

LAND WEST OF BEDFORD

ASSESSMENT OF POTENTIAL AND UPDATED PROJECT DESIGN

VOLUME 1

Introduction, summary, assessment and UPD

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David Wilson Homes







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Preface

Every effort has been made in the preparation of this document to provide as complete an assessment as possible, within the terms of the brief and written scheme of investigation. All statements and opinions in this document are offered in good faith. Albion Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party, or for any loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in this document.

Contributors

This document has been written or edited by Mike Luke (Project Manager) and Ben Barker (Project Officer). The majority of the contextual analysis and assignment to final phasing was undertaken by Jo Barker.

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- *Metal artefact X-rays- Rob White (Principal Keeper, Lincolnshire County Council Conservation Department),*
- *Digitisation- Joan Lightning (Albion)*
- *Database creation- Dave Coombes (Albion)*





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The open area excavations and strip, map and investigation were undertaken by the following teams:

- **Biddenham Loop**- the majority of the excavation area was supervised by Jo Barker, although Alison Bell, Richard Gregson and Adam Lodoen were responsible for smaller areas of short duration. Machine supervision, hand excavation and recording were undertaken by Lennard Anderson, Kerry Ashworth, Alison Bell, Melanie Bell, Anthony Clifton-Jones, George Demetri, Richard Gregson, Marcin Koziminski, Adam Howard, Annette Hughes, Iain Leslie, Adam Lodoen, Gary Manning, Jeremy Mordue, Gyorgy Nemes, Kathy Pilkinton, Anna Rebisz, Gareth Shane, Catrina Summerfield-Hill, Wiebke Starke, Jerry Stone, Kirsty Tuthill, Jennifer White, Adam Williams and Adrian Woolmer.
- **Land west of Kempston** the majority of the excavation area was supervised by Victoria Osborn, although Jo Barker was responsible for the areas to the south of the development. Machine supervision, hand excavation and recording were undertaken by Kerry Ashworth, Melanie Bell, Annette Hughes, David Ingham, Jan Janulewicz, Anthony Clifton-Jones, Adam Lodoen, Gary Manning, Mark Phillips, Jeremy Mordue, Slawomir Utrata and Adrian Woolmer.
- **Artefact processing** was overseen and reported on by Jackie Wells (Artefact Supervisor).
- **Ecofact processing** was undertaken or overseen by Sharon Gerber-Parfitt, assisted by Slawomir Utrata
- **Surveying** was undertaken by Mercedes Planas.

Field artefact collection was undertaken prior to earthmoving on the Biddenham Loop by:

- **Fieldwork** by Kerry Ashworth, Liz Davis, Adam Howard and Jerry Stone under the supervision of Ben Barker (Project Officer).
- **Artefacts** were processed by Jackie Wells (Finds Officer) and the stuck flint was identified by Holly Duncan (Artefacts Manager).

Mike Luke (Project Manager) was responsible for the overall management of the project. This included financial management, leading monitoring/progress meetings with the Consultant and Client, negotiating, and agreeing and monitoring deadlines for each area. Ben Barker (Project Officer) was responsible for the project on a day-to-day basis which involved co-ordinating the Archaeological Supervisors, monitoring and assisting the progress of each area, organising the deployment of plant and staff, and monitoring Health & Safety. While Ben was on leave cover was provided by Christiane Meckseper and Wesley Kier. All Albion Archaeology projects are under the overall management of Drew Shotliff (Operations Manager).

Dave Flanigan, Ashley Williams and their staff (PJ Construction) are due thanks for the efficient and responsive undertaking of all earthmoving and for their flexible working arrangements.

Fieldwork was monitored on a weekly basis by Simon Mortimer (CgMs Consulting) and areas were 'signed off' by Martin Oake (County Archaeological Officer, Bedfordshire County Council).

Albion Archaeology is grateful to David Wilson Home for awarding us the contract. Our gratitude is extended to a large number of individuals within this organisation but in particular we would like to acknowledge the co-operation and support of Guy Caswell and Chris Hatfield.

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Structure of the report

This Assessment/UPD report is divided into three volumes:

- *Volume 1: The text*
- *Volume 2: Data tables*
- *Volume 3: Figures*

In this textual volume Section 1 introduces the project, detailing the planning and archaeological background. Section 2 summarises the nature and implementation of the archaeological fieldwork. Section 3 describes the reasons for integrating the results of the DWH housing development with that of the Bedford Western Bypass in the form of a joint post-excavation project. The summary and discussion by chronological period (Section 4) is based on the final and combined phasing/contextual hierarchy for both projects. Section 5 presents a summary of the data-sets and a discussion of the major themes for analysis follows in Section 6. An updated project design is presented in Section 7. Detailed method statements for analysis, publication and archiving are presented in Appendices 1 and 2 (Sections 8 and 9). Section 10 is the bibliography.

Version history

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Key terms

Albion	Albion Archaeology
Client	David Wilson Homes (South Midlands)
Consultant	Simon Mortimer, CgMs Consulting
CAO	(Up to end March 2009) Martin Oake, County Archaeology Officer, Bedfordshire County Council
IfA	Institute for Archaeologists
LPA	Local Planning Authority (Bedford Borough Council)
<i>Procedures Manual</i>	<i>Procedures Manual Volume 1 Fieldwork, 2nd Edition, 2001. Albion Archaeology</i>
UPD	Updated Project Design- detailing the tasks required to undertake the analysis, publication and archiving of this project
WSI	Written Scheme of Investigation





Non-Technical Summary

This document represents a summary and assessment of the results of archaeological investigation associated with the Land West of Bedford housing development. It also presents an Updated Project Design and methodologies for analysis and publication of the results.

The development comprises c. 150ha of housing, infrastructure etc along with a country park. The development area comprises two large land parcels separated by the River Great Ouse and its floodplain referred to within this document as:

- *The Biddenham Loop centred on TL 210/484*
- *Land west of Kempston centred on TL 180/467*

In total c. 60ha of open area excavation was undertaken on the Biddenham Loop and c. 6ha on Land west of Kempston, mainly between October 2007 and October 2008, with ancillary works undertaken in September and October 2009. Beyond these areas additional information was provided by geophysical survey, aerial photograph analysis, evaluation trenches and a palaeo-environmental study. Far more substantial and significant complementary data was provided by the results of the Bypass investigations. Accordingly, it was agreed that the two projects should be combined, with joint analysis and publication allowing the results of both projects to be examined in a wider chronological framework and spatial landscape than could be achieved by either of them individually.

The known archaeological evidence prior to the recent investigations has been described in the Management Strategy (CgMs 2007), WSI (Albion 2007b) and, for the Biddenham Loop, the Bovis publication (Luke 2008). The Biddenham Loop has been the scene of human activity from the Palaeolithic through to the present day. Prior to the Bedford Western Bypass investigations (Albion 2007 and 2009), the evidence for the majority of Land west of Kempston suggested that, with the exception of the land around Kempston Church End, it was largely devoid of past human activity.

The results of the recent investigations are important for a multitude of reasons and will assist in addressing local, regional and national research objectives. These are detailed in this report but the more significant ones are summarised below:

- *The scale of the investigations will provide an opportunity to give a wider landscape setting to the many settlements, field systems, major boundaries and funerary/ceremonial monuments/events that were found. This will be in contrast to the majority of archaeological investigations which are concentrated on settlements.*
- *The location of the investigations on both river gravels (Biddenham Loop) and clay (Land west of Kempston) will assist in understanding the contrast in activity that occurred between the different geologies and settings. Although not as extensive as on the Biddenham Loop, significant pre-Roman activity was identified on the clays to the west of Kempston from the late Neolithic. One part of Land west of Kempston appears to have been continually occupied from the early Saxon period through to the present day.*
- *Two early Neolithic monuments on the Biddenham Loop are among only a small number of well dated monuments of this period in the country. No exact parallels have been found for the early Neolithic inhumations in their ditches.*



- *The early Bronze Age shafts are of particular interest because five have been radiocarbon dated, three contained unusual animal bone assemblages, and all are located within the vicinity of monument clusters.*
- *The identification of an extensive and well dated middle Bronze Age landscape on the Biddenham Loop is one of the most significant discoveries of the investigations. In contrast to the Thames Valley, evidence for this period in Bedfordshire and the wider region is still rare. Along with fields and large pits, and in contrast to other sites, a large number of human burials, including a cremation cemetery, and a smaller number of animal burials were found. All the evidence is firmly dated by radiocarbon determinations.*
- *No exact parallels are known in Britain for the late Iron Age ritual complex, although the arrangement is similar to a number found in northern France.*
- *The Romano-British bustum burial is a significant discovery because it is the first such burial to be positively identified in Bedfordshire and is comparatively rare in England.*
- *The evidence for early Saxon settlement within the investigation area, especially that on the Biddenham Loop, is another significant result. No such evidence was found during the Bovis investigations, giving the impression that the Romano-British population had moved to new settlements away from the Biddenham Loop.*
- *Perhaps the most important result of the investigation is the evidence for continuity, rather than discontinuity, in the evolution of the landscape. The identification of chronological periods, while essential in describing past human society, does tend to accentuate discontinuity. This applies both to individual monuments, some of which on the Biddenham Loop retained their significance to the local population for a prolonged period, and the development of the landscape itself. The Neolithic and Bronze Age monuments were incorporated into the middle Bronze Age field systems and some continued to be the focus of burials. Continuity of these fields into the middle Iron Age and even the Romano-British period is also indicated by the way later farmsteads are also located around the periphery of the earlier fields. The positioning of the main pit alignment across the Biddenham Loop has both elements of discontinuity and continuity. Although it does cut a number of earlier field boundaries, it does so at the corners of fields and for the majority of its course it crosses unenclosed land between two separate field systems. For the Roman to Saxon transition it is significant that the majority of the evidence for early Saxon settlement occurs in the vicinity of Romano-British settlements. On the Biddenham Loop the majority of the early Saxon buildings were constructed within a peripheral enclosure of an earlier farmstead.*

The methodologies, project team and timescale required to complete this project are presented in the Updated Project Design and in more detail in the appendices. The end product will be the publication of the results and, subject to the landowner's permission with regard the artefacts, the deposition of the project archive (Accession Number 2003.01) with Bedford Museum.

The role and support of the client (David Wilson Homes) and consultant (CgMs Consulting) will be acknowledged in all outputs.



1. INTRODUCTION

1.1 *Project background*

The background to this project is fully described in the Management Strategy (CgMs 2007) and therefore only a brief summary is provided here. CgMs Consulting was commissioned by David Wilson Homes to develop a strategy for mitigating the impact of a mixed-use development on archaeological remains within the southern part of the Biddenham Loop and within an area of land west of Kempston. This land had been allocated for development in the Deposit Draft of the Bedford Borough Local Plan (February 1997) and in the emerging local plan policies H6 and H7

1.2 *Status and purpose of this document*

This report represents an assessment of the results of all stages of the archaeological investigations occasioned by the mitigation strategy. An updated project design is included listing all tasks that will be required to analyse, publish and archive the results. The completion of these tasks will fulfil the criteria stipulated in the Written Scheme of Investigation (Albion Archaeology 2007b). This was produced around the time of the implementation of MoRPHE (English Heritage 2006) and is therefore still in line with MAP2 (English Heritage 1991a).

1.3 *Location and topography (Figure 1)*

The development area occupies land between the Bedford Western Bypass and the outskirts of Bedford/Kempston. It comprises two main land parcels separated by the River Great Ouse and its floodplain:

- **The Biddenham Loop-** land that lies within a large meander of the River Great Ouse to the south of the village of Biddenham and to the south-west of Bedford. To the south and east it is bounded by the River Great Ouse, and to the north by housing and a golf course. It is centred on TL 210/484.
- **Land west of Kempston-** land that lies to the west of Kempston, bounded to the east by housing, a school and the police headquarters. It is centred on TL 180/467.

The topography of the majority of the Biddenham Loop is flat, but there is a slope down towards the floodplain. The majority of the Loop lies at approximately 30-33m OD; its highest point is at 41m OD in the north-east (known locally as Honey Hill). The floodplain lies at approximately 28m OD and the slope down to it from the higher ground is steep to the west and east, and gentle to the south.

To the south near the A421, the development area is situated on the edge of the Marston Vale at 30m OD. From here the land rises to Bell Farm before dropping twice into shallow valleys containing tributaries of the River Great Ouse situated south and north of Ridge Road. The land rises to 40m OD by The Bury before sloping down to the River Great Ouse.



1.4 Geology

The underlying geology of the area is Oxford Clay (Land west of Kempston) and limestone (Biddenham Loop) which is overlain by river gravels and alluvium in the valleys. Occasional outcrops of Oolitic Limestone and Cornbrash Limestone, separated in places by Blisworth Clay, occur on the Biddenham Loop. Above the Cornbrash are the clays and sands of the Kellaway Beds and above these a layer of dark grey Oxford Clay.

1.5 Previous archaeological investigations (Figure 2)

There have been numerous archaeological investigations on and adjacent to the DWH development area over the last 15 years. These have been associated with a variety of separate planning applications but the majority have been undertaken by Albion Archaeology. With the exception of a watching brief on geotechnical test pits immediately prior to the commencement of earthmoving, none of these have been commissioned by the present Client. The work has comprised:

- Desk-based assessment
- Non-intrusive evaluation
- Intrusive evaluation
- Mitigation investigation

1.5.1 Desk-based assessment

A desk-based assessment was assembled from all available information (without new fieldwork) at the design stage for the housing and golf course development on the Biddenham Loop (CPM 1991).

1.5.2 Non-intrusive evaluation

1.5.2.1 Biddenham Loop

Non-intrusive evaluation was undertaken over the entire Biddenham Loop, although the subsequent planning application by Bovis only covered the northern part of the Loop. The non-intrusive evaluation, therefore, included part of the present development area. It comprised:

- **Field artefact collection** over c. 216ha was walked by BCAS (now Albion) using 20m by 50m collection units in 1991 (BCAS 1991). Forty-three artefact concentrations, mostly comprising struck flint, were identified.
- **Geophysical survey** over c. 44ha was subject to detailed gradiometer survey by Geophysical Surveys of Bradford in 1994 (GSB 1994). The survey areas were positioned both to examine known cropmarks and to provide even coverage of the area. Large numbers of pit- and ditch-type anomalies were identified.

1.5.2.2 Land west of Kempston

Non-intrusive evaluation was undertaken as part of the planning application for the present development area. It comprised:

- **Earthwork survey** over c. 9.6ha was undertaken by Albion to the southeast of The Bury centred on TL 01730, 47270 (Albion 2003).



- **Field artefact collection** over c. 15ha was walked by Albion using 20m collection units in 2002 and 2003 (Albion 2003). Although struck flint, Roman and medieval pottery were recovered, no significant concentrations were identified.
- **Geophysical survey** was undertaken by West Yorkshire Archaeology Service in 2002 (WYAS 2003). This involved the scanning of c. 38ha followed by the selected detailed survey in eight blocks of c. 4.6ha. A small number of pit-type and ditch-type anomalies were located but these were believed to be associated with relatively recent features/activity.

1.5.3 Intrusive evaluation

1.5.3.1 Biddenham Loop

Intrusive evaluation comprising trial trenches was undertaken as part of separate planning applications associated with the Bovis development and the present development. These comprised:

- **Bovis** - 56 trenches undertaken in 1995 (Wessex Archaeology 1995). Many of these confirmed the existence of sub-surface features associated with the geophysical anomalies and the presence of a considerable amount of other archaeological evidence.
- **Present development** - 22 trial trenches undertaken in 2003 by Albion (2004). These were primarily designed to test cropmark anomalies of uncertain status. They confirmed the existence of sub-surface features associated with the cropmarks and the presence of a considerable amount of other archaeological evidence.

1.5.3.2 Land west of Kempston

Intrusive evaluation was undertaken as part of the planning application associated with the present and adjacent planning applications. This comprised:

- **Cutler Hammer Sportsground** – geophysical survey and ten trenches were undertaken in 1999 (BCAS 1999a)
- **Present development** - 62 trenches undertaken in 2003 by Albion (2004). Although a number of these tested artefact clusters and geophysical anomalies, the majority were randomly distributed. A small number of concentrations of sub-surface features were identified.

1.5.4 Mitigation investigations

1.5.4.1 Biddenham Loop

Mitigation strategies have been implemented for the Bovis development, the Village Medical Centre and the Bedford Western Bypass which are adjacent to the DWH development area. They comprised:

- **Bovis detailed field artefact collection** the absence of sub-surface features within the evaluation trenches underlying the flint concentrations suggested that these may represent the only surviving evidence for some prehistoric activity. Therefore, more detailed field artefact collection was undertaken in 1996 in advance of open area excavation over nine flint concentrations. A total area of 6.1ha was subject to collection, usually at 4m but occasionally at 10m collection intervals (BCAS 1998, Luke 2008).



- ***Bovis open area excavation*** approximately 18ha were investigated in 1996-7 (BCAS 1996, BCAS 1997, SMA 1997, Luke 2008).
- ***Village Medical Centre*** approximately 0.35ha was investigated in 2004 (Luke 2008, 288-92).
- ***Bedford Western Bypass field artefact collection*** approximately 6ha were subject to artefact collection in 2006 (Areas 1 and 2). Collection was undertaken at 4m intervals (Albion 2009a).
- ***Bedford Western Bypass open area excavations*** approximately 9ha were investigated on the Biddenham Loop in 2006 (Area 3) and 2007 (Areas 1 and 2) (Albion 2007c and 2009).
- ***Bovis and Bedford Western Bypass watching briefs*** carried out during engineering test pitting.

1.5.4.2 Land west of Kempston

Mitigation strategies have been implemented for Marsh Leys and the Bedford Western Bypass which are adjacent to the DWH development area. In addition, other investigations have been undertaken in the vicinity and have produced significant results. These comprised:

- ***Southern Orbital Sewer watching brief*** approximately 0.7ha were subject to open area investigation within a larger watching brief area in 1991 and 1992 adjacent to Kempston Church End (Dawson 2004, 38-66).
- ***Kempston Box End quarry salvage investigation*** approximately 0.5ha were subject to emergency investigation in 2004 under during a brief halt in operations after the discovery of human remains (Luke and Preece forthcoming a).
- ***Bedford Western Bypass open area excavations*** approximately 7.5ha were subject to investigation adjacent to the present development. These were undertaken in 2005 (Areas 9, 10 and 11), in 2006 (Areas 5, 6, 7 and 8) (Albion 2007c and 2009a).
- ***Marsh Leys open area excavations*** approximately 8ha were subject to investigation to the south of the present development area. These were undertaken in 2000 and 2001 (Albion 2002, Luke and Preece forthcoming b).

1.6 Brief chronological summary of known archaeological evidence in the vicinity prior to the recent investigations

The known archaeological evidence prior to the recent investigations has been described in the Management Strategy (CgMs 2007), WSI (Albion 2007b) and, for the Biddenham Loop, the Bovis publication (Luke 2008). Therefore, only a brief chronological summary is presented below.

The majority of the archaeological evidence for the Biddenham Loop, prior to the recent investigations, derives from the Bovis excavations (Luke 2008). It was believed to represent settlements, monuments/burials and field systems, spanning the period from the late Neolithic to the end of the Romano-British period. This longevity of settlement was ascribed in part to local topography: a riverine location with adjacent land just above the flood plain. Any settlement would have been well positioned to exploit a wide range of natural resources. The precise nature of 'settlement' prior to the late Bronze Age was uncertain.



In summary the Biddenham Loop had been the scene of human activity from the Palaeolithic through to the present day. However, the earliest human activity was only known from flint artefacts within the ploughsoil; evidence for middle Bronze Age or Saxon activity was generally absent.

Prior to the Bedford Western Bypass investigations (Albion 2007c and 2009a), the evidence for the majority of Land west of Kempston suggested that, with the exception of the land around Kempston Church End, it was largely devoid of past human activity. However, the Bypass open area investigations indicated that the area might hold more archaeological evidence than had been suggested by the evaluation.





2. NATURE AND IMPLEMENTATION OF THE ARCHAEOLOGICAL FIELDWORK

2.1 Introduction

The methodologies for the investigations were detailed in a number of Written Schemes of Investigation (WSI) produced by Albion; they are summarised here.

2.2 Field artefact collection (Figure 6)

Detailed flint artefact collection was undertaken in early October 2007 in line with the WSI (Albion 2007a) over selected flint concentrations identified during the Bovis evaluation (Luke 2008, figs 4.2 and 4.5). Detailed field artefact collection, similar to that reported on here, was undertaken in advance of the Bovis development and the Bedford Western Bypass. The same methodology as these was employed during the recent artefact collection to ensure consistency and to facilitate comparisons. Collection was undertaken at 4m intervals, with each individual walker collecting flints from within a 2m wide strip along the length of their designated transect. Artefacts were bagged and left at the exact place they were found. Another team followed on behind the collection team to recover the bags, assign a unique number to the findspot and survey their exact findspot using differential GPS survey equipment. The results were presented in a separate report (Albion 2008a) and are therefore only summarised below.

2.3 Geotechnical test pit monitoring

Between 20th August and 11th September 2007 the excavation of 36 geotechnical test pits within the Biddenham Loop was observed to ensure they did not impact upon any archaeological deposits. The location of the test pits had been selected to avoid known archaeological features that had been identified by non-intrusive survey. In the rare cases where sub-surface features were observed the pits were moved to avoid them, so that they could be subsequently investigated within the open area excavations. Therefore, no significant archaeological features or deposits were identified during the test pitting.

2.4 Open area excavations

Open area excavation was undertaken between October 2007 and November 2008.

Within the WSI eighteen 'sites' of known archaeological potential were identified within the intrusive development area (Albion 2007b, figs 2 and 3). Much of the remaining land was of unknown archaeological potential (see 2.5). Some areas were not subject to archaeological investigation either because it was believed that they did not contain archaeological remains or for other reasons (see 2.7).

The excavation areas were stripped of overburden, under archaeological control, and archaeological investigations were undertaken in advance of construction work, to the strategy outlined in the WSI. All excavation and recording was undertaken in line with the *Procedures Manual* (Albion 2001).



A major review of the effectiveness of earthmoving and hand excavation strategies was undertaken in early 2008 while fieldwork continued and alternative strategies were proposed in an Updated WSI (Albion 2008b) (see below for more details).

2.4.1 Excavation sites of known archaeological potential

In areas of known archaeological potential earthmoving and open area excavation was undertaken well in advance of construction work. These areas were classified on the basis of a number of sources of information, e.g. the presence of:

- Cropmarks
- Geophysical anomalies
- Features within evaluation trenches
- Features within an adjacent open area excavations

These sites are summarised in Table 1 and those not removed from the investigation scheme (see 2.7) are shown on Figure 5 and Figure 6.

In total it was envisaged that areas of known potential amounted to 15.35ha on the Biddenham Loop and 2ha on Land west of Kempston.

2.4.2 Additional excavation sites of known archaeological potential

Three additional areas (Table 2), which were not envisaged as part of the original WSI, were subject to open area excavation during the main works in response to changes in the development design. All hand excavation and recording was undertaken to the same standard as in the WSI.

2.5 Areas of unknown potential

It was clear, especially on the Biddenham Loop, that all land classed as being of unknown potential was likely to contain archaeological remains. However, the precise location, nature and quantity of these were uncertain. In addition, anything other than large scale removal of topsoil and subsoil to archaeological standards was unlikely to locate these features. Therefore, in these areas earthmoving was undertaken in advance of construction work and, where remains were found, they were subject to open area excavation on a strip and map basis to the same standards as those used for areas of known potential.

The WSI envisaged that:

- The entire intrusive development area within the Biddenham Loop, excluding the country park and any significant open spaces (Albion 2007b, fig. 2) would be stripped under archaeological control.
- Around 50% of Land west of Kempston had some, unknown, archaeological potential so that this area would be subject to a similar methodology.

2.6 Ancillary works

During September and October 2009 open area excavation was undertaken in advance of the construction of a pipe between housing area H13 and the River Great Ouse. This was within southern part of a known Romano-British



settlement (Dawson 2004, Luke and Preece forthcoming a) and *c.* 60m from the Cutler Hammer Sportsfield which had produced evidence for Bronze Age and Romano-British remains (BCAS 1999). Therefore, to mitigate the impact of both the trench and the adjacent area of ground machine disturbance a *c.* 4m wide corridor was stripped between Cemetery Road and the River Great Ouse. All investigation was undertaken to the same standards as for the open area excavations. The sole exception was a *c.* 4m length where the pipe crossed the public footpath known as “The Causeway”. Here, the width of the pipe trench was reduced to *c.* 0.7m to reduce damage to the footpath.

2.7 Areas removed from archaeological investigation

2.7.1 Areas removed prior to issue of WSI

In early 2007, prior to any investigations, discussions took place between the Consultant and the CAO which resulted in an agreement that some land within the development area did not require archaeological investigation. These areas comprised *c.* 2.5ha on the Biddenham Loop (Albion 2007b, fig. 2) and *c.* 18ha on Land west of Kempston (Albion 2007b, fig. 3). A variety of reasons were adduced, including:

- No archaeological features were identified within the evaluation and this was believed to be an accurate reflection of archaeological potential.
- Underlying archaeological remains were unlikely to be impacted by development or could be preserved *in situ*, e.g. on football pitches.
- Post-medieval quarrying would have destroyed any archaeological remains that might once have been present.

2.7.2 Areas removed as a result of the updated WSI

An updated WSI was produced in early 2008 (Albion 2008b) which

- 1) Reviewed results to date, compared to those anticipated on the basis of the evaluation and adjacent investigations.
- 2) Reviewed the effectiveness of geophysical survey.
- 3) Reviewed the results of investigation of prehistoric ditches.
- 4) Reviewed the effectiveness of the earthmoving strategy.
- 5) Proposed a palaeo-environmental study within the Country Park obviating the need for a watching brief within part of this area.

Within the Biddenham Loop the investigations up to this review point had confirmed the presence of significant archaeological features, some of which could not be located by evaluation techniques. It was proposed that the original methodology be continued with minor alterations made to the excavation of ring ditches and field boundaries.

However, for Land west of Bedford it was suggested that ‘the present strategy is not the most effective and could result in an additional *c.* 30ha being stripped but turning out to be devoid of archaeological features’ (Albion 2008b, 11).

The revised earthmoving strategy for Land west of Kempston restricted investigation to:



- 1) Areas of known archaeological potential (Sites 16 and 17 as described in the original WSI).
- 2) An area of unknown archaeological potential to the south-east of Bedford Western Bypass Site 8.
- 3) Parts of the development area adjacent to Cemetery Road and The Bury where archaeological potential was known to exist outside the development area.
- 4) Beyond these areas, the opening of 20m by 20m boxes around the two evaluation trenches that contained isolated features believed to be pre-medieval in date.
- 5) In all of these areas a buffer zone of c. 20m from the last archaeological feature.
- 6) Additional transects or boxes if the “edge” of archaeological remains were ambiguous.

As a result of this revision only 6ha were subject to open area excavation out of a maximum possible 40ha within Land west of Kempston.

2.8 Palaeo-environmental study

Approximately 50ha of the development area within the Biddenham Loop was designated as Country Park, broadly coinciding with the present flood plain. Where evaluation had been undertaken in this area close to the river it identified significant depths of alluvium which would make geophysical survey and trenching unproductive. The potential impact of the development was largely restricted to shallow ponds and tree planting. It was therefore agreed that whilst the chances of disturbance of *in situ* archaeological deposits was low, waterlogged deposits within the area might provide significant palaeoenvironmental information relating to the main excavation areas.

An initial field and desktop assessment of the present floodplain was undertaken in March 2008. This identified a small number of palaeochannels in the vicinity of the present river some of which contained waterlogged deposits with some potential for palaeoenvironmental reconstruction (Rackham 2008).

All subsequent work was limited to the floodplain of the River Great Ouse in the area of the proposed Country Park intended for landscaping and pond construction (Figure 3). A programme of hand augering and coring was implemented in June 2008 for the recovery of intact core samples from identified areas of waterlogged deposits. These were assessed to determine if they could be used to reconstruct parts of the palaeo-landscape (Rackham 2009).

2.9 Fieldwork monitoring and area sign offs

During substantive open area excavation the investigations were monitored on a weekly basis on behalf of the client by Simon Mortimer (consultant from CgMs).

When substantive areas had been fully investigated Martin Oake (County Archaeological Officer (CAO)) inspected the works. This typically resulted in the areas being verbally “signed off” on-site, with subsequent confirmation in writing following the submission by Albion of a “sign off” plan. Over the course of the fieldwork over a dozen such plans were produced. Partly due to



the large number of individual plans and partly due to changes in local government in Bedfordshire two overall plans (one for the Biddenham Loop and one for Land west of Kempston) were produced by Albion in February 2009. These showed the areas of investigation that had been “signed off” by the CAO during fieldwork and the areas which had been excluded from investigation with the agreement of the CAO. In late March 2009, the CAO confirmed that these plans were an accurate representation of the situation. They are reproduced in this report as Figure 3 and Figure 4.

2.10 Interim reports

Five Interim Reports were produced during fieldwork:

- Interim 1- October 2007 (Albion 2007d)
- Interim 2- Xmas 2007 (Albion 2007e)
- Interim 3- Easter 2008 (Albion 2008c)
- Interim 4- June 2008 (Albion 2008d)
- Interim 5- October 2008 (Albion 2008e)

They summarised the preliminary results and interpretations of the evidence revealed. Interim 5 was produced at the end of substantive fieldwork and as such presents a preliminary, overall summary of the results and interpretation at that time.

2.11 Post-excavation checking and consolidation of the records

Immediately following the completion of fieldwork, the final checking and consolidation of the site records was undertaken. In addition, all outstanding artefacts and ecofacts samples were processed. The site archives were consolidated and their internal consistency checked.

2.12 Summary of the fieldwork extent and timetable

Archaeological fieldwork was undertaken between October 2007 and October 2009. The time periods of the different investigations are provided in Table 3. In total c. 60ha were subject to open area excavation in the Biddenham Loop and 6ha on Land west of Kempston.





3. THE JOINT POST-EXCAVATION PROJECT

3.1 Introduction

In April 2008, during the course of the fieldwork, the CAO suggested that the Land west of Bedford investigations should be analysed and published in conjunction with those from the adjacent Bedford Western Bypass investigations.

3.2 Discussion and agreement

Subsequent discussions took place over the feasibility of combining the two projects. These culminated in a meeting at Albion's office in Bedford on 27th May 2008 between Simon Mortimer (Consultant from CgMs for David Wilson Homes), Sean Steadman (Consultant from Scott Wilson for Bedford Western Bypass), Mike Luke and Ben Barker (Albion Archaeology) and Martin Oake (CAO).

All agreed "in principle" that a joint publication would provide an excellent opportunity to present the results of the investigation of a significant swathe of the Bedfordshire countryside. Joint analysis would allow the results of both projects to be examined in a wider chronological framework and spatial landscape than could be achieved by either of them individually. This would lead to a more meaningful interpretation of the results.

In late 2008 both clients confirmed that they would like to proceed with a joint analysis and publication project.

3.3 Detailed rationale for a joint post-excavation project

3.3.1 Archaeological grounds (Figure 5 and Figure 6)

- a. **Archaeological remains within one project continued into the adjacent one** – for example on the Biddenham Loop the same Bronze Age and Roman boundaries, including a pit alignment, were present in both investigation areas. On Land west of Kempston the same was true of Saxo-Norman settlement and boundaries.
- b. **Increased archaeological understanding** – for example where a handful of storage pits on one project were actually part of a larger settlement on the adjacent project.
- c. **Enhanced evidence for the past environment** – for example, with a wider pool of samples of charred plant remains, the best from both projects could be selected for analysis. In addition, the palaeo-environmental study within the David Wilson Homes Country Park on the Biddenham Loop had relevance for both projects.
- d. **Enhanced understanding of landscape evolution** – it is always desirable to get the "bigger picture" when investigating how the landscape evolves. Combining the projects facilitated this by providing both complementary and contrasting evidence. For example:
 - **Late Neolithic** activity within the housing development on the Biddenham Loop is dominated by monuments, but on the Bypass the majority of evidence takes the form of occupation foci.



- **Middle Bronze Age** field systems, which probably continued to function through the Iron Age and into the Romano-British period, are extensive within the housing development on the Biddenham Loop but not within the Bypass.
- **Late Bronze Age/early Iron Age** – two pit alignments have been investigated within the housing development on the gravels of the Biddenham Loop and two others have been found within the Bypass on the clays west of Kempston.
- **Romano-British** enclosures, trackways and boundaries have been investigated within the housing development on the Biddenham Loop, but part of a substantial farmstead with cemeteries has been investigated within the Bypass. Within the housing development on Land west of Kempston and within the Bypass very similar, although spatially distinct, bedding trenches have been found. It is also likely that the settlement density and landscape in this area was influenced by the existence of a large village/small town underlying Kempston Church End. Part of this settlement was examined within the Bypass.
- **Early-middle Saxon** – a settlement was found within the housing development on the Biddenham Loop, but only isolated buildings were found within the Bypass.
- **Saxo-Norman and medieval** – from the end of the middle Saxon period the Biddenham Loop was covered in open fields but Saxo-Norman and medieval settlement was found in the vicinity of The Bury on both the housing and Bypass projects.

3.3.2 Physical proximity

This was most noticeable on the Biddenham Loop where a wooden fenceline 1km in length separated the archaeological investigations on the two projects. It was also the case on land west of Kempston in the vicinity of The Bury and Bell Farm.

3.3.3 Single archaeological contractor

The fact that both archaeological projects were undertaken by Albion Archaeology, using the same fieldwork methodology, meant that it was relatively easy to undertake the post-excavation analysis to the same post-fieldwork methodology.

3.4 Resolution of timetabling issues

Inevitably, the two projects were at different stages in the post-excavation cycle when joint analysis and publication was agreed. The majority of the Land west of Bedford fieldwork was completed in October 2008. However, by this point the Bypass Assessment/UPD (Albion 2009a) had been submitted and the consultant had agreed that a number of tasks could be started prior to formal “approval” which was received in early 2009.

It was agreed that progress on the two projects should be synchronised by the end of 2009. To achieve this a non-standard approach to the Land west of Bedford assessment was adopted on the following basis:

- It was clear from the Interim Reports that the Land west of Bedford fieldwork had produced significant data, the majority of which would merit analysis and publication.
- For the two projects to be jointly published it was essential that the data from both should be jointly analysed.



- To meet the required timescale it would be necessary for the Land west of Bedford assessment to be based on the final contextual phasing, *i.e.* that derived from firm dating evidence (artefact and scientific determinations *etc.*) and detailed stratigraphic analysis.

Accordingly, the following steps were taken:

1. Detailed contextual analysis was undertaken immediately following the record checking/consolidation of the site archive. It was accepted that the contextual data did not require assessment because the results of the investigations presented in Interim 5 had demonstrated the significance of the data.
2. The pottery, flint and other artefact assemblages were quantified to assist in the establishment of the phasing hierarchy.
3. Human bone from Land west of Bedford was quantified at the same time as the bone from the Bypass. Again, it was accepted that the material did not require assessment and that early quantification was necessary to make the material available for radiocarbon dating.
4. The charred plant, charcoal and animal bone assemblages were scanned to identify material suitable for radiocarbon dating. Full quantification of chosen material was undertaken before it was submitted for dating.
5. Two batches of radiocarbon determinations were obtained to assist in the establishment of the phasing hierarchy.
6. Finally, a single phasing hierarchy was created for both projects, based on contextual analysis, artefact dating and the radiocarbon determinations. This represents a key stage in both projects because, following approval of the Land west of Bedford Assessment/UPD, they will proceed as a single project with the same research objectives, same methodologies and same specialists.

For the Bypass project, all quantification and contextual analysis has been undertaken as described in the approved Assessment/UPD. However, any tasks dependant on the final, combined phasing hierarchy have been on hold until the two projects were at the point where they could proceed as one.

3.5 Nature of this document

3.5.1 Frameworks

This Assessment report was prepared broadly in line with Appendix 4 of the WSI (Albion 2007b), which was agreed prior to the decision to produce a joint publication. The UPD was prepared in accordance with the principles in Appendix 5 of MAP2 (English Heritage 1991a). However, for the reasons outlined above this Assessment/UPD does, in places, take a non-standard approach.

3.5.2 Tasks undertaken and information provided in this document

To synchronise the two projects the following tasks were completed prior to this Assessment/UPD:

- Detailed **contextual** analysis.



- Re-examination of **aerial photographic** and **geophysical survey** evidence. Fully integrated where appropriate into the contextual analysis.
- Quantification/cataloguing of **pottery**. *Summary report presented in this document.*
- Quantification/cataloguing of **flint**. *Summary report presented in this document.*
- Quantification/cataloguing of **other artefacts** (including x-raying of artefacts for identification and / or archiving purposes). *Summary report presented in this document.*
- Quantification/cataloguing of **human bone**. *Summary report presented in this document.*
- Partial quantification/cataloguing of **animal bone**. Full quantification was limited to key bone assemblages which required radiocarbon dating. The remainder of the assemblage was assessed. *Assessment report presented in this document.*
- Partial quantification/cataloguing of **charred plant remains**. Full quantification was limited to deposits which required radiocarbon dating. The remainder of the assemblage was assessed. *Assessment report presented in this document.*
- Establishment of a **provisional phasing hierarchy**.
- **Scientific dating** of key deposits, undertaken at the same time as the Bypass dating to inform the final phasing hierarchy. The scientific dating strategies for both projects were submitted to the respective Consultants prior to implementation. *The results have been incorporated into the chronological summary and are presented in Table 53.*
- **Review of dating evidence** and provisional phasing hierarchy.
- **Combined final phasing hierarchy**, produced as a result of the review. *This is presented as a chronological summary in this assessment; the full contextual hierarchy is available as an Access database on the attached CD.*

3.5.3 Document scope

This document presents a summary of the combined final phasing hierarchy. It is primarily concerned with the results and analytical potential of the Land west of Bedford datasets. However, it does, where relevant, refer to complementary evidence from the Bypass investigations. For further details of the latter the Bypass Assessment/UPD (Albion 2009a) should be consulted.

The final phasing hierarchy presented here will not change; it will be presented to the specialists as the basis for the analysis and publication report writing stages of the project.

The UPD describes how the Land west of Bedford data will be analysed and published. More detailed methodologies for the proposed work and for that already undertaken are presented as appendices. They are all in line with those proposed in the Bypass Assessment/UPD (Albion 2009a) and for ease of cross-referencing use the same task numbers.



4. SUMMARY AND DISCUSSION BY CHRONOLOGICAL PERIOD

4.1 Introduction

The following summary and discussion of results are based on the final phasing/contextual hierarchy (for summary see Table 4). It is presented within traditional chronological periods. Aspects of continuity between the periods are mentioned but are discussed in more detail in section 6.5. Dating information has derived from a number of sources including contextual analysis, quantified pottery, flint and other artefacts, and scientific dating. The latter are summarised in Table 53. In addition, where available, evidence from non-intrusive surveys and historical maps has been incorporated to put the results into a wider spatial context. Where useful, the following section also makes brief reference to the results of the Bypass investigations because these have been fully integrated into the final phasing/contextual hierarchy.

The discussion is presented by Site Period with reference to Site Landscape and Landuse area, as required. A detailed explanation of the contextual hierarchy is presented in section 8. For more detailed information on the final phasing/contextual hierarchy the Access database on the enclosed CD should be consulted. However, it should be borne in mind that the text for each hierarchical level was created during contextual analysis and represents work-in-progress, rather than finished text.



4.2 Early prehistoric activity: the field artefact collection evidence

The ploughsoil on the Biddenham Loop has been recognised as a productive source of struck flint for at least 30 years (Woodward 1978). Field artefact collection was undertaken over the entire Loop during the Bovis evaluation, identifying findspots of Palaeolithic handaxes and concentrations of later flintwork. The latter have provided valuable information on the nature and location of activity in the Mesolithic/early Neolithic and late Neolithic/early Bronze Age periods (BCAS 1991). The majority of the concentrations were subject to more detailed field artefact collection during pre-development mitigation, *e.g.* Bovis (Luke 2008, 8-9) and the recent DWH development (Albion 2008a). Field artefact collection failed to reveal any significant flint concentrations on land west of Kempston (Albion 2003).

4.2.1 Palaeolithic

4.2.1.1 Background

Both the Biddenham and west of Kempston areas are known to have produced hundreds of hand axes (Luke 2007, 21). In the 19th century the Biddenham area, in particular, gained a reputation as a prolific source of palaeoliths when several hundred hand axes were found during quarrying (Wymer 1999, 123). In 1986, palaeolith-bearing deposits were located deep within the gravel, directly overlying the Oxford Clay, within a former quarry, known as Deep Spinney, adjacent to the Bromham Road to the north of Biddenham village (Harding *et al.* 1991).

4.2.1.2 Overview of results from the recent investigations

No material of this date was recovered from the DWH investigations

4.2.1.3 Discussion

No evidence recovered from the DWH investigations

4.2.2 Late Mesolithic/early Neolithic

4.2.2.1 Background (Figure 8)

Eight of the flint concentrations within the Biddenham Loop contained a significant Mesolithic component. The flint scatters suggest that human activity was concentrated along the edge of the river terrace (Bates 2008, 75; Luke 2008, fig. 4.2). It is possible that the interior of the Loop was still wooded at this time, making the edge of the river terrace an ideal location for the exploitation of a broad spectrum of natural resources. Woodland would have provided timber, fruit and a variety of game, with the river itself providing plants, fish, waterfowl and aquatic mammals (Luke 2008, 19).

4.2.2.2 Overview of results from the recent investigations (Figure 8)

Most of the areas subject to field artefact collection as part of the DWH development (Albion 2008a) were situated within the interior of the Loop and, therefore, away from the flint concentrations along the edge of the river terrace. However, Areas C and I did contain more Mesolithic/early Neolithic flint than expected.



With the exception of one tool, Area I produced only debitage. This, combined with three blades from the Bovis field artefact collection, could indicate a limited activity location. In contrast, the western part of Area C produced little debitage (one core) but three tools. When combined with the findings of earlier work (a blade core and six blades) the assemblage could suggest a short permanent or seasonal residential location.

4.2.2.3 Discussion of the results

Mesolithic sites on the edge of the river terrace are known downstream at Roxton, Bedfordshire (Luke 2007, 26) and, further afield, at Thatcham, Berkshire, on the River Kennet (Healy et al. 1992). Most of the areas subject to field artefact collection as part of the DWH development were within the interior of the Loop and, therefore, cannot contribute to a discussion on river edge occupation sites.

