, in D Brothwell and E Higgs (ed.) *Science in Archaeology*, Thames and Hudson, London
- Von den Driesch, A., 1976 A Guide to the Measurement of Animal bones from Archaeological Sites, *Peabody Museum Bulletin*

# **APPENDIX 6: GEOLOGICAL INVESTIGATION**

# 1. Introduction

A programme of Quaternary geological fieldwork, comprising a watching brief on geotechnical test pits and boreholes and three purposive geological boreholes, was carried out in order to investigate the Pleistocene coastal topography in the central part of the route and possible Pleistocene/ Holocene valley sediments in the northern part of the route.

# 2. Geological background

The geology of the Angmering by-pass route is dominated by Highdown Hill, an inlier of Upper Chalk preserved on the northern limb of the Littlehampton Anticline. The chalk at the northern edge of the anticline dips at c 14 degrees into the Clapham Syncline, which is an *en echelon* extension of the west-east trending Chichester Syncline. The western, northern and eastern slopes of Highdown Hill comprise Palaeogene deposits of the Reading and London Clay Formations, which line the syncline and overlie the chalk. The southern slopes of Highdown are covered with superficial Quaternary drift deposits of Head Gravel and aeolian loess. The southern face also probably preserves a series of marine cut benches and littoral deposits associated with middle and late Pleistocene high sea level events (Roberts M, 1999a).

### 3. Desktop assessment of preliminary geotechnical logs

Assessment of seven boreholes on the site of the Angmering Housing Development (Roberts M, 1999b) concluded that the sequences showed clear evidence for a Pleistocene marine transgression. The assessment of 5 preliminary boreholes and 4 test pits drilled along the route of the Angmering by-pass suggested the presence of a buried cliffline falling somewhere within the central part of the by-pass route. The OD heights of this apparent marine wave cut platform suggest a correlation either with sediments of the Norton Formation or the newly identified Merston Raised Beach (Roberts 1999c).

Pleistocene marine sediments were found in every borehole on the Angmering Housing Development site but there were none recorded in any of the first phase by-pass boreholes. There are two possible explanations for this:

- 1) There are two clifflines at differing altitudes: The lower equates to the Merston Formation, the higher to the Norton Formation.
- 2) There is a single cliffline: Within the area of the by-pass the marine sediments associated with this event have been eroded away by Pleistocene mass movement sediments flowing westward off Highdown Hill. Away from Highdown, in the Angmering Housing Development area, the sediments survive and are represented by marine sands and silts. All these deposits would belong to the Norton Formation.

## 4. Summary of fieldwork

The primary aims of the fieldwork were to attempt to locate the relict cliffline and to recover lithostratigraphic and biostratigraphic data to assist in resolving the interpretation and correlation of the various deposit sequences.

As part of the evaluation process, sixteen geotechnical test pits, five geotechnical boreholes and three purposive geological boreholes were monitored in the field by Mr.C.A.Pine, in consultation with Dr M.R.Bates. The work was intended to take place as a single phase but as a result of the foot and mouth crisis was eventually carried out in three phases: The test pitting in January 2001, the boreholes in the northern part of the route in November 2001.

# Pleistocene results

All sequences were monitored by a geologist and notes were taken during excavation/ drilling to supplement the geotechnical logs. From these observations it is clear that marine sediments are present in the southern part of the by-pass route. Preliminary scanning indicates the presence of molluscs in some sequences, offering the potential for obtaining amino acid ratios as well as biostratigraphic data. OSL samples will be collected from the cores following detailed description.

# Holocene

The only test pit to produce potentially significant Holocene deposits was TP312, located to the south of the A280 Water Lane, in a valley bottom area adjacent to a small stream. A thick sequence of probable Holocene sediments was identified in the valley bottom, interpreted as representing former floodplain environments including marshland, channel cut-offs and floodplain surfaces. At a depth of 2.60m were discreet pockets of black organic silt (very well humidified peat). Sieving of spoil from the test pit produced molluscs and plant macrofossils, suggesting the potential for further detailed Holocene palaeoenvironmental investigation.

In the light of these results a purposive trench was commissioned by West Sussex County Council on the site of TP312, as part of the by-pass environmental mitigation. This failed to encounter the organic horizon seen in the test pit and it is concluded that the discreet pockets of peat were a localised phenomenon.

# 5. Statement of Potential

### Pleistocene

The Angmering by-pass geological investigation, in conjunction with work in adjacent areas such as the Angmering Housing Development, has the potential to resolve some of the complex stratigraphic relationships between Pleistocene marine sedimentary sequences on the lower coastal plain of West Sussex. Preliminary examination of the borehole cores has confirmed the presence of marine sands at two locations in the southern part of the by-pass route. The data therefore has the potential to resolve current difficulties in interpreting and correlating this set of deposits, and should allow the postulated Pleistocene relict cliff line to be located more accurately.

### Holocene

There is no potential for further work on the Holocene sequence in the stream valley at the North end of the by-pass route.

# 6. **Recommendations**

### Pleistocene

It is recommended that detailed lithostratigraphic description of the deposit sequences is carried out, followed by comparison and correlation with other potentially related sequences on the West Sussex Coastal Plain, in particular those from the adjacent Angmering housing development.

Analysis of palaeoenvironmental and biostratigraphic indicators (including molluscs, ostracods and foraminifera) and scientific dating of the key deposits by means of OSL and Amino acid ratios, are required to assist in the interpretation and correlation of the sequences.

It is proposed that the work is published as part of a proposed wider monograph study of the geology of the West Sussex Coastal Plain.

### Holocene

No further work required.

# 7. References

- Roberts M.B, 1999a The proposed Angmering by-pass: A Preliminary Desktop Assessment. Unpublished report for West Sussex County Council
- Roberts M.B, 1999b The proposed Angmering Housing Development: A Preliminary Geoarchaeological Report. Unpublished report for West Sussex County Council
- Roberts M.B, 1999c River Lavant Flood Alleviation Scheme: Report on Geological Test Pits at Merston and Shopwyke. Unpublished report for West Sussex County Council





Figure 1 : Site Location



N



Figure 2 : Area 1: Trench Plan



N



Figure 3 : Area 2: Trench Plan



phasing

scale 1:800

40m



Figure 4 : Phased Feature in Area 1



Figure 5 : Phased features in Area 2

N