DISCOVERIES OF ICE AGE MAMMALS AND OTHER PLEISTOCENE DEPOSITS IN CENTRAL AND NORTH BUCKINGHAMSHIRE

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Discoveries of Pleistocene mammal remains in central and north Buckinghamshire are listed. Most of the finds have been made in the course of gravel extraction but cessation of extraction does not mean that opportunities for further discoveries in the vicinity have been exhausted. Such sites have considerable potential for enhancing understanding of both the Ice Age history of the county and the relationship between early man and his environment.

INTRODUCTION

The writer recently chanced on a short piece by Edwin Hollis (1914) in *Records* recording the discovery, in about 1914, of Pleistocene animal bones in alluvial deposits at Locke's brick pit on the Oxford Road, Hartwell, just over the parish boundary from Aylesbury. Hollis' account seems to have received little attention. The finds were briefly recorded in a British Geological Survey report (Sumbler 1991, 16), but were not at the time recognised as being *in-situ* and consequently were not subsequently included in an important description of the terrace deposits of the Thame, although another faunal-rich deposit, further downstream south of Shabbington, was considered (Horton and Sumbler 1995, 111–112).

The writer makes no claim to expertise in Pleistocene matters. The purpose of this paper is in part to revive interest in the Hartwell find since it appears to have produced quite a rich assemblage of fauna, but also to attempt a list of other discoveries of 'Ice Age' mammals from the centre and north of the county, in the hope that both the surviving finds and their contexts may be re-assessed by others in the future. The record of the location of many early discoveries is often imprecise, but it has proved possible in several cases to tie them down more accurately. Figure 1 gives an indication of the overall distribution. Discoveries from the main Thames valley and its terraces have not been included as they have been subject to relatively recent assessment (see on).

The dating of Pleistocene deposits is complex. In recent years substantial advances have been made in dating techniques through detailed study of the fauna and flora included within them and the character of the deposits themselves. This process has been aided by the chronological structure provided by closely-dated deep ocean and ice core records, which have demonstrated the subtleties of climate fluctuation over the millennia (for stages in relation to Buckinghamshire see Silva 2010). No attempt is made in this note to relate discoveries to specific phases of the Pleistocene unless previous recorders have already done so.

Apart from their intrinsic interest, there is always the possibility that discoveries of Pleistocene fauna may be accompanied by evidence for human activity. There is a suggestion of such a link at Hartwell but as yet no proven association between man and animals during the Pleistocene in Buckinghamshire. Discoveries of Palaeolithic axes from central and north Buckinghamshire are not common, but an indication that associations between such material and animal remains is not out of the question is indicated, for example, by the discovery of at least fourteen palaeoliths in the Bletchley/Fenny Stratford area (Millard 1965; Green 1971), an area which has also produced a number of Pleistocene animal finds. These axes are the most obvious surviving product of the Lower and Middle Palaeolithic periods, although representing only the most characteristic element

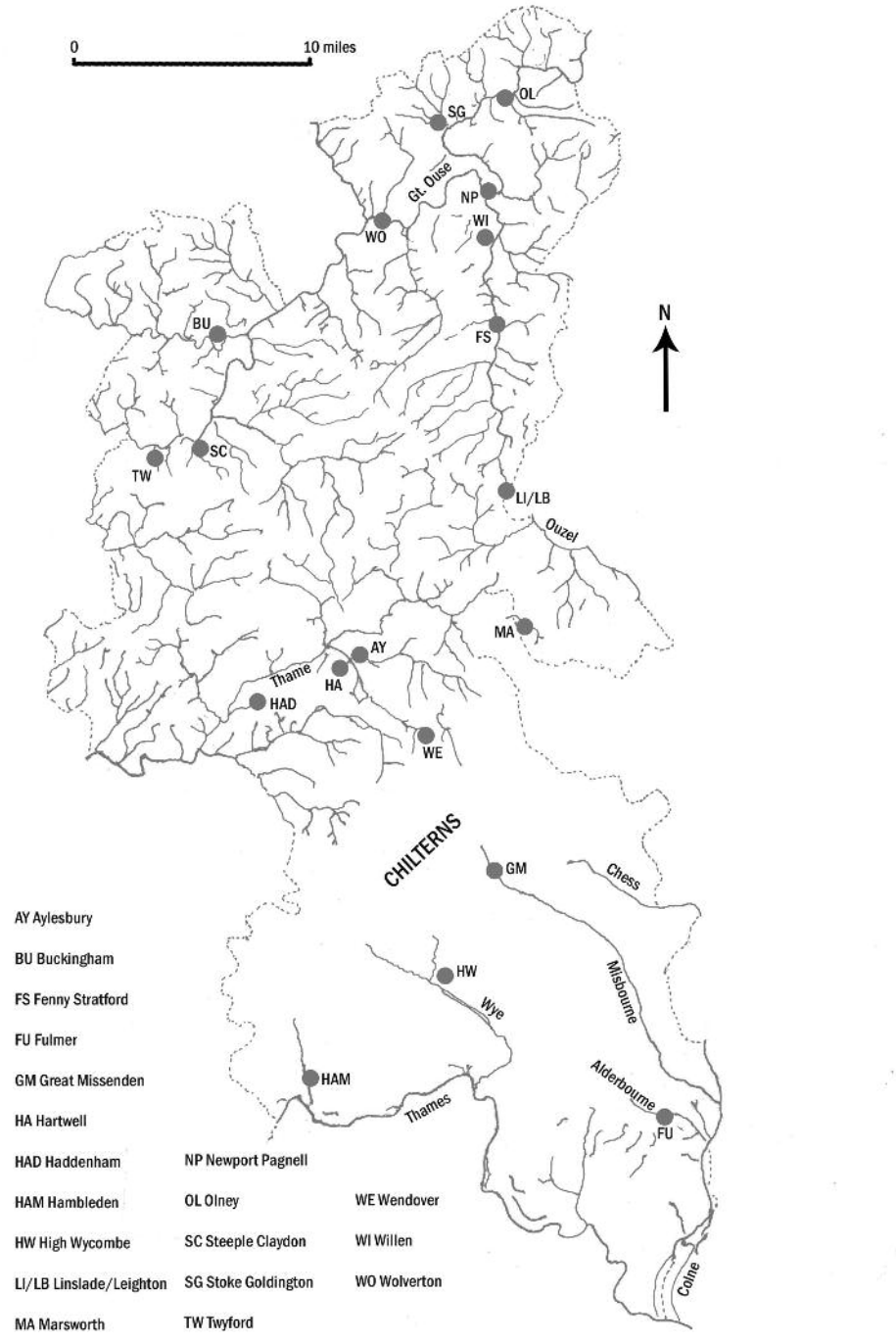

FIGURE 1 Finds of Pleistocene material from central and north Buckinghamshire noted in the text. Not all of the discoveries in the Milton Keynes new city area are shown and Hambleden village is included only to locate the valley

of a complex picture. As with the faunal remains of the period, it is river-valley finds of palaeoliths which dominate the record, but a study by Scott-Jackson (2000) has shown that such finds also occur quite commonly within 'clay with flints' which is not a riverine deposit but is present on the higher ground of the Chilterns, and there are a single finds from Buckinghamshire deposits. An extremely fine unabraded example from the former Brown's brick pit at Cholesbury is recorded by Lacaille (1966). Also present on the Chilterns, it may be noted, are relict fluvial deposits which mark an early pre-Anglian course of the Thames (e.g. Sumbler 1996, fig. 31; BGS 2004, included map of palaeogeography; Morigi 2005, 2–3, 14–15).