However, flint of this period was located within the interior of the Loop, indicating that earlier interpretations of a focus on the river edge may have been too simplistic. Although the flint within the ploughsoil is characteristic of limited, short permanent or seasonal occupation, the open area excavations did produce firm evidence for the presence of earlier Neolithic monuments (see 4.3.3). The combination of these two strands of evidence is a significant new discovery.

4.2.3 Late Neolithic/early Bronze Age

4.2.3.1 Background (Figure 9)

In contrast to the earlier period, the late Neolithic/early Bronze Age flint concentrations identified by Bovis field artefact collection were far more widespread, extending into the interior of the Biddenham Loop (Bates 2008, 80; Luke 2008, fig. 4.5). This suggests that extensive woodland clearance had taken place, possibly associated with an intensification of cultivation and an increase in population. The number of concentrations assigned to this period is double that assigned to the Mesolithic/early Neolithic; they also have area configuration estimates suggestive of longer occupation by larger social groups. All five concentrations interpreted as long/permanent (Luke 2008, 31) lie within the interior of the Loop, away from the river edge, perhaps indicating a significant change in lifestyle.

4.2.3.2 Overview of results from the recent investigations (Figure 9)

The nature of the flint assemblage from three of the recently walked concentrations (Albion 2008a) supports their original interpretation as locations of short, permanent and/or seasonal residence (one concentration), and permanent residential and/or multiple occupation (two concentrations).

Although both Areas I and C had an element of Mesolithic/early Neolithic flint, the majority of the assemblage, including both debitage and tools, dates to the late Neolithic/early Bronze Age. Both the range and the quantities of tools serve to confirm the suggestion of either a long permanent residential or multiple occupation location. Area G produced fewer pieces of debitage than the evaluation field artefact collection but did yield a backed knife, a barbed and tanged arrowhead and a retouched flake. The low numbers of several artefact



types accords with the definition of a short permanent or seasonal residential location, made on the basis of the Bovis field artefact collection.

4.2.3.3 Discussion of the results

The nature of the flint assemblage from three of the recently walked concentrations (Albion 2008a) supports their original interpretation as locations of short, permanent and/or seasonal residence (one concentration), and permanent residential and/or multiple occupation (two concentrations). However, a greater understanding of this period is gained from the sub-surface evidence (see 4.4 and 4.5).



4.3 Early Neolithic SP3

4.3.1 Background

The Bovis investigations within the Biddenham Loop identified earlier Neolithic flint concentrations within the ploughsoil (Luke 2008, 19-20) but no firmly dated, sub-surface features. However, it was tentatively suggested that some monuments, known only from non-intrusive survey, might date to the Neolithic (Luke 2008, 81). No evidence of this period was known from the land west of Kempston.

The location of the flint concentrations suggested that, during this period, human activity was concentrated along the edge of the river terrace above the flood plain (see 4.2.2). Where open area excavation was undertaken below flint concentrations, no sub-surface features were identified; it was presumed that the only evidence survived in the ploughsoil.

4.3.2 Overview of results from the recent investigations (Figure 10)

Evidence for this period was found on the Biddenham Loop only (Figure 11); it comprised three monuments SL1 (Table 5) and a shaft L2107 (SL10). Two of the monuments and the shaft were radiocarbon dated to this period. The two central monuments L2312 and L2356 represent the earliest firmly dated activity within the Biddenham Loop

Although field artefact collection identified areas of possible Mesolithic/early Neolithic occupation, no small pits or other evidence for settlement-type activity were identified.

4.3.3 Two central monuments (Figure 12 and Table 5)

4.3.3.1 Introduction

The two central monuments were assigned to the early Neolithic on the basis of the radiocarbon dating of bone from associated inhumations. These dates are particularly significant because:

- 1) Individual burials of this period are rare;
- 2) Monuments of this period more typically include causewayed camps and long barrows.

4.3.3.2 Central monument L2312/1213

- The only surviving component of this northeast to southwest aligned oval monument was the ditch which had been redug at least once.
- The shape in plan of the ditch was almost polygonal, most noticeably in the recut L2313. This may suggest that the ditch held wooden beams which supported some kind of barrier or screen.
- No evidence for an entrance through the ditch was identified, although this could have been removed by recutting.
- Two human skeletons were placed in the original ditch in slightly different stratigraphical locations.
- The skeleton SG24591/92 associated with the primary fill has been dated to 3940-3660 Cal BC (at 95.4% probability).



- The skeleton SG24590 associated with the secondary fill has been dated to 3770- 3640 Cal BC (at 95.4% probability).
- Ditch fill contained an incomplete part of a polished axe with an origin in Great Langdale, Cumbria.
- Both radiocarbon dates are considered to be reliable. The material used was from a short duration event (human burial); the two dates are consistent with the recorded stratigraphic positions of the burials.

4.3.3.3 Central monument L2356-59

- This ring ditch-type monument was located *c.* 150m from monument L2312/L2313 on a similar northeast-southwest alignment.
- The ditch and two internal graves survived.
- The ditch had been redug on three occasions (L2357/2358/2359) but never as a complete circuit. One recut had a C-ditch form.
- One grave was central within the monument; the other was 2m off-centre. The latter is the shallower, possibly indicating that it was dug through mound material and is, therefore, later than the central grave which might have been dug before the mound was constructed.
- The central skeleton SG24617 has been dated to 3520-3350 Cal BC (at 95.4% probability).
- The off-centre skeleton SG24618 has been dated to 3340-3020 Cal BC (at 95.4% probability).
- These dates indicate that the burials took place in the later part of the early Neolithic. It would be logical if the original, circular ditch were contemporary with the central inhumation. However, the off-centre inhumation cannot be confidently associated with any one particular recut.

4.3.4 Hengi-form monument L3210 (Figure 12 and Table 5)

Hengi-form monument L3210 has been assigned to this period on the basis that it was noticeably different in plan from the other circular burial monuments on the Loop and had some similarity in plan to L2312. It was sub-oval in shape, aligned northeast to southwest and originally had two opposing entrances (one later blocked). The steep sides of the ditch suggest that it may have originally held upright timber planks. The monument had been redefined on at least one occasion. One sample from the main ditch length and one from the blocking ditch length underwent Optically Stimulated Luminescence (OSL) dating. Unfortunately the resultant dates correspond with the last exposure of the glacial outwash rather than to the date this monument was dug (see Section 5.12.3).

4.3.5 Shaft L2107

L2107 (SL10) has been interpreted as a shaft on the basis of its steep sided profile and considerable depth, which distinguish this class of features from others on the Biddenham Loop. It is similar to later shafts, which are discussed in more detail below (see 4.5.5 and Table 7). This shaft contained a moderate assemblage of animal bone that included red deer. More significantly, its secondary fills also contained the semi-articulated remains of a wolf, which were radiocarbon dated to this period.

4.3.6 Discussion of the results

With the exception of flint scatters, evidence for early Neolithic activity within Bedfordshire and the region is rare. It typically comprises poorly dated monuments, assigned to this period on the basis of comparison with better dated



examples elsewhere (Luke 2007, 31-7). Very few monuments have been radiocarbon dated. The main reason for this is that much of the information on, for example, the Willington/Cardington monument complex derives from evaluation where there little opportunity for radiocarbon dating (Luke 2007, 37). In summary, although 'a small number of ring ditches have produced evidence to suggest that they may have been constructed in the early Neolithic, none of these are firmly dated' (Luke 2007, 37).

The two central monuments within the Biddenham Loop are, therefore, the first in Bedfordshire to be firmly dated to the early Neolithic. Their radiocarbon determinations are very early for monuments of this type, associated with inhumations. In 1999, Alastair Whittle stated 'the first single or limited-number burials under small barrows or in small ring-ditches date to the end of the Middle Neolithic' (1999, 60). In a reply to an email regarding the two Biddenham Loop monuments, Whittle stated: 'There are others now of this sort of date, and mainly in southern and eastern England as far as I know'.

No exact contemporary parallels have been found for the inhumations within ditches defining a ring/oval monument, as was the case with monument L2312/2313. At Eynesbury, Cambs. a comparable oval monument, but with clear entrances, produced early Neolithic pottery and a similar radiocarbon date but did not contain any burials (Ellis 2004, 7-11). Elsewhere in southern England where inhumations are associated with ring/oval monuments they are often within mortuary structures, e.g. Whiteleaf Hill, Bucks (Hey et al. 2007). There was no evidence for similar structures within the Biddenham Loop monuments; it is clear that within one monument the burials were placed in the ditch and within the other in individual graves. The Biddenham Loop monuments were redefined, as indicated by the redigging of all or part of their earlier ditches. Monuments are often considered to be of a single phase and function on the basis of non-intrusive surveys (Luke 2007, 38). However, the Biddenham Loop monuments clearly had a complex constructional history and it is not impossible that their purpose may have changed over time.

Although it was not possible to firmly date hengi-form monument L3210, its oval plan made it similar to L2312/2313 with which it is considered to be contemporary. Its northern entrance was blocked — cf. Eynesbury, Cambs. (Ellis 2004, 8). As with hengi-form monuments in general, the exact function of L2312/3 and L3210/11/12 is uncertain; they may have served a ritual or ceremonial role closely associated with mortuary practices. The entrances may have been aligned on astronomical movements or ceremonial routeways because on the Biddenham Loop they did not relate to any earlier monuments.

In summary, the occurrence of firmly dated, early Neolithic, sub-oval monuments with inhumations is nationally rare. Their complex development accentuates the intrinsic significance of all three monuments. They are also very important because of the influence they have on the evolution of the landscape — their existence was a significant factor in the positioning and layout of later activity. The shaft and its animal bone assemblage are also highly significant; are discussed in more detail below in conjunction with shafts assigned to a later period (see 4.5.5).



4.4 Late Neolithic SP4

4.4.1 Background (Figure 13)

The Bovis investigations within the Biddenham Loop identified evidence for monuments and possible ‘settlement’ areas.

The monuments comprised two possible rectangular enclosures and three oval enclosures (Luke 2008, 64). The rectangular enclosures were identified by non-intrusive survey only (Luke 2008, 81) and have been shown by the recent work to be parts of Romano-British enclosures. One oval monument was partially excavated (Luke 2008, 81 and fig. 5.4); the others were identified by non-intrusive survey only. As a result, their dating and function were uncertain. A shaft with an ‘unusual’ animal bone assemblage, only 40m from the partially excavated oval monument, was assigned to the Neolithic because it was truncated by a later ring ditch (Luke 2008, 84-5). One ring ditch, only known from non-intrusive evidence, was tentatively assigned to the Neolithic on the basis of its more oval plan and the presence of a possible entrance (Luke 2008, 23). This is now known to be of early Neolithic date and has been discussed above (see 4.3.3.2).

Previous evidence for late Neolithic settlement activity comprised flint concentrations in the ploughsoil (see 4.2.2.1) and small pits which often contained Peterborough Ware pottery. The flint concentrations are greater in number and far more widespread during this period, possibly suggesting that extensive woodland clearance had taken place. However, the small pits occurred individually, or in clusters, suggestive of camps possibly within woodland clearings.

4.4.2 Overview of the results from the recent investigations (Figure 13)

The vast majority of the evidence assigned to the late Neolithic period was located on the Biddenham Loop (Figure 14). It mainly comprised isolated and clustered small pits SL4, similar in nature to the Bovis evidence. However, one possible building L2705 was identified. Two similar pits SL109 were found on Land west of Kempston (Figure 16). In addition, two oval monuments SL98 and one segmented boundary SL96 on the Loop were assigned to this period, although they are poorly dated and mainly known from non-intrusive evidence.

4.4.3 Monuments SL98 (Figure 15)

Two unexcavated oval monuments L2191 and L2417, identified by non-intrusive survey, were located to the north-east and south of the Loop. They have been assigned to this period on the basis of comparison with similar but better dated monuments from elsewhere in Britain. Oval monuments are a wide and varied class of monuments, often referred to as oval barrows or mortuary enclosures. The nearest comparable monument was excavated at Willington, east of Bedford (Pinder 1986, fig. 4b). Oval monuments, distinguishable from long barrows and rectangular enclosures by being smaller and rounder in plan, are considered, at least in Sussex (Drewett 1986, 49), to be later in date than long barrows.



Non-intrusive survey evidence indicates that the ditches of monument L2191 had a complex, and presumably lengthy, development history that may have continued into the early Bronze Age. This scheduled monument is comparable to one at Radley, Abingdon, Oxon. (Fig. 2.1) where one end of the monument was twice left open (Bradley 1992, fig. 4).

4.4.4 Segmented boundary SL96

Immediately to the east of oval monument L2191 was a segmented boundary L2108 (SL96). It was only visible for a short length within the excavation area but was traced as a cropmark for at least 470m to the north-west. It produced a mixed assemblage of pottery and flint. The pottery included undiagnostic late Neolithic/early Bronze Age types and early-middle Iron Age types. It was assigned to this period because it was truncated by middle Bronze Age field system SL11 and was parallel to oval monument L2191.

4.4.5 Pits and postholes SL4 and SL109

The majority of the small pits dated to this period were found on both the Biddenham Loop SL4, although two were found on Land west of Kempston SL109.

On the Biddenham Loop the small pits (26) and postholes (6) were located to the north and west. Significantly, they occupied areas devoid of monuments possibly suggesting a zoning of different types of activities within the landscape. They occurred in clusters e.g. L2335, L2374, and dispersed over quite a large area e.g. L2411, L2412, L2704.

The majority contained Peterborough Ware and worked flint and were dated on this basis. The few that did not contain any artefacts fell within clusters of better dated pits or postholes. The earliest feature may have been posthole L2904 to the west of the Loop because it contained a large quantity of Ebbsfleet pottery. However, it was in the same alignment as three postholes L2902 containing Mortlake and generic Peterborough pottery which are usually considered to be later in date. A small pit L2412 contained part of a Fengate vessel with incised decoration and unusual fingertip impressions below the neck. This is one of a number of deposits within pits that have artefacts and/or ecofacts that 'standout' and have therefore been classed as "unusual" e.g. flint assemblage from small pit G23114 (L2704) which included a flake from a polished stone axe. All data recovered from these will be examined as a whole as part of the analysis and their status reviewed. It is likely that some will be interpreted as 'structured' deposits while others will be dismissed.

A possible rectangular building L2705 was located to the north-west of the Loop. It was defined by fourteen small pits/postholes which enclosed three sides of a c. 30m x 7m area. One of its small pits/postholes contained a large quantity of Mortlake pottery and the building's assignment to this period is based on this assemblage.

4.4.6 Discussion of the results

As with the early Neolithic, much of the evidence for this period in Bedfordshire and the region is derived from field artefact collection. Although the oval monuments within the Loop have not been subject to hand excavation and are,



therefore, not firmly dated, they are important for our understanding of the overall development of the landscape. Equally, it is unfortunate that so little of the segmented boundary fell within the excavation area and that, as a result, it cannot be more securely dated.

Individual and clusters of pits provide firm evidence for activity during this period. Their discovery is significant because, although these features dominate the settlement evidence for this period in southern Britain, they are considered to be under-represented in the archaeological record in Bedfordshire (Luke 2007, 39) and the Eastern region (Brown and Murphy 1997, 14–16). This is in part due to their small size and dispersed nature, which make it difficult to find them by anything other than open area excavation. There is an ongoing discussion over whether they represent permanent settlements or sites that were repeatedly occupied for relatively short periods of a time by an essentially mobile population (Thomas 1999; Garrow et al. 2005). Although only two pits were found on Land west of Kempston, they are significant because such features of this date are very rarely found on the Bedfordshire clays.

There has been considerable discussion over the significance of the material found within pits of this type. Thomas (1999, 64–74) suggested that such features were ‘dug and backfilled within a relatively short span of time’ (1999, 68) citing their steep, unweathered sides, absence of primary fill and the presence, often, of only one fill. He also believed ‘at a number of sites, more spectacular depositional practices alert one to the likelihood that something more complex than the routine disposal of waste material was happening’ (1999, 65). For example, pits at Yarnton, Oxon., contained deliberately placed deposits which included highly decorated pottery and good quality flintwork (Hey 1997, 107). In contrast at Kilverstone, Norfolk, analysis of the deposition pattern and condition of the assemblages suggested that the pit contents represented the detritus of everyday life (Garrow et al. 2005; Garrow et al. 2006). It was suggested that a ‘delay’ occurred between the creation of the material and its deposition in the pits, perhaps in an open area for rubbish accumulation, that the pits were excavated for the sole purpose of depositing the accumulated material and that where pits are found in clusters they may represent sequential deposition episodes.

The contents of the Biddenham Loop pits will contribute to the discussion on the function of this type of feature. Overall, the quantities of material are relatively poor in comparison to those discussed by Thomas. However, there are some unusual elements within the assemblages, e.g. fragment of polished axe, parts of different pottery vessels in same pit, and it is difficult to easily explain why some pits contained artefacts and others did not. Their contents need to be examined as a whole, i.e. the pottery, struck flint, animal bone, charred plant and wood remains, and hazelnut shells to see if they represent something other than ‘everyday household waste’ (Thomas 1999, 66). In particular the types of flint tools present have the potential to identify types of activities occurring at the site and the condition of the flint has potential to inform on the way it entered the pits. The presence of any re-fitting pieces, or pieces which may have derived from the same cores, might also suggest a particular pattern of use (Garrow, Lucy and Gibson 2006, 54, 67–69).



The identification of a possible rectangular building of this period is also significant because structures of this period are uncommon nationally and all the possible examples within Bedfordshire are round in form (Luke 2007, 40).



4.5 Early Bronze Age SP5

4.5.1 Background (Figure 17)

The existence of a concentration of ring ditches within Biddenham Loop has long been recognised (Woodward 1978). Their high density has led to the suggestion that the area represents a ‘monument complex’ (Luke 2007, 41-2), several of which have been identified at 5-6km intervals along the Great Ouse (Malim 2000). The ring ditches excavated within the Bovis investigations were not well dated. They could only be broadly assigned to the late Neolithic/early Bronze Age on the basis of flint artefacts, the quantities of which varied widely from just 7 to 170 pieces. One of the Bovis ring ditches truncated a feature interpreted as a shaft which contained an unusual animal bone assemblage (Luke 2008, 23). Just south of the Biddenham Loop on land west of Kempston three ring ditches were identified by geophysical survey and trenching at Cutler Hammer Sports Ground (BCAS 1999). Unlike the ring ditches within the Bovis investigations they occurred in a tight cluster only 6m apart.

Where excavation was undertaken below flint concentrations, few sub-surface features were identified (Luke 2008, 31). However, a number of individual, or clustered, small pits containing Beaker pottery and Collared Urns were present (Luke 2008, 31).

4.5.2 Overview of the results from the recent investigations (Figure 17)

Three clusters of ring ditches SL3, SL5 and SL7 were identified on the Biddenham Loop (Figure 18). One possible monument SL108 was identified to the west of Kempston (Figure 20). Eight shafts SL2 and SL6 were found in the vicinity of the ring ditches. In contrast, small pits, postholes and tree-throw holes SL8, SL90 and SL194 were identified away from the monument clusters; these may represent areas of occupation. The most extensive was SL8 which was situated to the southwest of the Loop just above the floodplain. A possible pond SL95 was located near one of the isolated pits.

4.5.3 Biddenham Loop monuments and ‘flat’ grave clusters SL3, 5 and 7 (Figure 19)

A total of 16 ring ditches are known within the Loop. Six were excavated within the recent investigations and four were partially excavated within the Bovis investigations. They occurred in three clusters to the northeast (SL5), south (SL7) and northwest (SL3). Although they could be described as “barrow cemeteries”, that term has not been used because not all of the ring ditches produced evidence for burials. Each cluster was loosely focused on an early Neolithic monument and also contained a late Neolithic oval monument. A row of three monuments in the northeast cluster SL5 were aligned SW-NE on the early Neolithic monuments L2312 and L2356. Monument L2312 itself was on a similar alignment.

The excavated monuments can be divided into at least two categories on the basis of the diameter and cross-sectional dimensions of their ditches (see Figure 19 and Table 6). The ditch of defining monument L2301 was recut (as L2314). Only the northwest monument cluster SL5 produced human remains — cremation burials situated both centrally and off-centre within the ring ditches



L2104 and L2106. In addition, a number of the small pits, including the central one, within ring ditch L2300 contained sherds of Collared Urns and may therefore represent truncated graves. A number of these graves and possible graves within these three monuments were radiocarbon dated to this period

Three apparently ‘flat’ graves, *i.e.* where there was no evidence for a monument or mound, were identified. Of course the latter might once have existed but without leaving any detectable, sub-surface trace. These, two cremation burials L2363 probably placed in Collared Urns and one inhumation L2371, were situated on the peripheral of monument cluster SL7. They have been assigned to this period on the basis of radiocarbon dating.

4.5.4 Monument SL108

A possible monument SL108 was located on the very edge of the excavation area to the west of Kempston. It comprised a short length of the ditch, possible mound material (visible in section) and Beaker pottery. Although no other monuments were found in this part of the investigation, SL108 was only 600m northwest of the ring ditches at Cutler Hammer Sports Ground.

4.5.5 Shafts SL2 and 6

Eight isolated shafts were identified within the recent investigations on the Loop and assigned to SL2 and SL6 (Table 7). Their near vertical sides and considerable depth distinguish them from the larger pits of later periods. Three contained unusual animal bone assemblages, such as: semi-articulated parts of a cow and a dog/fox (L2390); semi-articulated parts of a cow (L3215); and disarticulated red deer, wild boar or domestic pig and dog/fox, and an aurochs horn (L2315). The latter also contained a human bone dated by radiocarbon determination to broadly the same date. None of these bones were discovered in an obviously placed arrangement and none came from the primary fills. In total five of the shafts were dated by radiocarbon determinations to this period. However, it is clear that they may have been part of a long-lived tradition. A similar shaft L2107 produced an early Neolithic radiocarbon date (see 4.3.5) and another was stratigraphically earlier than a ring ditch within the Bovis investigations (Luke 2008, 23).

Five shafts SL6 were clustered to the southwest of early Neolithic monument L2312 seemingly continuing the alignment of five monuments described above. This deliberate positioning confirms that the central, early Neolithic monument was still a significant landscape feature for the early Bronze Age community. Shafts L2369 and L3215 were located to the south of the Loop on the periphery of monument cluster SL7. Isolated shaft L2315 was located to the northeast on the periphery of monument cluster SL5.

4.5.6 Isolated and clustered pits/postholes SL8, SL90 and SL194

Isolated and clustered small pits/postholes SL8 and SL90 were identified within the Loop; only a single pit SL194 was identified within Land west of Kempston. All were some distance from the contemporary monuments and shafts, suggesting they were in mutually exclusive locations.

The concentration of small pits and postholes SL8 to the southwest of the Loop (mainly within the Bypass investigations) contrasts to the more dispersed spread



across the remainder of the Loop SL90. This suggests that it could represent an area of either repeated short-term occupation over a long period of time or more permanent settlement. It comprised eight clusters of features situated on the gravel terrace just above the slope down to the floodplain. Some of the small pits contained pottery and relatively large assemblages of flint tools and flakes. Where present, the associated pottery was typically either Beaker or Collared Urn types. Two pits, in clusters L125 and L213, were radiocarbon dated to this period. The pits with no artefactual or radiocarbon dating were assigned to this period on the basis of their proximity to better dated examples.

One of the dispersed pits across the Loop (L2413, SL90) contained the largest assemblage of worked flint from the entire excavations. This included 93 flints including a mixed range of 35 tools some of which were more diagnostic of the Mesolithic or early Neolithic. However, the pottery assemblage included sherds of Collared Urn.

The isolated pit within Land west of Kempston lay 300m southeast of possible monument L709 (SL108) and it contained Collared Urn sherds.

Tree-throw L2401 was one of the few such features to produce artefacts — a relatively large quantity of Beaker pottery and a leaf-shaped arrow head.

4.5.7 Possible pond SL95

Possible pond SL95 was located in the northern part of the Loop, close to the possible late Neolithic rectangular structure L2705 (SL4). It was 22m to the north of contemporary pits L2706 (SL90). It did not produce any artefacts and has been assigned to this period on the basis of a single radiocarbon date.

Although there is no evidence to suggest it was still open or visible in the late Iron Age/early Romano-British period, it was located only 30m from the shrine complex SL50. It is worth noting that only one other large feature of this type was identified with the Loop — L2391 within middle Bronze Age field system SL13.

4.5.8 Discussion of the results

The Biddenham Loop contains a monument complex comparable to others known elsewhere in the country. The recent work has clearly demonstrated that it comprises three separate monument clusters. These appear to be loosely focused on Neolithic monuments, cf. Barrow Hills, Radley, Oxon. (Barclay and Halpin 1999, 323). Each monument cluster at Biddenham Loop contained a sub-oval and an oval monument, with some ring ditches aligned on the earlier monuments. Similar juxtapositions are known elsewhere in Britain, e.g. Winterbourne Stoke, Wilts., where at least seven of over twenty round barrows in a cemetery were aligned on the long axis of a Neolithic long barrow (Woodward 2000, fig. 41).

The occurrence of shafts, while not common, can be paralleled by examples from Baldock, Herts. (Duncan et al. 2009, 143), Barrows Hills, Oxon. (Barclay and Halpin 1999, 28), Easton Lane, Winchester (Fasham et al. 1989, 20-1) and the Bovis investigations (Luke 2008, 23). They are all classified on the basis of their steep profile and depth but most also contain structured deposits in the form of pottery, animal bone and in one example a human burial (Fasham et al.



1989, 20-1). The recently investigated shafts on the Biddenham Loop provide a significant addition to the known examples. They are of particular interest because five have been radiocarbon dated, three contained unusual animal bone assemblages, and all are located within the vicinity of monument clusters. The presence of a cluster of five shafts at the southwest end of the northeast to southwest aligned monuments of SL5 demonstrates an association. Although they are largely sterile of artefacts, their depth and unusual animal bone assemblage suggest that they could have been dug and backfilled as part of ceremonial events.

As discussed above (see 4.4.6), the discovery of small pits and postholes is significant because settlement evidence during this period is not common in Bedfordshire (Luke 2007, 39) or the region (Brown and Murphy 1997, 14–16). The evidence will contribute to the debate on whether settlement was permanent at this time. It is clear that on the Loop ‘settlement’ areas (both sub-surface pits and flint concentrations) were spatially distinct from the monuments, indicating that the two types of activity were mutually exclusive. This is a theme that has been discussed by Woodward (1978, 48-50) and others.



4.6 Middle Bronze Age SP6

4.6.1 Background

No middle Bronze Age settlement or funerary evidence was found within the Bovis investigations (Luke 2008, 66). However, an isolated cow burial was radiocarbon dated to this period (Luke 2008, 111), suggesting that the Biddenham Loop was not completely devoid of activity at this time. The apparent absence of evidence was considered to be partly a reflection of the difficulty of dating activity to this period in the absence of Deverel-Rimbury pottery (Luke 2008, 66).

4.6.2 Overview of the results from the recent investigations (Figure 21)

Extensive middle Bronze Age field systems were identified on the Biddenham Loop (Figure 22). They contained evidence for dispersed activity in the form of small and large pits, fencelines and possible settlement foci. Although no similar fields were identified on land west of Kempston, three discrete but much smaller activity foci were located (Figure 25).

4.6.3 Field systems SL11 and SL13, associated activity SL12 and SL14

By the middle Bronze Age the earlier, open landscape of the Biddenham Loop had been replaced by an extensive arrangement of fields. For convenience these are described as field systems with two loosely coherent systems being identified — one to the north SL11 and one to the south SL13. Between them, in the centre of the Loop, was a largely unenclosed zone SL12 in the vicinity of early Neolithic monument L2312.

The two field systems were located in broadly the same areas as the southern and northeast early Bronze Age monument clusters, with the individual monuments deliberately incorporated into the new fields. No field system was established over the northwest monument cluster, which was largely within the Bovis investigations. In the case of the northeast cluster each monument was incorporated into a separate field. In all cases the monuments lay towards the edges of the fields and in some cases were actually incorporated into the field boundary near the corner of the field.

The fields systems had wide axial divisions often in the region of 110m and 200m. They were aligned NNE-SSW possibly reflecting the natural topography (parallel to the 30m contour). A number of the major divisions comprise parallel ditches *c.* 7m apart and therefore give the appearance of trackways. However, in the case of the boundary between field L2339 and L3203 the ditches were not contemporary (see Figure 24) Although no definitive ends of the systems were identified, it was clear that the fields were located both on the (present) floodplain and on the higher ground to the northwest. The field boundaries comprise ditches and narrow, steep-sided trenches which may have held timbers. Some of the field boundaries within the excavation areas were discontinuous. This might partly be the result of later plough truncation but the identification of definite ditch terminals suggests that some boundaries may have comprised hedges or wooden hurdles. Where redefinition was identified, only short stretches of ditch, rather than their entire length, were re-cut.



Three inhumations and a sheep burial were found either in field ditches or adjacent to them. They were assigned to this period on the basis of radiocarbon dating and effectively date the establishment of the field systems, with some supporting evidence from a small number of stratigraphical relationships. Other burials (including cremation cemetery L2103), dispersed pits and postholes occurred within the fields and are discussed below (4.6.5).

Early Neolithic monument L2312 was fairly central to the largely unenclosed zone between the two field systems, suggesting that it was still a significant feature of the landscape. The zone contained six large pits, eight small pits and five cremation burials.

Fields SL14 were linked in to the northwest side of the southern system SL13, even though they were on a slightly different alignment. (They fell partly within the Bovis and Bypass investigations). A number of inhumations and animal burials in this area are discussed below (see 4.6.6).

4.6.4 Potential settlements SL91, SL92 and SL93

Three potential settlements SL91, SL92 and SL93 were identified on the basis of concentrations of pits and postholes and the presence of domestic debris. The nature and quantity of the domestic debris within SL91 and SL92 suggest that they may represent short-term occupation rather than permanent settlement. However, SL93 contained greater quantities of settlement-type features and domestic debris. A number of its constituent pits were radiocarbon dated to this period. Its location adjacent to early Bronze Age settlement SL8 suggests continuity of occupation.

4.6.5 Dispersed features within the fields

The fields contained dispersed small and large pits, isolated postholes and alignments of postholes. With the exception of the latter these were often located towards the edges of the fields.

4.6.5.1 Large pits

Nine features were classed as large pits because they were over 2.2m in diameter and often around 2.5m deep with steep sides (Table 8). They are undated because they contained a tiny quantity of pottery, an undiagnostic flint assemblage and no animal bone or other material that could be used for radiocarbon determinations. They were assigned to this period purely on the basis of their proximity to middle Bronze Age field boundary ditches. Similar features within the Bovis investigations were interpreted as late Bronze Age/early Iron Age water pits. Interpretation of the features within the DWH investigations is uncertain but it may be significant that none occurred within the northeast field system which is on higher ground and closer to the present-day river.

One exceptionally large feature L2391 comprised several large, intercutting pits, the latest of which had a trough-like base. Overall it was 7m by 6.5m and 1m deep. The northern side of the latest pit was scorched and was associated with a charcoal-rich deposit. The latter shared some similarities to the burnt mound-like deposit found in an adjacent field ditch. Both were radiocarbon dated to the middle Bronze Age.



4.6.5.2 Posthole alignments

Three posthole alignments were identified within the fields. They produced no dating evidence or material suitable for radiocarbon dating but were assigned to this period on the basis of their alignments which were usually perpendicular to the field ditches.

- L2177 comprises two alignments up to 25m long lay towards the north of field system SL11. One was perpendicular to the field ditches, but the other was on a unique alignment. Wider gaps between some of the postholes indicate the location of possible entranceways.
- L2405 lay in the northern part of southern field system SL13. It ran for 32m and crossed field boundary ditches.

Shorter alignments L2175 were also found in field L2100 within field system SL11. A comparable, short but more complex fenceline L1006 was found on Land west of Kempston (see 4.6.7).

4.6.6 Burials

A large number of middle Bronze Age human and animal burials were spread across the Loop. The majority were assigned to this period on the basis of radiocarbon dating. They were in the following locations:

- within or adjacent to ditches of field systems SL11 and SL13 (three inhumations) including SG21392 with worn grave goods;
- within possible enclosure ditch L101 (four inhumations and one cow, all within the Bypass investigations) assigned to SL15;
- isolated in peripheral fields SL14 (two cow burials within Bypass and Bovis investigations);
- isolated within field system SL13 (single cremation burial);
- in a cemetery L2102/3 within early Bronze Age monument L2104 (17 cremation burials and three inhumations);
- within unenclosed zone SL12 (five cremations burials, three of which were clustered to the north of early Neolithic monument L2312).

The cemetery in the northwest field system SL11 comprised seventeen cremation burials L2103 and three inhumations L2102. All were positioned within an early Bronze Age monument L2104; their layout suggests they respected a mound. The inhumations were arranged in individual graves parallel to the monument's ditch. The cremation burials were clustered in a 6.5m x 2.5m area on the inside edge of the ditch. Seven cremation burials within the cemetery and all three inhumations were radiocarbon dated to this period. Interestingly, one grave containing an inhumation was truncated by a grave containing a cremation burial indicating that the latter was later. A posthole type feature SG22143 was also located in this area which contained un-burnt human bone fragments.



4.6.7 Land west of Kempston

No field systems were present on Land west of Kempston but three areas contained contemporary activity, dated by radiocarbon determinations or artefacts.

Two small pits SL123 were located in the vicinity of early Bronze Age pit SL194. They were dated to this period on the basis of pottery and one contained a large assemblage of worked flint.

To the south, posthole alignment L1006 (SL117) within the Bypass investigations had some similarities to those within the field systems on the Biddenham Loop. It was 20m long and featured a central entrance. A number of the posts had been replaced, indicating that the structure was maintained for some time. No datable artefacts were recovered but a radiocarbon determination indicates a middle Bronze Age date.

A similar date was obtained for one of the features in a small cluster of pits and postholes SL116, which was identified 450m to the southeast within the Bypass investigations. No other contemporary activity was identified on Land west of Kempston, although all features on the clay were difficult to identify and the area of investigation around them was not as extensive as on the Biddenham Loop.

4.6.8 Discussion of the results

The identification of an extensive and well dated middle Bronze Age landscape on the Biddenham Loop is one of the most significant discoveries of the investigations. Evidence for the middle Bronze Age in Bedfordshire is extremely rare in contrast to, for example Cambridgeshire (Yates 2007, 94-8). This may reflect a lack of diagnostic flints and pottery, along with a change to less visible burial practices. Only a single feature of this period was found within the 19ha Bovis investigations and the apparent concentration of activity to the south and east side of the Loop seems to be genuine.

It is clear that the Biddenham Loop was transformed during this period — the open, monument-dominated landscape was replaced by enclosed fields and trackways. Although this change could be described as ‘dramatic’, the earlier monuments were still visible and were not ignored or forgotten, but were incorporated into the field layout. Interestingly, the locations of the two field systems appear to coincide with two of the earlier monument clusters and the unenclosed zone between them contained the central early Neolithic monument L2312.

Middle Bronze Age fields are not common in Bedfordshire but are increasingly being identified in southern England (Yates 2007). Late Bronze Age field systems are known within Bedfordshire (Dawson 2007, 61) but the only example believed to originate in the middle Bronze Age is at Broom (Cooper and Edmonds 2007, 89). Here, the evidence comprised ditches and posthole alignments but their character and extent were highly variable (ibid. 83-7). Far more extensive systems are known in the Thames Valley, many of which are believed to originate in the middle Bronze Age and to continue to develop until the end of the late Bronze Age (Yates 1999: 2007).



The Biddenham Loop field systems share a number of similarities with those at Perry Oaks, Heathrow (Framework Archaeology 2006, 95-164). Most obviously: they both developed in areas previously dominated by monuments; they display similarities in layout; fields were not established as a single event but the precise sequence of development is difficult to determine; the dating evidence which included radiocarbon determinations is consistent; both contained evidence for settlement and dispersed activity within the fields including large pits. A number of these similarities also occur within the Barleycroft/Over fields (Yates 2007, 95-6; Evans and Knight 2000; 2001). As with at Biddenham Loop Evans and Knight also believed that 'ring-ditch monuments and topographical features served as nodal points' and that droveways were absent (2001, 85).

Possible settlement foci and dispersed activity were identified within the Biddenham Loop fields, as at Perry Oaks (Framework Archaeology 2006, 114-32). The position of SL93, adjacent to an early Bronze Age settlement focus, suggests a degree of continuity. This is significant as it emphasizes the point that, although the physical appearance of the landscape had changed completely, the people occupied similar locations with potentially no break in occupation at all. It is possible that the settlement identified within the Bovis investigations to the northwest of field system SL13 also originated in this period.

The large pits within the Biddenham Loop fields are comparable to those at both Perry Oaks, interpreted as water pits (Framework Archaeology 2006, 133-149), and within the Bovis investigations where they were assigned to the late Bronze Age (Luke 2008, 37).

Another element of the Biddenham Loop fields are the poorly dated posthole alignments/fences. Similar features were found at Broom, Beds., where they were also considered to be associated with the fields (Cooper and Edmonds 2007, 85). A greater number and more extensive alignments have been identified at Barleycroft, Cambs. (Evans and Knight 2001). These varied in length from 77.5 to 129m and were not all contemporary.

It is interesting to note that a similar posthole alignment, although much shorter and more complex, was found on Land west of Kempston in an area where no fields were identified. This and the other activity foci do indicate that the Bedfordshire clays were not entirely devoid of activity at this time. This evidence is significant because despite extensive investigations associated with the dualling of the A421 only limited evidence for pre- early Iron Age activity was found east of Bedford (Webley 2007, 11) and none was found west of Bedford (Oxford Archaeology pers. comm.).

A large number of human burials and a smaller number of animal burials were found on the Biddenham Loop. With the exception of those within the cemetery, which were sampled, all the burials have been individually radiocarbon dated. With its grave goods and radiocarbon date of 1420BC-1210 Cal BC, inhumation SG21392 is noteworthy. All the inhumations at Biddenham Loop are unusual because Parker-Pearson has commented that, with the advent of the middle Bronze Age, cremation was universal and grave goods limited to a single pot to



contain ashes (1999, 90). However, the evidence from the recent investigations clearly demonstrates that both inhumation and cremation were being practised at this time on the Biddenham Loop. On other sites, burials of any kind of this period are quite rare, cf. Perry Oaks where ‘... the scarcity of cremations or inhumations ... either in cemeteries or singly is striking’ (Lewis et al. 2006, 151). A cremation cemetery of this period was identified at Broom (Cooper and Edmonds 2007, 92-8).



4.7 Late Bronze Age/early Iron Age SP7

4.7.1 Background (Figure 26)

The Bovis excavations produced evidence for activity in this period on the Biddenham Loop (Luke 2008, Chapter 7). The main area of late Bronze Age/early Iron Age settlement was located due north of the recent investigations. It was unenclosed, quite extensive and contained several activity foci, which included small pits, post-built structures and in some cases water pits. Although limited, the evidence suggested that the settlement was permanent and that mixed agriculture was practised.

At the time of the Bovis investigations it was believed that the first physical land division within the Biddenham Loop was a pit alignment, at least 1km long. It has now been investigated within the Bovis, Bypass and DWH investigations. Despite similarities in the pits' nature, size and spacing, some evidence for gang working was detected within the Bovis investigations.

4.7.2 Overview (Figure 26)

Within the recent investigations, evidence for human activity in the late Bronze Age-early Iron Age was dominated by pit alignments. These occurred on both the Biddenham Loop SL18 and land west of Kempston SL124. A limited number of isolated, small pits were also found in both locations. Two human burials were assigned to this period on the basis of radiocarbon dating.

Although the main pit alignment L105/L208 was on a different alignment to the middle Bronze Age fields, it is likely that they remained in use. This is because the pit alignment was mainly situated in the unenclosed zone SL12 between the two field systems; it only truncated the northern corner of system SL13 (Figure 27). All of the small pits assigned to this period lay within the middle Bronze Age fields, supporting the idea that the earlier field systems remained in use. Interestingly, the main pit alignment appeared to kink in the vicinity of early Neolithic monument L2312, again suggesting that even the earliest monuments retained long-term significance within the landscape.

4.7.3 Pit alignments (Figure 29)

Five pit alignments were identified within the DWH development area and the Bypass corridor — three on the Biddenham Loop SL18 (one known only from non-intrusive evidence) and two on Land west of Kempston SL124. All the pit alignments comprised fairly evenly spaced pits with no significant gaps (see Figure 29). Broadly speaking, those on the Biddenham Loop comprised similarly large pits, with only occasional smaller pits. Those on Land west of Kempston (within the Bypass investigations) comprised smaller pits but as they were found in a watching brief area it is possible that they had suffered truncation prior to their discovery.

The most extensive pit alignment L105/2801 was located in the centre of the Loop. It ran over 1km from river to river giving the impression of “cutting off” the Loop (Figure 27). Towards the centre of the Loop it was only *c.* 20m from the early Neolithic central monument L2312. In this area the alignment appeared to kink, which would correspond with the projected line of the



northeast to southwest alignment of monuments and shafts (see section 4.5.8). Pit alignment L105/2801 is securely dated to this period on the basis of its stratigraphical position between the middle Bronze Age field ditches and middle Iron Age storage pits. Supporting evidence from pottery and radiocarbon determinations indicate an early Iron Age date. No dating evidence was available for the other pit alignments and they have been assigned to this period because of their similarity to L105/2801 (Figure 29). The remains of a probable marker ditch were visible in gaps between some of the westernmost pits (within the Bypass investigations).

The positioning of the other two pit alignments on the Biddenham Loop appears to be designed to reinforce the natural 'boundary' of the river and/or its floodplain. L2110 was located to the northeast of the Loop; cropmarks beyond the investigation area indicate that it was at least 110m long. It was later replaced by ditches. A third pit alignment was located in the southern part of the Loop within the present floodplain, broadly parallel to the present-day river. It was only traced for a short distance by geophysical survey.

Two broadly N-S aligned pit alignments SL124 were identified to the west of Kempston (Figure 28). They were positioned in the vicinity of the edge of the present-day floodplain and were only 70m apart. Both were heavily truncated and difficult to identify. Therefore, their full extent is unknown.

4.7.4 Possible settlement activity

Evidence for other contemporary activity on the Biddenham Loop comprised a small number of dispersed pits SL20 and SL22 which were located, respectively, within the northern and southern middle Bronze Age field systems (Figure 27). The majority of the pits were dug into the middle Bronze Age field boundaries hence their assignment to this period. It is possible that the middle Bronze Age settlement SL93 remained in use during this period, although the main settlement area was probably that identified within the Bovis investigations.

To the west of Kempston one possible settlement focus SL125 was identified near the Bury (Figure 28). It comprised a cluster of pits including possible storage pits. The pits contained loom weights and possible hearth waste. Cylindrical loom weights are considered Bronze Age in date, while the triangular form is assigned to the Iron Age. The recovery of both cylindrical loom weights (considered Bronze Age in date) and triangular forms (considered to be Iron Age in date) from the same pit fills would appear to indicate a transitional date for the deposition. The composition of the assemblage from the fill of this pit might also suggest it was an 'abandonment' deposit to mark the end of occupation.

The only other evidence for occupation-type activity comprised possible fenceline SL126 which was 880m to the south of SL125.

4.7.5 Burial

The only burials of this period were an inhumation L2340 (SL20) and a cremation burial L2426 (SL22), both situated on the Biddenham Loop. They were dated by radiocarbon determination to the early Iron Age. Inhumation L2340 was in an isolated location away from the middle Bronze Age field



systems but cremation burial L2426 was located in the southern part of the Loop, 20m southeast of the possible trackway in middle Bronze Age field system SL13 (Figure 28).

4.7.6 Discussion of the results

English Heritage has highlighted the paucity of known settlement sites of this period (1991 and 1997). Bedfordshire is no exception with many of the presumed settlements either underlying hillforts or known only from the discovery of unstratified artefacts (Dawson 2007, 59). However, two settlements of this period are now known in the county: Broom (Cooper and Edmonds 2007, 98-132); and the one within the Bovis investigations on the Biddenham Loop (Luke 2008, 34-8). Another site at Gold Lane, Biddenham, only 1.5km to the north of the recent excavations, produced evidence for domestic activity within large rectangular enclosures (Dawson 2004, 9-12). The settlement located within the Bovis excavations was situated c. 180m north of the main pit alignment. The location of settlements near pit alignments is unusual but not unknown, cf. West Heslerton, North Yorks. (Powlesland 1986).

The Bovis settlement comprised clusters of postholes/pits, water pits, along with two/four post structures and one roundhouse. Similar evidence has been found on other settlement sites, e.g. Aldermaston Wharf and Knight's Farm, Berks. (Bradley et al. 1980), Heslerton, N. Yorks. (Powlesland 1986) and the Reading Business Park (Moore and Jennings 1992). These settlements have been variously interpreted as seasonally occupied (Bradley et al. 1980, 286), transitory (Powlesland 1986, 158-159) and permanent (Moore and Jennings 1992, 120-121). In addition to the settlement within the Bovis investigations it is possible that middle Bronze Age settlement SL93 was also occupied during this period. Possible settlement activity was found on Land west of Kempston SL125. The most significant feature within this area was the pit that contained two different types of diagnostic loom weights, suggesting a transitional date for their deposition. The composition of the assemblage also suggests it may represent an 'abandonment' deposit to mark the end of occupation.

The fact that the dispersed pits only occurred within the middle Bronze Age fields and the location of the main pit alignment through the unenclosed area dividing the two systems suggests that the earlier fields continued in use into this period. Late Bronze Age fields have been proposed at Octagon Farm and Eastcotts, Beds. (Dawson 2007, 61) but comparison with the recent evidence from the Biddenham Loop suggests they may have originated earlier.

Pit alignments, regionally and nationally, have proved difficult to date. This is largely because they are often found in isolation from contemporary activity. Only one of the five pit alignments within the investigations has produced dating evidence in the form of stratigraphical relationships with dated features, pottery and radiocarbon determinations. However, this has securely dated it to the early Iron Age. One of the other interesting aspects of this pit alignment is its proximity to early Neolithic monument L2312 in the centre of the Loop. At Eynesbury, Cambs. a pit alignment coincided exactly with the northern part of an early Neolithic henge-form monument. The author believed that this 'proved beyond doubt' that the monument was still visible in the landscape in the late



Bronze Age/early Iron Age (Ellis 2004, 106) and the same is likely to be the case on the Biddenham Loop.

The appearance of pit alignments may be linked to increasing territoriality during this period. By their very nature pit alignments must have functioned as boundaries but, on the other hand, their interrupted nature would not have provided an effective physical barrier. Individually, such enigmatic boundaries have local and regional significance. However, the importance of those on the Biddenham Loop is enhanced by the existence of an adjacent contemporary settlement and by the fact that they are integrated into the overall evolution of the landscape. The spatial and stratigraphical relationship that the main pit alignment on the Biddenham Loop has with the middle Bronze Age fields is curious. On strict stratigraphical grounds it is clearly later than some of the field ditches. However, in the main, its course takes it through the unenclosed zone in between the two field systems, suggesting that they were still in use. This may explain why, where it cuts across fields, it does so in peripheral areas.

The pit alignments on Land west of Kempston are the first to be found on the Bedfordshire clay and contribute significantly to our knowledge of pre-middle Iron Age activity on this land.

It is interesting to note that the two human burials would probably not have been assigned to this period if it was not for their radiocarbon determinations.



4.8 Middle Iron Age SP8

4.8.1 Background (Figure 30)

Apart from limited evidence on Land west of Kempston, the vast majority of the evidence for this period occurs on the Biddenham Loop (Luke 2008, Chapter 8).

Several unenclosed, early–middle Iron Age farmsteads were identified within the Biddenham Loop as part of the Bovis investigations. Three of these clearly continued into the DWH development. In addition to the farmsteads, the Bovis investigations located evidence for dispersed activity, comprising structures, pits and, in some cases, the re-use of Bronze Age ring ditches (Luke 2008, 42-44). They probably represent areas of short-term or seasonal activity, such as grain storage or the corralling of animals, on the periphery of the farmsteads.

The only evidence for this period in the vicinity of land west of Kempston derived from the Cutler Hammer Sports Ground evaluation (BCAS 1999). Over ten percent of the overall pottery assemblage was middle Iron Age in character, although only three small pits produced pottery solely of this period.

4.8.2 Overview (Figure 30)

In total eight middle Iron Age farmsteads are now known within the Biddenham Loop. All were situated on previously unoccupied land close to the present course of the River Great Ouse. The farmsteads within the recent investigations were all on the periphery of the middle Bronze Age field systems (Figure 31) and therefore it is presumed that some fields remained in use. Interestingly two farmsteads, SL30 and SL31, were positioned at either end of the early Iron Age pit alignment L105/2801 suggesting the earlier boundary may have continued to have some significance/visibility. More dispersed activity was found adjacent to two of the farmsteads and a small number of features of this period were identified within the middle Bronze Age fields.

To the west of Kempston one possible farmstead SL197 was located adjacent to the Cutler Hammer Sports Ground. In addition, dispersed activity foci SL138 and SL140 and a major boundary SL137 were identified (Figure 33). The only known burials were on The Loop and comprised three inhumations within farmsteads and three cremation burials located away from known farmsteads.

4.8.3 Farmsteads (Figure 32)

The recent investigations within the Biddenham Loop contained six farmsteads: SL27, SL30, SL31 (continuation of ones located in the Bovis investigations) and SL34, SL35 and SL36. Several of these were located within or adjacent to fields which originated in the middle Bronze Age, *e.g.* SL27, SL30, SL34 and SL35. All the farmsteads were unenclosed and between 0.6ha and 1ha in extent. They were characterised by a concentration of large storage pits which usually contained significant quantities of domestic debris principally pottery and animal bone. More unusual objects which indicate craft activities included an iron smithing hearth bottom from SL35 and the sawn antler off-cut from SL30. Some of the pits contained ‘special’ deposits including partial and complete animal skeletons. One contained a human skeleton (see below). Roundhouses were only positively identified within farmsteads SL31, SL34 and in isolation



SL28,. Four farmsteads SL30, SL31, SL34 and SL36 contained small ditched sub-rectangular enclosures, less than 25m in diameter, which may have originally contained buildings.

SL197 on land west of Kempston probably represents another farmstead. It was only identified within a narrow trench, so that its full extent and nature are unknown. It comprised a storage pit, a small number of small pits and two boundary ditches. In some ways its topographical position in relation to the present-day river is similar to the farmsteads on the Biddenham Loop.

4.8.4 Evidence for more dispersed activity

Dispersed clusters of features, including storage pits SL32 and SL33, were identified away from farmsteads on the Biddenham Loop (Figure 31). Another cluster of smaller pits SL21 was located in the northern part of the Loop within middle Bronze Age field system SL11 and may represent short-term activity within fields. Some, but not all, of these pits contained a small quantity of contemporary pottery.

4.8.5 Burials

Burials during this period comprised two cremation burials away from farmsteads and three inhumations associated with farmsteads.

Two cremation burials SL39 in middle Iron Age urns were found within the early Bronze Age ring ditch L2104 in the northwest of The Loop, in the same area as middle Bronze Age cemetery L2104/L2102.

Inhumation SG32283 was placed within one of the partially infilled storage pit in cluster L3207, farmstead SL35 (Figure 32). Two inhumations SG1235 and SG1237 (L102) were located within *c.* 15m of the roundhouse in farmstead SL31 (within the Bypass investigations). Like an inhumation found *c.* 20m to the east within the Bovis investigations (Luke 2008, 173), they were positioned adjacent to the early Iron Age pit alignment L105 and were radiocarbon dated to this period.

4.8.6 Major boundary ditch and associated activity (Figure 34)

To the west of Kempston a major boundary SL137 at least 200m long was identified towards the south of the investigation area within both the Bypass and DWH developments. Several clusters of pits and postholes SL138 and SL140 were located in its vicinity. SL140 contained two large water pits (within the Bypass investigations), one of which appeared to be stratigraphically later than the boundary. None of these contained datable artefacts or material suitable for radiocarbon dating and they have been assigned to this period on the basis of their proximity to the boundary. The absence of domestic debris suggests that they were associated with short-term activity in this area.

4.8.7 Discussion of the results

Bryant (1997) has presented a regional summary of the evidence for this period. Although it is accepted that 'most Iron Age settlements were farmsteads' (Haselgrove et al. 2001, 52), regionally, their distribution is considered 'to represent only a small fraction of the true number of sites' (Bryant 2000). This is likely to be because the majority of farmsteads were small and unenclosed,



like those found within the Bovis investigations, and are, therefore, difficult to detect. The key identifying characteristic of the Biddenham Loop farmsteads was the presence of a concentration of large storage pits. As such, they are similar to those at Stagsden Bypass (Dawson 2000) and Pennyland, Milton Keynes (Williams 1993). A number of storage pits on the Loop contained unusual deposits. There is also an increasing body of evidence for the view that some deposits should no longer be seen as random dumps of 'rubbish' but rather as important aspects of Iron Age behaviour (Cunliffe 1992; Hill 1995; Haselgrove et al. 2001, 8).

Activity away from the farmsteads was limited to dispersed features which included storage pits, and burials. They are presumed to represent areas of short-term or seasonal activity, such as grain storage or the corralling of animals, sometimes on the periphery of a farmstead but sometimes within the interior of the Loop. Such evidence is increasingly being recognised within more extensive excavations (Haselgrove et al. 2001, 11).

The presence of human remains on Iron Age sites was once considered to be a rare occurrence. However, although numbers are still relatively small, there is an increasing body of evidence for the burial of both individuals and disarticulated bones which the recent investigations will add to. It is relatively common to find inhumations within storage pits but the occurrence of three (including one from the Bovis investigations) adjacent to the early Iron Age pit alignment is particularly significant. It is also significant that two cremation burials of this period were found. Formal burials, especially inhumations, were not common before the 1st century BC (Cunliffe 1991, 505) and it is clear, therefore, that it did not represent the funerary rite of the majority of the population (Walker 1984, 461).



4.9 Late Iron Age/early Romano-British SP9

4.9.1 Background (Figure 35)

Two late Iron Age/early Romano-British farmsteads were identified within the Bovis development on the Biddenham Loop, with three others identified on the basis of non-intrusive survey. They were located close to, but not in exactly the same place as, the middle Iron Age farmsteads. They were more extensive than the earlier farmsteads and usually comprised at least one ditched enclosure. Both cremation (including a cemetery) and inhumation burials occurred on the periphery of the settlement areas. Away from the farmsteads there was evidence for dispersed and isolated activity, including field systems, short-term occupation and a possible shrine.

Contemporary activity was identified in the vicinity of land west of Kempston at the Cutler Hammer Sports Ground (BCAS 1999, 36) and at Marsh Leys Farm (Luke and Preece forthcoming b). The latter comprised two farmsteads *c.* 0.5km apart, like those within the Bovis investigations, largely unenclosed but with at least one ditched enclosure. The evidence from Cutler Hammer is derived from evaluation trenches where nearly 20% of the pottery assemblage dated to this period. This suggests that the extensive Romano-British settlement centred on Kempston Church End may have originated in this period.

4.9.2 Overview (Figure 35)

There was only limited evidence within the recent open area excavations for human activity on the Biddenham Loop during this period, but two possible farmsteads were identified within Land west of Kempston (Figure 38). The evidence on the Loop mainly comprised enclosures SL41 and SL42, boundary SL43 and shrine complex SL50 (Figure 36). The impression of a dramatic decline in activity within the Biddenham Loop in this period is misleading because one, largely unexcavated, farmstead is located within the DWH country park and two were identified within the Bovis excavation area to the northwest (Farmsteads 5 and 6/8). However, compared to the middle Iron Age, the impression of a significant reduction in the overall number of individual settlements is probably genuine.

4.9.3 Possible settlements (Figure 39)

Enclosures SL41 and SL42, and boundary SL43 on the Biddenham Loop may be associated with farmsteads, for which no firm evidence was available within the excavation areas. It may be significant that all were in the vicinity of middle Iron Age farmsteads. Enclosure SL42 was located 70m from middle Iron Age farmstead SL31, enclosure SL41 was adjacent to middle Iron Age farmstead SL30 and boundary L43 was next to middle Iron Age farmstead SL36. It is, therefore, possible that they represent developments of the earlier farmsteads. The interpretation of SL41 and SL43 is hampered by their proximity to unexcavated land. However, it is also significant that late Iron Age/early Romano-British pottery was found within middle Iron Age farmstead SL30 (in the vicinity of enclosure SL41) and within Romano-British farmstead SL54 (in the vicinity of boundary SL43). The absence of contemporary activity in the vicinity of enclosure SL42 within the Bypass investigations suggests that this area did not contain a farmstead. However, there is evidence in the HER



suggesting that post-medieval quarrying in this area may have disturbed a lot of contemporary pottery.

Settlement SL144 within the Bypass investigations to the west of Kempston indicates that the extensive Romano-British settlement centred on Kempston Church End originated in the late Iron Age/early Romano-British period. However, it is uncertain how large the settlement was at that time. Within the Bypass excavation area it comprised several large rectangular enclosures adjacent to a major trackway established on previously unoccupied land. Although no features within the pipe trench adjacent to the Cutler Hammer Sports Ground were assigned to this period, the quantity of residual late Iron Age/early Romano-British pottery in later features does indicate the presence of a nearby settlement. It is unclear if this was part of SL144, c. 370m to the northwest.

Towards the south of the investigation area to the west of Kempston a possible farmstead SL147 was identified within the Bypass investigations. It was on the edge of the excavation area and, therefore, its full extent and morphology is not known.

4.9.4 Shrine complex (Figure 37)

Shrine complex SL50 was located to the northwest of the Loop, 460m northeast of enclosure SL42. It comprised three very similar, possible shrines (one of which was found within the Bovis investigations). The two found within the recent investigations were both positioned within a larger rectangular enclosure. Their interpretation is mainly based on comparisons with similar structures elsewhere in the country. The latter were associated with burials and/or contained 'special' deposits, which the Biddenham Loop structures did not. It may also be significant that the gullies and ditches associated with the shrines did not contain a lot of domestic debris and that they were in an isolated location, 300m from the nearest farmstead.

4.9.5 Burials

The only burial assigned to this period occurred within the Bypass investigations. It comprised an urned cremation burial within settlement SL144 and in the vicinity was a possible rectangular funerary enclosure similar to those found in the vicinity during the sewer investigations (Dawson 2004, 42 and fig. 3.18).

4.9.6 Other evidence

The only other evidence for activity was situated on land west of Kempston, c. 630m to the northwest of possible farmstead SL147. It comprised a concentration of eight gullies and a number of small pits SL146 (mainly within the Bypass investigations). The gullies were more sinuous in plan and had more concave profiles than the linear features that have been interpreted as bedding trenches (see 4.10.6). Nonetheless, an agricultural function seems likely.

4.9.7 Discussion of results

All the settlements of this period within the Biddenham Loop were situated on previously unoccupied land but in the vicinity of middle Iron Age farmsteads. This appears to be a regional phenomenon because surprisingly few early-



middle Iron Age settlements are overlain directly by late Iron Age/early Romano-British replacements (see Simco 1973, fig. 1). Contemporary settlement shift and/or landscape reorganisation has been observed elsewhere in Bedfordshire, e.g. Stagsden Bypass (Dawson 2000, fig. 17), Hinksley Road, Flitwick (Luke 1999, 83), Haynes Park (Luke and Shotliff 2004, 118). The farmsteads were similar in that they comprised a single ditched enclosure and were more extensive than the middle Iron Age ones (as was the case with those found on the Bovis investigations). The appearance of ditched enclosures reflects a regional development during this period (Williams et al. 1996, 24; Bryant 1997, 28). The evidence from the Bypass investigations for a late Iron Age/early Romano-British origin for the extensive Romano-British settlement centred on Kempston Church End is significant. Earlier investigations had suggested it originated in the late 1st century AD (Dawson 2004, 41).

The small possible ritual complex towards the centre of the Loop is dated to this period by pottery and a single radiocarbon determination. It comprised two small square shrines situated within a single larger ditched enclosure. Another similar shrine was found within the Bovis investigations (Luke 2008, 53-5). Small pits were located centrally within each shrine but no human bone or unusual/“special” artefacts were found in these or elsewhere. However, similar small square enclosures have been associated with cremation burials in isolation from contemporary settlements, e.g. Roughground Farm, Glos. (Allen et al. 1993, 53, fig. 30) and within religious sites, e.g. Westhampnett, West Sussex (Fitzpatrick 2003, 15-8, fig. 33). Comparable small square enclosures have been interpreted as shrines and occur within settlements, e.g. Stansted (Brooks 1989, 323-4) and Heybridge (Atkinson 1998, 92-3), both in Essex. Although no exact parallels are known in Britain for such a ritual complex, the arrangement is similar to a number found in northern France (Haselgrove 2007, 496-8, fig. 3), albeit often associated with cremation burials. These types of enclosures are sometimes referred to as Viereckschanzen and are very rarely found in Britain.

Only one cremation burial of this period were found in the Bypass investigations within the Kempston Church End settlement although others are known (Dawson 2004). Cremation burials were also found in the vicinity of the farmsteads within the Bovis investigations including a cemetery of La Tene/early Roman type (Luke 2008, 51-3). In addition, two inhumations within the Bovis investigations were dated to the 1st century AD by radiocarbon determination.



4.10 Romano-British SP10

4.10.1 Background (Figure 40)

Evidence for this period has been found both within the Biddenham Loop (Luke 2008, Chapter 10) and in the vicinity of Land west of Kempston.

The results of the Bovis investigations on the Biddenham Loop suggested that all the late Iron Age/early Romano-British farmsteads continued to be occupied into the late 1st century AD, although they were augmented by extensive rectilinear systems of ditched enclosures (Luke 2008, 243). A number of the latter contained settlement-type features indicating the location of domestic foci but only one farmstead produced firm evidence for buildings, in the form of roundhouses. All the farmsteads were subject to minor redesign; two of them displayed more fundamental changes, with substantial boundary alterations.

An extensive Romano-British settlement was situated within Land west of Kempston to the south-west of the Biddenham Loop. It was first identified during sewer construction in 1990 (Dawson 2004, 38-66) and has been subject to piecemeal, mainly rescue-type, investigation since then (Luke and Preece forthcoming a; BCAS 1999). It was centred on Kempston Church End and comprised a gridded system of enclosures positioned between two parallel trackways. It is also known to have contained two large cemeteries (Luke and Preece forthcoming a; Dawson 2004).

To the south of the development area two contemporary farmsteads were located within the Marsh Leys investigations (Luke and Preece forthcoming b).

4.10.2 Overview (Figure 40)

Romano-British activity was extensive and present on both the Biddenham Loop (Figure 41) and to the west of Kempston (Figure 43). The evidence on the Loop comprised two farmsteads (one fully excavated and the other within the DWH country park), trackways, a major boundary and a number of burials including an unusual *Bustum* type. On Land west of Kempston, trackways, field systems and bedding trench systems were identified. However, the most extensive Romano-British remains were found within the known major settlement centred on Kempston Church End. The evidence from the Bypass and DWH investigations was assigned to SL155. The influence of this settlement on the contemporary landscape in the vicinity would have been significant and it is therefore discussed first.

4.10.3 Major settlement (Figure 44)

Major settlement SL155 was located adjacent to the River Great Ouse on land west of Kempston and originated in the late Iron Age/early Romano-British period as SL144. It had previously been investigated on the line of an Anglian Water sewer (Dawson 2004) and at Box End quarry (Luke and Preece forthcoming a). Approximately 1ha of the settlement, including a number of domestic enclosures, was examined within the Bypass (Albion 2009a). Approximately 360m to the southwest a 4m wide trench was investigated as part of the DWH development. This contained substantial ditches demonstrating that the Romano-British enclosure system continued into this area and that the results



of the Cutler Hammer Sports Ground evaluation were correct (BCAS 1999). It also contained quarry pits and a possible cambered path/road. On the basis of the recent and previous investigations and non-intrusive survey, the overall extent of the settlement is now known to be over 17ha.

Large areas on the western periphery of the settlement were the subject of open area excavation associated with the Bypass and the DWH development. The majority of this land was devoid of evidence for contemporary activity suggesting it may have been fields or pasture. However, it did contain two trackways, bedding trenches and isolated burials. Trackways L702 and L4501 appear to represent major routeways leading into the southern part of the settlement. A similar arrangement of trackways was observed at the settlement's northern end within Box End quarry (Luke and Preece forthcoming a).

4.10.4 Farmsteads (Figure 42)

On the Biddenham Loop two farmsteads SL51/SL52 and SL54, located to the northeast and south of the Loop, were subject to open area excavation. The majority of SL51/SL52 was within the DWH housing area. Only a fraction of SL54 was exposed within the Bypass corridor; the rest was within the DWH country park. They had both been previously identified by non-intrusive survey as part of the Bovis investigations (Farmsteads 11/20 and 12/16 within the publication). Two additional farmsteads (13 and 10/14) were identified to the northwest of the Loop within the Bovis investigations. All the farmsteads were 1.5–5ha in extent and comprised multiple rectangular enclosures often with at least one integral trackway.

With the exception of SL51/52, there is clear evidence that all the farmsteads on the Biddenham loop originated in the late Iron Age/early Romano-British period. SL51/52 is an exception because no sub-surface features and very little domestic debris of this period were found, suggesting that it was established on previously unoccupied land. To the south, farmstead SL54 may have been of a different 'status' to the others. It was the only one to produce significant quantities of roof tile, flue tile and brick fragments during field artefact collection, suggesting the presence of at least one substantial building. Comparable material from the same location, including samian and colour-coated pottery, flue tile and coins, is recorded in the HER (HER 3663).

Towards the south of the development area the presence of field system SL158, dated to this period within the Bypass investigations, may indicate that the farmstead that existed in the late Iron Age/early Romano-British period continued to be occupied, although there is no direct evidence for this.

4.10.5 Trackways, boundaries and fields (Figure 41)

Two major trackways SL53, defined by parallel ditches, were identified in the southern part of the Biddenham Loop. One L2376 was aligned N-S and was mainly situated on higher ground; the other L2306 to the east was within the present-day floodplain and appeared to respect both the natural topography and the middle Bronze Age fields. Both trackways appeared to stop or change when they met E-W boundary L112/L2336 that extended almost river to river across the Loop. Trackway L2376 stopped on meeting the boundary. Although trackway L2307 continued, it was not clearly defined by two ditches. The



trackways probably provided a route for animal movement onto the floodplain and linked the farmsteads to each other and possibly even to the major settlement at Kempston Church End.

The E-W boundary on the Biddenham Loop is considered to be significant and may represent an ownership marker. This is partly because of the changes it effects on the trackways where they intersect and partly because its alignment gives the impression of “cutting off” the southern part of the Loop. It is parallel to, but *c.* 80m north of the early Iron Age pit alignment.

No obvious fields were created in the southern part of the Loop during this period. It is therefore presumed that although the N-S trackway L2376 clearly truncated the middle Bronze Age field systems SL13 and SL14, many of the earlier fields may have been retained during this period. To the north of the major E-W boundary several fields SL49 were identified; they are part of a system previously identified within the Bovis investigations.

On land west of Kempston, as described above, two trackways L702 and L4501 approached the southern part of the major settlement centred on Kempston Church End. Another, defined by two parallel ditches, was associated with field system SL158 to the south. It may represent a major communication route because, if its alignment was projected southwards, it would coincide with trackway L4501. In addition, if the alignment of the latter was projected southwards, it would coincide with a major boundary/routeway within one of the Marsh Leys farmsteads to the south.

Field system SL158 comprised rectangular fields attached to the east side of a trackway. It was located at the southern end of the development area and was only investigated within the Bypass. The full extent of this system is unknown because it continued beyond the limit of investigation. There was some evidence for further boundaries and fields to the south in the form of SL159, also within the Bypass investigations, although these were on the edge of the investigation area.

4.10.6 Bedding trenches (Figure 45)

Away from the trackways and fields on land west of Kempston were four areas of bedding trenches, investigated within both the Bypass and the DWH development. They comprised parallel trenches, consistently 4.5m apart and *c.* 0.8m wide, with steep sides and an uneven base. In some areas, the trenches were filled with dark soils containing a moderate quantity of domestic debris. It is presumed that the trenches were deliberately filled with this material, presumably from middens/compost heaps on nearby settlements. Comparable features discovered on other sites in the region, *e.g.* Caldecote, Cambs. (Kenney 2001) and Wollaston, Northants. (Meadows 1996), have been interpreted as parts of vineyards, although fruit hedges is another possibility.

4.10.7 Shrine complex (Figure 37)

It seems possible that the late Iron Age/early Romano-British shrine complex SL50 to the east of fields SL49 continued to have some significance in this period — a small quantity of Romano-British pottery was found with it and N-S trackway L2376 appeared to be aligned directly on it.



4.10.8 Burials

Burials, both inhumation and cremation, were present within all of the farmsteads. Two of the cremation burials within SL52 contained a large number of nails suggesting that the cremated remains may have originally been placed within a casket. The largest number of burials derived from the inhumation cemetery located on the periphery of farmstead SL54 (within the Bypass investigations).

Perhaps the most unusual individual burial – of a type known as a *Bustum* burial – was one found in isolation within the southern part of the Loop to the west of the central trackway. This fairly rare and unusual type of burial takes its name from the Latin for “pile of cremated bone”. These burials result from the cremation of the deceased on a pyre constructed over the grave pit itself — in contrast to the majority of cremations in Roman Britain where the body was burnt on a pyre away from the actual grave. After combustion the cremated bone and pyre material falls, or is pushed, into the grave pit which is then backfilled. Nearly a hundred iron nails were found within the pyre debris. They may have been used during the construction of the pyre or perhaps more likely were already in timbers used as fuel in the pyre. Three pottery vessels were found within the grave: two carefully placed after the pyre had burnt out; and a third in 16 pieces. The latter may have been deliberately broken as part of the cremation and burial ceremony. Two of the vessels were dated to the 4th century indicating when the burial occurred.

4.10.9 Discussion of results

Geographically central within the development area was the major Romano-British settlement centred on Kempston Church End (Dawson 2004). It was first thought to be a villa but is now known to be a settlement in excess of 17ha in extent. It has a regular, gridded layout, contains at least two substantial cemeteries and has produced a diverse range of artefacts. It was thus considered to be a large, planned settlement and the only example of its kind in Bedfordshire (Dawson 2007, 73). Gaining a greater understanding of the origins and nature of this settlement is one of the key aims of the Bypass analysis. However, it is clear that, whatever its ‘status’, the presence of such a large settlement will have influenced the development and use of the surrounding landscape. For example, it may be significant that the inhabitants of farmstead SL54 (closest to the Kempston Church End settlement) were probably of a higher ‘status’ than those within the other farmsteads SL51/52. This is based on the presence of evidence for substantial buildings, a cemetery and a diverse range of artefacts. However, such evidence is never particularly clear-cut and cannot be directly equated with particular types of rural settlement (Taylor 2001, 50; Hingley 1989, 159-61).

Regionally, the investigation of Roman sites over the last ten years has gone some way to address the imbalance towards high status sites such as villas and towns. However, discussing the Roman period in 1997, Going commented that ‘little is known of villages, farmsteads, hamlets and other kinds of rural settlement’ in the eastern region (1997, 38). He also stated that the ‘study of other kinds of rural settlement has not progressed as rapidly as might be desired’. However, the body of evidence from Bedfordshire, to which results of the recent investigations can be added, appears to be more substantial. Dawson



(2007, 73) identified four main types of rural settlement in the county: substantial farms or villas, planned villages (e.g. Kempston Church End), linear/row farmsteads and focused/nucleated farmsteads. The majority of the evidence from the Biddenham Loop appears to fall into the category of focused/nucleated farmsteads, although as discussed above Farmstead SL54 may have been of a slightly higher status.

The defining characteristic of the Romano-British farmsteads on the Biddenham Loop is the rectilinear, ditched enclosure system (Luke 2008, 58). Williams et al. (1996, 83) have suggested that the creation of large enclosed areas was common practice in lowland Britain during the second half of the 1st century AD and the dating evidence from the Biddenham Loop farmsteads would be broadly consistent with such a date. A major difference between farmstead SL51/52 and those previously investigated on the Biddenham Loop was the absence of evidence for late Iron Age origins.

The evidence for fields, trackways and other activity away from the settlements within both the Biddenham Loop and land west of Kempston is significant and will allow reconstruction of the wider landscape to be attempted. Regionally, the dating of field systems and trackways is notoriously difficult, often because they contain only small quantities of datable domestic debris and they are rarely 'tied into detailed settlement evidence' (Going and Plouviez 2000, 19).

The cemetery containing 33 graves associated with farmstead SL54 (Bypass investigations) is a significant discovery because rural cemeteries are still relatively rare (Going 1997, 40). Cemeteries on the periphery of rural settlements are known in Bedfordshire at Bletsoe (Dawson 1994) and at Great Barford Bypass Site 4 (Poole 2007, 90-96). The latter contained 56 and 11 burials respectively. The graves within the SL54 cemetery will provide useful data to compare with both the isolated graves within the investigation area and the two cemeteries within the Kempston Church End settlement.

Palaeopathological evidence from one of the latter suggested, at the least, that some of its inhabitants may have served in the military (Boyleston and Roberts 2004, 348-9). One grave within the SL54 cemetery was exceptional because it contained no skeleton. It may reflect funerary practices associated with someone whose body was not available, e.g. died away from home. A similar empty grave was identified within the Kempston Church End cemeteries (Luke and Preece forthcoming a) but this practice appears to be relatively uncommon and is not discussed by Philpott (1991).

The bustum burial is a significant discovery because it is the first such burial to be positively identified in Bedfordshire and is comparatively rare in England. The nearest firmly identified examples were eight found in the vicinity of each other at The Lea, Denham, Bucks. (Fitzpatrick 2005, 428). They are often considered to have continental origins (Philpott 1991, 48).



4.11 Early Saxon SP11

4.11.1 Background (Figure 46)

No evidence from this period was found within the Bovis investigations on the Biddenham Loop (Luke 2008, 68). The Romano-British farmsteads excavated there ceased to function by the early 4th century (Luke 2008, 56) and produced no evidence for Saxon activity. However, there were records in the HER indicating the discovery of Saxon artefacts in the north-eastern part of the Loop.

A small 7th-century cemetery was found within the site of the Kempston Church End Romano-British settlement (Dawson 2004, 61), suggesting that not all of it had been abandoned. It was located within a later Romano-British fenced enclosure, equidistant between the two major trackways and adjacent to 4th-century masonry buildings. However, no contemporary evidence was recovered from the Box End quarry (Luke and Preece forthcoming a) or Cutler Hammer Sports Ground (BCAS 1999) investigations.

The absence of late 4th-century coins and pottery at the Marsh Leys farmsteads seems to indicate that both had been abandoned by the middle of the 4th century. One ditch investigated as part of the evaluation on Land west of Kempston contained pottery which has been tentatively dated to the Saxon period. With the exception of Bedford, the most substantive evidence for this period was a well known but unpublished Saxon cemetery within Kempston town *c.* 1.5km to the east (Kennett 1986; Wood 1984).

4.11.2 Overview (Figure 46)

Evidence for early Saxon settlements was identified to the northeast of the Loop SL62 (Figure 47) and adjacent to the Bury within land west of Kempston SL165 (Figure 48). In addition, evidence for possible settlement was found on the west side of the Loop and within the Kempston Church End Romano-British settlement.

4.11.3 Settlements (Figure 49)

The nature of the evidence for the two settlements was different. SL62 on the Loop comprised twenty sunken-featured buildings (SFB), while SL165 within land west of Kempston comprised mainly dispersed pits and postholes.

SL62 was located adjacent to the present-day course of the River Great Ouse, in the same area as Romano-British farmstead SL51/52. The settlement extended over 6ha and comprised a concentration of thirteen SFBs, interpreted as the core L2135, and seven more peripheral SFB L2132 (2), L2133 (1), L2134 (3) and L2162 (1). A small number of other settlement-type features, such as pits and postholes, were identified in all areas. The core of the settlement was established within one of the enclosures of system SL52. It is unlikely that all the SFBs were contemporary because a number had been infilled with domestic debris, demonstrating that they had been abandoned while the settlement as a whole remained in use. The domestic debris comprised large quantities of pottery, animal bone and other artefacts. In terms of the pottery assemblage the absence of characteristic middle Saxon types such as Maxey and Ipswich wares



and the presence of stamps often dated to *c.*450-650 suggests that the assemblage is early rather than middle Saxon in date.

Settlement SL165 on land west of Kempston extended over an area of 3.5ha. It was located in the vicinity of dispersed Romano-British activity SL56 to the west of trackway L4501 and to the east of bedding trenches L4510. It comprised a main focus L4518, *c.* 1ha in extent. This contained three possible SFBs, a cluster of twelve intercutting pits and more dispersed pits. The SFBs were smaller and less convincing than those on the Biddenham Loop. However, they contained postholes and early-middle Saxon pottery. A small number of isolated pits were located adjacent to Romano-British trackway L4501, suggesting that it may have remained in use.

4.11.4 Possible settlement (Figure 50)

Possible settlements were indicated by the presence of dispersed buildings SL63 on the west side of the Loop, and by activity foci SL164 and SL199 on land west of Kempston.

SL63 comprised eight SFBs, including three within the Bypass investigations, dispersed in a linear fashion over 0.6km between 25m and 200m from the present-day course of the River Great Ouse. Several lay within middle Bronze Age fields SL13, or were situated close to their boundaries. It is possible that they utilised existing boundaries or hedges. Five SFBs L2362 were clustered in a broadly SE-NW band, 170m in length. The other three were in more isolated locations, slightly nearer the river and spaced up to 210m apart. Three small pits may be associated with this activity, but were undated. A small quantity of domestic debris was recovered including early Saxon pottery, loomweights and two strap mounts. In addition, two SFBs contained lumps of clay including a single unfired loomweight. In contrast to settlement SL62, where pottery dominated the finds assemblage, animal bone was the predominant find. It is unclear if all the buildings were in use at the same time. Their interpretation is also unclear but they may represent non-domestic buildings associated with fields.

Domestic foci SL164 and SL199 were situated within the major Romano-British settlement SL155. Within the Bypass investigations SL164 comprised two large isolated pits L503, *c.* 60m apart, and inhumation L509. Within the pipe trench adjacent to Cutler Hammer Sports Ground, SL199 comprised a ditch and a shallow deposit overlying Romano-British ditches. These contained small quantities of domestic debris including early Saxon pottery. It is therefore likely that they represent the continuation of occupation within part of the Romano-British settlement.

The interpretation of activity focus SL166, *c.* 230m to the south of settlement SL165, is uncertain. It comprised two small pits one of which contained an *in situ* semi-complete pottery vessel. The latter contained a small quantity of burnt animal bone, originally thought to be human. It may represent a grave good associated with a burial later removed by ploughing.



4.11.5 Discussion of results

The evidence for early Saxon settlement within the investigation area, especially that on the Biddenham Loop, is another significant result. No such evidence was found during the Bovis investigations, giving the impression that the Romano-British population had moved to new settlements away from the Biddenham Loop (Luke 2008, 68). The precise interpretation of the evidence within the Church End Romano-British settlement is uncertain but it does suggest continuity of occupation.

Within Bedfordshire 'few excavated Romano-British sites show continuity of occupation into the Saxon period' (Edgeworth 2007a, 87). Regionally, Wade stated that 'it is still far from clear what happened in the 5th century' (2000, 23). However, like the national picture 'the impression of an abrupt change may be partly the result of the cessation of coin and pottery production in the late 4th century, leaving little for the archaeologist to use as dating material' (Edgeworth 2007a, 89). Without these datable artefacts, identifying settlements that continued into the 5th century becomes extremely difficult and dating it next to impossible (Cleary 2001, 93). Edgeworth also pointed out that there has been an assumption that the Romano-British way of life was replaced wholesale (2007a, 89). However, as long ago as 1984 Simco was saying that, in Bedfordshire, 'occupation of a site may appear to come to an end at the end of the 4th century, but it may be that the signs of continuing occupation are just not being recognised' (1984, 71-2).

In this context it is striking that within the investigations, with the exception of the dispersed SFB's on the west side of the Loop, all the other settlement evidence for this period occurs in the vicinity of Romano-British activity. In fact, it is possible that the core of SL62 was deliberately established within a peripheral enclosure of the earlier farmstead. Sometimes such juxtaposition has led to the suggestion that these are related to the establishment of foederati to protect British settlements, e.g. in explaining the location of the large cemetery within Kempston town in the vicinity of the large Romano-British settlement at Church End (Kennett 1986). There are numerous alternative explanations for such occurrences. Wingfield even suggested that although SFBs are considered by many to be a building type associated with the Saxons, they may have been used by the British too (1995). The transition from Roman empire to Saxon kingdoms has frequently been highlighted as of particular importance (English Heritage 1991b, 1997).

Given the extensive nature of the investigations in the vicinity of the settlements it is perhaps surprising that no definite burials of this period were identified. Only one possible grave L5001 (SL166) was identified on the basis of the presence of an in-situ pottery vessel but no human bone was found. Several reasons are possible for this absence including plough truncation (no post-built buildings were identified), the occurrence of cemeteries away from settlements (in unexcavated areas) or the possibility that on Biddenham Loop they were located in the earthworks of prehistoric monuments that have subsequently been removed. The latter or quarrying may explain the recovery of Saxon artefacts in the vicinity of SL62 as recorded in the HER.



4.12 Saxo-Norman SP12

4.12.1 Background (Figure 51)

The only evidence for activity in this period comes from Land west of Kempston. Evaluation trenches to the northeast of The Bury contained dispersed, settlement-type features. In addition, Bypass Area 8 contained field boundaries and an integral trackway which was later enclosed by settlement (Albion 2009a).

4.12.2 Overview (Figure 51)

All the evidence for Saxo-Norman settlement from the recent investigations was located adjacent to the present-day Bury on Land west of Kempston (Figure 52). The evidence of later land use and Domesday Book suggest that, at this time, the majority of the development area contained extensive open fields associated with the villages believed to have been in existence by this time, e.g. Biddenham and the various Kempston “End” settlements. However, because no firm dating evidence was recovered, agricultural features, such as furrows and headlands, have all been assigned to the medieval period (see below).

4.12.3 Settlement (Figure 53)

Evidence for settlement was found both to the west of The Bury (SL168 within the Bypass investigations) and to the east (SL169 within the DWH investigations). SL169 was situated in the same area as early-middle Saxon settlement SL165, indicating continuity of occupation. The two areas of settlement were quite different in nature — to the west SL168 comprised small enclosures while to the east SL169 was largely unenclosed. Although c. 200m apart, it is possible that they are both part of a larger settlement; the intervening was not part of the development and was therefore not excavated.

The core of settlement SL169 extended over 0.7ha to the west of possible trackway/boundary L4504. It included a possible rectangular building L4514, a cluster of large pits and potholes L4513 and two drying ovens L4512. Rich deposits of charred plant remains in some of the pits suggest that they were associated with the drying ovens.

4.12.4 Discussion of results

As is so often the case, there is no evidence from the investigations for discontinuity between the late Saxon and medieval periods despite the well-known political and tenurial changes around this time. The dating evidence is not very precise and is largely based on the presence of St Neots-type pottery.

The discovery of Saxo-Norman settlement in the vicinity of The Bury is significant for a number of reasons. It is located in the same area as early-middle Saxon settlement suggesting continuity of occupation. While not unknown in the region such an occurrence is unusual because earlier ‘settlements tended to be deserted in favour of new locations during the 7th century — the so-called ‘Middle Saxon shuffle’ (Wade 2000, 23). Evidence for the latter is indicated by the abandonment of settlement SL62 on the Biddenham Loop.



The Saxo-Norman settlement to the east of The Bury is located 200m from an area of contemporary settlement within the Bypass investigations. The nature of the evidence from the two settlement areas is quite different and, although this could suggest that they represent two separate farmsteads, they could equally represent two different parts of the same settlement. In this case the more dispersed evidence within the DWH investigations — including drying ovens and pits — may be located on the periphery of the main settlement.

In Bedfordshire, as is the case nationally, the period between the 9th and 12th centuries is the time when ‘the pattern of nucleated villages together with dispersed settlement that we see today was probably largely established’ (Edgeworth 2007a, 93). The Medieval Settlement Research Group believes that the development of settlements at this time and subsequent desertion is a fundamental research issue for this period (MSRG 1996). Another associated landscape development that is still poorly dated is the inevitable re-planning of the field systems at this time. It is therefore likely that the arrangements of boundaries and settlements around The Bury influenced the establishment of open fields systems, although the precise dating of these is uncertain.