The discovery of Pleistocene/Palaeolithic material in the course of gravel extraction, once carried out by hand but now completely by machine, presents both an opportunity and a challenge to on-site recording (Buteux *et al* 2009). However, in addition to mineral extraction there are other ground-disturbing works which can have a substantial impact on such deposits. For example, the proposed high-speed London to Birmingham rail link (HS2) potentially affects areas where discoveries have previously been made at Wendover and Hartwell, and possibly also near Twyford. In the past, sites of potential interest have unfortunately often fallen into a recording no-mans land, neither featuring in local environmental record systems nor those recording the historic environment. The work of the Ancient Human Occupation of Britain project (AHOB) has shown the value of close co-operation between disciplines, both in predicting and evaluating such complex buried evidence, and the need for a re-assessment of potential deposits in Buckinghamshire seems pressing.

A comprehensive bibliography of the results of recent research on the Pleistocene and Palaeolithic in Britain is included in an English Heritage/ Prehistoric Society publication (Anon. 2008) and a most useful field study guide has recently been published by Buteux, Chambers and Silva (2009).

Most of the data assembled here derives from museum records, from publications of the British Geological Survey, and from the Historic Environment Records (HERs) of Buckinghamshire, South Bedfordshire and Milton Keynes. In the case of the latter, the original Bradwell Abbey Field Centre Record cards held within the HER have sometimes provided additional information. HER record numbers for sites are included where available. Early Ordnance Survey maps have been consulted where appropriate. All accession numbers of items quoted below in the form '1921.17.1' are in Buckinghamshire County Museum, the first figure indicating the date of accession. Where accession numbers of material in other museums is given this is indicated. The British Geological Survey is abbreviated throughout as BGS and Ordnance Survey as OS.

The Pleistocene Discoveries at Locke's Pit, Hartwell

Hollis' account of the 1914 discovery at Hartwell (Hollis 1914), notes that Locke's brick pit was dug into 'the well-known Hartwell Clay', but that the clay was overlain by 'about five feet of Pleistocene deposit'; the latter being '… composed largely of local Portlandian material … here and there towards the base of the Pleistocene deposit are shallow bands of gravel and in these the mammalian bones are found.. '

He reported discovery of the following:

> 'Mammoth (*Elephas primigenius*); Woolly Rhinoceros (*Rhinoceros antiquitatis*): Hippopotamus (*Hippopotamus amphibius*): Urus (*Bos primigenius*): ?Bison (*Bison bonasius*): Cave-bear (*Ursus spelaeus*) and Spotted Hyaena (*Hyaena crocuta*).'

He notes [present author's italics] that …

> 'All the bones are much broken, and therefore difficult to identify with certainty, and although no doubt water-borne to their present position, they cannot have travelled far, as the fractures show no sign of wear, and in two cases where more than one piece of the same bone have been found the edges fit perfectly. *Mr. A.H. Cocks has suggested to me that the way in which two of the bones are broken suggest that it was done by man for the purpose of extracting marrow.'*

Some of this material, donated by Hollis, came directly to the County Museum, to which he had been appointed the first curator in 1907, on the museum's establishment in Church Street, Aylesbury. His finds were not, however, apparently accessioned until 1957 (1957.304–307). In 1957,

fragments of a hippopotamus incisor from the same pit that had been donated by a Mr S.G. Payne many years earlier (he was listed as a member of BAS in 1879) were also accessioned (1957.308). Previously, fragments of a rhinoceros tooth and a bone from a *Bos primigenius* from the Hartwell pit, donated by a Mr Sawyer, had been accessioned in 1921 (17.21–2), although the date of discovery is not recorded. In addition, amongst a large collection of fossils and other items accumulated by one Z.D. Hunt, which apparently entered the Society's collection in 1876 (*Recs Bucks* **4**, 392; BCM 1880.190), were '*c.*12 fragments of bone a [sic] teeth of hippopotamus' described as from 'Pleistocene river gravels, Hartwell'. These are very probably from the same source. This gives a total of four separate finders, and all the discoveries seem to have been recovered between the 1870s and early 1920s. Fortunately the finds are still in the County Museum. It may be noted, incidentally, that Late Iron Age and first to second-century Roman material, some of which seems likely to be from a cremation cemetery, came from the same pit (1909.2; 1909.85; 1936.153; 1941.206; 1973.248 and some unaccessioned material).

In summary, the following list of items has been reported from the Hartwell pit. The accession numbers of the material in the County Museum and the original identifications in the museum accession register are given, but it should be noted that some of the original species identifications may not be accurate.[1]

1880. 190.130. 1–12 Hippo etc.
1921.17.1 Rhinoceros tooth.
1921.17.2 *Bos primigenius.*
1921.17.3 *Bos longifrons.*
1957.304 Lower jaw and two teeth of spotted hyena – *Hyaena crocuta* (Fig. 4).
1957. 305 Canine tooth of bear, cave bear or brown bear (Fig. 4).
1957.306 Six fragments of woolly rhinoceros tooth: ?*Rhinoceros antiquitatis*.
1957.307 Three fragments of molar tooth of mammoth: *Elephas primigenius.*
1957.308 Fragments of incisor teeth of *Hippopotamus amphibius*.

History and Topography of Locke's Pit

The family history of the Lockes has been studied by Reynolds (1998). A 'William Speed Locke, brickmaker, resident at Castle Street, Aylesbury', appears in a printed Poll of the Electors of the Borough of Aylesbury in 1839 (BRO ref POL). From the 1880s, John Locke, born 1825, and his son Robert William Locke, born in 1861, appear under 'Hartwell' in various Buckinghamshire directories until the early 1930s, when apparently digging had largely ceased.[2] The Lockes had a variety of occupations at the Hartwell address, including that of grazier, brick and tile maker, lime burner and coal merchant.

The pit appears to have been first referred to by Smyth during a discussion on the Kimmeridge Clay deposit here '… which has induced the erection of a brick kiln there, where excellent red bricks are produced with ease.' (Smyth 1851, 22) The pit was subsequently depicted on a map by Smyth as 'Locke's Brick-Field' in a second volume which he published in 1864 (Plate IV); in the accompanying text it is noted that the pit is 'worked by Mr Locke' (Smyth 1864, 44). Figure 2 shows its location.

The pit attracted the interest of geologists from the mid nineteenth century onwards, not on account of the discovery of Pleistocene bones but as a good source of Kimmeridge clay fossils. The pit was to become part of a geological visitor's circuit which included the Bugle Pit, just over a kilometre to the west, worked for Portland and Purbeck Formation stone, and another clay pit on the Bierton Road, east of the town. The latter, Mr Hill's, commenced much earlier than the Hartwell pit and continued later (Pike 1995, 12–13).

During a geological visit to the Hartwell pit in 1856, which must have occurred shortly after it was opened, it was noted that the Hartwell Clay was being 'worked for the manufacture of bricks, tiles, draining tiles etc., by the enterprising Messrs Locke of Aylesbury.' (Morris 1856, 102). It was again formally visited in 1870 (Anon. 1870), and Morris himself paid a second visit with a group in 1873, when he also noted the presence of riverine deposits (Morris 1873):

> Kimmeridge Clay … forms the country to the north-west for six or seven miles, except where beds of alluvial deposit form low-lying meadows, through which these sluggish streams meander. One of these, and the most considerable, patches of river deposits lies immediately on the south-west of Aylesbury, and is crossed by the road to Oxford … the party of Members,

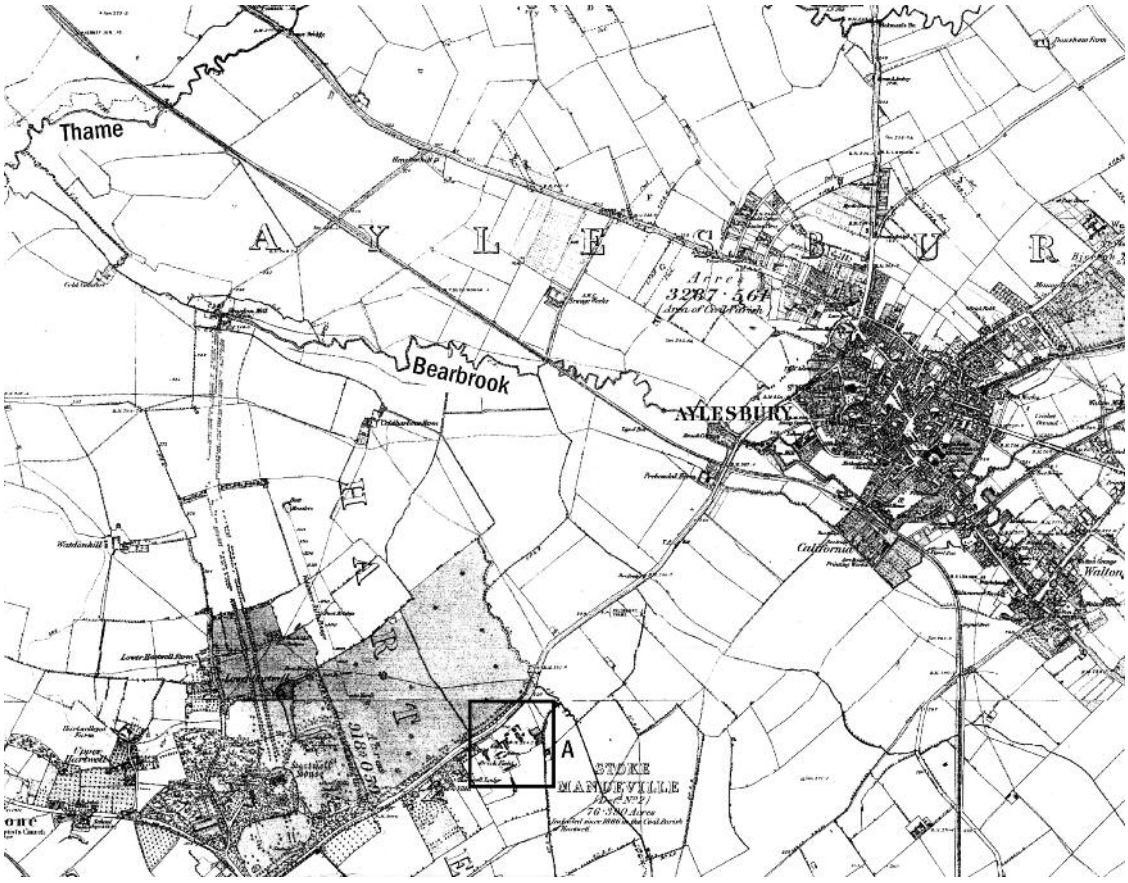

FIGURE 2 Ordnance Survey 6 inch sheets 28 and 33, survey 1877–80. River names added and area of Locke's pit indicated at A

> headed by Professor Morris, accordingly proceeded along this road [towards Oxford], crossing the patch of valley gravels, and stopping at a large excavation at the junction of these beds with the Kimmeridge Clay, which is here worked for brick and tile making.

In 1933 another party of geologists passed by '… the famous Locke's Pit, the type locality for Hartwell Clay' but considered that it was '... no longer worth a visit.' (Morley Davis 1934). Presumably, active digging had ceased and there were no exposures, although Arkell (1947, 111) asserts that the pit was still 'worked intermittently at least down to the outbreak of war in 1939.' The 1946 edition one-inch OS map (full revision 1930 with later corrections) shows extensive water-filled pits. An aerial photograph taken in 1950 (HER Run 364, photo 31/3134) shows that the pit had ultimately expanded to adjacent field boundaries but at that date it appears to be in process of being infilled and the 1963 OS 1:2500 map shows some standing water. A later photograph of 1971 (HER Run 403, photo 52023) shows that part of its eastern side had been reclaimed and was under grass, and a modern building constructed within it. The writer himself recalls a succession of lorries entering the site in the early 1970s when it was being used as a rubbish dump. The whole is now infilled and mainly under grass, although a small area of the pit survives in the north-west corner. The former pit was centred on SP 805 125. It lay at about 80m OD. Only three

FIGURE 3 Locke's Pit, Hartwell, in 1912. The figure on the right provides some scale. The shallow alluvial deposits have been stripped and figure is standing on clay in which spade marks can be seen. Photograph reproduced courtesy the British Geological Survey, ref P252363

photographs of the pit are known; one shows nine traction engines said to be at the pit *c*.1914, although the pit itself is not visible (Bucks County Council Historic Photographs website), and two others are in the possession of the British Geological Survey, one of which is included here (Fig. 3).

The principal stream between Aylesbury and Hartwell, the Bearbrook, which formerly powered a corn mill, runs close to Aylesbury, but there are also other unnamed streams, one of which passes Locke's pit on its eastern margin (Fig. 2). Spread over a floodplain of about a kilometre, the present streams are likely roughly to reflect the course of the earlier river. A little upstream just east of Aylesbury, the name 'Stocklake' recorded in 1700 (BRO D/TL/Box 39) suggests a memory of standing water here on the same floodplain. The whole drains into the Thame. In the immediate post-Pleistocene period such an area is likely to have been attractive to Mesolithic people. Hints of use at this period have been found in an excavation on the land of Coldharbour Farm, now Broad Leys housing estate (Parkhouse and Bonner 1997, 120).

Other Possible Pleistocene Material from Aylesbury

A small amount of material in the County Museum from 'Haydon Hill railway cutting, nr Aylesbury' including 'aurochs' should also be noted. Although not recorded as Pleistocene at the time of accession, one bone at least has subsequently been identified as such by Simon Timberlake.[3] These bones were donated by 'Miss Payne' (accession 1913.268.1–47), who in the same year donated two

FIGURE 4 Two of Edwin Hollis' finds from the Hartwell brick pit. Upper: hyena jaw (1957.304): lower: bear canine (1957.305) (In Buckinghamshire County Museum)

boxes of Roman pottery 'from railway cutting in construction GWR at Haydon Hill, nr Aylesbury' (1913.14). Previously, boxes of Roman pottery and worked red deer antler, apparently retrieved from the same cutting, had been donated by S.G. Payne, to whom she was presumably related (1905.84–7: 1912. 165–7). Some bone is referred to in *Recs Bucks* **10**, 214, which had been donated to the museum in July 1912 by Mrs S.G. Payne, and bone and Romano-British pottery donated by 'Miss Payne' are noted in *Recs Bucks* **10**, 353 and 354. There may be some duplication here. As previously noted, S.G. Payne had also donated material from the pit at Hartwell to the museum.