4.13 Medieval SP13

4.13.1 Background (Figure 54)

By the medieval period the majority of the land on the Biddenham Loop and Land west of Kempston was open fields associated with nearby villages. Many of these, such as Biddenham, Bromham and Kempston (presumably including its various Ends), are mentioned in Domesday Book indicating that they existed in the late Saxon period. It is often suggested that Kempston Brucebury manor-house was probably located near the site of the present Bury just outside the development area (Wood 1984, 36). A geophysical survey and desktop study undertaken within the grounds of the Bury failed to find any firm evidence for medieval settlement in this area, although this is clearly a possibility (Albion 2006, 22).

4.13.2 Overview (Figure 54)

The vast majority of the evidence for medieval activity within the investigation area comprised furrows and headlands associated with open field systems. The only settlement identified within the investigation area was SL172 which was situated within the Bypass corridor to the west of Kempston.

4.13.3 Open fields (Figure 55 and Figure 56)

The presence of open fields SL71, SL173, SL174 and SL175 was indicated by the existence of sub-surface parallel furrows within the excavation areas. In addition, headlands and one small area of ridge and furrow survived as earthworks. However, the full extent of the open field systems is indicated by cropmarks of furrows visible on aerial photographs. Historical maps also indicate the extent and layout of fields. It is clear that all land within the development area away from the River Great Ouse was utilised at one time for open fields, including some land now classed as floodplain. The major exceptions were the land between the main and back channel of the river and the area around Honey Hill on the Biddenham Loop.

4.13.4 Settlements

Of the two areas of Saxo-Norman settlement only SL168 continued into the medieval period. This, referred to as SL172, was only located within the Bypass corridor and clearly continued to the west of the investigation area. It is also possible that contemporary activity may be located within unexcavated land to the east under The Bury. The medieval settlement comprised an enclosure system and possible trackway; both elements were respected by the furrows of the open field system. The larger domestic enclosure was to the south of the trackway and a number of smaller enclosures were located to the north. One of the latter contained a circular possible fish pond. The excavation evidence suggests that the settlement declined or shifted focus in the 14th century.

4.13.5 Discussion of results

Overall very little sub-surface evidence for this period was found within the investigation areas. It is clear from a variety of sources that the majority of the area comprised open fields associated with villages outside the development area. As discussed above, there is no firm evidence for when the open fields were established but it is likely to be in the late Saxon period as in the rest of the



county (Edgeworth 2007a, 98). However, 'open fields seem to have evolved gradually over several centuries and continued to develop and change subsequently' (Wood 1984, 49).

The only settlement that existed in this period within the investigation area originated in the Saxo-Norman period and was respected by the open fields. It was enclosed and was associated with a possible fish pond. However, it produced no firm evidence to indicate that it contained Kempston Brucebury manor-house as is frequently suggested for the location (Wood 1984, 36). A study of medieval settlement in Bedfordshire and Northamptonshire indicated that Domesday manors were typically sited close to the rivers (Lewis et al. 1992). Therefore, although it is clearly a possibility that the settlement was associated with Brucebury manor-house, further work would be required to demonstrate this.

It is possible that the settlement declined in the 14th century, in keeping with the regional pattern (Wade 1997, 52). However, the limited extent of the excavation area makes it difficult to identify settlement shrinkage or shift. Although historically this has been well researched nationally, the changing patterns of expansion and decline, particularly on more marginal lands have not been so well studied archaeologically.



4.14 Post-medieval SP14

4.14.1 Background (Figure 57)

Evidence for post-medieval activity was known from both the development area and adjacent land.

No buildings were known to exist during this period within the development area. However, buildings were known adjacent to the development area in the vicinity of the present-day Bury. Their development history has been described in a desktop report (Albion 2006); it is briefly summarised here because it helps to explain the sub-surface evidence found within the investigation areas.

Historical documents indicate that in the vicinity of The Bury an existing manor house was replaced in 1628 by a brick mansion. The first representation of the manor house comes from Gordon's map of Bedfordshire (1736); it shows a four-storey building with three gables in the roof, two chimneys and a flagpole. The site of the mansion has been identified on historical maps and by geophysical survey. It is possible that the pond immediately to the west of The Bury was dug to extract clay for the manufacture of bricks. The rent roll of Edward Cater in 1652 mentions a manor house with gardens, orchards, a malthouse and dovehouse (HER 11679). The extent of the grounds associated with the house is shown on Bryant's map of 1826, labelled as "Great House". The grounds (HER 7030) correspond with the former pasture land to the east within the DWH development area. The survival of ridge and furrow earthworks in this area suggests that it had not been ploughed since the medieval period. Bryant's map shows a tree-lined driveway approaching the house through the parkland from the south-east and this also formerly survived as an earthwork within the DWH development area. The 1804 enclosure map and 1847 revised enclosure map show the house and, for the first time, a number of outbuildings to the west. By 1851 the main building and outbuildings had fallen into disrepair and they were pulled down soon after. The present house at The Bury was built shortly afterwards and is described below (see 4.15.2).

Historical documents and maps indicate the presence of a number of quarries on the Biddenham Loop and Land west of Kempston. Many were active in the 17th and 18th centuries (Wood 1984, 66-7). Quarry pits were identified within the Bovis investigations to the northwest of the Loop (Luke 2008, 2).

4.14.2 Overview (Figure 57)

Evidence of post-medieval activity was identified across the entire investigation area. Most of it comprises field boundaries, trackways and quarrying.

Extensive sub-surface remains were also found in the vicinity of The Bury and these correspond to a brick mansion outside the development area. Spatially discrete from this evidence the pipe trench adjacent to the River Great Ouse near to Cutler Hammer Sports Ground located a backfilled channel believed to be associated with Kempston Mill and a routeway.

4.14.3 Field systems and trackways (Figure 58 and Figure 59)

No firm dating evidence was recovered to enable a detailed understanding of the change from open fields to enclosure. However, sufficient sub-surface boundary



ditches, corresponding to historical maps, were identified to indicate that extensive field/enclosure systems existed by the beginning of the 19th century — SL77 within the Loop SL77 and SL183 on Land west of Kempston. In places, trackways were identified as sub-surface features, *e.g.* SL184 within the Bypass investigations to the south. SL184 actually comprised the junction of two trackways. A metalled surface was associated with both but was restricted to the eastern part of the excavation area. It is, therefore, likely that it was only this area that required metalling perhaps because it was at the junction and/or because it was wetter than elsewhere. The position and alignment of the trackways correspond with routeways shown on an interpretive historical map of 1800. It names one of the trackways as “Portway”.

4.14.4 The Bury (Figure 60)

The evidence in the vicinity of The Bury is clearly associated with the brick mansion located just outside the excavation area (see above). Trackways and driveways SL180 leading to the brick mansion were identified. Driveway L4506/L4522 may have originated in the medieval period as it followed the division between two open fields to the west of The Bury and as metalled trackway L819 (within SL72, SP13). In the post-medieval period the eastern part of this routeway was rebuilt as a cambered driveway L4506/L4522 that led directly to the The Bury through the parkland from the southeast. It is possible that trackway L4806 to the northwest of the brick mansion was created to provide more informal access when Cemetery Road was constructed.

In addition, the peripheral area contained smaller fields SL181, some of which contained orchards and large ponds/quarries. The latter were dug in the area of the medieval routeway, demonstrating that it had fallen out of use. Evidence for three brick structures and a well were located in two areas, L4531 and L4907, to the southeast of The Bury; they probably represent ancillary buildings associated with the mansion. Other features comprised two brick culverts and a soak-away and a loose cluster of small pits.

4.14.5 Quarrying

Two localised areas of quarrying were found to the northeast SL76 and west SL79 (within the Bypass investigations) of the Loop. Both areas contained numerous large quarry pits situated adjacent to the River Great Ouse in areas where natural limestone bedrock was close to the surface. Given this and their remote location, they may represent limestone quarries, although gravel would also have been extracted. Quarry pits were also identified within evaluation trenches for both projects in the vicinity of Ridge Road (Land west of Kempston). The enclosure award map of 1804 has this area labelled as “allocated for Surveyors of Highways” indicating that this, like so many gravel pits, were for the extraction of gravel to be used in road construction and repairs. The identification of this area of post-medieval quarrying within the development area resulted in this land being excluded from the recent archaeological investigations.

A large depression which survived as an earthwork within the DWH development area to the southeast of The Bury may be a former quarry pit which was not backfilled. This and the large ponds to the west within the Bypass



investigations may have been dug to extract clay for the bricks used in the mansion when it was constructed in 1628 (see above).

4.14.6 Mill channel and The Causeway

The pipe trench adjacent to the River Great Ouse near to the Cutler Hammer Sports Ground contained evidence for post-medieval activity SL100. This comprised a channel L5311 and evidence for a roughly parallel routeway on the edge of the river terrace.

The channel was probably the main course of the river at this time. However, its straight sides suggest that it was at least partly man-made and probably associated with Kempston Mill *c.* 250 to the southeast. Its position corresponds exactly with that of a channel marked on a map of 1804. Domesday Book mentions a mill in the manor of Kempston. Although this mill could conceivably be located elsewhere, *e.g.* Church End, Box End, it is clear that Kempston Mill existed in the medieval and post-medieval periods. It only ceased operations around 1950 (for discussion of Kempston mills see Wood 1984, 63-6). The river was diverted away from Kempston Mill in 1980 and the presence of modern textiles within the channel backfill would suggest this was when it was backfilled.

No deposits derived from the excavation of this channel were identified adjacent to it. However, it is possible that some of the arisings were used to create the bank that underlies The Causeway because this is believed to be only a few hundred years old. It is therefore likely that it served as both path and flood defences. A routeway pre-dating and to the southwest of The Causeway in this area is indicated by a metalled surface and wheel ruts; it may be at least early post-medieval in date. This served as the main route between Kempston and Church End until Cemetery Road was constructed in the early 19th century.

4.14.7 Discussion of results

The evidence from the investigation area would suggest that most enclosure had taken place by the beginning of the 19th century and before the parliamentary enclosure act for Kempston which was passed in 1802. However, there is documentary evidence to suggest that in some areas the process began centuries prior to this date and also that it did not necessarily affect all land in a given area. For example, the land within the DWH development area to the east of The Bury was originally open fields (as indicated by the survival of ridge and furrow) but by the 17th century at least was part of the parkland associated with the brick mansion. The importance of enclosed land lay in its exclusiveness. Ultimately enclosure meant that it was possible to restrict and eventually extinguish common rights (Wood 1984, 53). Detailed studies of open field systems and the changes brought about by enclosure in particular parishes are to be found in Hutching (1969), Hall (1991) and for Kempston in the parish survey (Wood 1984).

Edgeworth commented that 'of all fields of archaeology in Bedfordshire the post-medieval and industrial periods have the greatest potential for advancement' (2007b, 119). He also noted that 'with some exceptions, excavation reports tend to have only brief sections on post-medieval evidence' (ibid., 121). However, within the investigation area the only significant post-



medieval remains are those in the vicinity of The Bury. They are of interest in their own right in the context of the 17th-century mansion outside the development area but also because they are part of a sequence of occupation in broadly the same location from the early-middle Saxon period to the present day.



4.15 Modern SP15

4.15.1 Background

Land use within the development area over the last 150 years is well documented on historical maps. The majority of the area comprised fields but buildings were known within the Honey Hill area of Biddenham Loop and adjacent to Land west of Kempston in the vicinity of the present-day Bury.

The present-day house at The Bury was built shortly after the demolition of the brick mansion in the 1850s but away from the previous house (Albion 2006). The brick walls and gateway of the brick mansion were retained (and survive today). The layout of the buildings and grounds is shown on the 1st edition Ordnance Survey map of 1882. Although the tree-lined drive is still shown, it is possible that the main entranceway was from Cemetery Road where a lodge was constructed (HER 12579). The map shows that formal gardens and an orchard still existed to the east and north of The Bury. The layout of The Bury and its grounds did not change significantly during the 20th century. Another new track was constructed from Cemetery Road to provide access to the outbuildings and thus avoid the use of the main drive to the house.

4.15.2 Overview

Evidence in the vicinity of The Bury (SL188) comprised the remodelling of some of the post-medieval fields and the addition of two trackways L826/4621 and L821. Part of a brick-built drainage system was identified to the north of The Bury. A series of land-drains and drains L710, L823, L836 and L4807 were identified across the area. The evidence also included several dispersed pits and ground disturbance / levelling to the west of The Bury.

A farm SL78 was constructed around this time in the Honey Hill part of the Biddenham Loop within one of the post-medieval fields. The farmhouse walls featured limestone footings. It was built on the site of an early Bronze Age circular monument L2104 but did not appear to respect its ditch. It was partially rebuilt and extended on at least one occasion with bricks walls and concrete floors. It was associated with service trenches, drainage channels, rubbish pits and fences. The farmhouse is clearly shown on the 1881 OS map and is probably visible on the 1834 1st Edition OS map. It is also shown on a map of 1926 and is believed to have gone out of use shortly after World War Two. One lady who visited the excavations said she used to live in it as a child c. 65 years ago.

Other activity assigned to the modern period mainly comprised plough soils SL85, SL86 and SL87, and land-drains SL89. A section of the Southern Orbital Sewer was identified within the southern part of the investigation area.

4.15.3 Discussion of results

The most significant discoveries for this period are the Honey Hill farmhouse and peripheral activity to The Bury. However, these are only of local significance.



5. SUMMARY OF EACH DATA-SET

5.1 Introduction

In this section the different datasets are summarised.

The datasets recovered during the investigations can be divided into three main classes: contextual, artefactual and ecofactual.

- **Contextual** data relate to the identification of individual events such as the digging of a ditch, its primary infilling etc. These have been recorded as context records during excavation. All contexts have a detailed record sheet; many have a plan and section drawing, along with photographs.
- **Artefactual** data comprise human-made objects recovered during excavation. These have been divided for ease of discussion into pottery, ceramic building material, flint and other artefacts.
- **Ecofactual** data comprise natural materials found within excavated deposits. These are able to yield information on the nature of past human activity, crop regimes and the environment. They include animal bone, human bone, and information obtained from environmental samples (for example charred plant remains, charcoal, insects and molluscs).

The methodological approach taken with each dataset is briefly described in the relevant section, along with quantification, provenance (spatially and chronologically) and also condition.



5.2 Contextual

5.2.1 Types of context

The broad categories of contexts identified within the investigation are detailed in Table 11. This shows that the vast majority of features identified were negative ‘cut’ features and that most of these had more than one fill. Cremation deposits are slightly over-represented, in that they, where ever possible were dug in spits.

Just over 80% of the contexts were identified within the Biddenham Loop part of the investigation area. This reflects the relative size of the different excavation areas but also the density of archaeological contexts themselves. The Land west of Kempston area did, however, contain a higher proportion of structural remains. This reflects the focus of the investigation on the settlements located in the vicinity of The Bury and that this land was not subject to such intense arable cultivation as the Biddenham Loop.

5.2.2 Survival and condition of remains encountered

Evidence for activity from the early Neolithic period onwards have been identified, including traces of settlements, fields/agriculture, monuments and burials/ritual. Whilst the Romano-British period has produced the most artefacts, the most extensive remains within the area of investigation are associated with the middle Bronze Age field system.

The components of these landscapes which have survived best consist of relatively deeply cut negative features such as ditches, pits, and, to a lesser extent, graves (Table 12). In addition, structural features (postholes, drainage gullies etc), small pits and cremation burials were reasonably common. Less common were hearths/ovens/kilns and “positive” features which probably reflects the level of plough truncation. In contrast to the Bypass investigation, no areas of significant vertical stratigraphy survived.

5.2.3 Processes affecting the survival of archaeological remains within the area of investigation

The soils within the investigation area have been heavily exploited by arable agriculture. The widespread truncation of archaeological remains by modern ploughing has been documented on a regional and national level, as a result of the *Management of Archaeological Sites in Arable Landscapes Project* sponsored by the Ministry of Agriculture Fisheries and Food (DEFRA/OAU 2002).

This and other studies (English Heritage 2003) have established that gradual attrition caused by shallow ploughing, and dramatic destruction caused by deep ploughing, is responsible for the loss of more archaeological remains than the modern construction and aggregate industries. Both of the latter industries regularly employ archaeologists to investigate and record remains prior to destruction. Modern ploughing has been the most important process to have had a negative impact on the type and quality of remains within the corridor. Even remnants of ridge and furrow field systems, indicative of medieval ploughing, only partially survive within the Biddenham Loop part of the investigation area.



Post-medieval and modern disturbance has been limited to quarry pits and a modern farmhouse on the Biddenham Loop and a variety of activities in the vicinity of The Bury. These were relatively localized and, therefore, have not had a serious impact on earlier archaeological features.



5.3 Pottery

5.3.1 Methodology

Full quantification of the pottery has already been undertaken to allow it to be used to assist in determining the phasing hierarchy and associated scientific dating strategy. The reasons for this are described in section 3.4 and the methodology is described in section 9.3.1. Pottery was the principal determinant in assigning contexts to chronological periods. Its presence was also used to assist in the identification of domestic activity.

5.3.2 Quantification

A total of 7,832 sherds, weighing 129kg was collected, the largest assemblages deriving from features assigned to the Roman and Saxon periods (SP10 and SP11 respectively; Table 12).

5.3.3 Range and variety: pottery type series

One hundred and thirty fabrics were recorded and are listed below (Table 14) in chronological order, using common names and type codes in accordance with the Bedfordshire Ceramic Type Series, currently maintained by Albion Archaeology. One new Saxon fabric type was identified.

5.3.4 Provenance, phasing and date range

The pottery displays a wide date range spanning the late Neolithic to the post-medieval and modern periods. Approximately half the assemblage (by weight) is datable to the Roman period, and 29% is of Saxon origin (Table 15).

Although the degree of fragmentation is high, indicated by a low average sherd weight of 17g, a sizeable proportion of vessels from the Roman and Saxon periods are represented by more than one sherd. This suggests that much of the assemblage occurs in its primary context, close to areas where the pottery was used, and is further attested by the low incidence of residual or intrusive material. The assemblage is summarised in Table 16 by Site Period (SP) and spatially by Site Landscape (SL).

5.3.5 Early prehistoric

A total of 94 vessels were recovered, of types ranging from late Neolithic Peterborough Wares to late Bronze Age pottery. The assemblage weighs 4.1kg, giving an average sherd weight of approximately 6g, indicating that the assemblage was quite fragmented. None of the pots was complete and most were represented by only a few sherds. The pottery types found are shown in Table 17.

5.3.5.1 Fabric types

A number of fabric types were apparent in this assemblage. The tempering materials used were quartz, grog (crushed fired pottery) and fossil shell. The fossil shell was often represented by voids and impressions of the leached-out shell could be seen in some sherds under the x20 microscope. The majority of the sherds had been tempered by shell, and the presence of extensive voids had caused sherds from a number of contexts to become very fragile and fragmented. Quartz seen in the Peterborough Wares was often coarse or very coarse, white or



grey and very angular, showing through the surface of the sherds. The grog tempering, often combined with shell and quartz was mainly used for the early Bronze Age pottery.

5.3.5.2 *Wares, provenance and dating*

5.3.5.2.1 Generic

A total of 94 separate vessels was identified, of which 33 (35% by number, 25% by weight) were considered to be of prehistoric type but could not be more securely identified. Many sherds were fragile and fragmented and some had been found during sieving of environmental samples. Where no form or decoration was apparent on the sherds it was difficult to be certain of their type and date. These partial pots have, therefore, been designated as prehistoric only. Although further study of the fabric types will suggest a slightly closer date for some sherds, it is unlikely that exact types will be determined.

5.3.5.2.2 Peterborough wares

Sherds from 33 Peterborough Ware pots, sometimes called impressed wares, were found on the site; these comprised 20% of the vessels by number (see Table 5) and 32% of the pots by weight. None of the vessels was complete and only a few sherds had been deposited from each pot, often from the rim. A few sherds were unabraded but some were slightly to moderately abraded. A range of types of Peterborough Wares were recognised: Ebbsfleet, Mortlake and the rarer Fengate type. Two Fengate pots derived from an isolated pit L2412 in SL4 (SP4), and one is very unusual. This has incised decoration and unusual fingertip impressions below the neck, and the dating, associated deposits and context require special consideration.

The context of the deposition of all the pots requires some further study. Sherds from eight of the pots were placed in pits, but it is unclear why only part of each pot was deposited. For example, parts of four different vessels were found in a SL109 pit (SP4). As these vessels are not particularly abraded, they could be part of special deposits if placed with other material and artefacts (Thomas 1999, 64). Other pots were found in ditches, pits and a tree-throw hole as mentioned above, but the associated finds and the nature of the deposits requires more investigation.

Peterborough Ware pottery has been found on a number of sites in the region and within the Bovis investigations. Analysis will determine how these pots fit into the local, regional and national typologies. The extreme age and fragility of Peterborough Ware means that such vessels are rarely found so these are of particular interest. All these types of impressed wares are known to have been in use about 3000 BC (Gibson 2002, 80) and this is supported by the two radiocarbon dates of deposits containing this pottery from the investigations (RCD 26 and 27)

5.3.5.2.3 Beakers

There were parts of 18 Beaker pots (19% of the total by number, 12% by weight). Many pots are represented by only a few sherds or a single sherd and many of the sherds are moderately abraded. A variety of decoration is seen, comb, incised and fingernail impressions in differing patterns including chevron



and herringbone. It will be possible to use this to provide more precise dating for the sherds but without form this could be difficult in some cases.

Beaker pottery has been found within the Bovis investigations and elsewhere in the locality. However, it is clear that this type of vessel was in common use from 2500 to 1900 BC (Needham 2005) and this is supported by the one radiocarbon dates of deposits containing this pottery from the investigations (RCD 14). It is believed that some later types were still being used up to 1750 BC (Needham 2005) but this is unlikely to be the case with the Beaker pottery from a deposit dated 1410-1210 Cal BC (RCD 59).

The sherds of these vessels were found mainly in small pits and ditches. Beaker pottery is often found with burials, but is also known in domestic contexts. The context and condition of these sherds requires further investigation in order to determine the nature of their deposition or redeposition.

5.3.5.2.4 Collared Urns

Sherds from 14 Collared Urns were found on the site (16% of the total number of pots, 19% by weight). None of the vessels was complete but several different rims and decorative techniques were seen, including incised decoration and twisted cord. Collared Urns were first seen about 2200 BC (Gibson 2002, 96), and were probably in common use until about 1700 BC or even a little later (Allen 2008a, 115). This timespan is supported by the four radiocarbon dates of deposits containing this pottery from the investigations (RCD 6, 7, 19 and 20). Further study of the sherds will allow closer dating from typological schemes.

Parts of these pots were found in pits, ditches and graves. The latter includes cremation burials L2363 (SL7, SL5) in possible graves within the interior of circular monument L2300 and within the ditch of circular monument L2314 (both SL5, SP5). However, this type of pottery is also known from domestic contexts (Allen 2007, 62-5).

5.3.5.2.5 Deverel Rimbury Urns

Sherds from five bucket urn vessels were found. These had a range of simple decoration including small raised or applied cordons and fingernail and fingertip impressions on the cordon or body. One partial pot was found in a grave, associated with one of the inhumations L2102 (SL11, SP6) and the remaining four in pits within possible settlement area SL92 (SP6). This type of pot is often found in funerary contexts, but is also known from domestic sites.

These vessels are assumed to be of middle Bronze Age type, but are not closely dated in this region. One within the investigations was associated with an inhumation L2102 which was dated to 1500-1310Cal BC (RCD33). Recent studies suggest that few dates have been obtained for urns outside southern Britain and that some styles may have been common from the early Bronze Age onwards (Allen 2008b, 34), possibly from 2000 to 1000 BC.

5.3.5.2.6 Generic Bronze Age

Sherds of two other vessels were recovered from a central pit in monument L2300 (SL5, SP5) which also contained sherds of Collared Urn. These exhibited fingernail and fingertip impressions and are probably from urns of



early Bronze Age type, but there is not sufficient surviving to be certain of the form and date. They were found with a sherd which may have been part of a Collared Urn. Further sherds from a tree-throw in L2400 and pit in L2159 within field system SL11 (SP6) may also be Bronze Age in date. Two sherds with a fine wall and small fingertip impressions (segmented boundary SL96, SP4) may be of late Bronze Age date.

5.3.6 Late Bronze Age/early Iron Age

Pottery datable to the late Bronze Age/early Iron Age totals 122 hand-made sherds (877g), tempered with a range of flint, quartz and grog (types F01A/B/C and F02). Vessels in the coarser fabric types have thick walls and are more crudely made than those in finer fabrics, which are well made with carefully burnished and/or tooled surfaces. Sherds are generally small, abraded and undiagnostic. Vessel forms are single examples of a carinated jar with incised decoration, and an ellipsoid bowl.

The fragmentary nature of the assemblage has made it difficult to date, and it is possible that some of these sherds may derive from an earlier period. This appears to be supported by radiocarbon dates (RCD 44, 46 and 54), which suggest some of the features from which this pottery derives are of middle Bronze Age origin.

5.3.7 Early/middle Iron Age

Early-middle Iron Age pottery totals 850 sherds weighing 17.2kg. The assemblage comprises hand-made pottery tempered with a range of sand (types F03, F28, F29, F35), organic (F19, F22), grog (F17) and calcareous/shelly inclusions (types F14, F15, F18, F21, F27, F30, F37, F16A/B and F16), the latter predominating. Diagnostic forms are relatively scarce and comprise thin-walled, round-shouldered vessels with rounded, flat, or bevelled rims, and simple flat bases. Three ovoid jars also occur. Thicker-walled sherds in shell-tempered fabrics, some ranging up to 20mm, attest the presence of larger vessels, some possibly used for storage. Decoration is rare, and comprises finger nail and finger tip impressions around vessel shoulders and rims, and random combing. Scoring on a number of sherds suggests they may belong to the East Midlands Scored Ware tradition, and demonstrates a middle Iron Age component to the assemblage. The majority of the assemblage derives from farmsteads SL30, SL34 and SL35 (SP8). The assemblage will enable the chronological or functional differences between different settlements in the area, including those within the Bovis and Bypass investigations, to be examined.

The pottery has potential to help promote the development of a more standardised Iron Age type series, and assist in the clarification and/or refinement of the dating for Iron Age types. Bryant (2000, 14) has drawn attention to the lack of published examples of Iron Age pottery assemblages within the region which have been subject to full quantification and analysis, noting that the absence of quantified assemblages severely limits the degree to which intra- and inter-site comparisons can be made. Lack of suitable material has also hindered the dating of earlier Iron Age assemblages (*ibid*, 2000, 15).



5.3.8 Late Iron Age/early Romano-British

The late Iron Age/early Romano-British assemblage comprises 113 predominantly grog-tempered sherds (1.1kg) deriving from vessels in the 'Belgic' tradition (types F05, F06B/C, F09) and contemporary hand-made coarse wares (type F07). Diagnostic elements are everted and bead rim jars, and a single footring base. Decoration comprises cordons, incised motifs, random and vertical combing. All are generally abraded. Most derive from ritual complex SL50 and agricultural activity SL146 (both SP9), and the remainder occur as residual finds in later features.

The assemblage is useful as it indicates continuity between the early Iron Age and Romano-British settlements. Although small and mainly from non-settlement activity, its significance is enhanced by the proximity of contemporary settlements within the Bovis and Bypass investigations.

5.3.9 Romano-British

This assemblage (3,362 sherds, weighing 61.4kg) comprises a comparable range of wares to those recovered from the contemporary nearby settlements within the Bovis investigations (Luke 2008), Kempston Church End (Dawson 2004) and Marsh Leys Farm (Luke and Preece forthcoming b), and generally reflects the composition of Romano-British rural sites in the Great Ouse Valley. The basic, utilitarian types present, coupled with the relatively low quantities of both regional and continental imports, could be indicative of a low 'status', domestic assemblage (see below). The majority of the assemblage comprises coarse wares, represented by a standard range of locally manufactured, reduced, sand-tempered wares and shell-tempered vessels.

Vessel forms include lid-seated and roll-rim jars and bowls; flanged, plain-rim, reed-rim and rectangular-rim bowls; jars with triangular, reed, undercut, bead, and everted rims; necked jars; storage jars; ring-necked and plain-necked flagons; beakers (folded, poppy-head, plain-rim, scale, pentice-moulded) dog dishes; cordoned jars; reed-rim, bead, triangular-rim and cordoned bowls; lids; platters; Castor boxes; and specialist forms such as *mortaria* and *amphora*. A standard range of decorative elements, including vertical and wavy incised motifs, horizontal, vertical and random combed patterns, rilling, slipping, rouletting, barbotine, overall burnishing and burnished lattice motifs occur.

Regional and continental imports each constitute less than 4% of the Roman assemblage. Regional imports include early Roman products of the Verulamium-region industries, mica-gilded wares and pink-grogged vessels likely to derive from either Caldecotte (Bucks) or Towcester (Northants). Later regional imports include vessels from Oxfordshire, Hadham (Herts.), Essex and the Nene Valley. With the exception of samian ware, *amphorae*, and a single sherd of possible Rhenish ware, no other continental imports were present.

The samian assemblage comprises 164 sherds (3.5kg), predominantly of central Gaulish origin, datable to the second century. Smaller quantities from south and east Gaul also occur. Diagnostic vessel forms are mainly bowls, cups and dishes (Table 18). Several sherds are stamped with makers' marks, and a number of lead rivets/plugs and drilled repair holes are evidence of vessel curation.



Significant Roman pottery assemblages were associated with farmsteads SL51 and SL52, which respectively yielded 27.8kg and 14.5kg. Within these deposits, many vessels are represented by more than one sherd and represent accumulations of domestic settlement debris. Pottery recovered from a SL53 *Bustum* burial L2399 comprises a complete shell-tempered coarse ware jar used as the urn; two accessory vessels are represented by a colour-coated pentice-moulded beaker and a coarse ware dog dish.

Approximately 28% of the Roman pottery occurs as residual material in post-Roman features (principally Saxon settlement features in SL62 and SL199).

Pottery, in particular, has been recently used by Evans to characterise different Romano-British site types (2001). However, such evidence is never particularly clear-cut and cannot necessarily be directly equated with the 'status' of the occupants (Taylor 2001, 50; Hingley 1989, 159-61). Analysis will contribute to this debate. It will also enable the chronological or functional differences between different settlements in the area, including SL54 and SL155 within the Bypass investigations, to be examined.

5.3.10 Early Saxon

Pottery datable to the early Saxon period comprises 1,853 sherds weighing 36.8kg. The vessels are predominantly sand-tempered (fabric types A16, A18, A19, A23, A26, A27 and A32), hard-fired, undecorated and in most cases, entirely reduced. Fabrics containing calcareous and organic inclusions (types A05, A15, A24 and A01 respectively) and Mountsorrel granite (A25) are also present in smaller quantities. Examples of a new fabric (provisionally type A) containing fine sand, red iron ore and sandstone have also been identified. Characteristic middle Saxon types such as Maxey or Ipswich wares are absent from the site.

Diagnostic forms comprise jars and bowls with either everted, upright or inturned rims. Bases are rare and occur in rounded, flat-angled and flat-rounded forms. Three footring bases and a partial pedestal base were recorded. Six carinated vessels and a complete miniature pot were also present. Vessel wall thickness varies between 3mm and 15mm. Decorative elements comprise pinching / rustication, finger tip impressions, combing, incised vertical and horizontal linear motifs and applied bosses and lugs. Stamped vessels are rare and include plain circles, 'petals', ring-and-dot and cruciform motifs.

The surfaces of most sherds are untreated apart from simple hand-wiping, although a high proportion are burnished. Several sherds have deliberately oxidised exterior surfaces. A number are internally or externally sooted, and bear traces of thick internal black residues, the latter possibly resulting from the accidental burning of vessel contents during cooking.

The majority of the Saxon assemblage is associated with settlements SL62, SL63, SL165 and SL199. The absence of characteristic middle Saxon types such as Maxey and Ipswich wares and the presence of stamps often dated to c.450-650 may suggest the assemblage is early rather than middle Saxon. However, the land occupied by settlement SL165 continued to be utilised in the Saxo-Norman period as a settlement SL169. The precise dating of the pottery



will be examined determined as part of the analysis. A semi-complete vessel was recovered from a small pit L5001 (SL166) associated with activity on the peripheral settlement SL165. It may represent a grave good associated with a burial later removed by ploughing.

Thirty-four sherds occur as intrusive finds in pre-Saxon features and 116 are residual in post-medieval quarry pits SL76 (SP14).

The Saxon assemblage, which comprises a range of plain, decorated and stamped wares, is one of the largest recovered from the county to date. The identification of a new fabric type will usefully augment the Saxon Pottery Type Series. The presence of Saxon pottery is of interest as it demonstrates continuity from the Roman period, which is often absent from multi-period sites in the county, most noticeably within the adjacent Bovis investigations (Wells 2008, 271-7). The assemblage has potential to determine the status and perhaps the cultural associations of the occupants. Study of functional evidence may indicate the nature of settlement and activity undertaken across the site.

5.3.11 Saxo-Norman

The Saxo-Norman assemblage comprises 288 shell-tempered sherds weighing 3.1kg. Vessels are wheel-thrown, in the St Neots-type ware tradition (type B01) and its variants. Forms are everted-rim jars of varying size and diameter, and large bowls with inturned or simple upright rims. The exterior surfaces of a number of jars are sooted, indicating their use as cooking pots. All are generally abraded. The majority derived from settlement SL169 (SP12), with the remainder occurring as residual finds in medieval features assigned to SP13. The assemblage may assist in determining the nature and duration of the Saxo-Norman settlement. Although on its own, it is probably too small to provide very much information on the economic basis and status of the settlement when combined with SL168 within the Bypass investigations this should be possible.

5.3.12 Medieval

Seventy-four sherds weighing 909g are datable to the medieval period. Thirty-five percent are shell tempered vessels of 12th–13th-century date (fabric B07), likely to derive from production centres on the Beds./Bucks./Northants. borders. Vessel forms are wheel thrown jars with simple everted rims, and jugs, one of the latter with rouletted decoration. The medieval phases are also characterised by locally manufactured fine and coarse sand tempered fabric types (C03, C05, C59A/B, C69, and C75), occurring in a similar range of forms to the shell tempered vessels. Sooting marks on both shell and sand tempered sherds confirm that a proportion of these types represent kitchen wares. High medieval finewares comprise a glazed sherd of Brill-Boarstall ware (C09), a regional import from Buckinghamshire.

Late medieval pottery comprises 27 reduced and oxidised sand tempered sherds (343g) datable to the 14th to early 16th centuries. Reduced wares are consistent with the broad south to east Midlands reduced ware tradition. Forms are bowls and a single jug with a thumb base. Most are associated with field system SL173 and activity focus SL175 (SP13).



The assemblage may assist in determining the nature of the medieval settlement. Although on its own it is too small to provide very much information on the economic basis and status of the settlement, the analysis will be enhanced by the assemblage from SL172 within the Bypass investigations. A comparison with other medieval assemblages in the vicinity will help to establish the spatial and temporal context for these sites.

5.3.13 Post-medieval

Post-medieval pottery comprises 26 sherds weighing 386g. They include lead- and iron-glazed, and slip-decorated earthenwares, Blackware, Nottingham stoneware, and mottle / speckle-glazed ware. Forms are large bowls, and a Blackware cup fragment. The majority were associated with field system SL77 (SP14) and settlement activity in the vicinity of the Bury SL188 (SP15). The assemblage has little potential for further analysis.

5.3.14 Modern

Seventeen sherds (95g) dating from the 18th century onwards were recovered. Fabrics represented are earthenware, salt-glazed stoneware, Mocha ware, transfer-printed ware and miscellaneous mass-produced wares, including two sherds of plant pot. Most derived from plough soil SL85, SL186, and Honey Hill farmhouse SL78 and the Bury SL188 (all SP15). The assemblage has no potential for further analysis.



5.4 Ceramic Building Material

5.4.1 Methodology

Full quantification has already been undertaken to enable CBM to be used to assist in establishing a final phasing hierarchy. The reasons for this are described in section 3.4 and the methodology is described in section 9.3.1. This has specifically resulted in the identification of diagnostic brick and tile of Roman, medieval or post-medieval date. In addition, the presence of fired clay has been used to assist in the identification of domestic activity.

5.4.2 Quantification

One hundred and nineteen brick and tile fragments, weighing 8.5kg, were recovered, the largest assemblages deriving from features assigned to the Roman and post-medieval periods (SP10 and SP14 respectively; Table 19). Fired clay fragments weighing 9.7kg were collected, mainly associated with Saxon features (SP11).

5.4.3 Provenance

5.4.3.1 Brick and tile

Roman: (32 fragments, weighing 3.1kg)

Thirty-seven percent of the assemblage (by weight) is datable to the Roman period. The majority of the diagnostic material (24 pieces) comprises shell-tempered flanged roof tiles (*tegulae*), with curved roof tiles (*imbrices*), combed flue tiles and brick fragments being less well represented. Shelly tile fabric is similar to pottery ware type R13, and at least some examples may derive from the same source. Eight pieces of sand-tempered building material occur. The fragments are fairly small, with an average weight of 97g, and are generally abraded. *Tegulae* range in thickness between 15-25mm. Two examples have circular or linear finger impressed decoration, and one is combed.

The majority of the Roman brick and tile derived from features associated with farmsteads SL51/52 with tiny quantities recovered from trackway/boundary ditches SL53. Smaller quantities occur as residual finds in Saxon settlement SL62 and possible settlement SL199 (Table 20).

The assemblage has been useful in assisting with dating features as part of the phasing hierarchy process. However, other than comparing it with the larger assemblages found during the Bypass investigations is too small to have further potential for analysis.

Post-Roman: (87 fragments, weighing 5.3kg)

Sixty-three percent of the assemblage (by weight) comprises sand-tempered flat roof tiles and brick fragments (8.4kg) dating from the late medieval period onwards. Fragments are smaller than their Roman counterparts, with an average fragment weight of only 62g, and display variable abrasion. No complete examples were recovered: the only measurements taken were the thicknesses of flat tiles, which range between 12-16mm. Single examples of a curved or ridge tile and a glazed roof tile, the latter possibly from Lyveden, Northants., were also present.



Post-Roman peg tiles and brick fragments derive mainly from medieval and later deposits (SP13-SP15). The assemblage has been useful in assisting with dating features as part of the phasing hierarchy process, but otherwise has little potential for further analysis.

5.4.3.2 *Fired and unfired clay*

The majority of the fired clay assemblage (259 pieces) comprises amorphous and abraded fragments in a fine or coarse oxidised, sand-tempered fabric, while pieces in either a shelly (six examples) or organic fabric (five examples) constitute the remainder. Forty-two daub fragments with smoothed surfaces and wattle impressions (ranging between 25-40mm in diameter) were identified, and part of an organic circular slab or plate, likely to derive from an oven or similar structure.

Over 2.1kg of fragmentary clay was recovered from the fills of SFBs G23241 and G23243, assigned to possible settlement SL63 on the west side of the Loop. The clay was in lumps, clearly not *in situ* and comprised friable silty amorphous pieces. Only a few retained diagnostic elements — in most cases a smooth surface on one side suggestive of the lining of walls or other structures.

One unfired loom weight was found in G23246 (see section 5.6.3.7). Similar deposits, described as ‘raw clay’, were encountered within SFBs at Mucking, although some of these were recognisable as weathered loomweights (Hamerow 1993, 15-6) (see section 5.6.3.7 for fuller discussion). Tipper noted that the number of unfired clay fragments which occasionally retain their original loom weight form is a small proportion of the total amount of unfired clay which is often noted in excavation records but rarely quantified (2004, 167).

With the exception of the unfired clay from the two SFBs, the overall assemblage has little potential for significant analysis.



5.5 *Flint and stone*

5.5.1 *Methodology*

Full quantification has already been undertaken to enable worked flint to be used to assist in establishing the final phasing hierarchy. The reasons for this are described in section 3.4 and the methodology is described in section 9.5.1.

5.5.2 *Quantification*

A total of 638 items were catalogued and these are presented in Table 21, subdivided into debitage or tools.

Although a large percentage of the debitage and some of the long-lived tools (*e.g.* scrapers) cannot be dated to any one period, there are sufficient diagnostic traits to demonstrate that Mesolithic to the late Neolithic/ early Bronze Age activity occurred on the site. The Mesolithic is represented by at least one blade, a microlith and two truncated blades, while a piercer, two awls and two serrated blades have been assigned to the transitional Mesolithic to early Neolithic period. The early Neolithic is represented by four leaf-shaped arrowheads, two fabricators, a laurel leaf knife and one end/side scraper. The five axes and one axe trimming flake are assigned a Neolithic date, while three oblique, two chisel and one petit tranchet arrowheads are of late Neolithic date. The late Neolithic to early Bronze Age period is represented by two barbed and tanged arrowheads, a scale-flaked knife and two thumbnail scrapers.

5.5.3 *Provenance*

Of the total recovered assemblage 625 pieces (98%) were from phased deposits. These are presented by Site Period (SP) and object type in Table 22. The following discussion will concentrate on SP3 (early Neolithic) to SP7 (late Bronze Age to early Iron Age). It is assumed that the assemblages from early to middle Iron Age (SP 8) and later deposits are residual.

5.5.3.1 *Early Neolithic SP3 (Table 23)*

Monument cluster SL1 yielded 29 lithic items, the majority comprised debitage but two axes, a retouched flake and a utilised flake were also identified.

Inhumation SG24590, one of two burials in central monument L2312, contained a single small hard hammer struck flake which had been placed in a gap between the arms and body. A spall (struck debitage of less than 20mm length) was found within the fill of the burial. The majority of the remaining assemblage from L2312 derived from the tertiary fill of the monument ditch and in the main comprised debitage including four flakes, a spall, a multi-platform flake core and a single blade. The exception to this was the incomplete remains, comprising blade edge and part of the body, of a polished stone axe of Epidote tuff with an origin in Great Langdale, Cumbria (Group VI). Local parallels for the occurrence of Group VI stone axes come from the investigations at Broom Quarry, Beds., in particular two fragments from Kings Hill phase 3, C ditch Monument II (Beardsmore, Conneller, Edmonds and Pollard 2007, App. 1: 220; Edmonds 2007 App. 9 (CD), 295-6).