The Haydon Hill railway cutting, just north-west of Aylesbury, runs from SP 7996 1440 to 7951 1468; the top of the cutting has a height of *c*.81m OD. The railway line is now surrounded by the light industrial area of Rabans Lane. From Haydon Hill the land slopes south-west to the Bearbrook which feeds into the Thame about 10 metres lower at 71m OD. The railway cutting would initially have been dug for the Aylesbury-Buckingham Railway that was sponsored by the Duke of Buckingham (Gadsden 1962). Construction of the line commenced at Verney Junction in 1861, reaching Aylesbury in 1868. Although this could been the occasion when the material was discovered, in 1891 the line was acquired by the Metropolitan Railway whose own line had reached Aylesbury from London in 1892, and by 1897 the Metropolitan had doubled the existing line to the north of the town (Dow 1962; Cockman 2006; Foxell 2000). It seems more probable that it was the later event that led to

discovery of the bones, since the expanded cutting would have been both on a larger scale and closer to the period when the Paynes seem to have been actively collecting. It may be noted that the height of both Haydon Hill and the deposit at Hartwell are similar, at around 80-81m OD. The locations are *c*.2km apart.

Finally, an isolated find from that part of Wendover which drains north towards the Thame may be noted. A *Bos primigenius* horn core (1930.70.1) was found in a garden in Nightingale Road, donor Miss Burnet (SP 865 082, NGR to road) but the only available printed geological sheet of this area (BGS 1946) shows no alluvial deposits here. Although the species does occur in Pleistocene deposits, it is also found on early post-glacial sites (O'Connor and Sykes 2010, 3).

River Terrace Deposits of the River Thame

Over time, rivers cut both downwards and upstream. At intervals the downcutting results in the river's former beds of sand, gravel and other alluvial deposits being left stranded as remnant higher terraces, although these are not immune to subsequent modification over time (e.g. Gibbard 1985, 5). Where a terrace sequence is identifiable, the terraces highest above present river level are clearly the earliest. The British Geological Survey has identified seven terraces accompanying the Thame, numbered from 7 (the oldest), to 1 (the most recent). These are mapped on BGS Sheet 237 (Horton *et al* 1995) and described in more detail by Sumbler (1995). Only the three latest are present in Buckinghamshire and of these only the third (Shabbington) terrace was recorded in the survey as having produced Pleistocene material (Horton *et al* 1995, 110–112 and fig. 25).

The BGS maps extensive third-terrace deposits around the village of Shabbington, and the County Museum holds an important collection of Pleistocene material from this third terrace, found 'in excavating a [railway] cutting near Thame, between Thame and Oxford' (1905.342.1–147). The discovery although attributed to 'Shabbington', was actually made just across the river into Oxfordshire, south-west of North Weston, in Tiddington-with-Albury parish. Its discovery was described by Codrington (1864) and the accessioning of the material to the Buckinghamshire County Museum noted in *Recs Bucks* **9**, 244. Codrington records that 'The mammalian remains were found in great abundance'; they included mammoth, horse, and rhinoceros. The Oxford University Museum of Natural History also holds mammoth bones found 'near Thame' at about the same time, and these are likely to have been from the same site (Acc. Q.01148-01157). Sumbler (1995, 99) notes that the association at the site of both cold and temperate elements in the fauna may indicate that the terrace incorporates material from more than one period. The terrace deposits are thought to extend from the 'Wolstonian' through the Ipswichian to the early Devensian. Upstream of the third terrace is the second, Ickford terrace, attributed to the Devensian, which presented some problems of definition. A small area is recorded in Buckinghamshire north of Ickford Bridge at about 60m OD.

It may be worth noting at this point, that the County Museum has a mammoth tusk 'from Cuddington', a village close to the Thame, donated by Mr G.H. Wiltshire (1922.62.1). The accession register records that it was 'Found when digging at the Grove, Cuddington 1904'; it is also noted in *Recs Bucks* **11**, 223. There is, however, a problem with the attribution of the find to 'Cuddington' since it has not been possible to trace 'the Grove' within the parish either as a structure or a group of trees. However, in the adjoining parish of Haddenham, Mr G.H. Wiltshire appears as a resident in *Kelly's Directory* for 1924,[4] and in the same parish there are several 'Groves': Grove End, Scotsgrove Mill and Scotsgrove House, which cluster together at the western end of the parish near the confluence of the Thame and a tributary brook. It therefore seems likely that 'the Grove' was an abbreviation for Scotsgrove, and that the find actually came from Haddenham. The OS six-inch map, 1900 edition, shows only one pit in the 'Grove' area, a 'sandpit' just east of Scotsgrove House and adjacent to the Thame-Haddenham Road (SP 7122 0745). Although this might appear to be a possible candidate for the findspot, BGS maps the area as a sandy Kimmeridge Clay formation, which could not contain a mammoth tusk. Nevertheless, since the pit is also very close to deposits that are mapped as 'head' and is only a short distance from the Thame alluvium, the tusk could perhaps have come from either the 'head' or from an unmapped alluvial deposit in the immediate vicinity.

Finally, there is the first, and most recent, Quarrendon terrace. The latter accompanies the present

river along much of its length at about 1.5-2m above the present-day alluvium. It is at about 70m OD near the former village site of Quarrendon but extends north and south of the town to a height of up to *c.*80m OD. The terrace includes Hartwell. Lacking exposures, BGS suggested that the terrace deposits are 'generally thin: thicknesses greater than 3m are exceptional.' (Sumbler 1995, 96). At the Hartwell pit, Hollis noted that the deposits above the Pleistocene fauna contained Portlandian erosion material. Both Aylesbury to the east of the Bearbrook and Hartwell to the west have outcrops of Portland stone which could have provided this material.

At present all the watercourses local to Aylesbury drain directly north and west into the Thame; further to the west and south-west drainage is into the Ray, Cuttle Brook and Ford Brook. Not far south of Aylesbury lies the Wendover gap with drainage south-east into the Misbourne. A Pleistocene deposit lying not far from the junction of the two systems at Wendover is noted further on during discussion of the Misbourne valley.

The whole landscape north of the Chilterns would have been drastically altered by the Anglian glaciation which was responsible for thick ice sheets that would have covered the site of Aylesbury and which further to the east nearly reached London, about 480,000–420,000 years ago (Sumbler 1995, fig.1: 1996, figs 29 and 32, and Silva 2010, 7–8). Substantial deposits of this phase survive in a sand pit at Buckingham (Eyers 2007 and see Sumbler 2002) and there are extensive deposits of glacial till (material deposited at or near the base of an ice sheet) in the Milton Keynes area. Localised till deposits have been recorded as far south as Fleet Marston, near Aylesbury, and Sumbler (1995) argues that these were deposited during a late stage of the Anglian glaciation. This glaciation, whose ice sheet seems to have been checked by the Chiltern scarp (Shephard-Thorn 1994, 85), was responsible for diverting the Thames from what was once a more northerly course towards its present course south of the Chilterns and also erased, or significantly modified, pre-existing rivers over which it spread. The river terraces that can now be recognised north of the Chilterns (as they can on the Thame, the Ouse and the Ouzel) must post-date the main phase of the Anglian glaciation.

Sumbler (1995, table 1) attributes both the the Ickford and Quarrendon terraces to a phase of the next major glaciation, the Devensian (MIS 2–4). However, the presence of the hippo bones recorded at Hartwell does not comfortably fit this dating since, as Sumbler himself notes elsewhere, this mammal apparently only occurs in the preceding Ipswichian interglacial (Sumbler 1996, 120; Bridgland, Schreve *et al* 2004, 129). A review of the Hartwell find would obviously be of interest.[5]

A Preliminary List of Other Pleistocene Deposits from Central and North Buckinghamshire

It is surprising that there appears to have been no previous attempt at listing the location of Pleistocene faunal discoveries from the county. Although the author has endeavoured to make the following as comprehensive as possible it is more than likely that that there are omissions and he would be pleased to learn of discoveries which have been overlooked. Not surprisingly it has been the uncovering of mammoth tusks which has always attracted most attention, and less visually significant material is bound to have been under-recorded in the past. The mammalian identifications have been accepted here as reported and no doubt some would be re-classified by re-examination; for example *Mammuthus primigenius* was not the only mammal to produce tusks, although this seems to be a common identification.

In the following list, locations are grouped by principal river system and tributaries, working from upstream to downstream where there is more than one discovery. Where depths of alluvial deposit in the valleys are available in the literature they have been included as a rough guide to potential future deposits.

Although finds from the north bank tributaries of the Thames are included, the fairly numerous mammalian remains from the Thames valley itself are not as they have been extensively discussed in publications by The British Geological Survey and other authors (e.g. Gibbard 1985, chapter 6, who lists in summary the occurrence of mammalian species by terrace, and Sumbler 1996). There have also been detailed studies of Palaeolithic finds associated with these terraces, such as Wymer (1999) and more recently an account by Wessex Archaeology (1996). Silva (2009 and 2010) has also summarised this information. It may be noted in passing, however, that the County Museum holds

Pleistocene mammalian material from Taplow, Cippenham, Marlow, Colnbrook, Wraysbury, Langley Marish, Iver and Bourne End/Little Marlow and Palaeolithic handaxes from a number of locations.

The first site to be noted is the important site at Marsworth which cannot readily be referred to any existing river system, but may belong to an early Upper Thame.[6]

Marsworth

Two completely-infilled chalk-streams which came to light during topsoil stripping prior to chalk quarrying in 1976 (Anon. 1978), were investigated between 1976 and 1986. The significance of these nationally-important deposits, from the viewpoint of this article, is that unlike most of the other deposits recorded here, their presence could not easily have been predicted as they were distant from any existing watercourse. The Marsworth finds have received the most comprehensive cross-disciplinary investigation of any Pleistocene deposit containing faunal remains in Buckinghamshire (Green *et al* 1984, Murton *et al* 2001 and summarised in Silva 2010). The upper of the two channels, which like Hartwell contained hippopotamus (Murton 2001, table 8), has been confidently dated to the climatic optimum of the last interglacial (the Ipswichian); the infill of the preceding lower channel, which also contains temperate species, is likely to belong to a warm phase of the preceding glaciation. It contained what may be the earliest evidence in the UK for woolly mammoth.

The Upper Great Ouse and its Tributaries

The British Geological Survey maps intermittent river terrace deposits commencing at Buckingham (BGS 2002). Only in a few areas did it prove possible to differentiate two distinct terraces in this section, at about 2 and 5m above the floodplain; the majority are 'undifferentiated' (Sumbler 2002: see on for Ouse deposits in the vicinity of Milton Keynes). Of the terraces, Sumbler notes (p.24) that they 'are composed largely of reworked glacial deposits'. At Buckingham, Whitaker (1921, 124) notes a borehole 'in the meadows by the old water-mill about ¼ mile from the railway station where about '… 19' of gravel, sand and boulders were encountered.'

1. Buckingham.

Mammoth molar broken into two and red deer antler: from valley gravels near goods station, Buckingham. (1918.135.1-2 and 1918.135.3). The OS six inch sheet 13 SW, 1900 edition, shows a gravel pit a little south-east of Lords Bridge immediately adjacent to the station on the south side (SP 694 331) and this is likely to be the findspot.

The Padbury or Claydon Brook

The Padbury Brook, as its mapped terrace deposits show, reflects the course of what was once a substantial tributary of the Ouse with headwaters extending west into Oxfordshire and a subsidiary, the Claydon Brook, extending as far east as Swanbourne in Buckinghamshire (BGS Survey, sheet 219, 2002). There is no obvious information about the depth of alluvium but Whitaker (1921, 161) mentions '8-10 ft' of gravel as far east as Stewkley.

1. Steeple Claydon.

'Mammoth tooth and bone from about 5 feet below the surface of the gravel pit at Steeple Claydon. August 1876.' (1956.87.1–2). Donor Sir Harry Verney. The only Steeple Claydon gravel pit shown on the OS six inch sheet, 18 SW, 1900 edition, a date not far off the accession, is an 'Old Gravel Pit' about 700m east of Three Bridges Mill (SP 681 267). This lies in Steeple Claydon parish and was on Verney land[7] so it is likely to be the findspot.

2. 'Twyford.'

'From gravel and clay pit opposite Three Bridges Mill, Twyford. SP 676 270.' Mammoth leg bone; Rhinoceros (left femur, left humerus); Rhinoceros? (7th cervical vertebra, thoracic vertebra); Rhinoceros sp. (juvenile metatarsal); *Elephas sp.* (juv. left tibia); Horse (right scapula). Donor Mr G. Hodges, Thornborough (1974.245.1 and 1974.251.3–9).

Although recorded as being from Twyford, the grid reference actually places the site just north of the stream forming the parish boundary in Preston Bissett parish. There are no pits shown in the area on the 1900 edition OS six inch map, but on the 1951 1:2500 map there are lakes here; presumably infilled pits. Although donated to the museum in 1974 it seems probable that the find would have come from these small pits during their working life, which has not been further defined. The lakes (pits) are adjacent to a diversion of the road from its

former course to the east and it is possible that the gravel was dug for use during road construction. It is worth noting that this site and the Steeple Claydon site above are only *c.*700m apart and both at *c*.85m OD.

The Middle Great Ouse

There has been extensive gravel extraction both on the Northamptonshire and Buckinghamshire sides of the Ouse valley in the vicinity of Milton Keynes between Wolverton on the west and Newport Pagnell to the east, but only four finds of Pleistocene faunal material seem to have been recorded on the Buckinghamshire side. An important study of deposits in this part of the valley is included in Green (1996).

1. Wolverton, Manor Farm.

HER event number 1123. SP 808 421. During initial gravel extraction in 2008, Martin Bates (then University of Lampeter), recovered fragments of the pelvis of a large mammal. This is currently stored at the University. No other information is available. The gravel is thought to be of late Devensian age.

2. Newport Pagnell.

The following are in the County Museum collection: donor Mr A. Bullard. No other location available.

1905.436.1, 1-2. Two Woolly rhinoceros (also ox or cow tooth).

1905. 437. Tooth of Mammoth (molar).

3. Stoke Goldington.

HER event number 8829. SP 8553 4872. Samples taken from a buried channel exposed in a gravel pit produced pollen, plant macrofossils, molluscs, insects and ostracods. Also present were fragments of vertebra of an elephant (species not determined), molars of mammoth and *equus*, a bovid ulna, fish bones, and bones of a northern vole. Dating of these temperate deposits proved problematic as they 'cannot be correlated with the standard succession for the British Pleistocene'. However, it was suggested that they could be of a similar period to those noted above at Marsworth, and that the Stoke Goldington lower channel infill dates to Oxygen Isotope Stage 7 (Green, C.P. *et al* 1996). [NB. In the article the pit is erroneously noted as being in Bedfordshire]. Material from this site is in the Natural History Museum, London (Pal. Ground 53G2).

4. Clifton Reynes(?)

Francis Colmer's notebooks (BCM 182.1988, book I, pages 5 and 13) record 'I have a fine molar of a mammoth from North Bucks (Clifton Reynes I believe).' Colmer was an antiquary and artist active in the High Wycombe area who contributed articles to the *Bucks Free Press* in the 1930s.

The Ouzel

Much of the Ouzel, whose southernmost course forms the county boundary between Buckinghamshire and Bedfordshire, is bounded on its west side by substantial deposits of glacial till, laid down during the Anglian glaciation. Within the valley BGS maps flood-plain deposits and first and second terrace material, of which only first terrace material is present as far south as Leighton Buzzard (BGS 1970 and 1992).