The fills of L2313, the redefinition of the central monument L2312, again produced debitage, including a blade and flakes, and a possible utilised flake. The secondary fill also yielded an unusual small, quite thin ovate axe like tool with both faces and all edges cortical. The surviving cortical edges are smooth, almost ground in feel, and in two places the edge has been chipped, perhaps accidentally, and is patinated. At one end of the tool a flake seems to have been deliberately struck (unpatinated) and at the other, narrower and thinner, end there is slight ret/flaking.

Although no flint was found in the fills of burial monument L2356, its subsequent redefinitions L2357, L2358 and L2359 did yield a small assemblage of three blade-like flakes, two flakes (one squat, one hard-hammer struck) and a retouched fragment that may possibly be from an old flaked tool.

The fills of southern monument L3210, and its first redefinition L3211, produced a small assemblage of debitage which included two blade-like flakes and a bipolar core with blade-like removal scars.

5.5.3.2 Late Neolithic SP4 (Table 24)

SL4 comprised dispersed and clustered small pits on the Biddenham Loop. The fills of pits in L2335, L2704 and rectangular post-built structure L2705 produced flint. One of the pits in L2704 in addition to three items of debitage, had a trimming flake from a polished flint axe. The assemblage from the other pit in L2335 included two blades, one possibly utilised, a blade-like flake, a finely serrated flake, and a fragment from a polished flint axe. The fills of L2705 contained three pieces of debitage and a small bifacially flaked ovate, possibly an unfinished knife or sub-circular scraper.

SL96 comprised a NW-SE aligned segmented boundary L2108. A small assemblage of debitage, was found in its tertiary fills.

On Land west of Kempston the two isolated pits assigned to SL109 produced a small quantity of flint, L4904 yielding two somewhat blade-like flakes, whereas L4808 contained a late Neolithic petit tranchet arrowhead.

5.5.3.3 Early Bronze Age SP5 (Table 25)

SP5 produced one of the larger assemblages under consideration. Debitage forms the majority and there remains an element of earlier flint technology with 10 blades and 15 blade-like flakes identified. The flake assemblage (44) does appear to be squatter and thicker. Amongst the more diagnostic tools there are classically transitional late Neolithic/early Bronze Age, or early Bronze Age types, including a barbed and tanged arrowhead and a thumbnail scraper. However, there is an element of residuality with an unfinished late Neolithic oblique arrowhead from monument L2300 (SL5), a possible early Neolithic fabricator from a pit in L2400 (SL8) and an early Neolithic leaf-shaped arrowhead from a pit in L2401 (SL90).

The largest assemblage, and one that contains a mixture of dated flints, derives from the fills of a single pit G23007 (L2413 in SL90). This single pit yielded 93 flints (65% of the assemblage from SP5). Debitage accounted for over 65% of the pit assemblage and included 10 core or core fragments (including single and



multiple platforms and 4 which have either blade or blade-like removals), 6 blades and 42 flakes (including 10 blade-like flakes). Amongst the 35 tools present, a range of types were identified (see Table 25) and while the tool assemblage did contain early Bronze Age types, such as a barbed and tanged arrowhead and a thumbnail scraper, Mesolithic and early Neolithic tools were also present including two awls, a piercer, a microlith and two truncated and retouched blades.

5.5.3.4 Middle Bronze Age SP6 (Table 26)

During the later prehistoric period there was an increasing trend towards the production of shorter and squatter flakes, almost entirely produced with a hard hammer. The decline in flintworking technology led to an increase in the frequency of miss-hits, hinge fractures and broken flakes/shatter (Butler 2005, 179). Flakes frequently possess broad platform remnants, obtuse flaking angles and prominent and multiple bulbs (Ballin 2002). Studies of late Bronze Age settlements with large assemblages of flint indicate that *c.* 95% of an assemblage of this date will comprise debitage, and only a limited range of tool types will be present, including scrapers, notched flakes, retouched flakes and sometimes piercers (Butler 2005 188-189 quoting Drewett 1982 and Fasham *et al.* 1978).

The flint assemblage from deposits of the middle Bronze Age is presented in Table 27 by SL. The overall SP6 assemblage produced the largest quantity of flint from the investigations, accounting for 53% of the total phased assemblage. It is evident, however, that a sizeable proportion of the assemblage is residual, as attested to by the presence of blade cores, blades and bladelets, and blade-like flakes amongst the debitage (forming 27.5% of the debitage assemblage), and Neolithic axes, early and late Neolithic arrowheads, and late Neolithic to early Bronze Age scale-flaked knives.

It can be seen in Table 27 that fairly small quantities of flint occur across a number of land use areas (L nos) in SL11, 12, 91, 92 and 123. A concentration of 27 flints from the fill of a pit G45121 in L4539 (SL123), while containing some residual flint, does have 17 hard-hammer struck flakes of good quality dark grey flint, all similar and probably deriving from the same core. These could be contemporary with SP6 activity. A slight concentration (16 flints) also occurs in the tertiary fills of L2138 (SL92), pits and tree-clearance activity. This assemblage however contains six pieces which are diagnostic of a Neolithic date. It is likely that most of the small assemblages from SL11, 12, 91 and 92 reflect activity from previous periods which became incorporated into the accumulated fills of features relating to middle Bronze Age activity. However, a much higher concentration of material is apparent in possible settlement area SL93 (specifically L2353) and to a lesser extent from field system SL13.

Six pits within L2353 (possible settlement SL93) produced flint, five pits yielding seven pieces or less and residual flints were apparent in at least one of the assemblages. One (S24534) of the two adjacent pits within G23274 contained a scale-flaked knife, two scrapers on broad/squat flakes, a flake and a utilised flake and could be contemporary with activity in SP6. Also within G23274 is pit S24503 and it is this pit which contained 121 flints, all from the same context. Of the 121 pieces of worked flint from pit S24503, 54 pieces (44.6% of the pit assemblage) have diagnostic traits which indicate a date within



the Neolithic period, the majority suggestive of an earlier Neolithic origin. This assemblage includes flakes from polished flint axes (2), blades (16), core fragments with very neatly struck flake and some blade-like flake scars (3), serrated, retouched or utilised blades (9), blade-like flakes (9) and utilised pieces on blade-like flakes (10), a piercer on a blade, and end scrapers formed on blades or blade-like flakes (4). There are also some flints which may originate from contemporary activity, for example some small and irregular-shaped flakes (*c.* 20), a small serrated piece on an irregular-shaped hard-hammer struck flake and four irregular-shaped utilised flakes. The question therefore arises as to how and why this assemblage was deposited within one pit. Butler argued for the ‘the reuse of flakes that had been produced and discarded in an earlier period of prehistory’ (2001, 179) and noted that ‘during the late Bronze Age flint was frequently scavenged from earlier barrow mounds or spoil heaps’. With regard to the latter he noted a similar occurrence in the middle Bronze Age at the late Neolithic flint mines at Grimes Graves (*ibid.*). It is, therefore, possible that pit S24503 represents a carefully scavenged and curated collection.

Two areas in field system SL13 contained twenty or more flints. The fills of a trackway ditch L2341, produced 21 flints. The assemblage was of mixed date containing blades and an early Neolithic arrowhead, in addition to squat hard hammer struck flakes. This assemblage is likely to be the result of accumulation over time. One large pit G23181 in field L2349 contained an assemblage of 52 flints. This pit may be a small example of the scavenging and curating process suggested for pit S24503 above, in that it contained residual flint, in the form of blades, a piercer on a blade and a serrated blade, in addition to flakes that were jagged, squat and hard-hammer struck.

5.5.3.5 Late Bronze Age/early Iron Age SP7 (Table 28)

A small assemblage of twenty-five pieces of worked flint was found within deposits assigned to SP7 (Table 28). In most cases these occurred in small numbers (five or less) and residuality was evident, for example the late Neolithic chisel arrowhead from pits SL22 and a retouched flake from pits SL125 which also displays Neolithic traits. Pit alignment L2801 (one of three assigned to SL18) contained 16 flints. However, these derived from the fills of 12 separate pits and the incidence of flints occurring in each pit did not number more than 3. Residuality was also apparent here, including a fabricator of early Neolithic date from one pit, a barbed and tanged arrowhead from another pit. One core from a third pit may have originally been a hammerstone that was subsequently utilised as a core.



5.6 Other artefacts (excluding flint)

5.6.1 Methodology

Full quantification has already been undertaken to enable artefact dating to be used to assist in establishing the final phasing hierarchy. The reasons for this are described in section 3.4 and the methodology is described in section 9.7.2.

Objects with diagnostic dates were considered during the process of assigning contexts to chronological period. The presence of other artefacts was also used to assist in the identification of domestic activity.

5.6.2 Quantification, range and typological date

The assemblage of nearly 500 other artefacts from deposits assigned to Site Period is presented by material type in Table 29. The range of object types is presented in Table 30.

The objects span all chronological periods and the majority are associated with craft and agriculture-related activities, giving the impression of rural, subsistence-based occupation from the later prehistoric period. The quantities of nails and tacks could suggest structures and internal fittings, but as will be discussed below over 60% the assemblage derives from grave deposits.

The typological date range of the assemblage spans from the late Bronze Age to the 19th century. There is little in the assemblage that could be dated earlier on the basis of typology, although one fragment from a saddle quern was present, the use of which could date from the Neolithic to the Iron Age. Purely from the 'other artefacts' viewpoint this would appear to suggest a lack of settled agricultural-based activity prior to the late Bronze Age (however see flint artefacts recovered during field artefact collection in section 4.2). At least two cylindrical loom weights, the form in use in the late Bronze Age, were found. Although a number of items can be dated to the Iron Age, the date range of these items could not be refined further. Triangular loom weights, of which at least three were found, remained in use throughout the Iron Age. Remains of a bun-shaped quern of Hertfordshire puddingstone could also date to the Iron Age, although it must be noted that as a type they appear to have continued in use in the 1st and 2nd centuries AD. This is also true of the single ceramic sling shot.

During the late 'Belgic' Iron Age, brooch deposition increased massively throughout southern England, the increase so marked that the term 'fibula event horizon' has been coined (Haselgrove 1997, 51-53; Hill 1995; Hill 1997). This however was not apparent in the excavations being considered here; only the remains of three brooches, consisting of fragments of coils or pin, were found and these could equally well date to the first half of the Roman period. In fact there are no artefacts that can be dated exclusively to the late Iron Age and the apparent absence of activity at this time has been discussed above (see 4.9.2). The Romano-British period is comparatively better represented both in the quantity and range of artefacts recovered, but the assemblage is not numerous. Items that can be dated to the Roman period, but not further refined to specific centuries, include a socketed cleaver, a small turf cutter, two bracelets (including one from Cool's Group VII), a linch pin (Manning type 2b), tweezers suspended from a toilet set holder, hobnails (6) and a lathe-turned shale spindle whorl.



Amongst the more closely dated Roman items are a 2nd-century bath flask and twelve coins. The earliest dated coin is an As of Trajan (AD98-117). One coin dates to the late 3rd century, eight to the 4th century and two to the 3rd–4th centuries.

Typologically dated finds of earlier Anglo-Saxon date are also fairly well-represented and include annular loom weights (3), a loop headed pin (6th century); cigar shaped pin beaters (2), double-sided composite combs (up to 5); and a single sided composite triangular back comb. A copper alloy bar mount with lobed terminals is thought to date to the 7th century, while a single intermediate loom weight dates to the 7th–8th centuries. There are also four pig fibula pins, one apparently in the process of manufacture. As a type these pins become popular in the Anglo-Saxon period but also continue in use into the Saxo-Norman period. The latter period is also represented within the assemblage in the form of a phyllite whetstone, a single-sided comb (Ashby type 7) dating to 900-1100 (Ashby 2007), and a decorated bone dress pin, the form and motif paralleled by a pin from Coppergate from deposits dating to c.930-975 (MacGregor, Mainman and Rogers 1999, fig. 911 cat no. 6904).

The early to high medieval period is not represented within the ‘other artefacts’ assemblage. A single wire wound-headed pin could date to the late medieval period, but the type does continue in use into the 17th century. The post-medieval into the earlier modern period is represented by fragments of wine bottles, a William III half penny (1694-1701), pistol balls (6), a wavy rimmed oxshoe, a composite button and a curry comb, the latter paralleled by a 17th–18th-century example from Ardingly Fulling mill and forge (Goodall, 1976, 63 and fig. 9b).

5.6.3 Provenance

5.6.3.1 Early Bronze Age SP5 (Table 31)

Few ‘other artefacts’ were recovered from early Bronze Age deposits. While the remains of a saddle quern of Lower Greensand (possibly sourced from West Sussex or Kent), fragmentary remains of a possible loom weight (form not discernable) and a possible antler pick, may well derive from activity of this period, there is also evidence for intrusive activity. Hammerscale was found in the environmental samples from the fills of two shafts (SL2), three monuments (SL5) and a pit (SL90); a small (5mm by 5mm) fragment of iron was also found in a fill of one of the same monuments that produced hammerscale. The quantities of hammerscale were extremely small and it is likely that these represent evidence for ferrous smithing activity during later phases, which subsequently moved down through the soil. A similar situation has been noted on other excavations (Rackham *et al.* 2009, App. 4.III 52). Small quantities of hammerscale were found in numerous samples throughout the chronological span of the project but only partial remains of one smithing hearth bottom (644g) was found in a middle Iron Age deposits (see below), and small quantities of undiagnostic ferrous slag (139.8g) from early to middle Saxon deposits. For this reason, instances of hammerscale will receive no further analysis.



A 3rd–4th-century Roman coin from the secondary fill assigned to this period of a monument L2314 in SL5. There are other instances of Roman coins being found in the fills of Bronze Age monuments that may still have been visible in the landscape at the time of deposition. A concentration of later Roman coins were found in the fills of a Bronze Age barrow cemetery to the northeast of Baldock and here it was suggested that the coins represented continued, premeditated deposition of coins in an area of special significance (Guest 2009, 113).

Antler, comprising the top tine and part of the beam with cut marks, was found in the secondary fill of a large shaft (L2368, SL6). The tine tip is flattened and smoothed. This may represent a discarded or reworked pick.

5.6.3.2 Middle Bronze Age SP6 (Table 32)

The assemblage from middle Bronze Age deposits derived from ditch fills of field boundaries (L2171 and L2100) or trackways (L2341) and from burials. The ditch fills of the field boundaries contained nails but, as these deposits represent accumulation of material over time, their presence may have derived from the final in-filling of these ditches rather than them being intrusive. The trackside ditch produced a heavily eroded pin or perhaps a needle, manufactured from a pig fibula.

The remaining items were recovered from burials. Little can be said of the small iron sheet fragments, all 10mm or less in size, from cremation cemetery L2103 beyond them representing intrusive activity. Inhumation SG21392 in the vicinity of a field ditch in system SL11 was exceptional in that it was accompanied by what appear to be worn grave goods. Fragments of up to five amber beads, and a blue-green glass bead, were found in the region of the head and upper neck of the inhumation. A finger ring was worn on the right hand which was positioned near the waist and a second curving fragment of wire was found in the torso area, which may be part of the ring. A small curving fragment of wire was also found in the region of the ear and may represent an earring. The ring, beads and other fragments of copper alloy all survived in a poor and fragmentary condition. The finger ring, which appears to be of the coiled wire variety, can be paralleled from Beaker flat grave 919 from Barrow Hills (Needham 1999, 186 and fig 4.14), while a ‘necklace’ which contained amber, jet and faience beads was found with a cremation in Pit E, possibly the primary deposit in barrow 16 from the same site (Barclay and Wallis 1999, 234). Beads and necklaces of jet, amber and faience are classically found in graves belonging to the Wessex II culture of the final early Bronze Age (1700-1500BC) and rarely are found outside that region. The example quoted above from Barrow Hills, and two others (Ashville Trading Estate Abingdon and Stanton Harcourt) in the Upper Thames region are some notable exceptions (Barclay and Wallis 1999, 234).

5.6.3.3 Late Bronze Age/early Iron Age SP7 (Table 33)

Although the ‘other artefacts’ from late Bronze Age/early Iron Age deposits were limited in quantity and type they are of interest in both the manner of deposition and the cross-over in typological date range. Remains of up to seven loom weights were found within the fills of a single pit G45088 in SL125. The primary fill yielded fragmentary remains of a loom weight the form of which



could not be determined. The secondary fills however yielded up to six loom weights, two of certain cylindrical form and three of triangular form. Cylindrical loom weights are considered Bronze Age in date, while the triangular form is assigned to the Iron Age. The recovery of both forms from the same pit fills would appear to indicate a transitional date for the deposition.

5.6.3.4 Middle Iron Age SP8 (Table 34)

A small quantity of ‘other artefacts’ were recovered from early to middle Iron Age deposits, the majority found within the fills of storage pits, indicating their re-use as rubbish pits. The presence of an iron smithing hearth bottom from SL35 and the sawn antler off-cut from SL30 attest to small scale craft activity within the farmsteads. The ceramic sling shot from boundary ditch SL137 is probably indicative of hunting, in this instance for wild fowl. A storage pit in farmstead SL34 also yielded the remains of a probable spearhead, comprising a short closed socket, formed by overlapping the sides of the socket, and the start of flat blade with shoulder. The whetstone from tree clearance holes in SL138 is of quartz arenite and indicates some trade contacts as the source lies in either Buckinghamshire or Wiltshire (per. com J Eyers). There is evidence for intrusive activity in the form of a post-medieval kick from a wine bottle and a bar strap mount, both from the enclosure ditch of farmstead SL30.

5.6.3.5 Late Iron Age/early Romano-British SP9

‘Other artefacts’ within deposits of this period were limited to the shrine complex SL50 and comprised 36 nails and tacks. Where heads survived they were all flat. The fills of the structures accounted for 26 of the nails and tacks; a further 8 were found in the enclosure ditch surrounding the shrines and two from pit fills.

These cannot be dated typologically, but are of interest in mirroring the occurrence of nails at shrine L79 from the Bovis excavations (Duncan 2008, 237) where it was suggested that they were used to affix cladding or weatherboard. In addition a single small dark blue glass bead was found in the ditch fill and a single hobnail was found in a pit.

5.6.3.6 Romano-British SP10 (Table 35)

Unsurprisingly the Romano-British period deposits were more prolific in yielding ‘other artefacts’. Ditch fills from the farmstead SL51 yielded the greatest quantity of artefacts. Subsistence activities, including the processing of grain and the cutting of turf were represented along with craft related items in the form of a leather working awl and an antler off-cut. There are however indications that there was a degree of disposable wealth suggested by the presence of a bath flask and a rather fine pair of tweezers on a bar and loop toilet set holder. Access to markets is indicated not only by the toiletry items, but also by the quern of Old Red Sandstone, its source lying on the Welsh borders. The As of Trajan suggests occupation in the very late 1st century into the 2nd century AD and this is supported by the presence of a Hertfordshire Puddingstone quern, likely to have gone out of use in the 2nd century and the probably 2nd century bath flask. The coin of Constantine I, could suggest that the farmstead continued in use into the 4th century. The assemblage of iron fragments and one nail from burial SG21415 within the farmstead can offer little assistance in refining the dating of the inhumation.



Possible farmstead SL52, adjacent to SL51, has a more limited assemblage. With the exception of a glass bead that could be either residual from the Iron Age or intrusive from later Anglo-Saxon activity, and a sherd from a spouted jug of later 2nd to 3rd-century date, the finds in the main comprise nails and hinges and are not closely datable. Little can be said of the inhumation SG21541 (L2119) which yielded a single nail. The 38 nails found associated with cremation burial SG22032 (L2128) suggests that the cremated bone may have been contained within a box. A similar burial SG22034 (L2130) also with nails was found *c.* 80m to the east within an evaluation trench. Both are unusual in not having a pottery or glass vessel containing the cremated remains within the box (Philpott 1991, 16). Unurned cremation burial SG22012 (L2197) to the north was accompanied by two brooches, one of iron and the other of copper alloy. The condition of the copper alloy brooch fragment suggests that these may have been pyre goods.

Trackways and boundaries SL53 produced a small and not particularly informative assemblage, either in terms of date or range of activities being carried out. It did however contain a *Bustum* burial, the fills of which produced 117 nails; the surviving heads were all flat. The condition of the nails, a large number having no corrosion products adhering and having an almost 'pristine' appearance, suggests that they had been exposed to heat and may have formed part of the pyre structure.

The pipe trench investigations within settlement SL155 produced a very limited assemblage. The single bracelet belongs to Cool's group VII (1983, 140) penannular bracelets with grooved terminals, a form that was in use intermittently throughout the Roman period. The bedding trenches within SL156 produced a second bracelet of Cool's group VII and part of what maybe a Manning type 2 knife. This knife from is considered early Roman in date, going out of use in the 2nd century (Manning 1985, 108-110).

5.6.3.7 Early Saxon SP11 (Table 36)

The early Saxon deposits produced one of the larger assemblages. The material composition of the assemblage was also noticeably different in having a higher percentage of antler and bone objects in comparison to earlier periods. Craft activities were well represented, in particular antler/bone working, with 25 off-cuts present. It is possible that the actual end-products of the antler/bone working are also present, such as the five composite combs and the five bone dress pins that were found. Evidence for textile production, including spinning and weaving, are also evidenced by the spindle whorls, loom weights, a pin beater and a possible fibre processing spike. There is however little evidence for ironworking, with only 150g of undiagnostic ferrous slag present. Residual Roman artefacts are present within the assemblage, including a linch pin, a lathe-turned shale spindle whorl, vessel glass and two coins. Although these may be residual, they may also represent the Saxon penchant for collecting Roman items, and indeed one of the coins is perforated. A small amount of intrusive activity in the Honey Hill part of Biddenham Loop is suggested by the presence of a modern bottle, a cast iron gear(?) and a very small bead.

An unfired annular loom weight was found in SFB G23243 (L2362, SL63) in



association with other undiagnostic lumps of clay (see section 5.4.3.2). Similar unfired loom weights were found at Mucking (Hamerow 1993, 17), where it was suggested that the numerous loom weights found in a rough line were not the remains of a loom with weights left to rot *in situ*, but represented weights which had fallen from storage racks. The existence of unfired loom weights was proven at West Stow where an SFB had burnt down (West 1985, 138). They were only ‘fired’ on their upper sides which would have been exposed to the flames. Tipper (2004, 167) also notes the evidence from West Stow and concludes that loom weights were probably used in an unfired state and simply thrown away and replaced after breakage.

5.6.3.8 Saxo-Norman SP12 (Table 37)

In comparison to the preceding Saxon period, the assemblage from SP12 is more modest and derived almost entirely from settlement SL169. There is evidence for access to markets in the form of whetstones imported from Norway and either north or west Britain. The lava quern fragments could be residual from the Roman period, but lava querns continued to be imported from Germany in the late Saxon period into the medieval period. Bone and antler objects are still present, in the form of ice skates, a comb and a dress pin. The decorative motif on the comb connecting plate indicates a date of *c.*900-1100, while the dress pin can be paralleled by a pin from Coppergate from deposits dating to *c.*930-975 (MacGregor, Mainman and Rogers 1999, fig. 911 cat no. 6904). The single whittle tang knife conforms to Ottaway’s type C1, in use from the mid-Saxon period to the 11th century (1992, 568-70).

5.6.3.9 Medieval SP13 (Table 38), post-medieval SP14 (Table 39) and modern SP15 (Table 40)

The assemblage from medieval and post-medieval deposits is limited. No artefacts can be typologically dated to the medieval period. The post-medieval assemblage in the main derives from quarrying activity and trackways. Lead pistol balls, a brazen button, a William III half penny date the activity to between the 17th up to the 19th century. The curry comb and a tine from a pitchfork attest to some agricultural activity.

The medieval and post-medieval assemblages contain residual artefacts from earlier activity, as indicated by the discovery of Roman coins: one in a medieval deposit and five in the post-medieval deposits. Although residual, they will contribute to compiling a coin profile for Roman activity,

Modern deposits continued to yield a mixture of artefacts dating from the Roman to the post-medieval periods along with a single wavy rimmed oxshoe dated to the 19th to 20th centuries.



5.7 Animal bone

5.7.1 Methodology

The animal bone was examined in two stages:

1. Specific contexts to determine whether any bone present was suitable for radiocarbon dating,
2. Scan/assessment of the entire assemblage.

The first stage was an essential part of the scientific dating strategy (see 5.12.1) and, therefore, of the establishment of the final phasing hierarchy. All animal bone which was considered as potential material for radiocarbon dating was identified, fully recorded and assessed in terms of its potential suitability.

The scan/assessment was undertaken on all the recovered animal bone. The aim was to assess the potential of the material to provide information about deposition, the meat diet of the inhabitants of the settlements and the exploitation of animals at different stages of their history. The scan included the recording of the:

- state of preservation
- approximate number of fragments provisionally identified to each species
- approximate number of unidentified fragments
- the number of mandibles with surviving teeth for each species
- number of bones with epiphyseal fusion for each species
- number of measurable bones for each species.

These details were recorded on to a relational database (Microsoft Access), which forms part of the site archive. The final phasing hierarchy and other contextual information were stored within the archive, enabling the assemblages from different sites and periods to be easily separated. Detailed records of anatomies represented, fragmentation, gnawing, butchery marks, pathology, ageing and metrical data were not made, although brief comments were made about specimens with notable features, such as obvious butchery marks and pathological changes. The presence of any associated bone groups was also noted. Bones from sieved contexts were also scanned and the species provisionally identified were noted.

5.7.2 Overall sample size and assemblage preservation

Bones from 513 contexts were scanned, producing a total of approximately 5,476 fragments, excluding those from sieved samples and a small number of bones that have subsequently been discovered among the human remains. The great majority of the contexts and bones were from the Biddenham Loop, whereas just over 622 were recovered from Land west of Kempston. The preservation of the assemblages from each context was assigned to one of five grades ranging from excellent to poor (Table 41). Although assemblage preservation was generally good/moderate, a slightly higher proportion of well preserved groups were recovered from Land west of Kempston than from the Biddenham Loop. In addition, 16% of the assemblages were poorly preserved, suffering severe erosion and/or burning.



5.7.3 Provenance

A brief description of the assemblage is presented by Site Period (SP) below and summarised in Table 42:

5.7.3.1 Early Neolithic SP3

Shaft L2107 on the Biddenham Loop produced around 50 bones. Hand excavation of the shaft produced 43 bones of a well preserved partial skeleton of a large young adult canid, almost certainly a wolf, and further bones of this animal were found in the sieved sample. All parts of the skeleton are represented. Six substantial portions of red deer antler from at least two antlers were also recovered. One antler base had been cast whilst a second had not been shed from the skull. A less well preserved group of five dog bones was found in another context in the shaft.

Although the overall sample is not large, the features produced a number of important faunal assemblages. Very few well dated skeletons of wolf have been found on British Neolithic sites (Yalden 1999) and the full recording of the bones in shaft L2107, will provide valuable comparative data for zooarchaeologists and its discovery will require separate publication in a specialist journal as well as in this site report.

5.7.3.2 Late Neolithic SP4

Possible rectangular building L2705 on the Biddenham Loop produced three unidentified bones from one of its post-holes.

5.7.3.3 Early Bronze Age SP5

A total of 117 animal bone fragments were identifiable and were generally derived from funerary/ritual deposits located on the Biddenham Loop.

Shaft L2390 produced around 100 bones of a fairly complete skeleton of a canid. Preliminary identification indicates that this belonged to quite a small adult dog. However, comparison with a fox skeleton is required to confirm this identification. There are also three vertebrae and two ribs of a large mammal, probably cattle, which also appear to have been deposited as an associated group. Shaft L2315 produced substantial portions of an aurochs horn core along with a tibia of a fox/dog, a red deer metatarsal and a large scapula from a domestic pig or possibly a wild boar. The pits within monument L2300 contained identifiable fragments of sheep, cattle, pig (in a sieved sample) and red deer antler.

Again although the overall sample is not large, the features produced a number of important faunal assemblages many of which are firmly dated by radiocarbon determination and occur within shafts. The presence of aurochs horn core, worked deer antler and the discovery of other associated bone groups, e.g. dog/fox, cattle, will also provide important information.

5.7.3.4 Middle Bronze Age SP6

A total of 196 animal bone fragment were identifiable and were generally from features associated with the extensive field system on the Biddenham Loop.



Ditch G23161 within field L2349 included 62 bones from a small and slender adult sheep skeleton. Most parts of the skeleton are present including fragmentary remains of the mandibles but mainly limb bones have survived.

The primary fill of large pit G23286 (within field L2391) produced several bones of wild species including a red deer tibia and metatarsal, and some bones of a fawn. A roe deer mandible was found in the same feature. In addition, an articulated group of three complete pig metacarpals were recovered from this pit. These are large enough to be considered to have belonged to an adult wild boar rather than a domestic pig.

Generally, other features assigned to the middle Bronze Age produced very few bones. Of possible interest, isolated inhumation L2375 contained a fragment of cow bone and a large pit in field L2342 contained large cattle vertebrae.

Again although the overall sample is not large, the features produced a number of important faunal assemblages many of which are firmly dated by radiocarbon determination. The presence of the sheep and, within the Bypass corridor, of cow skeletons (Albion 2009a) also provides important information, along with the wild species from one of the large pits.

5.7.3.5 Late Bronze Age/early Iron Age SP7

A total of 34 animal bone fragments were recorded.

A total of 32 animal bone fragments were recovered from the main pit alignment L2801 that crosses the Biddenham Loop. The tertiary fills included the fragmentary remains of a cattle skull within pit G28009. Small numbers of other cattle bones, horse, pig and dog were also found in other pits.

On Land west of Kempston, only two unidentified fragments were recovered from two pits within domestic focus L4502. Sieved samples also failed to produce any identifiable material and preservation generally was quite poor.

Although the overall sample of bones from this phase is small, their presence within a major landscape feature such as pit alignment L2801 suggests that they should be subject to further analysis, as such features are notoriously sterile.

5.7.3.6 Early/middle Iron Age SP8

A total of 320 animal bone fragments were recovered, the majority from storage pits within farmsteads on the Biddenham Loop.

Among the animal bone fragments from storage pits on the Biddenham Loop were several animal bone groups. The largest sample is from storage pits L3206 and includes over 100 bones from an immature dog skeleton (pit G32018). One of the tibiae has a healed fracture. Pit G23248 (within storage pit cluster L2397) produced a partial skeleton of an immature pig consisting mainly of the skull, jaws, several vertebrae and bones from the upper forelimbs. Several limb bones and ribs of a neonatal sheep were found in storage pits G23036 (L2309). Cattle were represented in most pits and small numbers of horse were also found. Storage pit cluster L3207 produced several bones of amphibians and small



mammal including a partial toad skeleton in storage pit G32023. The back of a cattle skull was found in enclosure ditch G23039 (L2311).

Sixteen animal bone fragments were recovered from Land west Kempston. They mainly derived from pits in SL138. Only a horse bone and a cattle tooth are identifiable within this very eroded assemblage.

This assemblage is also dominated by the remains of associated bone groups of immature dog, pig and sheep. Such depositions have been a subject of considerable debate amongst Iron Age archaeologists (*e.g.* Grant 1984; Cunliffe 1992; Hill 1995; Wilson 1999; Morris 2008) and Morris' work, in particular, has demonstrated that further carefully-recorded examples are required to further our understanding of this sort of deposit. The analysis of these groups within the recent and Bypass investigations (Albion 2009a) can contribute to this broader discussion.

No further analysis is required of the animal bone recovered from Land west of Kempston due to the small amount of bone recovered and its poor condition.

5.7.3.7 Late Iron Age/early Romano-British SP9

The only bone from this period was unidentifiable and from shrine complex L2700 on the Biddenham Loop.

5.7.3.8 Romano-British SP10

Approximately 586 animal bone fragments were recovered, the vast majority from features on the Biddenham Loop.

The Biddenham Loop produced about 580 fragments of animal bone, mainly from ditches associated with farmsteads SL51 and SL52. In particular 125 fragments were found in features associated with enclosure L2127 (possible farmstead SL52).

Sheep/goat bones are well represented in SL51/52. Goat was positively identified from enclosures L2121 and L2128 (SL51 and SL52 respectively). The latter was associated with a mandible of a small dog and cremated human remains. However, the majority of the remaining sheep/goat bones, which are comfortably the most common species represented in this period, probably mainly belong to sheep. Cattle elements are also quite commonly represented, although less so than in several contemporary samples from the region. These included sizeable assemblages from enclosures L2114 (SL51) and L2129 (SL52). Pig bones are poorly represented in this period and are outnumbered by sheep/goat, cattle and even horse. The horse assemblage, however, includes 13 bones of a partial adult horse skeleton from trackway L2306 (SL53). The only identified element of red deer consists of a sawn antler offcut in enclosure L2120 (SL51). Rabbit bones were present in a number of features in SL51 and SL52, suggesting modern disturbance. A small number of bird bones were retrieved. Domestic fowl and mallard are the only species provisionally identified.

Contemporary features on Land west of Kempston produced only 12 animal bone fragments by hand collection. They derived from trackway L4501,



bedding trenches L4510 and isolated pit L4515 (all SL156). Five of the six identifiable fragments belong to cattle, the other to sheep/goat.

Although the sample is of modest size, and some features have been disturbed by rabbit burrowing, the assemblage is important because it can provide useful information pertaining to the local and regional exploitation of animals in the Romano-British period. Of particular interest is the presence of large horse bones, a phenomenon also noted in the Bypass faunal assemblage. This may represent evidence for the introduction of improved breeds of horses in this period and several bones from the Biddenham Loop can provide metrical data to investigate this question. In addition, the initial assessment of species representation suggests higher percentages of sheep/goat are represented within farmsteads SL51/52 than has been noted within contemporary farmsteads on the Bovis investigations (Maltby 2008) and Marsh Leys (Maltby forthcoming). In contrast to the major contemporary settlement centred on Kempston Church End, there does not appear to be any evidence for the presence of specialist butchers, but careful examination of the cattle bones, in particular, is required to verify this.

No further analysis is required of the animal bone recovered from Land west of Kempston due to the small amount of bone recovered and its poor condition.

5.7.3.9 Early Saxon SP11

A total of 3691 animal bone fragments were recovered, the majority from settlement SL62 on the Biddenham Loop, although significant amounts were recovered from settlement SL165 on Land west of Kempston.

A total of 126 contexts produced a substantial faunal sample of nearly 3,400 fragments, largely from sunken-featured buildings (SFBs), on the Biddenham Loop. Over 2,100 of these were associated with SFBs in the core area L2135 of settlement SL62 and 800 were found in the peripheral domestic foci L2362. The assemblages were generally moderately preserved with gnawing damage quite common and charred bones not infrequently represented in some contexts. Some of the largest groups are well preserved with bones surviving in good condition.

Cattle elements are dominant in these deposits, particularly in settlement core L2135. Some groups include several mandibles and butchery marks were frequently observed on cattle bones. Sheep/goat are quite well represented in most of the SFBs. Both sheep and goat are present with the former in the majority. Pigs are slightly better represented than in the Romano-British period and include several bones of neonatal or juvenile animals, implying that some pigs were being kept at the settlement. Horse bones are much more poorly represented than in the previous period. However, they were identified in small numbers in the peripheral domestic focus L2134, the settlement core L2135 and within the dispersed SFBs L2362 to the west of the Loop. A tooth of a very old individual was recovered from L2135 but two thoracic vertebrae of an immature animal were recovered from L2362. A substantial part of a fragmented horse skull was also found in L2362 (G23245.03). A tibia from L2135 has possible indications of being worked. Only a single element of a dog was identified. Cat is also represented by only one bone in the hand-collected sample.



Most of the 13 red deer elements consist of antler, some of which have been sawn or charred. However, a mandible and metacarpal were found in peripheral domestic focus L2132 and a butchered first phalanx was recovered from L2135. Two bones of roe deer were found in L2134 and one bone of hare in L2135. Bird bones are better represented in this phase. Most of those provisionally identified belonged to domestic fowl but a few bones of goose, ducks and wild species are also present. Twelve frog bones were found in L2132. Only one fish bone was recovered from hand excavation. Although counts of bones from sieved samples were not calculated, several samples were noted as containing identifiable elements. These include a canine tooth from the settlement core L2135, which is large enough to be considered to be from a wild boar. Several fish bones, a few of which should be identifiable to species, were retrieved and further bones of the major domestic species, cat and bird are also present.

Twenty-six contexts on Land west of Kempston produced animal bones, with most assemblages being at least moderately preserved and the sample contains some good groups. All but six of the 295 hand-collected bones are from pits and an SFB associated with domestic core L4518 of settlement SL165. As in the contemporary material from Biddenham Loop, the identifiable assemblage is dominated by cattle. The only probable associated bone groups consists of seven cattle vertebrae from SFB G45022 (L4518) and parts of an elbow joint (unusual deposit G45022.06) within the same feature. Butchery marks were frequently observed on cattle bones and several are measurable. Sheep/goat elements are fairly well represented and the sample includes butchered horn cores of both sheep and goat. Pig is slightly less well represented than in the sample from the Biddenham Loop. There is a scapula from either a large domestic pig or possibly a wild boar. The 14 bones of horse include a tibia from a large animal. Only a single bone each of dog and cat have been provisionally identified in this assemblage. The three red deer elements collected by hand all derive from the large pits G45027 in the domestic core L4518 and consist of fragments of tibia, metacarpal and calcaneus. Red deer was also noted in the samples from a number of SFBs. Roe deer is represented by part of a skull and attached antler in L4518. The only bird bone is probably unidentifiable.

A substantial assemblage has been obtained from SFBs. These represent a coherent assemblage and the samples from some buildings are sufficiently large to make detailed intra-site comparisons in species and element representation. There is good butchery evidence and substantial samples of metrical and ageing data are available for the major domestic species in particular. Identifiable material from the sieved samples includes a few fish bones. Given the absence of any Saxon material from the Bovis investigations (Luke 2008) and only very small assemblages from the Bypass investigations, this material represents the first opportunity to examine a good sample of animal bone of this period from a recently excavated site in the county.

5.7.3.10 Saxo-Norman SP12

A total of 259 fragments of animal bone were recovered, all of which derived from activity around The Bury on Land west of Kempston.



Most of the bones come from pits L4513 within settlement SL169. These include several partial skeletons. At least two adult dogs are represented by an associated group from isolated large pit G48006 (L4513). Seven bones of another large adult dog were found in a trackside ditch of L4504. The hind limbs of a cat were also found in pit G48006. Three ribs and two thoracic vertebrae of a horse were recovered from pit G45026, within dispersed pits L4526 to the west of SL169. Some of the other horse elements in the same context may have belonged to the same animal.

Excluding bones in animal bone groups (ABGs) cattle are comfortably the most common species represented. In contrast to earlier phases, pig bones outnumber sheep/goat but neither were found in large numbers. A substantial part of a pig skull was found in the secondary fills of G45068, the easternmost of the two drying ovens within L4512.

This produced a sample similar in size to that from recovered the early Saxon settlement SL165 which was located in the same area. However, it was of a different nature, in that it includes partial skeletons of three dogs, a cat and possibly a horse. Metrical analysis of the dogs will provide information about the stature of the animals and will add to the data pool available for regional comparisons of dog breeds in the historic period. The assemblage, along with that from the Bypass, will be comparable with only a handful of such published in the county. It will be interesting to compare it with that recently excavated from the town of Bedford (Malty in prep.).

5.7.3.11 Medieval SP13

Only 11 fragments of animal bone were recovered, all from open fields and track ways on Land west of Kempston.

Six of the fragments of animal bone were unidentifiable, including all of the material recovered from furrows in open fields L4528 and L5106. Sheep and pig bone fragments were recovered from trackway L4507 and a fragment of sheep bone from feature cluster L4529. This material has no analytical potential.

5.7.3.12 Post-medieval SP14

A total of 106 animal bone fragments were recovered, the majority from quarry pits identified within the Biddenham Loop.

One-hundred-and-one animal bone fragments were recovered from post-medieval features within the Biddenham Loop. Most of the bones were found in quarry pits SL76. Cattle, sheep/goat, pig, horse, rabbit (a pair of tibia) and domestic fowl are the only species identified. The sheep/goat assemblage includes two articulating cervical vertebrae in fields SL77, which also produced a robust pig metacarpal of an improved breed.

Only five animal bones were recovered from activity SL180 adjacent to The Bury on Land west of Kempston. Four animal bone fragments were recovered from the trackside ditch L4506, of which only a single bone each of cattle and horse was identifiable. A large metacarpal of a horse was found in enclosure L4523. This material has no analytical potential.



5.7.3.13 *Modern SP15*

Five contexts produced 41 animal bones. On the Biddenham Loop a total of 25 fragments of animal bone were recovered from features associated with modern agricultural activity and the Honey Hill farmhouse SL78. Only nine elements of cattle, three fragments of sheep and the sawn base of a red deer antler were identifiable.

On Land west of Kempston 16 animal bone fragments were recovered from pits and agricultural activity SL188 adjacent to The Bury. Cattle, horse and sheep/goat are represented. Five of the horse bones are from G49013 (L4532) and consist of two pelves, a femur, tibia and metacarpal of one or more large animal. This material has no analytical potential.



5.8 Charred plant remains

5.8.1 Sample collection and methodology

Approximately 754 bulk soil samples were taken on site for environmental reasons from a range of features and chronological periods.

The selection of flots for a rapid assessment by the author was partially based on the results of an initial scan carried out by Albion, which identified those samples with identifiable charred plant remains, with an item score ranging from 1 (occasional) to 5 (abundant). This suggested that approximately half the flots contained potentially identifiable charred plant remains and half contained no identifiable charred plant remains.

On the basis of the initial scan, the 35 flots with a rating of between 3 and 5 (moderately rich to rich) were selected for rapid assessment by the author. In addition, a further 44 large and potentially productive flots were extracted during a visual examination of the remaining flots. Finally, those considered for radiocarbon dating were examined. Thus, a total of almost 100 flots, from virtually all Site Periods, were used for the assessment to establish the character of the charred plant remains, in terms of economic and possibly environmental data, and the potential of the material for making comparisons between the different periods and the significance of the data on a local, regional and national level. Assessment of the remaining flots was based on the results of the initial scan carried out by Albion.

The selected flots were assessed using a binocular microscope with a magnification of up to x40. The material was initially divided into different size fractions using a stack of sieves for ease of scanning the material. Only fractions of the larger flots were assessed at this stage. A breakdown of the number of samples and estimated abundance of charred plant remains by period is shown in Table 43.