The interpretation of deposits within the valley as a whole is complicated by the presence of an early river channel which crosses between the valleys of the Ouse and Ouzel, and a glacial lake whose sediments have been recorded around and to the north of Fenny Stratford. Deposits associated with the latter extend to a depth of 'at least 37.3m' near Simpson (Horton *et al* 1974). Shephard Thorn *et al* (1991, 91) note also that there 'could be three channels below the Second and First terraces and the alluvium'.

The excavation in the early 1970s of substantial areas of sand and gravel around Milton Keynes, including Willen Lake, Hartigan's Pit, and Cotton Valley sewage treatment works, brought to light a number of finds. Many of these were recorded by the archaeologists of the Milton Keynes Archaeology Unit (MKAU), based at Bradwell Abbey Field Centre (BAFC). The discoveries were noted on record cards which are now in the Milton Keynes HER. The cards note that a number of the finds were retained with the MKAU finds at BAFC. When the unit closed, finds from the unit were moved into the Milton Keynes Archaeology store, currently managed by the County Museum Service.

In the upper Ouzel, there are extensive sand pits, principally south of Leighton Buzzard, which are mainly dug in the Lower Greensand. Occasionally infilled sub-glacial channels (one about 560m

wide) have been recorded cutting these deposits, for example at Heath and Reach (Shephard Thorn *et al*. 1994, 88, 93 and plate 10).

1. Linslade/Leighton Buzzard area

Linslade, lying adjacent to the Ouzel and now joined administratively with Leighton Buzzard, was formerly part of Buckinghamshire. The early settlement of Linslade, now known as Old Linslade, lay on the west bank of the Ouzel. Few of the find-locations from the headwaters of the Ouzel can now be accurately located, although the majority seem to lie on the Leighton Buzzard side of the river, which was the principal area of sand and gravel extraction. However, all local sites which have produced Pleistocene material are noted here in order to highlight the interest of the area. The identification of two palaeoliths from the Buckinghamshire side (see on) is also of significance.

The discoveries are noted below in order of publication.

(a) Oxford University Museum of Natural History has some *Elephas primigenius* tusk fragments. Donor W.G. Hayter, 24 December 1841 (Acc. No. Q.01858). There is a photocopy of a letter with the find from Hayter, who had an address at 11 Hyde Park [London]. In it he says that the bones were 'dug from a bed of gravel on the bank of the River Ouzel (a small stream dividing Beds and Bucks) about 1 mile NW of Leighton Buzzard in the parish of Linslade the whole extent of the … [?] could not be accurately ascertained, the tusks, for such I presume they were, when discovered were perfect, by my bailiff they were considered to be the [?bones] of the animal, they were measured by him and found to be 5' 4½ in long & 2 feet circumference at the base when removed'.

The letter implies a donation date for the material but it does not include a recipient address and the date of its accession to the museum is not recorded. The distance of 'about 1 mile' from the centre of the town would place the find near Old Linslade and I am grateful to Maureen Brown for the information that in 1841 W.G. Hayter took on the tenancy of Linslade Manor Farm. His bailiff lived in the old manor house (Linslade Manor at SP 911 268). Hayter, who was an MP, published an account of improvements at Linslade Farm in the course of which he drained the whole farm; 'the bed of the river has been effectually cleared out by the removal of upwards of 7000 cubic yards of alluvial deposit … The meadows were of the worst possible description … they were at all periods of the year liable to be overflowed by a mill stream which half encircled them.' (Hayter 1843). There seems little doubt that this drainage work was the occasion of the find.

b) On an excursion in 1873, the Buckinghamshire Archaeological Society visited Linslade (*Recs Bucks* **4**, 210–215):

'At Linslade National School Dr Lawford exhibited several interesting curiosities. One was a remarkably perfect flint, found near the river Ouse [*sic*], in the gravel about six feet deep. It was exhibited at a meeting of the Society of Antiquaries and was pronounced by a great authority, Mr Evans, to be the genuine work of human hands. … On the banks of the Ouse [*sic*] were also found elephants' teeth, a piece of a tusk in a perfect state.'

Dr Lawford was clearly a recognised local antiquarian.[8] In 1893 he exhibited a 'Case of local antiquities' (unfortunately not otherwise described) at an exhibition at Leighton Buzzard Vicarage (copy at Bedfordshire Record Office ref. P91/28/22).

So far as the tusk is concerned, it is uncertain whether Lawson was referring to a find in his possession or to the discovery made by Hayter's bailiff, noted above; the teeth, however, had not otherwise been recorded. The discovery/discoveries are likely to be the source of a *Victoria County History of Buckinghamshire* entry (vol. I, 23), noting that: 'remains of elephant (mammoth) have been recorded from Linslade'

c) Lewis, E.W. 1879 *Lectures on the Geology of Leighton Buzzard and its neighbourhood delivered before the Working Men's Club and Institute of that town.* A.P. Muddiman, Steam Printer, Leighton Buzzard.

'On the table is a fine specimen of elephant's tooth *(Elephas primigenius* I presume) found in some gravel near the gas-works; also a portion of a tusk found in the same place, and which must have been of very considerable length, probably some six or eight feet. The teeth may be found in the gravel of this neighbourhood very freely, though generally in a much more fragmentary and decayed condition than the one you see before you now.' (Lewis 1879, 74).

Leighton Buzzard's gas works was adjacent to the LNWR (Dunstable Branch) railway line. Not far east near 'Grovebury Crossing', a 'Sand Pit' marked on the six inch OS sheet 28, SW (2nd edition, 1902) at SP 924 241, is the nearest pit.[9]

d) Robert Richmond in *Leighton Buzzard and its Hamlets* (1928, 1) has two relevant entries. On page 1 he records '… flint implements etc, have been found in many of the gravel pits near Leighton, including those at Bassett Road, Bassington and along Wing Road up to the top of the hill. Antlers of red deer and mammoth have been found *along* with these implements'. On page 109 he states that 'Mammoth tusks and teeth have been found in the Bassett and Stanbridge Road pits *associated* with many small scrapers' [current author's italics].

That the 'association' between flints and mammoth cannot be taken literally in this instance is strongly suggested by the rather general reference 'Wing Road up to the top of the hill'. Only one small gravel pit is shown anywhere near this road on the OS six inch sheet 28, SW, 1902 edition (at SP 899 235),[10] and in Richmond's second account he makes no reference to a discovery of mammoth remains in this area. So far as the Wing entry is concerned, he probably meant that that flints had been found in the immediate vicinity, e.g. in fields adjacent to the course of the road, which he probably also intended to indicate for the other two sites, *i.e.* that flints had been found at the same pit rather than in any way directly associated with the animal finds.

Although Richmond probably did not intend either to imply a find of mammoth on the Wing Hill, there is nevertheless an interesting piece of information about possible Pleistocene deposits here. It is contained in the notebooks of another local antiquarian, F. Gurney of Egginton. His notebooks are divided between Buckinghamshire Archaeological Society and Bedfordshire Record Office. Amongst the latter collection, one volume, X325/160 with folios unnumbered but at about f102, has the following:

'Thursday 18 September 1919. Tonight walking up Wing Hill I noticed by the roadside under the cutting in what looks like glacial gravel, but wh. Richmond says is river-gravel, and if so it must be the top terrace of it, a carefully trimmed blade of palaeolithic age, exactly like dozens I have found at Biscott. The colour is mottled blue and white, with slight ochreous stains. I can hardly believe that it came from road-mending material, for flint and gravel is never used for these roads, and has never been in any recollection. Evidently the Palaeolithic stone I picked up some months ago on Lords Hill in Linslade is by no means solitary.' Earlier on the volume at about folio 86, he describes his Lords Hill find as a scraper 'deeply changed in colour by age and plainly no Neolith'. Gurney was a good friend of Worthington-Smith, a well respected scholar in the field of lithics, so his identification of both flints as Palaeolithic should be treated seriously.

BGS (1990) maps material on Wing Hill as glacial till and Shephard-Thorn *et al* (1994, 93–95) record the complexity of the deposit which contains bands of sand and gravel as well as a buried channel. In 2007 the present writer noted that a 2-3m thickness of gravel had been exposed at the top of Wing Hill during construction of the Leighton-Linslade bypass. It is possible that Gurney's Palaeolithic flint derived from such a deposit.

For the sake of completeness, the discovery of a mammoth tooth in a rockery garden at Moor Hills, Wing, should be noted; presumably a collector's piece (acc. 1964.138).

Returning to Robert Richmond's reference (above), to the discovery of mammoth remains at the Bassett Road and Stanbridge Road pits, these two finds seem unambiguous.

(e) Bassett Road pit. The 1902 map referred to above does not show a pit on Bassett Road itself but there is one at the end of an urban extension to Bassett Road, Queen Street (SP 920 259). The Bedfordshire HER (10722) records from air photographs a second disused pit (presumably post-1902) a little further south (SP 9183 2533). The find of mammoth may have come from either of these locations.

(f) Stanbridge Road pit. There is a sand pit quite close to the town just north of the Stanbridge Road on the OS six inch sheet 28, SE 1902 edition (SP 929 252). The HER 10724 however suggests either SP 9363 2470 OS (1st edit 1887) or SP 9361 2475 2 gravel pits (OS twenty-five inch 2nd edit. 1901).

(g) Messrs Arnold's sandpit. ?location of pit.
Recs Bucks **15** (1947), 74 notes acquisition of 'A

mammoth molar. Mr M.D. Perrin.' The County Museum accession register (1947.55.1) records that that it was found in 1946. A tusk was said to have been found with it. I am grateful to Maureen Brown for the information that in 1935, Arnold's were working four pits in the area so which pit is referred to remains unclear.

2. Fenny Stratford

'From certain Pleistocene deposits at Fenny Stratford the British Museum possess two imperfect molar teeth and a tusk of the mammoth (*Elephas primigenius*) which were presented by Sir Philip Duncombe in 1873.' (VCH Bucks 1, 25). This material is still in the Natural History Museum, London (NHMUK 43508-9: Pal. Ground 53F 18). Dr Currant, observes, *pers. comm*., that it includes two pieces of *Mammuthus primigenius* upper molar, and a piece from a *Coelodonta antiquitatis* – woolly rhino. An attached museum label states that it was 'found 16' below the surface in digging for bricks'. The accession register records; 'Tusk 9' 8" long, 16 below surface digging out clay for bricks on the top of the clay at Fenny Stratford Feb 1872'.

The OS twenty-five inch sheet XV.10, 1881 edition, shows a brickfield close to Fenny Stratford between the Ouzel and the canal, just south of the A5 at SP 8850 3384. The Bucks Record Office holds a 'survey and terrier' of 1858 of land in nearby parishes including Water Eaton (which adjoins Fenny Stratford on the south). Duncombe, who presented the tooth and tusk, held 'Plantations, Brick and Tile Yard Buildings' here (D/DU/6/24). As there is no reference to a brickyard actually in Fenny Stratford at this period but Water Eaton lies immediately adjacent, it seems likely that this would have been the relevant pit. The BGS map of 1970 shows the site on 'glacial lake deposits' but the deposit's boundary here, which lies beneath development, may be unclear and immediately to the north 'sand and gravel of unknown age' are mapped.[11]

3. 'Bletchley'

Three finds with no other location:

(i) Oxford University of Natural History has: Q.01857 *Elephas primigenius*. The museum has no detail about donor or date of accession.

(ii) HER 3237. *Elephas primigenius* tusk. In private possession. Found August 1955. Information from J. Royston, Buckinghamshire County Museum.

(iii) HER 3256. SP 880 340. Atlas vertebra of *Cervus elephas*, found in Bletchley area by Mr Palmer of Aylesbury Vale District Council. Boulder Clay (1955.80).

4. Bow Brickhill, Caldecotte Lake.

HER 3353. SP 8886 3523. In April 1982 during excavation of Caldecotte Lake, R.J. Williams of MKAU noted Mesolithic flints: 'Beneath the main alluvium was a discontinuous band of reddish brown alluvial clays which contained several flints. Several fragments of partially fossilised bone were recovered from this layer …'

5. Simpson.

HER 3233. SP 8805 3505. Bone of *Elephas primigenius*. Found during sewer digging by Mr Mead, Canal Side Farm, Simpson Road, Milton Keynes. Alluvium, June 1953. With finder.

6. Willen Lake, Little Woolstone.

The southern end of Willen Lake (Willen Reservoir) is only *c*.600m distant from the pits operated by Hartigan (see Broughton and Milton Keynes below). Mainly extracting first terrace material (BGS 1971).

(i) HER 3278. SP 87946 41052. One *Elephas antiquus* tusk found in basal layer of gravel above Oxford Clay, approx 2.5m deep from surface. OD(?) level 56.119m (top of Oxford Clay.). Found Mr P. Watling, Newlands Farm, Pineham, 1974. [This tusk is now (in 2011) in the care of the City Discovery Centre, Milton Keynes.]

(ii) HER 3278. SP 87830 40920. One scapula of mammoth (*Elephas primigenius*) 4.25m deep in clay, below 1.2m of gravel. Found Mr P. Watling, 'Infrastructure'. Conserved David Parish, Bucks County Museum. BAFC. 'Finds marked 279'. 2nd Terrace.

(iii) HER 3315. SP 8795 3980. Cannon bone of horse, found by A. Wooton. 1975. [No other information.]

7. 'Broughton'
Two finds from Broughton are recorded below but there is some uncertainty about the exact location of the discovery as there were three pits in close vicinity, as follows:

a) The 1:10,000 OS sheet 83NE (published in 1987 but the relevant area surveyed in 1971), shows a small, apparently disused pit at SP 897 398 just south of the village. This lies within Broughton parish and is on the east side of the stream separating Broughton from Milton Keynes village. It is not indicated on the BGS 1971 Special Milton Keynes geological sheet (see below).

b) However, west of the pit above, BGS 1971 does show a larger shaded area indicating an extracted area immediately east side of the stream and also in Broughton parish (SP 895 398). This does not seem to be shown on any OS maps.

c) A third pit is shown on BGS 1971. This substantial pit (centred on SP 889 397) lay on the west side of the stream separating Broughton and Milton Keynes and is in Milton Keynes parish. However, its northern end was within 300m of Broughton parish church and its southern end extended within 200m of Milton Keynes church. Apart from the 1971 geological map indication, the standard OS 1:10,000 sheet 84SE (surveyed in 1969), shows a 'Pit (disused)' with the word 'Conveyor' beside it at SP 891 401 (the pit's northern extent). The presence of the conveyor implies recent disuse. The adjoining OS southern sheet 83 NE (surveyed slightly later in 1971), shows the pit's extension towards Milton Keynes village as water-filled and presumably also disused. The pit produced significant late Saxon finds in 1967 (Parkhouse *et al* 1996, fig. 1, reporting on earlier work by Dennis Mynard).