5.8.2 Overview of results

The flots consisted virtually entirely of plant remains preserved by charring, with variable amounts of charcoal (including potentially identifiable fragments) making up a substantial part, or all, of the botanical material. Other charred botanical remains in the assessed flots consisted of largely cereal remains (grains and chaff), with some pulses and weed/wild plant seeds. The condition of this material was variable but a large part was potentially identifiable to species or at least genus. There were 'uncharred' seeds in some of the flots from wild plants/weeds, for example, bedstraw (*Galium* spp.), knotgrasses etc (*Polygonum* spp.). This material, however, is probably intrusive, given the nature of the soils at the site and the presence of rootlets in samples which could have allowed passage of intrusive material down the soil profile. A brief description of the results from the assessed flots is presented by Site Period (SP).

5.8.3 Provenance

The number of samples by period is shown in Table 43, with the majority of samples (461 or 72% of the total) being taken from prehistoric contexts, dating from the early Neolithic to the middle Iron Age period (SP3 to 8); 78 samples



(12%) were from late Iron Age/Romano-British contexts (SP9 and 10); 74 (12%) from early Saxon features (SP12); 16 (2%) from Saxo-Norman deposits (SP13); and four (<1%) from post-medieval and modern contexts (SP14 and 15). Nine samples (1%) were from features not assigned to period.

5.8.3.1 Early Neolithic SP3

The twenty-three samples from this period were collected from burial monuments and shaft-like features. The assessed flots produced indeterminate grain fragments. Full quantification of the productive flots is the only way to identify the range of crop and wild plants present in this period.

5.8.3.2 Late Neolithic SP4

The 15 samples from this period were collected from pits and ditches. None of the assessed flots produced rich charred plant assemblages, although hazel nut (*Corylus avellana*) shell fragments were identified within nine of the samples. Only one sample (9006) contained cereals, including one grain of *Triticum* sp. Full quantification of the productive flots is the only way to identify the range of crop and wild plants present in this period.

5.8.3.3 Early Bronze Age SP5

The 96 samples assigned to the early Bronze Age produced remains of occasional cereal and wild resources. Charred cereal grains were present in some flots including free-threshing wheat grain (*Triticum aestivum/turgidum*), while hazel nut (*Corylus avellana*) shell fragments, and occasional weed seeds, for instance from cleavers (*Galium aparine*) were identified. Tubers of false oat grass/onion couch (*Arrhenatherum elatius*) were also noted in several samples; these tubers have previously been found in Bronze Age cremations and have been interpreted as tinder. Full quantification of the productive flots, including the three with fairly frequent/frequent remains, is the only way to identify the range of crop and wild plants present in this period.

5.8.3.4 Middle Bronze Age SP6

The 211 samples from this period were taken from the fills of pits, post-holes, ditches and cremations. The assessed flots included some notable assemblages that included cereal remains and wild food resources, with some evidence for more detailed information on crop husbandry (weeds) and processing (chaff). Charred cereal grains were present in some flots including from hulled wheat (*Triticum dicoccum/spelta*) and barley (*Hordeum* sp.) plus leguminous seeds and hazel nut shell fragments. Full quantification of the productive flots is the only way to identify the range of crop and wild plants present in this period.

5.8.3.5 Late Bronze Age/early Iron Age SP7

The 52 samples assigned to this period were collected from pits, ditches and cremations. Approximately a quarter of the flots were productive; these contained cereals, chaff and weed seeds and wild plant resources for crop husbandry and processing information. The assessed remains included two assemblages with hulled wheats and barley, weed seeds, e.g. field madder (*Sherardia arvensis*). Full quantification of the productive flots, including the one with abundant remains, is the only way to identify the range of crop and wild plants present in this period.



5.8.3.6 Middle Iron Age SP8

The 64 samples from this period were taken mainly from storage pit fills and occasional ditches. Approximately half the flots were productive and contained occasional grains and wild plant remains. These included hulled wheats, barley, cleaver weed seeds, and hazel nut shell fragments. Full quantification of the productive flots, including the one with fairly frequent/frequent remains, is the only way to identify the range of crop and wild plants present in this period.

5.8.3.7 Late Iron Age/early Romano-British SP9

Nineteen samples were collected from this period, mainly from pits and ditch fills. In total, six of the samples were productive, including one good sample from shrine fill (sample 7011). These included hulled wheat (grain and chaff) and weed seeds. Full quantification of the productive flots is the only way to identify the range of crop and wild plants present in this period.

5.8.3.8 Romano-British Period SP10

The 59 samples from the Romano-British period were primarily collected from bedding trenches and funerary deposits. A total of 40 samples had productive flots. These included a very good assemblage from *Bustum* burial L2399 which included information on crop-husbandry (cereals, weeds) and processing (chaff) plus wild resources. Full quantification of the productive flots including the one with abundant remains is the only way to identify the range of crop and wild plants present in this period.

5.8.3.9 Early Saxon Period SP11

Seventy-four samples were collected from this period, mainly from the fills of SFBs. Over half the assessed flots produced rich charred cereal assemblages, with both free-threshing and hulled wheats being identified along with hulled barley and oat (*Avena* sp.). One of the two assessed flots from Land west of Kempston also produced a significant quantity of charred broad beans (*Vicia faba*). The presence of hulled wheats in Saxon deposits, in this case within the SFBs of settlement SL62, is unusual but not unknown. Such cereals were generally replaced by free-threshing wheat by this period and may support an early rather than middle Saxon date for this settlement. Charred weed seeds were present in some of the flots, including docks (*Rumex* sp.), corn gromwell (*Lithospermum arvense*) and leguminous seeds. Charred hazel nut shell was also recorded. Full quantification of the productive flots including the one with fairly frequent/frequent remains is the only way to identify the range of crop and wild plants present in this period.

5.8.3.10 Saxo-Norman period SP12

The 16 samples from this period were taken primarily from pit fills within settlement SL169. Half of the assessed flots contained significant charred botanical remains, with free-threshing wheat, rye and oats being identified and with relatively large numbers of weed seeds including stinking chamomile. Charred hazel nut shell was also noted in the flots. Full quantification of the productive flots including the two with fairly frequent/frequent remains is the only way to identify the range of crop and wild plants present in this period.



5.8.3.11 Post-medieval period SP14

Three samples were assigned to the post-medieval period, although none contained significant quantities of identified remains.

5.8.3.12 Modern SP15

One small flot collected from a modern feature was not assessed because of its size and assigned period.

5.8.4 Discussion

This assessment allows for general comments on the potential of the identifiable charred plant remains by period. Although there are only a small number of samples with fairly frequent or abundant charred plant remains prior Romano-British period this is often found to be the case. Full quantification is the only way to identify the range of crop and wild species in the prehistoric period, particularly from the early Bronze Age onwards. Richer charred plant assemblages from later prehistoric and historical periods will permit more detailed examination of crop husbandry and crop-processing activities (Hillman 1981; 1984). Saxon charred remains also included evidence for the cultivation of pulses. The spatial plotting of the results will allow an examination of the activities (crop-processing *etc*) taking place across the site.

In addition to the remains of charred grain, there is evidence from the earlier periods for the use of wild food resources and the collection of plants for use as tinder/fuel, including during cremations.

The assessment results suggest that the charred plant remains are of local and regional significance, in terms of economic importance. The presence of identifiable material in virtually all periods will allow comparisons between periods, at least in crop types, while the remains may be compared on both a local and regional scale with the archaeobotanical results from other sites close-by and over a comparative date range, including the Bypass (Albion 2009a) and Bovis investigations (Luke 2008) and slightly further afield (Scaife, 2000; Murphy 2007).



5.9 Charcoal

5.9.1 Sample collection and methodology

A total of 754 bulk soil samples were taken on site for environmental reasons (see section 5.8.1 for summary of samples). The aim of the assessment of the charcoal was to establish the potential of the material to consider such issues as woodland resources and their exploitation. Where charcoal was to be sent for destructive radiocarbon dating it was fully identified.

5.9.2 Results

Flecks or fragments of charcoal were present in 623 of the 642 samples (97%) that were subject to charred plant remains assessment. The breakdown by fraction size is given in Table 44. The vast majority of the productive samples contained charcoal that was less than 4mm in diameter, although a reasonable number (35%) also contained charcoal that was greater than 4mm in size. Approximately 209 samples contain potentially identifiable charcoal fragments, although the majority of these are less than 4mm in size. A total of 89 of these have been identified as containing good quantities of material that may have high potential in taxonomic diversity.

Table 45 shows that the majority of the samples that contained potentially identifiable charcoal (that was greater than 2mm in diameter) contained less than 10 pieces per sample, whereas, the samples that contained fragments less than 2mm in diameter frequently had more than 50 pieces. This may be a function of post-depositional fragmentation; however it does indicate that the availability of readily identifiable material will be limited. Analysis of taxonomic diversity within samples is likely to be restricted to these less fragmentary samples.

A wide range of taxa was provisionally identified within the samples selected for destructive dating including *Alnus/Corylus* (alder/hazel), *Acer* sp. (maple), *Betula* type (birch), *Fraxinus excelsior* (ash), Maloideae (hawthorn, apple, pear etc.), *Prunus* sp. (cherry/blackthorn), *Quercus* sp. (oak), *Rhamnus cathartica* (buckthorn), Salicaceae (willow family) and *Ulmus* sp. (elm).

Table 46 shows the distribution of charcoal fractions by chronological period. This shows that significant quantities of potentially identifiable charcoal fragments have been recovered from contexts dated from the late Neolithic to the Saxo-Norman period. Particularly well represented are the middle Bronze Age, early middle Iron Age and the early Saxon periods. The majority of the material has derived from cremation burials, sunken-featured buildings and burnt mound-like deposits within field ditches.

It should be noted that the charcoal assemblage also contains material derived from features of intrinsic interest, such as the Romano-British *Bustum* burial L2399 and late Bronze Age/early Iron Age cremation burials, that may fall within a period that otherwise contains relatively little charcoal.

5.9.3 Discussion

There is a large quantity of charcoal from the excavations and there seems to be a notable diversity of taxa. The assemblage complements and enhances that



from the Bypass investigations. For example, charcoal is present and available in greater amount within several chronological periods where less good assemblages were available from the Bypass investigations. There is now charcoal available from the early Neolithic and middle Bronze Age periods. In addition, much greater quantities are available for the early Saxon period.

The identification of the charcoal will shed light on the nature of the woodland environment, how it changed over time and the selection of species for use as fuel, for instance, for the cremations (including the middle Bronze Age cremation burials and the Romano-British *Bustum* burial).



5.10 Human bone

5.10.1 Introduction and methodology

Full quantification has already been undertaken to enable the human bone to be used for radiocarbon dating and therefore to assist in establishing the final phasing hierarchy. The reasons for this are described in section 3.4 and the methodology is described in section 9.9.1. Age and sex codes used are presented in Table 47.

5.10.2 The assemblage

Human remains were recorded from all areas of the investigations, with the highest concentration on the Biddenham Loop. The material consisted of inhumed remains, samples of inhumed bone (recovered by wet sieving), burnt bone from probable cremation burials, fragments of human bone (burnt and unburnt), and contexts containing burnt bone of unknown origin.

A summary of the inhumations, unburnt bone from samples and cremated bone is presented in Table 48, Table 49 and Table 50.

5.10.2.1 Inhumations (Table 48)

A total of 15 inhumations were identified. A summary of the quantification and identification of the material is given in Table 48. It should be noted that unburnt skull fragments were found in a feature SG22145 within cremation cemetery L2103. Also, skull fragments recorded as SG24592 are likely to represent post-depositional disturbance in antiquity to inhumation SG24591. This SG has been treated as part of SG24591 for the purpose of this summary.

Many of the inhumations are largely complete, but all are poorly preserved. Only one (from grave SG21392) could be described as being in 'good' condition; whilst 60% of the skeletal material was in a 'poor' state of preservation.

Only two sub-adults (from graves SG22030 and SG32283) were identified within the assemblage. Of the remaining 13 inhumations, the ages of eight individuals could be estimated. These ranged from 18 to greater than 45 years, with the most common age at death being in the 26-35 year bracket (50%).

Of the 15 inhumations only 2 could not be sexed. Three displayed male characteristic traits, four were probably male, five probably female and one displayed female characteristic traits.

Only four of the inhumations did not display pathological changes. The most common pathology present was dental disease which affected 60% of the individuals. Non-metric variations were present in 86% of the individuals, with squatting facets being particularly common.

5.10.2.2 Un-burnt human bone (Table 49)

Thirteen samples, from eight graves, contained additional un-burnt human bone (see Table 49). Sample <5005> represents the entirety of the skeletal material



recovered from grave SG24618 because the poor preservation of the associated skeleton (5065) meant it could not be lifted by hand.

5.10.2.3 *Cremated bone (Table 50)*

A total of 38 cremation burials were identified. A summary of the quantification and identification of the material is given in Table 50. It should be noted that cremation burial SG22029 also included a small quantity of un-burnt human bone and that SG50001 contained animal rather than human bone and is therefore not a cremation burial.

The amount of burnt bone within each grave was highly variable. It ranged from 0.1g (one fragment) to nearly 1.1kg. The average weight of the burnt bone within each cremation was 259g. The average estimated fragment size was 13.5mm and approximately 30% of the fragments were identifiable.

Nearly 58% of the cremations derived from adults, 13% from sub-adults, and 29% were undetermined. All of the cremations burials are likely to have been of single individuals, although SG32286 displayed both adult and juvenile characteristics. Burnt animal bone was also present within nine of the graves.

Only three of the cremations burials displayed traits characteristic of sex: grave SG22050 is likely to have contained a male, grave SG24637 a probable male and SG24487 a probable female. Only two of the cremation burial exhibited traces of pathological change; traces of osteo-arthritis were noted within grave SG24636 and spinal damage within grave SG 24637.

5.10.3 Provenance

5.10.3.1 *Early Neolithic SP3*

Four inhumations have been securely dated to the early Neolithic (SP4); two within monument L2312 and two within L2356.

Within monument L2312 two individuals were recovered from the ditch: a moderately well preserved male skeleton (SG24591) and a less well preserved probable female skeleton (SG24590). Both skeletons were mature and exhibited traces of dental disease and wear. The probable female skeleton exhibited mastoiditis/otitis media and is likely to have been deaf in her left ear. A further *c.* 4g of bone was recovered from a wet sieved soil sample taken from the grave. The grave of this individual appears to have been disturbed by a later redefinition of the monument L2313 and a fragment of disarticulated skull was identified within the primary fill (SG24592) of the subsequent monument.

Monument L2356 contained two inhumations that were placed within individual graves within the interior of the ring ditch. Both were very poorly preserved. SG24617 was recovered as a skeleton, where as SG24618 could not be lifted by hand and was recovered by wet sieving the contents of the grave, producing *c.* 27g of bone. No pathological changes were present and only the central burial (SG24617) could be identified as adult.



5.10.3.2 *Early Bronze Age SP5*

Six cremation burials and one inhumation were assigned to the early Bronze Age.

Circular burial monument L2104 contained two contemporary un-urned cremation burials. Later burial SG22019 contained *c.* 35g of burnt human bone whilst grave SG22023 produced *c.* 646g. The smaller cremation burial is likely to be that of an adult, whilst the grave SG22023 contained bone derived from a sub-adult. No pathological changes were evident in either cremation burial, but many of the bones within SG22023 were noted to exhibit tar-like staining.

Two un-urned cremation burials were identified within circular burial monument L2106. Grave SG22050 contained *c.* 716g of burnt human bone, whilst grave SG22051 produced only *c.* 56g. The former was the grave of an adult male, whilst SG22051 was undetermined. No pathological changes were evident in either cremation burial.

The two dispersed urned cremation burials within L2363 comprised grave SG24468 and grave SG32286. Grave SG24468 produced *c.* 279g of burnt human bone that is likely to have derived from an adult. Grave SG32286 contained *c.* 248g of human bone that is likely to have derived from a sub-adult. No pathological changes were evident in either cremation burial.

Isolated inhumation L2371 comprised burial SG24161, which contained the largely complete skeleton of a robust adult male. The individual displayed traces of dental disease, a well-healed rib fracture and traces of possible trauma to the pelvis. Non-metric traits included squatting facets.

5.10.3.3 *Middle Bronze Age SP6*

The middle Bronze Age produced 25 cremation burials and 7 inhumations.

L2102 comprised three inhumations, situated within the interior of early Bronze Age circular burial monument L2104, within graves SG22029, SG22030, and SG22031. Grave SG22029 contained a largely complete adult female, with an impacted third molar, and an intrusive fragment of male skull. An additional *c.* 67g of bone was recovered from associated contexts. This material included a small quantity of (*c.* 26g) burnt bone that included an ox-sized long bone fragment. Grave SG22030 contained a largely complete but fragmentary skeleton of an adolescent female, with dental disease, Schmorl's nodes and squatting facets. Grave SG22031 contained a complete young adult female, also with traces of dental disease, Schmorl's nodes and squatting facets, in addition to traces of osteoporosis. An additional 20.3g of human bone was recovered from soil samples.

Cremation cemetery L2103 contained 17 graves that contained human bone. The individual graves produced between 0.1g and 1075.7g of burnt bone. The average content was 227g. Only one burial could be identified as that of a male (SG22011) and one (SG22145) as that of a probable female. Three burials were identified as sub-adult (SG22016, SG22024, and SG22033). No pathological changes were evident in any of the cremated human bone. Animal bone, or



possible animal bone, was identified within at least four of the cremation burials (SG22014, SG22020, SG22021, and SG22028).

Cemetery L2103 also included a posthole-type feature SG22143 which contained un-burnt skull fragments of an adult male which displayed traces of *cribra orbitalia*.

Isolated inhumation L2136 within field L2100 comprised burial SG21752. This produced the poorly preserved skeleton of an adult of indeterminate sex. No pathological changes were present.

Isolated inhumation L2158 comprised a single burial SG21392. This produced a largely complete skeleton of an adolescent, possibly male, that exhibited traces of dental disease and lateral squatting facets. A further *c.* 45g of human bone was recovered from associated contexts, including a mid hand phalanx that was stained light green.

L2365 comprised a cluster of three cremation burials to the northeast of early Neolithic monument L2312. Burial SG24587 produced *c.* 20g of human bone, burial SG24588 yielded *c.* 24g, and burial SG24589 contained *c.* 55g. It is likely that the latter two burials were of adults, whilst SG2487 is undetermined. No pathological changes were evident.

Isolated inhumation L2375 comprised a single burial SG23997. This contained the fragmentary limbs and skull of an adult male. A further 0.4g of human bone was recovered from wet sieving associated contexts. The skeleton displayed traces of *osteochondritis dissecans* on the right foot and slight enamel hypoplasia.

Isolated urned cremation burial L2384 comprised grave SG24487. This contained *c.* 517g of burnt human bone from an adult possible female. Charring of the carpals and meta-carpals was noted but no pathological changes were evident.

L2392 comprised two un-urned cremation burials adjacent to field ditches. Burial SG23966 comprised *c.* 64g of cremated human bone which displayed traces of slight weathering. Only 5g of cremated human bone was present within burial SG24423. None of the bone was identifiable and no pathological changes were evident.

5.10.3.4 Late Bronze Age/early Iron Age SP7

This period produced one inhumation burial and one cremation burial.

Isolated inhumation SG23573 (L2340) contained a largely complete but fragmentary skeleton of an adult female, with dental calculus and inter-vertebral disc disease. A further 20.1g of bone was recovered from wet sieving of soil samples. SG24424 (L2426) comprised a single isolated and un-urned cremation burial with *c.* 43g of cremated human bone. It was largely unidentifiable and displayed traces of slight weathering.



5.10.3.5 *Early-middle Iron Age SP8*

This period produced two cremation burials and a single inhumation.

L2105 comprised two urned cremation burials located within the interior of early Bronze Age circular monument L2104. Grave SG22010 produced a total of *c.* 452g of cremated bone, all of which was unidentifiable but is likely to derive from an adult. Grave SG22017 produced *c.* 458g of bone from an adult and also included occasional fragments of ‘clinker’/fuel slag. Charring was noted on the hand phalanx, but no pathological changes were apparent.

Storage pit cluster L3207 contained the largely complete but fragmentary remains of an adolescent possible male from grave SG32283. A further *c.* 73g of bone was recovered by wet sieving. The skeleton displayed osteochondritis dissecans on the left foot, dental caries and slight calculus. Congenitally absent mandibular M3 molars were also noted.

5.10.3.6 *Romano-British SP10*

This period produced four cremation burials and two inhumations.

Inhumation SG21415 in enclosure L2113 (farmstead SL51) contained a poorly preserved skeleton in. It comprised the extremely fragmentary and largely unidentifiable remains of an adult, possibly male. No pathological changes were present.

Four burials were found within possible farmstead SL52. Inhumation SG21541 in enclosure L2119 contained a poorly preserved skeleton, from which the skull was absent. The individual was a mature adult, probable male. Pathological changes included spinal degenerative joint disease. Nearby field L2128 contained a single un-urned cremation burial SG22032. It contained 270g of cremated human bone from an adult of indeterminate sex. No pathological changes were present. L2197 comprised a single un-urned cremation burial SG22012 within early Bronze Age circular monument L2104. It contained 150g of cremated human bone from a probable adult of indeterminate sex. No pathological changes were present.

Isolated *bustum* burial SG24636 (L2399) comprised cremated bone recovered from the grave and from pottery vessel SG24637. A total of 954g of bone was recovered from the grave. However, this included around 20% of cremated animal bone including dog, sheep/goat, and chicken. The cremated human bone was derived from an adult of indeterminate sex. Traces of possible osteoarthritis were identified on an apophyseal fragment. The contents of the pottery vessel included 919g of cremated bone, also including significant quantities of animal bone (dog identified). The individual is likely to have been an adult male. Traces of pathology include osteoarthritis, Schmorl’s nodes and intervertebral disc disease. Further analysis may be able to determine if the cremation deposits in the grave and in the pottery vessel represent two or one individuals.

5.10.3.7 *Early Saxon SP 11*

An almost complete pot within a pit SG50001 (L5001) contained 5.1g of burnt bone. It was originally thought to be a cremation burial. Analysis has shown



the bone to be unidentifiable cortical bone, from an animal rather than a human being.



5.11 Palaeo-environmental

5.11.1 Introduction

The following is a summary of the palaeo-environmental study and its results. A staged programme of Initial field and desktop assessment followed by hand augering and finally coring using a rig. For more detailed information the relevant specialist report should be consulted (Rackham 2008 and 2009), but the methodology is summarised in section 9.13.1. All work was limited to the floodplain of the River Great Ouse in the area of the proposed Country Park intended for landscaping and pond construction (see Figure 3).

5.11.2 The results

The initial field and desktop assessment illustrated the presence of palaeochannels and associated waterlogged deposits with some potential for palaeoenvironmental reconstruction (Rackham 2008). These deposits were subsequently sampled by hand augering and coring. Once radiocarbon dating had been undertaken they were then subject to assessment.

5.11.2.1 The sediments

The upper deposits in all boreholes were oxidised clays and silty clays. No stabilisation horizons that might reflect palaeo-landsurfaces were recognised in the sequences. The boreholes towards the river all showed evidence of channels indicating that any earlier landsurfaces had been eroded by the river prior to the development of the modern floodplain. Away from the river the transects showed mixed stoney clays and clayey gravel at the base of the alluvial sequence but no evidence for a palaeosol although BH0 in Transect B has an oxidised horizon immediately above the sandy gravel at 1.77m which might indicate a standstill or surviving sub-soil horizon. In Transects A-C the limestone is fairly shallow and underlies the floodplain at a depth of approximately 2m in places.

The organic sediments located can be summarised as follows:

- Transect A produced significant organic sediments in boreholes 2, 3 and 4 so a 3m core was taken between boreholes 3 and 4. A thickness of 0.8m of organic sediment was recovered in this core.
- Transect B produced significant organic sediments in boreholes 3, 4 and 5 so a 3m core was taken between boreholes 4 and 5. A thickness of 0.67m of organic sediment has been recovered in this core.
- Transect C produced some organic remains and shell fragments at the base of all five boreholes but with a maximum of 0.2m of organic silts in core 3. No core was taken.
- Transect D produced significant organic sediments in boreholes 6 and 7, the latter with a maximum thickness of 0.75m. A 3m core was taken immediately adjacent to BH7 which produced a thickness of 0.77m of



organic sediments. Borehole 5A was noted as rich in molluscs from 181-213cm depth, so a core was taken at this location also.

- Transect E produced 0.25m of organic silts and shelly sands in boreholes 7 and 8. This has been treated as the same channel as that recorded in Transect D and has not been sampled.

5.11.2.2 *Radiocarbon dating*

Samples from the organic deposits in three of the cores were submitted for radiocarbon dating. These comprised Transect A (BH4A at 2.64m depth), Transect B (BH4A at 2.68m depth) and Transect D (BH7a at 2.64m depth).

The three radiocarbon determinations indicate that the organic sediments sampled in Transects A and B date to the early Bronze Age and may well derive from different parts of the same palaeo-channel. The date from BH7a in Transect D is significantly later, dating to the very late Bronze or early Iron Age suggesting a later channel of the River Great Ouse.

5.11.2.3 *Pollen*

The assessment of the eleven samples from three cores from floodplain deposits has demonstrated that sub-fossil pollen survives in the sediments, but that preservation ratios are low.

There is the potential to conduct further palaeoenvironmental work on the material with AMS radiocarbon dating. This material has the potential to provide a window into the past vegetational history of the site.

5.11.3 **Summary**

It is evident that a Bronze Age and Iron Age palaeochannel of the River Great Ouse have been located and recorded. Early Bronze Age deposits were identified within a channel by transects A, B and C. Although the latter was not cored or dated it is supported by the limited aerial photographic evidence (Rackham 2008) which suggests that transects B and C cross the same palaeochannel. One might have expected from the photographic data that Transect D also crossed this channel, but the radiocarbon date from BH7a indicates sediments nearly a thousand years later. The palaeochannel fills, although organic, are calcareous and pollen preservation is not good, although plant macrofossils and wood are recorded as present. Snails, both terrestrial and aquatic, are recorded in the cores and Core 5AA specifically recovered a sequence of mineral sediments in which snails were observed in the lower channel fills and the overlying alluvial deposits.

No archaeological deposits or ancient land surfaces (palaesols) were recognised during coring. Although no 'river banks' were identified when the level and depth data is plotted the location of channel edges can be construed in the area of the transects. The alluvial sediments indicated repeated seasonal flooding of the floodplain. The occurrence of the latter suggests that there will be no permanent settlement on the valley floor. However, the floodplain is likely to have been used for summer pasture or hay production. Had Mesolithic or Neolithic activity occurred on the river banks all evidence is likely to have been scoured away by channel movement and erosion across the floodplain.



Analysis of the Biddenham Loop sediments will permit some consideration of the palaeoenvironmental history of the River Great Ouse and its surrounding landscape. Similar information is rare in Bedfordshire. In fact only one dated sequence is published from the River Flit near Flitwick (Scaife 2000, 22) about 8 miles south of the investigation area. A possibly contemporary but undated sequence was recovered from a quarry between Sandy and Biggleswade (Scaife 2000). An as yet unstudied palaeochannel sequence from Willington Quarry on the banks of the Great Ouse has also been dated to the early Bronze Age (Rackham in prep.).

With Bronze Age monuments, fields, pit alignments and settlement excavated within the adjacent housing development area, the significance of the contemporary organic river channel sediments is greatly enhanced. They will give a unique opportunity to investigate the vegetation and landscape changes between the early Bronze Age and the 1st millennium BC.



5.12 Scientific dating

5.12.1 Introduction

Scientific dating of key deposits was undertaken to assist in finalising the phasing hierarchy. The selection procedure and rationale for each sample was detailed in a document agreed with the Consultant on 22nd May 2009 (Albion 2009c). The document described the deposits, outlined the reasons for their selection and highlighted the value of obtaining a scientific date. Selections were made during the creation of the provisional phasing/contextual hierarchy. The majority of the scientific dating was radiocarbon but two deposits were subject to optically stimulated luminescence (OSL) to test the suitability of this method. The material available for scientific dating included animal bone, human bone (including cremated), antler, charcoal, charred seeds and soil.

Selection took account of the following:

- Classification as a “key” deposit requiring dating.
- Absence of firm artefactual dating evidence.
- Likely pre-Roman date, unless the context was of intrinsic interest
- Presence of adequate quantities of material that could be used for dating, *e.g.* bone samples had to exceed 5g.
- Preference was given to material that was less likely to be residual, *e.g.* human burials and animal bone groups (ABGs).
- Cremated bone was chosen from the most productive spit within the cremation deposit (excluding the uppermost spit).
- Preference was given to primary, then secondary fills. Tertiary fills were excluded unless significant in their own right.
- Preference was given to charred seeds over charcoal due to the potential longevity of wood.
- Usually only one sample was selected from each contemporary Group.
- Usually only one Group was sampled from each Landuse area (unless contemporaneity was in question).

5.12.2 Radiocarbon dating

The samples were sent in two batches, largely determined by the availability of the material to be dated. Of these six were either rejected by the lab due to insufficient carbon content or failed for other reasons. These comprised RCD 4, 9, 14, 28, 29 and 32. A total of 52 samples were successfully subject to destructive accelerator mass spectrometry (AMS) dating. All samples were given a Glasgow University (GU) lab number and on the successful achievement of a determination a SUERC radiocarbon date number. All have been issued with a dating certificate which forms part of the site archive. For further information on the methodology see section 9.14.1.

The radiocarbon dates range from 3950–3710 Cal BC (RCD 8) to 1020–1170 Cal AD (RCD 2). However, the majority derived from the early Bronze Age and middle Bronze Age (see Table 53 which is presented in original sample number order to facilitate cross-referencing back to the strategy document). The majority of the dates fit in with the stratigraphy and expectations based on the



provisional phasing. In the few cases where they do not the results are logical and consistent with other evidence.

Additional work will focus on:

- Radiocarbon dating of suitable material associated with late Bronze Age/early Iron Age pottery — difficult to date due to its fragmentary nature (see section 5.3.6) — which occurs within “key” deposits. For additional information see section 9.14.3 and Table 52
- Where possible, Bayesian analysis on the radiocarbon dates. This will allow the combination of different types of information, *e.g.* stratigraphy and radiocarbon dates, to produce more realistic estimates of the dates of key past events. For example, the inhumation within the original early Neolithic monument L2312 is stratigraphically earlier than the inhumation within the recut monument L2313. Bayesian analysis will help to refine the dating of both burials and the monument itself. For additional information see section 9.14.3.

5.12.3 Optically Stimulated Luminescence dating (OSL)

Sample recovery and background radiation reading for potential optically stimulated luminescence (OSL) dating was carried by Dr Simon Armitage of Royal Holloway University, London. The selection of samples was restricted to ‘key’ deposits without firm dating evidence which had sufficiently high quartz grain content to facilitate this dating technique. For further information on the samples taken on site and the methodology see section 9.14.2.

Nine samples were taken, mainly from monuments, a pit alignment and a shaft. As the suitability of deposits on the Biddenham Loop for OSL dating was untested only two samples were chosen for initial processing (samples 8 and 9); they derived from stratigraphically early and late deposits within early Neolithic hengi-form monument L3211/12.

The results were as follows:

- Sample 8 from monument L3211 (SL1, SP3) = 8,800+/- 600 years old
- Sample 9 from monument L3212 (SL1, SP3) = 9,500+/-600 years old

The two assessed samples yielded ages which are much older than the archaeology suggests. The individual age estimates (24 per sample) were quite variable. This often indicates that the sample wasn’t fully exposed to sunlight prior to burial. This would yield age overestimates, since some of the “geological” OSL signal remains in the sample at the point it is deposited.

It is likely that the dates received are a combination of the date of exposure during the construction of monument L3211 and the last geological exposure of the quartz grains to sunlight before being deposited as glacial outwash (around 10,000 years ago).

No dating of the remaining OSL samples is proposed because successful cannot be guaranteed.



6. DISCUSSION OF THE MAJOR RESEARCH THEMES FOR ANALYSIS

6.1 Introduction

The original generic aims and objectives and research themes for analysis were presented in the Management Strategy (CgMs 2007) and the Written Scheme of Investigation (Albion 2007b). These and a number of new ones determined by the results of fieldwork are discussed below.

The investigations have produced evidence for a landscape utilised from the Mesolithic to the present day. The types of human activity have varied both chronologically and spatially. This activity will be examined both within single chronological periods and as cross-period themes. The latter will ensure that any continuity and discontinuity in the landscape will be explicitly considered.

The Bypass and DWH investigations are extensive in their own right. However, by combining both projects a significant swathe of the Bedfordshire countryside will be examined within a single chronological and landscape framework. This will result in a more meaningful interpretation than could be achieved by either project individually. It will provide an opportunity to give a wider landscape setting to the settlements, field systems, major boundaries and funerary/ceremonial monuments/events. In addition, the value of combining two substantive investigations undertaken to the same methodology significantly enhances their group value.

6.2 National, regional and county research frameworks

At a national level, English Heritage's criteria for prioritising archaeological "sites" is evolving. It's funding criteria for rescue projects, as set out in *Exploring our Past* in 1991 (English Heritage 1991b), were similar to those it uses to define a "site" as being of schedulable quality. These included period, rarity, group value, survival/condition, fragility/vulnerability and potential. More recently a draft Research Agenda (English Heritage 1997) builds upon the earlier criteria, with the aim of developing an approach reflecting 'the greater determination to pursue research themes' and 'wider interests (e.g. in landscapes)'. These include goals such as advancing understanding of England's archaeology, supporting the development of national, regional and local research frameworks and promoting public appreciation and enjoyment of archaeology. Although the Research Agenda was intended for projects seeking English Heritage resources, i.e. not those undertaken within the PPG 16 framework, its goals and objectives are relevant to the Land west of Bedford investigations.

National priorities for the Iron Age and Roman periods were formalised over 10 years ago by Hingley (1989), Millet (1990), English Heritage (1991), James and Millet (2001), Haselgrove *et al.* (2001), and, specifically for ceramics, by the Prehistoric Ceramics Research Group (PCRG 1991) and the Study Group for Roman Pottery (Willis 1997).



The archaeological resources of the East Anglian region were assessed in 1997 (Glazebrook 1997) and a regional research agenda and strategy was produced in 2000 (Brown and Glazebrook 2000).

However, of more relevance to the Land west of Bedford investigations are the series of papers on the Archaeology of the Great Ouse Valley (Dawson 2000a) and the resource and research agenda for Bedfordshire (Oake *et al.* 2007)

6.3 Examine a transect through the river gravels and adjacent clayland

6.3.1 Overview

The location of the investigations means that the principal project aim is to examine in detail a landscape of relatively dense, multi-period human activity adjacent to the River Great Ouse. The two major land parcels are situated on different geologies — Biddenham Loop on sandy gravels and Land west of Kempston mainly on the clay periphery of the Marston Vale.

Until relatively recently the river valley and its gravel terraces rather than the adjacent claylands dominated the evidence for past human activity. The evaluation undertaken in advance of both the Bypass and DWH developments appeared to support this position. The absence of evidence from the clay had led to the suggestion that these areas were largely unsettled in the Roman (Simco 1984, 21) and other periods. However, over the last ten years some, but not all, fieldwork on the clay has produced evidence. Activity pre-dating the early Iron Age is still very rare; for example, none was found at all on the recent Bedford-M1 road scheme (Andy Simmons pers. comm.). Limited evidence for the Iron Age is known but is limited to settlements, *e.g.* within the Wixams (Ingham forthcoming), Luton Road, Wilstead (Luke and Preece forthcoming c), Steppingley to Willington pipeline (Network Archaeology 2004, 189). More substantive evidence for Roman settlement is now known, *e.g.* Stagsden Bypass (Dawson 2000b, 61-66), Great Barford Bypass (Timby *et al.* 2007).

Within this context, the results of the Bypass and DWH investigations are significant because they have located significant pre-Roman activity on the clays to the west of Kempston. Limited activity, evidenced by small pits, was taking place there in the late Neolithic and early Bronze Age, although the evidence is nowhere near as dense as that from the Biddenham Loop. Small pockets of middle Bronze Age features were also found; they were more widespread than those of earlier periods. More substantial evidence was found for the late Bronze Age in the form of pit alignments (within the Bypass investigations) and during the middle Iron Age in the form of a substantial boundary ditch (within both investigations).

This project, which includes substantial open area investigation on both gravels and clays, therefore provides an excellent opportunity to address the imbalance between our level of understanding of past human activity on these two types of geology. It now seems increasingly likely that the view that the clays were largely uninhabited was probably a reflection of the fact that the majority of archaeological investigation in Bedfordshire had been undertaken on gravels in river valleys not clay (Oake 2007, 4).



6.3.2 Statement of potential

Due to the location and nature of the investigations there is excellent potential to address this issue on both chronological and spatial grounds.

6.4 Establishment of a chronological framework

6.4.1 Overview

This document demonstrates that it has been possible to establish a combined intra- and inter-period chronological framework for both projects. All significant features/deposits have been assigned to chronological periods. This was achieved primarily through the examination of artefact typology and stratigraphic sequence. The phasing hierarchy has also been ‘calibrated’ by c. 85 radiocarbon dates (52 funded by DWH and 33 by the Bypass). This framework is fundamental to the successful conclusion of the project and will underpin the future analysis of all data-sets.

6.4.2 Statement of potential

Due to the artefactual dating, stratigraphical evidence and radiocarbon dating there is excellent potential to address this issue.

6.5 Continuity and discontinuity in the landscape

6.5.1 Introduction

The investigations have produced evidence for twelve chronological periods. The latter can usefully characterise activity at a particular point in time and, thereby, highlight discontinuity. Conversely, they can also hinder an appreciation of continuity in the landscape. The transition from one chronological period to the next is a common theme in both national (English Heritage 1997, 43-45), regional (Brown and Glazebrook 2000) and county research agendas (Oake *et al.* 2007). Continuity, discontinuity and transition from one period to the next are, therefore, a major research theme and are discussed briefly below.

6.5.2 Mesolithic to early Neolithic

Within Bedfordshire and the region, the majority of the evidence for Mesolithic occupation like that on the Biddenham Loop, comprised flint scatters within the ploughsoil rather than sub-surface features (Luke 2007, 25; Dawson 2000, 47-49). This may reflect the mobility of hunter gatherers groups during this period but does make it difficult to identify the change to more sedentary lifestyle.

6.5.3 Early and late Neolithic to early Bronze Age

It has long been recognised that the Biddenham Loop contains a concentration of monuments (Field 1973; Woodward 1978). However, it is clear from the recent investigations that individual burials, shafts and a large number of small pits are also present.

There is good evidence from the recent investigations to suggest that the different types of monuments originated in different chronological periods, *e.g.* hengi-form are early Neolithic, oval types are late Neolithic and circular burial monuments are early Bronze Age in date. However, it is all too easy to assume that monuments are of a single phase and function, whereas there is increasing



evidence that some had complex constructional histories and varied functions (Luke 2007, 51). Examples from the recent investigations include the re-digging of the ditches that define monuments and the re-use of one early Neolithic monument (L2310) as the site of a later circular burial monument (L2314).

In addition, there is clear evidence that some monuments retained their significance to the local population for a prolonged period. For example, each monument cluster on the Biddenham Loop appears to be focussed on an early Neolithic monument. A number of monuments were also repeatedly used as burial sites, *e.g.* L2104 which contained burials dated to the early and middle Bronze Age, and the middle and late Iron Age. Such continuity is supported by the monuments' incorporation into the middle Bronze Age field systems, with the southern and northern field systems broadly corresponding to the location of earlier monument clusters.

The small pits and postholes are considered to be evidence for occupation sites during these periods. A number, but not all, of the pits contain pottery, flint, animal bone and charred plant remains. Although chronologically distinguishable on the basis of the presence of different pottery styles, the form and contents of late Neolithic pits are essentially indistinguishable from those of early Bronze Age date. The absence of buildings/structures, storage facilities and fields has suggested to some that the earlier transient lifestyle continued and was not necessarily replaced at this time by one based around settled agriculture (Bradley 1986, 39).

Radiocarbon dating of the shafts indicates that the majority were infilling during the early Bronze Age but there is clear evidence from one dated to the early Neolithic that they may have been part of an earlier tradition.

6.5.4 Early Bronze Age to late Bronze Age

In the Thames Valley the change from a landscape dominated by monuments to one divided into fields is known to originate in the middle Bronze Age and to continue to develop until the end of the late Bronze Age (Yates 1999). However, evidence for such a change has been very difficult to detect in Bedfordshire (Dawson 2007, 59 and 61), but is better known in Cambridgeshire (Yates 2007, 94-8). The only site in the county with any evidence for middle Bronze Age fields is Broom (Cooper and Edmonds 2007, 89). Therefore, the discovery of a well dated and extensive middle Bronze Age landscape, including fields, on the Biddenham Loop is one of the most significant discoveries of the investigations. Although this change may appear to be 'dramatic' the earlier monuments were not ignored or forgotten. As described above they were incorporated into the new layout and some continued to be the focus of burials.

Continuity is also indicated by the way middle Bronze Age settlement SL93 is in the same location as early Bronze Age settlement SL8. These, like the late Bronze Age settlement identified within the Bovis investigations, are located in a similar position on the periphery of the fields. Continuity of these fields into the middle Iron Age is also indicated by the way the farmsteads are also located around the periphery of the earlier fields suggesting they remained in use.



The positioning of the main pit alignment across the Biddenham Loop could be used to demonstrate both discontinuity and continuity. It does cut a number of earlier field boundaries. However, it does so at the corners of fields on the periphery of the systems; for the majority of its course it crosses the unenclosed land between the two main field systems. Overall and taking into account other evidence, it is likely that the field systems remained in use after the pit alignment had been constructed.

6.5.5 Late Iron Age to Romano-British

With a single exception, all the Romano-British settlements appear to have originated in the late Iron Age, as was the case with the contemporary farmsteads on the Bovis investigations. Again like the latter, none directly overlay middle Iron Age settlements. Similar settlement shift and/or landscape reorganisation has been observed elsewhere in Bedfordshire, *e.g.* Stagsden Bypass (Dawson 2000, fig. 17), Hinksley Road, Flitwick (Luke 1999, 83).

No obvious fields were created in the southern part of the Loop during the Romano-British period and it is therefore presumed that, although two new trackways clearly crossed some of the middle Bronze Age field boundaries, many of the earlier fields may have been retained.

6.5.6 Roman into Saxon

There is little evidence for activity within the Romano-British settlements in the late 4th century. The transition from Roman empire to Saxon kingdoms has frequently been highlighted as of particular importance (English Heritage 1991b, 1997). In Bedfordshire ‘few excavated Romano-British sites show continuity of occupation into the Saxon period’ (Edgeworth 2007, 87). However, he like Wade (2000) considered that the impression of an abrupt change was more associated with the cessation of coin and pottery production in the late 4th century. Within the recent investigations it is significant that the majority of the evidence for early Saxon settlement occurs in the vicinity of Romano-British settlements. In the case of SL62 on the Biddenham Loop the majority of the SFBs were established within a peripheral enclosure of the earlier farmstead. Interestingly, there is also some evidence from the charred plant remains that one of the early Saxon settlements was growing cereals that were more typical of the Romano-British period than of the middle-late Saxon period.

6.5.7 Saxon-Norman through medieval to post-medieval

There is a dramatic drop off in evidence for settlement in the Saxo-Norman period, compared to the early Saxon and Romano-British periods. This is presumed to be associated with the nucleation of settlements around this time (Edgeworth 2007, 93) – settlements which were located outside the investigation areas. However, in terms of continuity it is noticeable that settlement around The Bury, on Land west of Kempston, which originated in the early Saxon period continued through the Saxo-Norman, medieval and post-medieval periods to the modern day.

6.5.8 Statement of potential

There is excellent all round potential to elucidate the issues of continuity and discontinuity in the development of the landscape.



6.6 Determine the nature of settlements

6.6.1 Introduction

Over twenty different settlements have been identified within the investigation area. The nature of the evidence for these varies by chronological period.

6.6.2 Origins, development and mobility over time

The origins and continuity of settlement sites from earlier periods has been discussed above.

The evidence for settlement during the late Neolithic and early Bronze Age principally comprises small pits and postholes. These occur both individually and as clusters. There is an ongoing discussion, which the evidence from the investigations will be able to contribute, over whether they represent permanent settlements or sites that were repeatedly occupied for relatively short periods of a time by an essentially mobile population (Thomas 1999; Garrow *et al.* 2005).

The morphology of the settlements appears to be quite distinct within different chronological periods. Contrast, for example, the dispersed late Neolithic and early-middle Bronze Age settlements with the unenclosed, but compact, middle Iron Age farmsteads. These, in turn, were different to the Romano-British farmsteads, which always comprised a series of rectangular enclosures — again in contrast to the settlements of the early Saxon and Saxo-Norman/medieval periods.

It is clear that the layout of settlements within individual chronological periods, especially those of Romano-British and Saxo-Norman/medieval date, were not static but changed over time. Excavation at Hinksley Road Flitwick similarly demonstrated a switch from unenclosed to enclosed settlement during the early-middle Iron Age (Luke 1999, 81-3).

6.6.3 Layout and function

The characterisation of each settlement is essential to facilitate comparison with contemporary settlements within the investigation areas and on other sites. This will involve study of the artefactual and ecofactual evidence but also of settlement layout. The different settlement ‘types’ will contribute to a number of current research areas. For example, Bryant has highlighted that for the late Bronze Age/early Iron Age the majority of settlements in East Anglia are unenclosed, but in Wessex they are enclosed (1997, 25). However, within Bedfordshire both forms exist (Dawson 2007, 62).

- **Late Neolithic/early Bronze Age-** possible settlements of this period are nationally rare (Brown and Murphy 1997, 12). The Biddenham Loop is peppered with small pits and postholes of these periods. However, even when the features occur in clusters it is unclear if they represent anything more than short-term, repeated occupation of the same piece of land. The analysis of all pit contents may contribute to this debate especially if they are interpreted not as ‘structured’ deposits. The extent of SL8 (SP5) is also particularly important.
- **Middle-late Bronze Age/early Iron Age-** the number of excavated sites in the county is tiny (Dawson 2007, 61) and English Heritage



has highlighted the paucity nationally of settlement of these periods (1991 and 1997). Therefore, the dispersed settlement evidence on the Biddenham Loop in the form of SL93 within the recent investigations and that identified within the Bovis investigations are particularly important. They can be compared to similar settlements known elsewhere in the country, *e.g.* Heathrow Perry Oaks (Lewis *et al.* 2006, 114) and Heselton (Powesland 1996).

- **Early-middle Iron Age-** the unenclosed nature of the farmsteads on the Biddenham Loop fits the regional trend (Bryant 1997, 25). The farmsteads from the recent investigations will be compared to those which appear to be very similar within the Bovis investigations (Luke 2008, 39-42) and others known regionally.
- **Late Iron Age/Romano-British-** the number of published rural farmsteads, like those on the Biddenham Loop is still small in comparison to their actual numbers (Going 1997, 38). The layout and extent of the Church End settlement SL155 led Dawson to state ‘no other site like this has been investigated in the county and it may have been a planned settlement’ (2007, 73).
- **Early Saxon-** settlements of this period in Bedfordshire often comprise a small number of SFBs and/or wells (Edgeworth 2007, 91-3). The presence of larger, post-built building is rare, *e.g.* Harrold Meadway (Albion in prep.), but their existence elsewhere has been used to suggest that SFBs mainly served as ancillary sheds or workshops. The numbers and clustering of the SFBs within SL62 are unusual for a settlement in Bedfordshire.
- **Saxo-Norman/medieval-** the only settlement within the investigation area of this period was located in the vicinity of The Bury, Land west of Kempston. It comprised both dispersed and enclosed elements. Excavation of rural, non-moated settlements in Bedfordshire is quite rare (Edgeworth 2007, 99).

The establishment of ground plans of entire settlements was a key aim of the investigations. For Romano-British and Saxo-Norman/medieval settlements that extend beyond the investigation area this will only be possible through the use of geophysical survey (to be undertaken as part of the Bypass investigations). The latter will complement the evidence from the excavations which has identified domestic and non-domestic enclosures within the Romano-British settlements on the basis of feature types and artefacts present.

6.6.4 Core and periphery

Evidence for non-settlement activity on the periphery of settlements has, in the past, frequently been missed or overlooked. However, with more extensive excavations, like those reported on in this document, it is now increasingly being recognised, at least for the Iron Age (Haselgrove *et al.* 1989). This is the case with the middle Iron Age farmsteads especially those on the west on the Biddenham Loop. This will contribute to our understanding of the utilisation of the landscape away from the “core” and thus help redress the current imbalance in our knowledge.



6.6.5 Statement of potential

The evidence from the investigations has excellent potential to contribute to this issue.

6.7 Determine the nature of activity away from settlements

6.7.1 Overview

Prior to large-scale open area excavations, much investigation was concentrated on settlements, so that little information about the wider landscape was available. The investigation of Romano-British trackways, fields, burials and shrines therefore provides a valuable addition to the current poor knowledge of activity within the rural landscape in the region (Going and Plouviez 2000, 19).

Presumed major land boundaries, such as the late Bronze Age/early Iron Age pit alignments and the middle Iron Age boundary ditch, may be linked to increasing territoriality during these periods. Pit alignments are well known regionally and nationally, although only a few are known within Bedfordshire outside of the recent investigation area (Dawson 2007, 61). On the one hand, pit alignments' very nature suggests that they served a boundary function but, on the other hand, their interrupted nature would not have provided an effective physical barrier. The significance of those within the investigation area is enhanced both by their presence within an area of intense past activity and by the fact that the main one on the Biddenham Loop is firmly dated.

6.7.2 Statement of potential

The evidence from the investigations has excellent potential to contribute to this issue.

6.8 Beliefs and practices

An insight into the beliefs and practices of past peoples is provided by their monuments, treatment of the dead and evidence for 'structured deposits'

6.8.1 Monuments

'In general the ceremonial/funerary monuments in the county are not well understood either individually or as groups or complexes' (Oake 2007, 9). Indeed, the fundamental interpretation of ring ditches as either ceremonial or funerary is often impossible to determine based on non-intrusive survey or ploughed out remains (see Clare 1986: 1987).

Three different 'types' of monument have been identified on the Biddenham Loop: early Neolithic henge-form, late Neolithic oval enclosures (dated to this period on very tentative evidence) and early Bronze Age circular monuments (with at least two different sizes identifiable). However, it was only possible to demonstrate in a small number of cases, where central burials were present, that the monuments' original or primary function was funerary.

What is clear is that the early Neolithic henge-form monuments were distinct from the ring ditches in that they were noticeably sub-circular (with L2313 more polygonal in plan), had been redefined or altered in some way and often had entrances. In addition, L2312/13 contained burials within its ditches and the steep profile of L2310/11 suggests it may have held a palisade. These are,



therefore, interpreted as ceremonial monuments, a function that is probably supported by them becoming the focus of later monuments.

It is of course possible that their function changed over time and even that some served multiple functions.

6.8.2 Human burials

Human burials have been identified from nearly all chronological periods up to the end of the Romano-British period on the Biddenham Loop. This will enable changes in burial practices over time to be examined. For example it is noticeable that a large number of burials occurred in the middle Bronze Age but that the subsequent periods were largely devoid of burials. The change from “formal” late Neolithic/early Bronze Age burials to the far less archaeologically apparent burial practice of the late Bronze Age/early Iron Age has been discussed by Bruck (1995) and has been identified as a regional research priority by Brown and Murphy (2000, 10).

The greatest numbers of human burials occurred in the middle Bronze Age in part because of the presence of a cremation cemetery. Both inhumations and cremation burials were present. A number were found within or adjacent to field ditches. The four inhumations from the Bypass investigation are particularly interesting because they were all placed around the same time (as indicated by radiocarbon dating) in a crouched position within individual ditch segments. A small number of isolated inhumations and cremation burials were associated with Romano-British farmstead SL51/52. A cemetery containing 31 inhumations was located on the periphery of farmstead SL54 within the Bypass investigations. These are particularly significant because ‘Roman burials are remarkably uncommon in the eastern region’ (Going and Plouviez 2000, 19) especially from rural settlements. Whilst the situation is a little better in Bedfordshire, our understanding of burial practices has not “really progressed” (Oake 2007, 11). The *Bustum* burial L2399 is a fairly rare type of burial and the first to be positively identified in Bedfordshire. It is interesting that it was located a considerable distance from the nearest settlement.

6.8.3 Shrines or funerary structures

The small possible ritual complex of late Iron Age/early Romano-British date is intriguing because no exact parallels are known in Britain. It is located away from contemporary settlement towards the centre of the Loop. The arrangement of square structures and a larger rectangular enclosure is similar to a number found in northern France (Haselgrove 2007, 496-8, fig. 3). Two Romano-British period structures within the Bypass investigations have also tentatively been identified as shrines or funerary structures. Again, they are located away from contemporary settlement but are similar to possible funerary structures found on the periphery of the nearby settlement at Kempston Church End (Dawson 2004, 42 and fig. 3.18).

6.8.4 Animal burials

The majority of the animal burials were radiocarbon dated to the middle Bronze Age. Of these, one was a sheep within one of the field ditches and four were cattle (including the three within the Bypass investigations). Complete skeletons of cattle dating to this period have rarely been found and their discovery is of



zooarchaeological significance. However, the association of significant numbers of cattle bone with burial monuments is known at Irthlingborough, Northants. (Davis and Payne 1993) and Gayhurst, Bucks. (Deighton and Halstead 2004). Complete and incomplete animal burials were also found in the early Neolithic and early Bronze Age shafts and within middle Iron Age storage pits.

6.8.5 ‘Structured’ deposits

Possible structured deposits were identified in the majority of the chronological periods represented within the investigations (Table 10). These comprise unusual quantities/types of flint (from late Neolithic, early Bronze Age and in particular middle Bronze Age deposits), articulated animal bone (from early Iron Age, early Bronze Age and middle Iron Age deposits), unusual overall artefact assemblages (from all periods) or placement of animal skulls (from Romano-British deposits within the Bypass investigations). These may be evidence for ritual events which appear to have been particularly commonplace in the Iron Age (Hill 1995).

6.8.6 Statement of potential

The overall evidence from the investigations has excellent potential to contribute to this issue.

6.9 Establish the settlements’ socio-economic basis

The charred plant and animal bone assemblages will provide basic data on crop and animal husbandry for most of the settlement areas.

6.9.1 Plant remains

The charred plant remains provide evidence for the agricultural economy of the settlements and changes over time. They will allow comparisons to be made on the range of crops grown. The richer samples will enable the crop husbandry and processing practices within their associated settlements to be studied. Suitable material was recovered from most chronological periods.

Wild species will indicate what food resources were “natural”, *i.e.* from woodland, hedgerows *etc.*

6.9.2 Faunal remains

Animal bone species will also provide a valuable indicator of the pastoral economy of the different settlements. The age data from the faunal assemblage will provide evidence regarding local breeding, plus the priority given to the production of meat, as opposed to secondary products. The overall age study will suggest which products were the most important within specific periods and settlements. The greater proportion of cattle may be related to the local terrain. Work done on Iron Age animal bone assemblages from sites in the Thames valley (Wilson *et al.* 1978, 136 and Grant 1984, 109) strongly suggests a link between cattle quantities and the availability of water and, therefore, of suitable pasture. Some of the bones exhibit butchery marks. In addition, there are a number of deposits which represent clear evidence for the accumulation of waste from specialist processing (within the Bypass investigations).

In their own right the middle Bronze Age cattle skeletons are important because such remains are rarely found in Britain and their discovery is of



zooarchaeological significance. There is good evidence for an increase in the size of particular domestic stock by the Romano-British period which fits a known trend in southern England in general (Maltby 1981, 185). It is unclear if this is due to an improvement in husbandry practices and/or the introduction of larger stock.

Low numbers of bird, deer, hare and fish bones were found in the Romano-British period on farmstead SL54 (within the Bypass investigations) and settlement SL155 suggests the utilisation of wild animals. The low numbers may be associated with the landowner/hunting rights issues rather than simply a genuine lack of wild species.

6.9.3 Artefacts

Artefact evidence was found from most chronological periods for craft that included:

- Textile production- multiple loom weights in late Bronze Age/early Iron Age settlement SL125, spindle whorls, loom weights, pin beater from early Saxon settlement SL62
- Iron working- hearth bottom from middle Iron Age farmstead SL35 and slag from early Saxon SL62
- Leather working- awl from Romano-British deposits
- Bone and antler working- off-cuts from middle Iron Age and early Saxon deposits

6.9.4 Other evidence

The layout of the middle Bronze Age field system, its trackways and large pits, along with the faunal and plant remains, will enable the function of the fields to be discussed. Although it is clear that the fields were used for animal husbandry, it is unclear if this was restricted to winter months when the floodplain may have been flooded (as suggested for Fengate by Prior 1996, 316), or were part of a system of crop/animal farming within individual landholdings (as suggested by Lewis *et al.* 2006, 1532-3). The evidence for Romano-British fields and trackways (within the Bypass investigations) and the presence of possible vineyards will add to the overall picture.

6.9.5 Statement of potential

The overall evidence from the investigations has good potential to contribute to this issue.

6.10 Society

6.10.1 Overview

The evidence from the settlements of all periods within the investigation area is consistent with farming communities. Further analysis will help to determine the status and cultural associations of the occupants. Some evidence for the 'status' of the occupants of the Iron Age and Romano-British settlements can be derived from the structural, artefactual and ecofactual data-sets. However, such evidence is never particularly clear-cut and cannot be directly equated with a particular type of rural settlement (Taylor 2001, 50; Hingley 1989, 159-61). To some extent, the evidence for 'status' of the Romano-British settlements is



inextricably linked to the occupants' adoption of Roman culture and this may not necessarily be directly linked to their 'status'.

Some of the questions to be asked with regard the occupants of the settlements are:

- 1) Are there any differences between the various middle Iron Age farmsteads?
- 2) Was Romano-British settlement farmstead SL54 occupied by people of higher status than the other farmsteads within the Biddenham Loop?
- 3) Could the Kempston Church End Romano-British settlement SL155 have originated as a deliberately planned village?
- 4) Was the Saxo-Norman and medieval settlement SL168/169 and SL172 part of a manorial complex?

These questions will be resolved principally by the analysis of the artefactual assemblages. However, even the animal bone assemblage may help, especially in the case of the possible presence of specialist butchers on settlement SL155 (within the Bypass investigations) and improved stock, particularly horse, on the Biddenham Loop farmsteads.

6.10.2 Statement of potential

The overall evidence from the investigations has good potential to contribute to this issue.

6.11 Investigate the wider environment

In addition to providing information on the vegetation, foraging and crops for several different chronological periods, the charred plant remains and charcoal will provide an indication of wider environmental conditions. The charcoal will provide complementary information on woodland resources and their exploitation during various periods. However, for the early and late Bronze Age it is the palaeo-environmental study in the present floodplain that will provide more detailed and reliable information. This is particularly important because this represents a key period of time in the transformation of the open monument-dominated landscape to one enclosed by fields and trackways

The distribution of field systems, isolated features and artefacts within the ploughsoil may permit an attempt at the reconstruction of the location of areas of woodland. This is an understudied part of the Romano-British landscape (Going and Plouviez 2000, 19)

The wild animal species present may also give an impression of the wider environment, although, as ever, this is not a straightforward situation. For example, the small numbers of fish bones present on all settlements within the Biddenham Loop are not what would be anticipated, given their location next to the River Great Ouse.

6.11.1 Statement of potential

The overall evidence from the investigations has good potential to contribute to this issue.



6.12 Review investigation strategy including evaluation

6.12.1 Overview

The evaluation was undertaken in several stages over a number of years – initially non-intrusive and subsequently intrusive in the form of trial trenching. On the sandy gravels of the Biddenham Loop these were reasonably successful in achieving their objectives in terms of locating, dating and characterising archaeological remains.

However, the evaluation results on the clays to the west of Kempston were a relative failure, based on the results of the open area excavations. It is not unusual for dispersed, small Neolithic and Bronze Age pits not show up in evaluations. However, the late Bronze Age/early Iron Age pit alignments, the middle Iron Age boundary ditch and even the Romano-British bedding trenches were not detected by geophysical survey or trial trenching undertaken as part of the evaluation. It may be significant that the bedding trenches within Bypass open area 10 and the middle Iron Age ditch within the DWH investigations only became visible on the surface two weeks after stripping.

In terms of methodology it will be useful to examine in more detail the major shortcomings of the evaluation and the lessons learnt during the open area excavations.

6.12.2 Statement of potential

The overall evidence from the investigations has good potential to contribute to this issue.





7. UPDATED PROJECT DESIGN

7.1 Introduction

When combined with the results of the Bypass investigations the data sets from the DWH investigations have very good potential to contribute to a number of regional and national research objectives. On this basis analysis and publication of the results is recommended.

The following sections present an Updated Project Design, outlining the nature of the analysis and publication, a timetable for completion of the work and details of the project team who will undertake it. Detailed method statements for completed and proposed tasks are presented in Appendix 2.

7.2 Computer-based system of analysis

Albion operates a fully integrated computer-based system of analysis. Databases, digital drawings and photographs are interfaced *via* a GIS system (Gsys) allowing all chronological, spatial and material groupings (and any combination thereof) to be viewed and manipulated.

The system enables rapid and flexible analysis of the different data sets. It also facilitates the output of a series of text reports, supported by plan and other graphic forms.

7.3 Phasing hierarchy

The underlying framework for the analysis and publication of artefactual and ecofactual data will be the phasing hierarchy. This had been finalised on the basis of contextual analysis, artefact dating and radiocarbon determinations.

Further details of these are provided in Appendix 1.

7.4 Publication

A joint publication with the Bypass was agreed at a meeting held on 27th May 2008 between Albion Archaeology, the DWH archaeological consultant, the Bypass archaeological consultant and the County Archaeological Officer. The benefits will be the opportunity to present the results of the investigation of a significant swathe of Bedfordshire countryside, with potential to elucidate the development of the landscape from the prehistoric period onwards. This approach has been described in more detail in section 3.3. The preferred publisher is East Anglian Archaeology who have a reputation for professional and academically reviewed publications. They were responsible for the adjacent Bovis publication (Luke 2008) and are currently publishing Marsh Leys (Luke and Preece forthcoming a).

The publication will take the form of a printed A4 monograph, supported by a body of digital data on CD.

Printed volume

- A synthetic text concentrating on the unusual, new and most significant discoveries.



- As such, it will not be a “traditional” publication like Luke 2008 or the chronological summary in this report. Rather, it will be modelled on the layout and approach of publications such as Perryoaks Heathrow Terminal 5 (Framework Archaeology 2006) and Broom (Cooper and Edmonds 2007).
- It will comprise cross period chapters as follows:
 - **Introduction**
 - **The first settlers** (Mesolithic)
 - **Landscape of monuments and settlements** (early Neolithic to early Bronze Age)
 - **Farming around the ancestors** (Middle to late Bronze Age and early-middle Iron Age)
 - **Romans and Saxons**
 - **Settlement within a landscape of fields** (Saxo-Norman, Medieval and post-medieval)
 (Note. chapter names indicated are only provisional)
- Only significant structural components, artefacts and ecofacts will be described. Some of these will be integrated with the text while others will be highlighted in some way, perhaps in boxes.
- The text will be generously illustrated with a variety of plans, artefact drawings and photographs. It is envisaged that a small number of reconstruction illustrations will be included.

CD

- The entire project database in Access database format which will provide detailed textual descriptions of the contextual hierarchy.
- Detailed plans of selected elements of the contextual hierarchy will be included where appropriate.
- Full artefactual and ecofactual analytical reports.
- CAD all features drawing

When this Assessment/UPD has been approved, a publication synopsis will be prepared and submitted to East Anglian Archaeology.

7.5 Archiving

The site archive is currently held at offices and stores of Albion Archaeology in Bedfordshire. On publication it is hoped that the project archive (artefacts subject to the landowner’s permission) will be deposited with Bedford Museum under accession number 2003.01. The intellectual property rights for all text and graphics/illustrations are retained by Albion Archaeology and individual authors. Archiving will be undertaken in line with MoRPHE (English Heritage 2006) and other relevant national standards.

The site archive currently comprises the elements listed in Table 51. It will increase in size with quantification of records and specialist reports, once these have been completed.



7.6 Timetable

7.6.1 Overview

Following the approval of the assessment and updated project design, Albion would like to proceed rapidly with the analysis and publication of the results. This would minimise any loss of project momentum.

The number of specialists involved, quantity of work, volume of data and the conflicting requirements of individual specialists' and organisations' work programmes would normally entail a lengthy timescale, especially when combining two substantial projects such as the Bypass and DWH investigations. However, because the final contextual phasing for DWH has been completed as part of this Assessment/UPD document the two projects have been synchronised (see section 3.4). As a result, once this document is approved, detailed specifications can be prepared for specialist analysis and text preparation for the combined Bypass and DWH datasets. This means that a timetable of one year to circulation of the first draft of the monograph text is possible.

7.6.2 Key stages

The key stages are summarised below. Detailed method statements, with task numbers are provided in Appendix 2.

Key stage 1	<ul style="list-style-type: none"> ▪ Final radiocarbon dating ▪ Circulation of publication/phasing hierarchy document to specialists ▪ Programming individual specialists ▪ Commencement of quantification of selected elements of datasets 	task 208.27 task 208.12	2 months
Key stage 2	Completion of analysis, specialist and site narrative/contextual database texts	all tasks to 208.27	8 months
Key stage 3	Completion of first draft of publication	up to task 209.02	6 months
Key stage 4	Circulation to consultants, advisors and other interested individuals for comment and subsequent discussion/amendments.	209.03	*
Key stage 5	Publication and archiving	up to task 210.02	*

*timescale out of Albion's control

7.6.3 Project review

Five key stages can be identified within the analysis and publication programme (see above). Completion of these principal stages of the project will each provide a natural review point (English Heritage 2006). At each of these stages a progress summary will be produced and circulated. An indication of time likely to be required to reach these is indicated above.

7.7 Project team

The project will be run by Albion Archaeology whose staff form the majority of the core project team (see below). MoRPHE stresses the possibilities for personal and professional development (English Heritage 2006, 16 and 26) and



every opportunity will be taken to facilitate CPD for team members, giving them the opportunity to expand their experience of post-excavation analysis within the scope of this project.

The majority of the external specialists will be the same individuals who have worked on the earlier stages of the project and where possible, sites in the vicinity *e.g.* Bovis Biddenham Loop, Kempston Box End, Marsh Leys.

A number of advisors, all with a current knowledge of specific chronological issues will be involved during the project at key stages. They will be invited to attend the analysis seminar (see below), provide general assistance and to comment on a draft of the publication.

- Principal author and project management- *Mike Luke (Albion)*
- Contextual analysis and drafting text- *Ben and Jo Barker (Albion)*
- Ceramic artefacts- late Bronze Age to medieval *Jackie Wells (Albion)* and Neolithic to mid Bronze Age *Carol Allen (independent specialist)*
- Coins- *Peter Guest (Cardiff University)*
- Struck flint- *Sarah Bates (independent specialist)*
- Other artefacts- *Holly Duncan (Albion)*
- Animal bone- *Mark Maltby (Bournemouth University)*
- Human bone- *Natasha Powers (MoLAS)*
- Charred plant remains- *John Giorgi (independent specialist)*
- Charcoal- *Dana Challinor (independent specialist)*
- Palaeo-environmental study- *James Rackham (independent specialist)*
- Phosphate analysis- *John Crowther (Lampeter University)*
- Radiocarbon dating- *Gordon Cook (Scottish Universities Environmental Research Centre)*
- OSL dating- *Simon Armitage (Royal Holloway University London)*
- Bayesian analysis- *Peter Marshall (independent specialist)*
- CAD drawings- *Joan Lightning (Albion)*
- Illustrations- *Cecily Marshall and Joan Lightning (Albion)*
- Photography- *Dave Stubbs (independent specialist)*
- Advisors- it is hoped that the following will agree to be advisors for this project: Vicky Cummings (Neolithic and early Bronze Age), David Yates (middle Bronze Age), David Knight (late Bronze Age and Iron Age), Peter Guest (Romano-British), Drew Shotliff (Saxo-Norman and medieval), Simon Mortimer (overall publication)

The precise role of the advisors will vary with the individual but it is anticipated that their role will be twofold:

- Can be corresponded with for advice and comparable data during the analysis and publication text writing
- Will read and comment on appropriate sections of the draft publication



7.8 Communication and management

7.8.1 General communication

As the aim of the project is to produce a fully integrated report, liaison between the team members will be important. This will particularly be the case during analysis and preparation of text sections for the publication. Close interaction between the principal author and the specialist contributors will ensure that the most important aspects of each data-set are brought to the fore.

Day to day liaison within the team and between the Project Manager and Consultant will be by email and phone.

7.8.2 Seminar

It is proposed that a round table seminar be held attended by both consultants, and as many specialists and advisors as possible. The timing of this cannot be firmly stated at this time but it will be after the circulation of the Final phasing/publication information liaison document and during the early stages of analysis.

7.8.3 Acknowledgement

The role of the client (David Wilson Homes) and consultant (CgMs Consulting) will be acknowledged in all outputs, along side where relevant the client and consultant for the Bypass investigations.





8. APPENDIX 1: EXPLANATION OF THE CONTEXTUAL HIERARCHY WITHIN THIS DOCUMENT

Albion has a standard approach to detailed contextual analysis which requires the assignment of contexts to a hierarchy. Each hierarchical level/element gradually becomes more interpretative and less detailed in nature.

The actual names given to these entities e.g. Sub-group, Group, Land use area *etc.*, is less important than their hierarchical position. Not all contexts will have progressed beyond the Group level.

During contextual analysis, work was undertaken from the bottom (context) upwards; first assigning significant contexts to sub-groups, then assigning significant sub-groups to groups, then significant groups to land use areas, then significant land use areas to phases.

It should be remembered that the Bypass contextual analysis was largely completed before work on the DWH data began. This explains why the issuing of numerical elements to the hierarchy sometimes appears a bit “clumsy”. To facilitate establishment of an overall interpretive chronological and spatial framework for both projects, two new hierarchical levels were created — Site Landscape (SL) and Site Period (SP). Project-specific land use areas were assigned to Site Landscapes and project-specific phases were assigned to Site Periods.

8.1 Site Period

8.1.1 Definition

A Site Period represents a meaningful chronological time period (see Table 4) that contains a collection of phases from different projects within the entire investigation area.

8.1.2 Numbering

1. *Not used*
2. *Reserved for residual flint artefacts from field artefact collection or excavation*
3. Early Neolithic
4. Late Neolithic
5. Early Bronze Age
6. Middle Bronze Age
7. Late Bronze Age/early Iron Age
8. Middle Iron Age
9. Late Iron Age/early Romano-British
10. Romano-British
11. Early Saxon
12. Saxo-Norman
13. Medieval
14. Post-medieval
15. Modern
20. *Unassigned*



8.2 Site Landscape

8.2.1 Definition

A **Site Landscape** represents a meaningful spatial element within a Site Period. Examples include farmsteads, monument complexes and peripheral agricultural areas. Site Landscapes may transcend different projects and excavation areas, but are divided numerically into:

- Biddenham Loop- SL01-99
- Land west of Kempston- SL100-SL199

8.2.2 Numbering

The Site Landscape number was a numerical assignment.

8.3 Phases

8.3.1 Definition

A **Phase** is a collection of land use areas, considered to be contemporary in date within a particular project and spatially discrete investigation area, *e.g.* excavated site such as Site 1, Site 2 (Bypass) or land parcel such as Biddenham Loop, Land west of Kempston (DWH).

8.3.2 Numbering

Within the Phase number the first two digits reflect the area in which the site was located, *e.g.*

For the Bypass investigations

- **Site 1-** Phase 101, Phase 102, Phase 103 *etc*
- **Site 2-** Phase 201, Phase 202, Phase 203 *etc*

For the DWH investigations

- **Biddenham Loop-** Phase 201, Phase 202, Phase 203 *etc*
- **Land west of Kempston, adjacent to The Bury-** Phase 4501, Phase 4502, Phase 4503 *etc*
- **Land west of Kempston, near Bell Farm-** Phase 4601, Phase 4602, Phase 4503 *etc*
- **Land west of Kempston, pipe trench-** Phase 5301, Phase 5302, Phase 5302

NOTE: Phases have been completely replaced by Site Period with the exception of those settlements where it was possible to recognise more than one episode of activity. These all occur on the Bypass:

Romano-British

- **SL54-** Phases 304 and 305
- **SL155-** Phases 503 to 507

Saxo-Norman

- **SL168-** Phases 802 and 803

Medieval

- **SL172-** Phases 804 to 806



Post-medieval

- **SL181-** Phases 807 to 808

8.4 Land use areas

8.4.1 Definition

A **Land Use Area**, or ‘L number’, represents a meaningful spatial element. They typically comprise spatially and/or functionally associated Groups, *e.g.* a monument (defining ditch and internal features), an enclosure (both the boundary and internal activity), an area of unbounded activity, a major boundary *etc.*

8.4.2 Numbering

A single non-decimal number, *e.g.* **L2300**, comprises only the “construction” elements, *i.e.* the “cuts”.

However, decimal point 1, *e.g.* L2300.1 represents the use (primary) infilling deposits. A decimal point 2, *e.g.* L2300.2 represents the use/disuse (secondary) elements infilling deposits and a decimal point 3, *e.g.* L2300.3 represents the disuse (either tertiary or sole) infilling deposits.

8.5 Groups

8.5.1 Definition

A **Group** represents a functionally or spatially distinct element within a Land use area. Groups are an aggregation of related deposits/features, *e.g.* a roundhouse, a structure, a collection of pits, graves sharing similar attributes, a major boundary ditch, a water pit *etc.*

8.5.2 Numbering

A single non-decimal number, *e.g.* **G23126**, includes only the “construction” elements, *i.e.* the “cuts”.

Decimal point 1, *e.g.* G23126.1 represents the use (primary) infilling deposits; decimal point 2, *e.g.* G23126.2 represents the use/disuse (secondary) elements infilling deposits; decimal point 3, *e.g.* G23126.3 represents the disuse (tertiary) infilling deposits, and decimal point 5, *e.g.* G23126.5 represents a group with a single filling deposits.

8.5.2.1 Example of phasing hierarchical assignments concerning a “cut”

1. The “cut” of a ditch (as revealed in single or multiple excavated segment) is assigned to a **group**. This group represents an enclosure boundary.
2. This **group** is assigned to a **land use area**, which includes other groups (*e.g.* buildings, pit groups *etc.*). This land use area represents an enclosure within a settlement.
3. This **land use area** is assigned to a **phase**. This phase is assigned in a sequence established by stratigraphic relationships and finds within a particular excavation area.
4. The **land use area** is also assigned to a **super landuse area** which is an amalgamation of contiguous land use entities that span excavation areas



- and/or projects.
5. The **phase** is then assigned to a chronological **site period**. This transcends all sites and represents a chronological period.



9. APPENDIX 2: METHOD STATEMENTS FOR ANALYSIS, PUBLICATION AND ARCHIVING

Due to the accelerated nature of this project, tasks shaded in grey have been completed in advance of the issue of this report.

9.1 Professional Standards and Guidelines

In addition to *MoRPHE* and associated guidelines, the project will follow all relevant guidance issued by English Heritage, much of which is available on the Historic Environment Local Management (HELM) website (<http://www.helm.org.uk>). The following are particularly relevant to this project:

- Centre for Archaeology Guidelines:
 - *Environmental Archaeology, a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, 2002
 - *Human Bones from Archaeological Sites: guidelines for producing assessment documents and analytical reports*, 2002
- *English Heritage Research Agenda: an Introduction to English Heritage's Research Themes and Programmes*, 2005
- *Discovering the Past Shaping the Future: Research Strategy 2005-2010*, 2005

Throughout the project, all other appropriate standards and guidelines will be followed, particularly those issued by the following organisations:

Archaeology Data Service (ADS) – such as *Digital Archives from Excavation and Fieldwork: Guide to Good Practice, Second Edition*, 2000 and *Archaeology Data Service CAD: A Guide to Good Practice*, 2000.

Association of County Archaeological Officers – notably *Standards for Field Archaeology in East Anglia (East Anglian Archaeology Occasional Paper, 14)*, by D Gurney (2003).

Bedford Museum – *Preparing Archaeological Archives for Deposition with Registered Museums in Bedfordshire* (Bedford Museum and Luton Museum, version 2.7. 2007).

Society of Museum Archaeologists – *Archaeological Archives - a Guide to Best Practice in Creation, Compilation, Transfer and Curation* (Brown 2007) and *Preparation of Archaeological Archives: Selection, Retention and Dispersal of Archaeological Collections* (SMA 1993).

Institute for Archaeologists (IfA) – especially the *Codes of Conduct* and any standard and guidance documents which are relevant to the project (such as *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials*, 2001).

In addition, relevant guidelines published by national or regional societies and specialist interest groups will be consulted, where applicable.



9.2 Analysis of contextual data

9.2.1 Liaison meetings (208.01)

On-going discussion will take place between the principal members of the project team throughout the analysis and publication stages. These will cover the nature of the work required, commissioning of the work, addressing queries that come up during the course of the project *etc.*

9.2.2 Analysis of HER and historical maps (Task 208.02)

The Historic Environment Record was examined to provide additional information, where necessary, on archaeological sites in the vicinity. All available historical maps have been examined in an attempt to correlate archaeological features located within the investigation area to features on the maps, in particular for the area around The Bury and Honey Hill. In addition, it will enable the medieval and post-medieval field alignments to be compared to those of greater antiquity.

9.2.3 Non-intrusive surveys (Task 208.04)

The results of non-intrusive surveys (geophysical survey and aerial photograph analysis) undertaken as part of the Bovis investigations have been fully integrated into the contextual analysis for both the DWH and Bypass investigations.

It has been agreed that as part of the Bypass post-excavation project three additional geophysical surveys will be undertaken. These are designed to improve understanding of the extent and morphology of the Romano-British and medieval remains on Bypass Areas 3, 5 and 8 which extend beyond the road corridor. This work will be undertaken when ground conditions are suitable.

9.2.4 Computerisation (Task 208.05 and 208.06)

The quantity of the datasets means computerisation was essential. Albion operates a fully integrated computer-based system of contextual analysis using databases (through Access) and a mini GIS (Gsys) for interrogation.

The digitised all features drawing was checked and corrected to ensure it linked correctly with the contextual database. Thus, the drawings are fully interrogatable and manipulable by any database table. All section drawings have been scanned so they are easily available during contextual analysis.

Once other data-sets were entered into database tables it was possible to rapidly interrogate them within the Gsys programme. For example, it is possible to plot the distribution of specific find types, or all features which are considered to be contemporary *etc.* This type of interrogation has greatly enhanced the analysis of data and, therefore, the interpretation of the archaeological remains. It will also enable basic publication figures to be produced rapidly.

Cropmarks, geophysical anomalies and selected historical maps were geo-referenced and digitised to permit examination during contextual analysis and, where possible, integration into the contextual hierarchy.

9.2.5 Sub-group and group (contextual) analysis (Task 208.07)

All contexts were assigned to a single sub-group which usually consists of one or more (typically several) contexts that are closely related, both stratigraphically and interpretatively. For example, comparable cuts within a single ditch length were assigned to the same sub-group. As a minimum, primary, secondary and tertiary fills of ditches were also kept separate at sub-group level. The sub-group to which each context was assigned was determined by analysis of the primary contextual information, specifically context sheets and section drawings that had been produced on site.

Cuts/deposits were classified as:

- ◆ Construction (post-packing and default code for all cuts)



- ◆ Naturally derived infilling
- ◆ Deliberate infilling

The sub-group allocation for each context was entered into the contextual database table. A sub-group text was written directly into the sub-group database table so that it could be easily accessed. It comprises a factual, descriptive section as well as an interpretative section, setting out the rationale behind the definition of the sub-group.

Any sub-groups which had limited or no further analytical value (*e.g.* features/deposits of geological origin) were not subject to any further analysis. Each remaining sub-group was assigned to a single group, representing a higher level of interpretation. Most, but not all, groups comprise multiple sub-groups that are all similar both stratigraphically and interpretatively.

When assigning sub-groups to groups, the artefactual and ecofactual assemblages recovered from each sub-group were considered. This helped to identify any that contained significant or unusual assemblages which might need to be considered as possible 'structured' deposits during artefact and ecofact analysis. Such sub-groups were separated out at group level.

The construction and primary fill sub-groups were assigned to the following group types:

- ◆ Ditch length
- ◆ Pit cluster
- ◆ Individual burial
- ◆ Individual hearth/oven/kiln
- ◆ Individual water pit
- ◆ Individual isolated feature
- ◆ Furrow

Other fill sub-groups, *i.e.* primary, secondary or tertiary, were assigned to separate groups to reflect the likelihood that they might be considerably later in date than the construction/use fill groups and would therefore need to be analysed separately. However, to ensure that their spatial location (*e.g.* within a specific pit group) was not lost, they were issued a group number comprising a decimal point of the "containing" group for example G11.2 is a fill of pit group G11 *etc.*

The group allocation for each sub-group was entered into the sub-group database table. A group text was then written directly into the group database table, so that it could be easily accessed. It comprises a descriptive section as well as an interpretative section. Group plans were not routinely produced, but this can be easily done *via* the relational database tables and digitised site plan.

9.2.6 Land use area and phase (contextual) analysis (Task 208.11)

Any groups with limited or no analytical value (*e.g.* features/deposits of unknown date) were not subject to any further analysis. Each remaining group was assigned to a higher level of interpretation known as a land use area. The construction and fill groups were assigned to the following land use area types:

- ◆ Monument- including internal evidence for activity
- ◆ Domestic enclosure- including internal evidence for activity
- ◆ Non-domestic enclosure- including internal evidence for activity
- ◆ Field- including internal evidence for activity
- ◆ Cemetery
- ◆ Trackway/droeway
- ◆ Boundary
- ◆ Significant isolated feature-including shaft

Groups representing fills may be considerably later in date than the construction/use groups and to distinguish these at land use area level they were assigned to a separate land use areas. However, to ensure that their spatial location, *e.g.* within a specific domestic enclosure was not



lost, they were issued a land use area number comprising a decimal point of the “containing” land use area, e.g. L2.3 is the tertiary filling land use area of enclosure L2.

The land use area allocation for each group was entered into the group database table. A land use area text was written directly into the land use area database table so that it could be easily accessed. It comprises a descriptive section as well as an interpretative section. A plan was produced for each land use area, with the location of all relevant groups marked.

Each land use area was assigned to a higher level of interpretation known as a phase, which may contain one or more land use areas. Each phase comprised land use areas that were broadly contemporary and represented the sum total of archaeological remains at a given stage on a particular excavation site or land parcel. Each phase was assigned to a site period.

The phase allocation for each land use area was entered into the land use area database table. A phase text was written directly into the phasing database table so that it could be easily accessed. It comprised a descriptive section as well as an interpretative section. A plan was produced for each phase, with the location of all relevant land use areas marked.

The completion of the land use area and phase analysis represents a key stage in the analytical programme, and is normally the precursor to the production of publication text and illustrations. However, the scale of the project and integration with the Bypass data meant that two other hierarchical levels were required — Site Period and Site Landscape. These are described in section 8 as they form the basis for the chronological summary presented in this report.

9.2.7 Provisional/final phasing and publication liaison (Task 208.12a and b)

The provisional phasing hierarchy was reviewed against other dating evidence, e.g. the pottery assemblage, radiocarbon dating *etc.*, to enable any anomalies to be identified and resolved (Task 208.12a). After this the final phasing hierarchy was established and it is this that is presented in this report.

Once this report has been approved a document known as *Final Phasing and Publication Information for Specialist* will be produced (Task 208.12b). This will include information on the final combined BWB-LWB phasing hierarchy and the format of the required publication text

9.2.8 Site narrative (database) text (Task 208.13)

It is proposed that no site narrative will be presented in the printed publication, but that the project database with the full contextual hierarchy will be included on a CD as part of the publication. This means that detailed descriptions of the different elements of the contextual hierarchy will be available in a “searchable” format, but that they will not need to be included in the print volume. The textual descriptions currently in the database were created rapidly by several different analysts during contextual analysis and were never intended for wider circulation. Therefore, the textual component of the database will require editing to ensure it is consistent and to a good standard of English.

9.2.9 Illustration mock-ups (Task 208.14)

The digitised plan and section data will be interrogated *via* the relational database tables to produce mock-up publication illustrations. Plans will be produced to illustrate Site Periods and Site Landscapes and, as appropriate, Phase, Land use areas and Groups. Those with different elements of the contextual hierarchy labelled will be provided on the CD with more interpretative figures produced for the print volume.

9.3 Analysis of pottery

9.3.1 Pottery quantification and recording (Task 208.08)

The pottery was laid out in context order. It was quantified by minimum vessel and sherd count, and weight. Fabrics were identified according to the Bedfordshire Ceramic Types Series. One new Saxon fabric type was identified. All attributes such as decoration, evidence of function (sooting, wear marks *etc.*), and manufacturing techniques (firing characteristics *etc.*) were recorded. Where possible, the pottery types were assigned to chronological period. Quantified



data was entered onto the relevant table within the project database. Provisional selection of pottery vessels of intrinsic interest for publication-standard illustration was made at this juncture (see Task 208.17 for final selection).

9.3.2 Pottery provisional/final phasing and publication liaison (Task 208.12)

See contextual analysis section.

9.3.3 Pottery technical text (Task 208.15)

Approximately 130 fabric types have been identified as a result of the quantification. A type series will be produced for all fabrics, including published references where these exist. This text will be included on the CD. However, only Neolithic, Bronze Age fabrics and new, unusual or unpublished later fabrics will be described in detail. Each entry will include a list of the forms, decoration, date range and reference illustrations within the publication. Additional selection of pottery vessels for publication-standard illustration will be made at this juncture, specifically of new or unpublished fabric types (see Task 208.17 for final selection).

Example of type series entry for previously published fabric type:

Type R07A Black burnished ware (15.5%)

Fabric: Tomber and Dore (1998, 127).

Forms: burnished bead rim jar and flat-rimmed bowl.

Date range: late 2nd century+.

Illustrations: none

Example of type series entry for previously unpublished, unusual or site-specific fabric type:

F01B Fine flint (7.8%)

Fabric: Hard fired, rough fabric with variable orange-brown to grey surfaces and core.

Occasionally reduced throughout. Contains abundant, well-sorted angular flint 0.5–1.5mm, sparse well-sorted fine sub-rounded quartz and red and black iron ore.

Forms: Jars with tapered everted, rounded or internally bevelled rims, plain hook-rimmed jars and carinated vessels. Decoration is rare and comprises fingertip impressions around the girth and neck, random scoring and smoothing/wiping of exterior surfaces. Vessel wall thickness: 7.5–7.6mm

Date range: Late Bronze Age/early Iron Age

Illustrations: Fig. 7.17 P20–21; Fig. 7.18 P29–30

9.3.4 Pottery analysis and publication text (Task 208.16)

The publication text will only be prepared on receipt of the final phasing liaison report and will comprise two elements:

- ‘Standard’ specialist report- summarising the assemblage within appropriate chronological periods by fabric type, forms, decoration and attributes. The text will refer to comparative assemblages (published or unpublished). In addition and where appropriate, the pottery assemblage from individual elements of the structural hierarchy *i.e.* land use areas and groups will be discussed. This will include the ‘special’ deposits containing pottery identified as part of the contextual analysis. This report will be included on the CD.
- ‘Significant’ highlights- summarised and short sections on, for example: specific types of pottery, *e.g.* Collared Urns, Beakers; specific assemblages, *e.g.* pots in funerary contexts; comparisons of the assemblages from different farmsteads/settlements, *e.g.* the middle Iron Age farmsteads or between the Romano-British farmsteads and larger settlement *etc.* These elements will be considered for inclusion in the print volume, possibly as boxed items within the synthetic text.

9.3.5 Pottery illustration (Task 208.17)

Final selection of pottery vessels for publication-standard illustration or photography will be made at this juncture. The criteria for the selection of illustrated pottery vessels will be based on the following:

- fabrics and forms previously unknown in the county and therefore unpublished
- better examples of those types already published



- vessels of intrinsic interest
- vessels from specific key features or groups
- representative vessels from key chronological periods

Illustration of the pottery will be carried out by the Illustrator and checked by the artefact analyst. An illustration catalogue will be produced for each pottery figure.

It is estimated that there will be 16 figures (not all full A4 page) and these may comprise the following:

- Eight figures for late Neolithic/early Bronze Age pottery illustrations
- Two figures for mid-late Bronze Age/early-middle Iron Age pottery illustrations
- Two figures for Romano-British pottery illustrations
- Three figures for early Saxon pottery illustrations
- One figure for Saxo-Norman and medieval pottery illustrations

Each figure will comprise between 6 and 10 individual pottery illustrations (pencil drawn, then inked in, then mocked up) and the approximate breakdown is as follows:

- Neolithic and early Bronze Age - 44 drawings
- Mid-late Bronze Age/early-middle Iron Age - 10 drawings
- Romano-British - 19 drawings
- Early Saxon - 36 drawings
- Saxo-Norman - 3 drawings
- Medieval - 2 drawings

Selected pottery illustrations and photographs will be presented in the print volume.

9.4 Analysis of ceramic building material and fired clay

9.4.1 CBM quantification and recording (Task 208.09)

The material was laid out in context order and quantified by fragment count and weight. Any complete or measurable dimensions were noted. Where possible, the brick and tile was also spot dated. Data was entered onto the relevant table within the project database.

Provisional selection of fragments of intrinsic interest for publication-standard illustration was made at this juncture (see Task 208.17 for final selection).

9.4.2 CBM provisional/final phasing and publication liaison (Task 208.12)

See contextual analysis section.

9.4.3 CBM technical text (Task 208.18)

A fabric description will only be produced for the CBM and fired clay where it differs significantly from that published in Bovis Biddenham Loop (Wells 2008). Each detailed entry will include a fabric description, forms and discussion on sources. This text will be included on the CD. Selection of fragments for publication-standard illustration may take place at this juncture (see Task 208.20 for final selection).

Example of a fabric type description for CBM:

Sand (75.1%)

Fabric: fine and hard fired, orange throughout, turning to brick-red where over-fired. Generally finely tempered, although some fragments are coarsely made and contain angular quartz of up to 6.0mm in size. Contains frequent, well-sorted, sub-angular multi-coloured quartz *c.* 0.2-0.5mm and dark red and black iron ore *c.* 0.1-0.3mm. Also rare angular flint inclusions of up to 5mm in size.

Forms: *tegulae*, *imbrices*, flue tiles and bricks.

Illustration: Fig. 15 nos. 1-6.

Source: although no production centres are known in the immediate vicinity, it is likely that the quartz inclusions found in sandy types derive from the Greensand ridge.



9.4.4 CBM analysis and publication text (Task 208.19)

A brief 'standard' specialist report will be produced, based on the summary presented in this document. Only the following material will be subject to further study:

- Romano-British material from farmsteads SL51 and SL52. This will enable the material to be compared with Bypass material from farmstead SL54 (which is believed to have contained substantial buildings) and settlement SL155 (believed to be a unique type of site in the county)
- Early Saxon unfired clay from the fills of SFBs G23241 and G23243. This will allow this material to be compared to similar assemblages encountered in SFBs at other sites, such as West Stow, Mucking *etc*

9.4.5 CBM illustration (Task 208.20)

It is likely that only selected material of unfired clay with diagnostic elements will be illustrated.

9.5 Analysis of worked flints

9.5.1 Flint quantification and recording (Task 208.10a)

The flint was quantified and completeness, presence of cortex, patination, sharpness, and edge damage were noted, as well as the presence of hinge fracture and whether the debitage was primary (dorsal face completely covered in cortex). This data was entered onto the project database. Identification and data entry was carried out by Sarah Bates.

9.5.2 Flint technical catalogue (Task 208.21a)

A technical catalogue will be produced containing an entry for *c.* 638 flints. Detailed descriptions will be provided for each with references to similar examples from other sites. This will comprise a database table and will be included on the CD. Selection of objects for publication-standard illustration will be made at this juncture (see Task 208.23 for final selection).

9.5.3 Flint publication text (Task 208.22a)

The publication text will only be prepared on receipt of the final phasing liaison report and will comprise two elements:

- 'Standard' specialist report- summarising the assemblage within appropriate chronological periods. The text will refer to comparative assemblages (published or unpublished). In addition and where appropriate, the assemblage from individual elements of the structural hierarchy, *i.e.* land use areas and groups will be discussed. This report will be included on the CD.
- 'Significant' highlights- summarised and short sections on, for example: the struck flint assemblage from the Neolithic and early Bronze Age monuments, *e.g.* SL1, SL5, SL7; the Neolithic stone axes; continuity of flint working into the middle to late Bronze Age; the scavenged or curated assemblages from middle Bronze Age deposits *etc.* These elements will be considered for inclusion in the print volume, possibly as boxed items within the synthetic text.

9.5.4 Flint illustration (Task 208.23a)

Final selection of artefacts for publication-standard illustration or photography will be made at this juncture from the 638 flints. The criteria for the selection will be based on the following:

- objects of intrinsic interest
- previously unpublished objects in the county
- better examples of those types already published
- objects from specific key features or groups
- representative objects from key chronological periods

Illustration will be undertaken in pencil first and once checked by the artefact analyst will be inked in. This type of illustration is far more time-consuming than, for example, pottery because



of the detail, different views and profiles often required. This task will include mock-ups and paste-ups for the final publication.

Approximately 50 flints will be drawn including material from field artefact collection. They will be presented on figures by contextual phasing hierarchy so that curated flint assemblages are presented together. The figures are likely to comprise the following:

- One figure for early Neolithic SP3 including the two axes
- One figure for late Neolithic SP4 including the sub-circular scraper and petit tranchet
- Two figures for early Bronze Age SP 5 including arrowheads, awl, piecer
- Two figures for middle Bronze Age SP6 including curated material
- One figure for late Bronze Age/early Iron Age SP7

9.6 Analysis of coins

9.6.1 Coins investigative conservation

All coins from the main excavation areas were x-rayed and, where necessary, stabilised. Due to the condition of the coinage, some cleaning was undertaken by Phil Parkes (Cardiff University) to enable full identification.

Two additional, Roman coins from the Kempston pipe trench require x-ray.

9.6.2 Coin identification (Task 208.10b)

Once all the x-rays have been completed the identifications will be checked by the coin specialist.

9.6.3 Coin technical catalogue (Task 208.21b)

The full list of coin identifications will be produced using standard works of reference.

9.6.4 Coin analysis and publication text (Task 208.22b)

In its own right the coin assemblage from the DWH investigations probably would not justify analysis due to its small size. However, its analytical potential is enhanced by the more sizable assemblage from the Bypass investigations. Reporting will only be undertaken on receipt of the final phasing liaison report and the x-rays. It will comprise two elements:

- ‘Standard’ specialist report- summarising the assemblage with a discussion of the coins’ archaeological context, concentrating on the nature of the deposits from which they were recovered within appropriate chronological periods. The text will refer to comparative assemblages (published or unpublished). In addition and where appropriate, the assemblage from individual elements of the structural hierarchy, *i.e.* land use areas and groups will be discussed. This report will be included on the CD.
- ‘Significant’ highlights- summarised and short sections on, for example: comparison of the assemblage from the farmsteads and settlement with other coin groups in the vicinity of Bedford, particularly those from the substantial settlement centred on Kempston Church End and farmsteads within the Bovis Biddenham Loop and Marsh Leys. These elements will be considered for inclusion in the print volume, possibly as boxed items within the synthetic text.

9.7 Analysis of other artefacts (excluding coins)

9.7.1 Other artefacts X-radiography and stabilisation (Task 206.08)

All ironwork and selected non-ferrous objects were x-rayed by Lincolnshire County Council Heritage Service’s Conservation Department. An assessment of the condition of the metalwork was carried out at the same time; necessary stabilisation and repackaging was undertaken. The single shale item also received stabilisation treatment. Preliminary identifications were up-dated in light of the information gained from the x-rays.



9.7.2 Other artefacts identification (Task 208.10c)

Each of the c. 500 objects were identified and quantified by number and/or weight. They were assigned a narrow term and, where applicable, a date range. Petrological identification of the worked stone objects was confirmed by Dr Jill Eyers. Information on the following has been recorded and entered into the project database:

- form
- method of manufacture
- material and source
- presence of diagnostic features
- condition

9.7.3 Other artefacts provisional/final phasing and publication liaison (Task 208.12)

See contextual analysis section.

9.7.4 Other artefacts technical catalogue (Task 208.21c)

A technical catalogue will be produced containing an entry for the c. 500 objects (excluding some of those of post-medieval and all of modern date). Detailed descriptions will be provided for each with the exception of coins and nails (information on these will be tabulated). References to similar examples from other sites will be provided and added to the database. This text will be included on the CD. Selection of objects for publication-standard illustration will be made at this juncture (see Task 208.23 for final selection).

Examples of entries in the other artefacts technical catalogue:

RA 7 G127.2, L22.2, Phase 5. Fig. 17. *Iron handle*. Handle fragment comprising an iron rod of rounded cross-section encased in a copper alloy sheet, now damaged and sprung open. *cf.* Wardle 1990 (Gorhambury), fig. 128, no. 258. Length (straightened) 103mm.

RA 8 G127.3, L22.3, Phase 5. Fig. 17. *Vessel glass*. Colourless glass beaker fragment, comprising a portion of the upper body and a slightly out-turned rim. The latter is damaged but appears to be knocked off and unworked. Numerous faint shallow, horizontal lines have been cut into the external surface. The metal has 'pin-head' bubbles in it (and a series that follow along the cut lines) *cf.* Frere 1972 (Verulamium I) fig. 76 no. 61. Thickness 1.6mm. 3rd to 4th century.

9.7.5 Other artefacts publication text (Task 208.22c)

The publication text will only be prepared on receipt of the final phasing liaison report and will comprise two elements:

- 'Standard' specialist report- summarising the assemblage within appropriate chronological periods by type. Discussions will include reference to published parallels, object function with reference to activities (*e.g.* crafts, agriculture), economic status and deposition patterns. In addition and where appropriate, the assemblage from individual elements of the structural hierarchy, *i.e.* land use areas and groups will be discussed.
- 'Significant' highlights- summarised and short sections on, for example: the gravegoods from middle Bronze Age inhumation SG21392 which are rarely found in this period; changes in loom weight styles in the late Bronze Age/early Iron Age; the nails and tacks associated with shrine complex SL50; the nails from two cremation burials on SL52 which may suggest a casket/box and from Bustum burial L2399; evidence for textile production on the early Saxon settlement SL62; the unfired loomweight from SFB G23243 *etc.* These elements will be considered for inclusion in the print volume, possibly as boxed items within the synthetic text.



Objects for illustration by chronological period will be selected at this juncture. Integration of external specialist report(s) will also be undertaken.

9.7.6 Other artefacts illustration (Task 208.23c)

Final selection of artefacts for publication-standard illustration or photography will be made at this juncture from the 500 non-flint objects selected for analysis. The criteria for the selection will be based on the following:

- objects of intrinsic interest
- previously unpublished objects in the county
- better examples of those types already published
- objects from specific key features or groups
- representative objects from key chronological periods

Illustration will be undertaken in pencil first and once checked by the artefact analyst will be inked in. This type of illustration is far more time-consuming than, for example, pottery because of the detail, different views and profiles often required. This task will include mock-ups and paste-ups for the final publication.

It is estimated that 70 non-flint objects will be drawn and presented on figures by Site Period:

- Early Bronze Age SP5- single figure with antler 'pick'
- Middle Bronze Age SP6- single figure with wire finger ring and amber beads.
Photography will be considered as an alternative
- Late Bronze Age/early Iron Age SP7- single figure with loomweights
- Middle Iron Age SP8- single figure with variety of objects eg iron spearhead, ceramic sling shot
- Late Iron Age/early Romano-British SP9- single figure with tacks from shrine complex
- Romano-British SP10- two figures with multiple objects e.g turf cutter, off-cut/waste 'plague, casket/box lid mount
- Early Saxon SP11- six figures with multiple objects eg combs, pin beater, knife, bone/antler cut offs
- Saxo-Norman SP12- single figure with multiple objects eg ice skate, comb, dress pin
- Post-medieval SP14- single figure with multiple objects eg 'curry' comb

9.8 Analysis of animal bone

9.8.1 Animal bone quantification and recording (Task 208.24a)

All the bones, including any material from sieved samples from pre Saxo-Norman (SP4-11) on the Biddenham Loop, and from the early-middle Saxon and Saxo-Norman (SP11 and SP12) on Land west of Kempston, will be re-examined and the identifiable material fully recorded.

Overall, this will entail the detailed recording of c.2,844 animal bone elements (plus a small number from sieved samples) and a cursory examination of 2,341 further currently unidentifiable elements to establish whether any are actually identifiable. These will be fully recorded, taking account of quantity (refitting when possible), species, skeletal part, side, fragmentation (referring to the proportion of the skeletal part represented), age (mandibles and epiphysis fusion) and size (measurements of all whole limb bones and of the later fusing articular ends). Detailed recording of butchery marks, particularly on material from SP10, SP11, SP12, will be undertaken. All possible metrical, ageing and epiphyseal fusion data will be recorded from samples selected for further analysis. Around 290 bones are measurable, and over 140 mandibles can provide ageing data, with many of these from Saxon deposits. Epiphyseal fusion data will be recorded on a large sample of over 770 bones, including bones in associated groups.

9.8.2 Animal bone publication text (Task 208.24b)

The publication text will only be prepared on receipt of the final phasing liaison report. It will comprise:

- 'Standard' specialist report- with discussion of species within each period. If significant assemblages of animal bone are recovered from individual



interpretive or spatial units, *e.g.* land use areas or groups, they will be discussed individually. The report will also discuss other significant aspects such as mortality rates, metrical data, butchery *etc.*

- ‘Significant’ highlights- summarised and short sections on, for example: the early Neolithic wolf skeleton; animal bones within the early Bronze Age shafts; the middle Bronze Age animal burials; animal bones from the middle Iron Age storage pits; possible introduction of large horse breed and specialist butchers in the Romano-British period; comparisons between the assemblages from the different early Saxon settlements *etc.* These elements will be considered for inclusion in the print volume, possibly as boxed items within the synthetic text.
- Wolf skeleton- is worthy of separate publication in a specialist journal. This is likely to be either *Environmental Archaeology* or *Journal of Osteoarchaeology*

9.9 Analysis of human bone

9.9.1 Human bone quantification and recording (Task 208.25a)

The human remains were fully recorded to recognised standards, in order to establish accurate age and sex estimates and record skeletal and dental pathology. All wet sieved bone was reunited with the individual from whom it originated prior to analysis. Bone from non-funerary contexts was examined to try to determine whether it derived from the identified burials or from graves that had otherwise been destroyed.

The inhumed remains were recorded onto paper forms compatible with the Museum of London Oracle database. This included a full skeletal inventory, age and sex estimation using recognised standard methods, metric and non-metric analyses and detailed observations of pathological conditions. Pathological information was supported by additional paper recording forms and digital photographs where required. Gross pathological changes were noted and specific conditions identified by a numerical code. An estimate of minimum number of individuals (MNI) within each context was made, together with comments on the presence of animal bone or artefacts.

The percentage of a complete individual present was estimated to the nearest 5% (based on the proportions of skull 20%, torso 40%, legs 20%, and arms 20%). It was assumed that no skeleton was entirely complete and thus the maximum score was 95%. Preservation was estimated on a three point scale: 1= good, 2= moderate 3= poor. A summary catalogue was compiled indicating the body areas present. Where appropriate, age and sex of individuals were estimated using numerical codes (Table 47). Sub-adult age was based in the eruption of the permanent molars, when the dentition was absent individuals were recorded as ‘subadult’ (unless they were obviously neonatal based on size and morphology). Sex estimation was made using a visual assessment of the characteristics of the pelvis and cranium (Buikstra and Ubelaker 1994).

The burnt bone was recorded following current guidelines (McKinley 2000, 2004) and Museum of London standards. Samples were passed through a series of graded sieves to separate the 10mm, 4mm and 2mm fractions. Each fraction was weighed. The approximate percentage of fragments identifiable to body area was estimated as a proportion of the sorted sample. Identifiable elements were separated by body area and weighed. Where completeness allowed, identifiable elements were fully catalogued and an indication of sex and age-at-death were determined. Detailed observations of colour and fragmentation and pathological changes were made. All data was entered into a specially designed Excel spreadsheet.

The bone recovered from samples by wet sieving was recorded using the same methods as the burnt bone but omitting the information on fragmentation and colour.

9.9.2 Human bone analysis and publication text (Task 208.25b)

The data will be compiled into a series of Excel worksheets to establish corrected prevalence rates, allowing full characterisation of the buried population for each Site Period and/or cemetery and comparison with other contemporary sites. This will result in the production of a comprehensive osteological report.



The publication text will only be prepared on receipt of the final phasing liaison report. It will comprise;

- ‘Standard’ specialist report- with discussion of human bone from burials and non-funerary deposits within each Site Period. Due to their quantity and firm dating the middle Bronze Age burials have the greatest potential to be discussed as a meaningful population and demographical profile. The report will also discuss other significant aspects such as mortality rates, metrical data, pathological data *etc.*
- ‘Significant’ highlights- summarised and short sections on, for example: the four early Neolithic inhumations; the middle Bronze Age cremation cemetery and isolated inhumations/cremations; the Romano-British *Bustum* burial. These elements will be considered for inclusion in the print volume possibly as boxed items within the synthetic text.

9.10 Analysis of charred plant remains

9.10.1 Charred plant remains processing/quantification (Task 208.26a)

Individual soil sample size ranged in volume from less than one to 130 litres, although most samples were *c.* 20 litres. Between one and 120 litres (an average of ten litres) of soil was processed from each sample, with between 0.1 and 120 litres (but mainly ten litres) being retained from a number of samples. Processing was carried out using a ‘Siraf’ type flotation tank, with mesh sizes of 0.25mm and 1mm for the recovery of the flot and residue respectively. Once processed, the ‘flots’ and residues were dried, with the latter being sorted for environmental remains and other ecofacts. There was great variation in the size of the individual flots, although the majority were small.

A total of 191 productive samples (occasional/moderate or greater quantities of charred plant remains) representing every pre-medieval Site Period were identified as part of the assessment. Some of the richer samples potentially contain thousands of identifiable items. The break down of samples which will be quantified as part of the analysis is presented below. In addition, as a double-check flots not examined as part of the assessment will be scanned.

- **Early Neolithic (SP3)**- 6 samples
- **Late Neolithic (SP4)**- 2 samples
- **Early Bronze Age (SP5)**- 9 samples (including at least 3 with fairly frequent/frequent remains)
- **Middle Bronze Age (SP6)**- 31 samples
- **Late Bronze Age/early Iron Age (SP7)**- 28 samples (including at least 1 with abundant remains)
- **Middle Iron Age (SP8)**- 34 samples (including at least 1 with fairly frequent/frequent remains)
- **Late Iron Age/early Romano-British (SP9)**- 13 samples
- **Romano-British (SP10)**- 21 samples (including at least 1 with abundant remains)
- **Early Saxon (SP11)**- 39 samples (including at least 1 with fairly frequent/frequent remains)
- **Saxo-Norman (SP12)**- 8 samples (including at least 2 with fairly frequent/frequent remains)

The charred plant remains (seeds, fruits and chaff fragments) will be extracted and quantified in absolute numbers, with the exception of small cereal fragments (less than 2mm), charcoal, stem fragments and indeterminate plant items. These flots may need to be sub-sampled using a riffle-box, before quantification and identification. The plant remains will be identified using a binocular microscope, the seed reference collection housed in the Environmental Section, MoLSS and seed reference manuals (Berggren 1981; Beijerinck 1947). The results will be entered onto Excel spreadsheets (suitable for output to Access).

9.10.2 Charred plant remains analysis and publication text (Task 208.26b)

The publication text will only be prepared on receipt of the final phasing liaison report.



- Standard' specialist report- with discussion of species within each period. If significant assemblages are recovered from individual interpretive or spatial units e.g. landscapes or groups, they will be discussed individually. It will detail the analysis of selected samples and incorporate, where relevant, the results of the assessment. A large number of detailed tables will be required giving species breakdown (by Latin name) for each chronological period. Ethnographic work on traditional crop-processing practices (Hillman 1981, 1984) will be used in the interpretation of the charred plant assemblages. Consideration will also be given to previous archaeobotanical work carried out in this area and the region as a whole from the Bronze Age to late Roman period, for example Scaife (2000)
- 'Significant' highlights- summarised and short sections on, for example the wild species in the Neolithic and early Bronze Age deposits, early evidence for crop cultivation, use of plants in cremations, significance of the continuation of hulled wheats in the early Saxon period etc. These types of highlights will be considered for inclusion in the bound volume possibly in boxed items within the synthetic text.

9.11 Analysis of charcoal

9.11.1 Charcoal quantification (Task 208.27A/a)

It is proposed that charcoal from features of intrinsic interest such as hearths, burial deposits and burnt mound like deposits are subject to detailed identification. In addition, selected samples with greater frequency and higher fraction size from early Neolithic to early Saxon deposits. It is likely that analysis will focus on no more than 50 samples chosen in consultation with Albion Archaeology. Along with identification their apparent dimensions and growth rates will be recorded.

9.11.2 Charcoal publication text (Task 208.27A/b)

The publication text will only be prepared on receipt of the final phasing structure.

It will focus on:

- exploitation and availability of woodland resources
- deliberate selection of species for specific activities
- changes over time and within chronological periods

9.12 Analysis of specialist soil samples

9.12.1 Background

Thirty-seven specialist soil samples were taken from various features on the Biddenham Loop. These included phosphate samples and spot and column samples for pollen. They were taken on the advice of the project's environmental archaeological consultant (Dr James Rackham) from contexts where it was predicted that preservation might be more favourable. The type of features sampled contained very little artefactual or macro-ecofactual material. They were, however, significant elements in the pre-Iron Age landscape, and their exact function is still in debate.

No substantial office-based work has been undertaken on these samples, pending completion of the radiocarbon dating. The available samples have the potential to provide evidence as to whether the middle Bronze Age large pits contained standing water and/or organic material and whether they were rapidly backfilled. The results will be compared to the shaft and pond which have been radiocarbon dated to the early Bronze Age, partly because these are likely to have been dug for a different purpose. This information will be used to assist in the interpretation of these features e.g. did they contain water.

9.12.2 Pollen

9.12.2.1 Pollen sampling

The pollen from the palaeo-environmental study and the Bypass indicate that while survival will be generally poor, small quantities of identifiable pollen will survive. The samples taken for



pollen were targeted on features where survival would be better, i.e. deeper features that may have contained water.

Samples for pollen analysis were as follows:

- One Kubiena-style column sample was taken from the base of large pond G27002, within L2703, radiocarbon dated to the early Bronze Age (SP5).
- Two spot sample from a clayey deposit in shaft G23255, within L2390, that was radiocarbon dated to the early Bronze Age (SP5).
- One Kubiena-style column sample was taken from the base of large pit G23182 and one spot sample from a clayey deposit in large pit G23181, both within field L2349, assigned to the middle Bronze Age (SP6).

9.12.2.2 Pollen analysis (Task 208.27B)

Thin sections will be prepared from the three pollen spot samples and from the most organic fraction of the two column samples. This work will be carried out at Lampeter University, following the methods for determining pollen concentrations as described in the published literature (Moore *et al.* 1991; Stockmarr 1971). The slides will be scanned, the observed pollen types noted and a qualitative appraisal of the frequency of the taxa will be made.

Should the pollen concentrations and pollen preservation be found to be significant, it is proposed that the two column sample are processed and analysed in conjunction with those from the palaeo-environmental study area (see section 9.13).

9.12.3 Phosphate

9.12.3.1 Phosphate sampling

Phosphate samples analysed from the Bypass suggest that significant variability exists between samples that were once rich in organic content and those that were more sterile. Thin section analysis is proposed, which will provide insight, not only into the specific sources of phosphate enrichment, but also into the general nature of the deposits, their mode of development and post-depositional changes, etc. Within the Biddenham Loop investigation area, phosphate sampling was employed to check whether the organic content of specific features had been lost to chemical leaching.

Samples for phosphate analysis were as follows:

- 7 samples from shaft G23255 (L2390) radiocarbon dated to the early Bronze Age (SP5).
- 25 samples from three large pits G23180 (within field L2352), G23181 and G23182 (L2349) all assigned to the middle Bronze Age (SP6).

9.12.3.2 Phosphate analysis (Task 208.27C)

Total phosphate (Phosphate-P) analysis of all samples will be carried out by Lampeter University. This will be complemented by determinations of loss-on-ignition (LOI), which provides an estimate of organic matter concentration.

Analysis will undertaken on the fine earth fraction (i.e. < 2 mm) of the samples. The Phosphate-P will be determined following alkaline oxidation of the sample with NaOBr, using 1 N H₂SO₄ as extractant (Dick and Tabatabai 1977). LOI will determined by ignition at 375oC for 16 hrs (Ball 1964) – previous experimental studies have shown that there is no significant breakdown of carbonate at this temperature. Pearson product-moment correlation analysis will be used to investigate the relationship between the phosphate-P and LOI, with statistical significance being assessed at the 95% confidence level (i.e. $p < 0.05$).

Thin section analysis will only be carried out should significant differences be identified between samples.



9.13 Analysis of palaeo-environmental

9.13.1 Palaeo-environmental sampling and methodology

All work was limited to the floodplain of the River Great Ouse in the area of the proposed Country Park intended for landscaping and pond construction (see Figure 3). An initial field and desktop assessment illustrated the presence of palaeochannels of the river and waterlogged deposits with some potential for palaeoenvironmental reconstruction (Rackham 2008). A secondary objective of the survey was to identify whether any archaeological deposits might occur in the floodplain area.

A programme of hand augering and coring was therefore implemented for the recovery of intact core samples from several locations on the floodplain which could be assessed and subsequently used, if appropriate, for the reconstruction of the palaeo-landscape of the area under housing development. Five hand auger transects were laid across the area at approximately those locations indicated in the walkover survey (Rackham 2008). A one metre long 25mm diameter gouge auger was used to core the floodplain deposits until gravels or bedrock were reached. Separate to this boreholes were undertaken in Transects A, B, C, D and E. Each borehole was described and logged on site. The location and level of each borehole was surveyed.

On the basis of the results of the cores from these transects locations were chosen for core sampling using a small mechanical Dando Terrier 2000 coring rig. At each location a continuous three metre core (in 1m units) was taken from the modern ground surface through to the underlying geological sediments.

9.13.2 Palaeo-environmental analysis (Task 208.27D)

The bottom 1.6m of recovered core from Transect A, Core 4A will be taken forward for analysis of the Bronze Age sequence to give a context for the adjacent contemporary archaeological landscape and that the sequence between 190 and 270cm is studied from Core 7A, Transect D, to establish how the vegetation and landscape has changed between the early Bronze Age and the 1st millennium BC. Both these sections of the cores will be sampled in 10cm units (after sampling for pollen) and processed for macrofossil remains to add complimentary data to the environmental picture gained from the pollen analyses and recover material suitable for further radiocarbon dating.

Core 5AA from Transect D will be broken up into 10cm units and processed for the recovery of mollusc shells and radiocarbon datable material. It is presumed that the deposits in this core are likely to be contemporary or a little later than those dated from Core 7A and with mollusc shells occurring up the sequence and into the alluvial deposits above these will yield a picture of environmental change or stability on the floodplain of the river that can be tied into the broader picture revealed by the pollen analyses.

9.14 Scientific dating

All significant deposits which had not been firmly dated by stratigraphy or artefactual content were considered for scientific dating as part of the provisional phasing review. Consideration was based on whether suitable material was available from secure deposits. In the case of radiocarbon dating this meant the presence of carbon-rich material. In the case of Optically Stimulated Luminescence (OSL) dating it meant whether samples had been taken for this purpose during fieldwork. To facilitate the selection of material for radiocarbon dating some quantification of human bone, animal bone and charred plant remains was undertaken in advance of the main phase of work. A scientific dating proposal was produced in May 2009 (Albion 2009c), setting out a hierarchical list of proposed samples. Following agreement of the Consultant and Client, samples were submitted to laboratories in several batches:

- Batch 1 (21 radiocarbon determinations)
- Batch 2 (31 radiocarbon determinations)
- Batch 3 (2 OSL determinations)

The dates achieved by the scientific dating programme have been examined as part of the phasing review (task 208.12) and, where necessary, changes have been made to the phasing hierarchy. Following the phasing review, the final phasing hierarchy was established and is



presented in this report along with the determinations from the scientific dating (see Table 53 for summary of the radiocarbon dates).

9.14.1 Completed radiocarbon dating (Task 208.27E)

A total of 52 samples were selected for destructive accelerator mass spectrometry (AMS) dating. This procedure allowed the accurate dating of less than 5g of sample material. This included cremated bone where structural carbonate within the surviving inorganic content of the bone (the crystalline 'bio-apatite') was measured following pre-treatment.

Dating was undertaken by Scottish Universities Environmental Research Centre Radiocarbon Laboratory (SUERC), under the control of Professor Gordon Cook. Pretreatment of charcoal and bone samples followed the methods described in Russell *et al.* (2010 in press) while AMS measurements were as described in Xu *et al.* (2004). The SUERC radiocarbon dating laboratory is at the centre of international intercomparisons and has been involved in the organisation of, and participated in, all of the International Radiocarbon Intercomparisons. The data generated have demonstrated that the SUERC laboratory produces measurements that are accurate and with a justifiable precision. The most recent QA data can be found in Naysmith *et al.* (2010 in press).

The radiocarbon results are given in Table 53, and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages (Stuiver and Polach 1977). The calibration of the results, relating the radiocarbon measurements directly to calendar dates. All have been calculated using the calibration curve of Reimer *et al.* (2004) and the computer program OxCal v4.0.5 (Bronk Ramsey 1995; 1998, 2001). The calibrated date ranges cited in the text are those for 95% confidence. They are quoted in the form recommended by Mook (1986), with the end points rounded outwards to 10 years.

9.14.2 Completed OSL dating (Task 208.27F)

Sample recovery and background radiation reading for potential optically stimulated luminescence (OSL) dating was carried on 8/7/2008 and 20/10/2008 by Dr Simon Armitage of Royal Holloway University, London. The selection of samples was restricted to 'key' deposits without firm dating evidence which had sufficiently high quartz grain content to facilitate this dating technique.

The following samples were taken:

- **OSL Sample 1** – the sole fill (11048) of oval pit [11047], L3104 located adjacent to the entrance to hengi-form monument L3101 (SL3, SP5)
- **OSL Sample 2** – the secondary fill (11032) of ditch [11060], defining hengi-form monument L3101 (SL3, SP5).
- **OSL Sample 3** – the secondary fill (11009) of large pit [11003], L3102, dug across the original entrance of hengi-form monument L3101 (SL3, SP5).
- **OSL Sample 4** – the secondary fill (8913) of shaft [8850], G28021, (L2802, SL6, SP5), located immediately to the south west of monument L2312.
- **OSL Sample 5** – the secondary fill of pit BL402 [16080] within pit alignment L2801 (SL18, SP7).
- **OSL Sample 6** – abortive sample taken from shaft [4610], G23254 (L2368, SL6, SP5) near central monument L2313.
- **OSL Sample 7** – the tertiary fill (12253) of ditch [12249] that was part of monument L3214 (SL7, SP5).
- **OSL Sample 8** – the secondary fill (12611) of ditch [12605] that was part of hengi-form monument L3211 (SL1, SP3).
- **OSL Sample 9** – the tertiary fill (12505) of ditch [12501] that was part of the entrance blocking ditch L3212 of hengi-form monument L3211 (SL1, SP3).

As the suitability of the Biddenham Loop for OSL dating was untested, only two samples were chosen for initial processing. OSL samples 8 and 9 were chosen from the earliest and last phases of the development of hengi-form monument L3211. It was hoped that the dates would place this sterile, monument within a temporal framework alongside the more securely dated monuments within the Loop.



OSL samples were collected in opaque plastic tubes hammered into the face of a cleaned section. Samples were processed under subdued orange light in the luminescence laboratories at the Department of Geography, RHUL. For OSL dating, quartz was extracted from the bulk sample using standard laboratory techniques.

Briefly, carbonate and organic matter was removed using HCl and H₂O₂ washes respectively. The samples were then wet sieved to either 125-180 or 180-250µm. Heavy mineral grains were removed by density separation and the remaining grains were etched in 40% HF solution for 50 minutes. All samples were subsequently placed in fluosilicic acid for 5 days to dissolve any remaining feldspar grains, followed by an HCl wash for 1 hour to dissolve any fluorides. External dose rates were calculated from the concentration of radioactive isotopes (U, Th, K) determined by *in situ* dose rate measurements using an Ortec MicroNomad γ-spectrometer.

The absence of heavy mineral grains and feldspars in the etched quartz samples was confirmed by the analysis of grain mounts under a petrological microscope and an absence of IR signal during OSL measurement. The dose rate conversion factors of Adamiec and Aitken (1998) were used throughout and the internal alpha dose contribution assumed an a-value of 0.03 ± 0.01 in the dose rate conversion (Mauz *et al.* 2006). The beta dose attenuation/absorption was accounted for using the factors of Mejdahl (1979).

Luminescence measurements were performed on two Risø OSL/TL-DA-15 systems using blue light LED stimulation (470 nm, ~40 mW/cm²) and a U-340 detection filter. All luminescence measurements were performed for 50s whilst the sample was held at 130°C to prevent re-trapping in 110°C TL trap (Murray and Roberts 1998; Murray and Wintle 2000). Four or five regenerative doses up to 380 Gy were used to bracket the De of each sample and either a 10 or 50 Gy test dose was used. The luminescence signal was integrated from only the initial part (0.3 or 0.6s) of the decay curve to increase the signal to noise ratio and to enhance the sampling of the most bleachable and thermally stable 'fast' component signal which dominates the start of the OSL decay curve. A background was subtracted from the last 10s of the stimulation with the test dose background taken from the previous natural or regenerative measurement (Murray and Wintle 2000).

9.14.3 Additional scientific dating work (Task 208.27E)

A further six radiocarbon dates are required to determine the dates of "key" deposits which contain pottery that has proved difficult to date firmly. Details of these are presented in Table 52. The results will not significantly affect the final phasing hierarchy.

A Bayesian approach will be adopted for the interpretation of the results wherever possible (Buck *et al.* 1996). Although the calibrated dates are accurate estimates of the dates of the samples, they can be refined by Bayesian analysis. In the case of the monuments, it is the chronology of the features that is under consideration, not the dates of individual samples. This can be elucidated not only using the absolute dating information from the radiocarbon measurements, but also by using the stratigraphic and spatial relationships between samples.

Bayesian analysis allows the combination of these different types of information explicitly, to produce realistic estimates of the dates of interest. For example, the inhumation within original SP3 monument L2312 is stratigraphically earlier than the inhumation within the recut monument L2313. In this case a Bayesian analysis will be used to refine the overlapping radiocarbon dates. It should be emphasised that the *posterior density estimates* produced by this modelling are not absolute. They are interpretative *estimates*, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives.

The technique proposed is a form of Markov Chain Monte Carlo sampling, and will be applied by Peter Marshall using the program OxCal v4.0.5 (<http://c14.arch.ox.ac.uk/>). Details of the algorithms employed by this program are available from the on-line manual or in Bronk Ramsey (1995; 1998; 2001; in press).



9.15 Overall publication, archiving and project management

9.15.1 Editing text including specialist reports (Task 208.28)

The entire text will be read and edited to ensure a consistency in approach. The site narrative within the database will form the basic descriptive text for Site Period, Site Landscape, phase, land use area and group. Specialist reports will be standardised and, where necessary, edited to ensure that they are consistent with other parts of the publication.

9.15.2 Synthetic text (Task 208.29)

Only the synthetic text will be published as part of the A4 monograph. It will concentrate on the unusual, new and significant discoveries. It will comprise cross-chronological period chapters:

- **The first settlers** (Mesolithic)
- **Landscape of monuments and settlements** (early Neolithic to early Bronze Age)
- **Farming around the ancestors** (Middle to late Bronze Age and early-middle Iron Age)
- **Romans and Saxons**
- **Settlement within a landscape of fields** (Saxo-Norman, medieval and post-medieval)
Note. Chapter names indicated are only provisional)

Only significant structural components, artefacts and ecofacts will be described. Some of these will be integrated with the text while others will be highlighted in some way, perhaps in boxes. The precise number and content of these is unknown at this stage, but will be discussed with the relevant specialists as they undertake their analysis. However, the following are a number of possible topics:

- **The early Neolithic wolf skeleton**
- **Neolithic stone axes**
- **Collared Urns**
- **Evidence for curated flint in the middle Bronze Age**
- **Grave goods within the middle Bronze Age inhumations**
- **Function of the iron tacks found in the late Iron Age shrine complex**
- **The Bustum burial**
- **Unfired clay within the early Saxon SFBs**

9.15.3 Publication illustrations (Task 208.30)

It is at this stage that a final list of publication-standard figures and photographs required for the publication will be produced. It is anticipated that the majority of 'structural' figures can be created from the mock-ups (Task 208.14) but this task includes the creation of figures for all data-sets.

9.15.4 Publication production (Task 209.02)

This task involves the final checking and integration of all the different elements of the publication eg text, figures, photographs, CD.

The most substantial of these tasks will be associated with the creation of the CD element of the publication and will include:

- **Creation of project database with tables for different datasets**
- **An explanation of the database contents and how it could be used**
- **Creation of PDF versions of all specialist reports**
- **Creation of PDF versions of all illustrations**
- **Creation of digital drawing**
- **An explanation of what is included in the digital drawing and how it could be used**

Note. Although the database will be checked for major inconsistencies it must be accepted that the descriptions in the contextual hierarchy elements have been produced as part of contextual analysis and are therefore not intended to be publication-standard text.



9.15.5 Refereeing process (Task 209.03)

The draft publication will be refereed internally by Albion Archaeology, by the project chronological advisors and the consultants. This task includes time for discussing issues raised with the appropriate person.

9.15.6 Amendments based on referees comments (Task 209.04)

This task comprises making amendments to the text and illustrations based on the referees comments.

9.15.7 Publication production (Task 209.05)

This includes all tasks associated with the production of the publication by East Anglian Archaeology eg addressing readers comments, issues associated with copyediting, proofs and page layout, prior to the final version is submitted to the printers.

9.15.8 Archiving and accessioning (Task 209.06 and 209.07)

Upon completion of the report, the written and material archives will be prepared for accessioning to Bedford Museum. The cost of transfer includes transport, liaison and storage charges.

9.15.9 Project management

All project tasks have been identified from Albion's generic task list menu. These have been entered onto the Albion's Time Recording System (TRS) so that expenditure and resources can be tracked throughout the life of the project. The management of the project includes monitoring the task budgets, programming tasks, checking timetables and liaising with the consultant.





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