Determining which of the three pits the two finds noted below came from would require further research on their ownership.

(i) Eight pieces of mammoth tooth, *Mammuthus primigenius,* collected 16.10.1965 by S.C. Coryndon of the Merchant Venturers, Bristol from a pit leased by GFX Hartigan. Natural History Museum, London (Pal. Dept. M 34730 – M 34737. [Dr Currant incidentally notes *pers. comm*. that the donor worked at the Natural History Museum prior to 1971 and was the daughter of Sir Robert Coryndon, Governor of Kenya].

(ii) '…a mammoth tooth was obtained from the washing plant' at the Broughton Quarry of Messrs GFX Hartigan in 1967–8'. (Horton 1974, 53),

8. Milton Keynes village. Hartigan's Pit and adjacent area.

Williams (1993, 177) notes: 'Between 1969 and 1988 an area of 61 hectares sited between the village of Milton Keynes to the east and the river Ouzel and the Woolstones to the west, was quarried for three million tonnes of sand and gravel). A smaller area to the NE of Milton Keynes village had been previously quarried in the 1960s …' [see note above] (Williams 1993, figs 1 and 75). Digging commenced in 1969 near the Ouzel and moved east. Hartigan's Pit was of substantial extent, centred on SP 884 388, and mainly extracted second terrace material. Archaeological excavations were carried out at the site by H.S. Green in 1972 and 1973 and his presence at the quarry may have occasioned the reporting to him of some of the discoveries from the working pit.

The list below is in approximate sequence of discovery as recorded in the HER or newspaper report, etc. The various names used for the pit have been retained.

(a) 'Hartigan's Gravel Pit, Milton Keynes. HER 3202: individual locations as follow, noted below: (i) SP 8812 3875 (ii) 8812 3879 (iii) 8813 3877 (iv) 8812 3879.

(i) 23.3.1972. Disturbed finds recovered during gravel washing at the plant. Three large fragments of tibia of very large bone – most probably *Bos primigenius*. Found in gravel washing. At BAFC [A note on the card says 'see archive'].

(ii) 23.3.1972. 3rd metatarsal (left side) of horse, also two fragments of pelvic girdle of horse. Found near to the base of gravel by E. Campion. At BAFC.

(iii) March 1972. One bone of ?*Elephas*. Found near base of gravel. At BAFC.

(iv) March 1972. One tooth of *Elephas ?primigenius*. Found near base of gravel. March 1972. At

BAFC [note on card 'Finds marked MK 201].

(b) 'Hartigans Gravel Pit, Milton Keynes.' HER 3215. SP 882 387. Two teeth, probably mammoth and one bone fragment. Found at Hartigan's washing plant. Found by Alan Gregory and Duncan Tough (MKDC). One at BAFC other with A. Gregory [No date given on the record card but probably 1972.]

An MKDC press release dated 15/7/72 (copy at the MK Discovery Centre) which refers to the discovery of a mammoth tooth in the washing plant, 'probably a molar and almost completely intact', may refer to the above find. It notes that 'a number of fossilized bones have been discovered during the excavation of a Bronze Age barrow on the edge of the same pit' [See note on Stephen Green's work above]

(c) [Hartigan's Gravel Pit – presumed to be from here on account of the find date although not specified in the following]. The *Wolverton Express* of 16.3.73 reports that, Tony Cassidy of the Open University Geological Society has found part of the tusk of a woolly mammoth 'in a gravel pit near Broughton village in Milton Keynes'. An accompanying picture shows a small piece of tusk with a diagram indicating 'how much he uncovered before it crumbled'.

(d) Hartigan's Gravel pit. HER 3277. SP 8833 3845. 1974. One *Elephas antiquus* tusk stratified in gravel approx one metre above Oxford Clay. Excavated and conserved by David Parish of Bucks County Museum [At that time recorded as being at BCM].

(e) 'Milton Keynes' [find presumed by the writer to be from Hartigan's pit on account of the find date.] The *Bucks Standard* of 8.2.74 reports that: 'Two combined bones, believed to be part of the "elbow" of a prehistoric woolly rhinoceros, have been unearthed at Milton Keynes by Mr Stephen Green, an Environmental Department archaeologist supervising excavations on behalf of the New Towns Development Corporation.'

(f) Hartigan's Pit, Milton Keynes. HER 3355. SP 8872 3889. April 1982. Fragment of base of horn case attached to part of skull found lying in discarded material at bottom of gravel pit. [presumably *Bos* but not stated as such]. Finder R.J. Williams, MKAU. At 'MKDC'.

(g) Hartigan's Pit, Milton Keynes. HER 3363. SP 888 389. August 1983. Pleistocene long bone found in base of pit. From disturbed context, 'impossible to define whether came from clay or gravel'. Sent to D. Parish, Bucks County Museum, for examination and identification.

(h) Milton Keynes 'SP 885 392'. Two juvenile mammoth teeth. Collected from Milton Keynes village, gravel pit spoil heap *c*.1990. (1992.6.2)

(j) 'Hartigan's'. In a display case in Milton Keynes Museum are five pieces of mammoth tooth, presented by GFX Hartigan. It has not proved possible to gain any further information about this find from the museum but it could also be from Hartigan's Milton Keynes pit.

(k) Milton Keynes. Found on line of road H4. HER 3219. SP 884 396. February 1973. Tusk found in river gravel 8' and 5' down. Was originally 2' 6" long and 8" max diam but fell into fragments when lifted. *Mammuthus primigenius*. Found by F. Gardner Stangle, Prebend House, Buckingham, Open University Geological Society. With finder.

9. Cotton Valley Sewage Treatment Works, Milton Keynes.
Work at this site mainly extracted first terrace material and head deposits (BGS 1971).

(a) HER 3200. SP 884 409. 1 complete ox horn in 2 pieces and fragment of another ox horn, in 3 pieces (*Bos primigenius*). Stratigraphy – at base of gravel pit, at the point of junction with Oxford clay (square 33). From head of sedimentary tanks. Found September 1972. Finds at BAFC.

(b) HER 3205. SP 887 407. Pleistocene horse bones. Found on interface of Oxford clay and gravels. Found January 1973. At BAFC.

(c) HER 3232. SP 887 404. *Equus*, one fragment limb bone; four fragments of limb/girdle of *Elephas.* Found *c*.1972 at sewage works by Mr R.M. Rylance, c/o AE Farr Ltd, Cotton Valley Sewage Works. (1972. 177.1 and 177.2.1–4).

Central Buckinghamshire –the tributaries of the Thames

The rivers are considered from west to east.

The Hambleden Valley

No Pleistocene finds appear to have been recorded from the valley of the Hambleden Brook. BGS (1980) records some 'Younger Coombe Deposit' in the heads of the valleys (around Fingest and Turville), and 1st (Flood plain) Terrace Deposits in the main valley downstream to Mill End (Hambleden). Squirrell (1978, 64–6) gives information on a borehole near Flint Hall downstream of Skirmett which recorded 4.3m of gravels and one near Pheasants Hill north of Hambleden where 6.5m was recorded; both onto chalk. Gibbard (1985, 80, fig. 49) provides a longitudinal sketch profile along the valley based on information from three boreholes. In October 2011 during excavation of a substantial hole at the foot of rising ground on the east side of the valley in the grounds of the Stag and Huntsman at Hambleden (SU 785 865), the writer observed what appeared to be large flint nodules to a depth of 5m below ground level with no obvious bedding but some irregular horizontal iron(?) staining. No chalk was observed. The whole could be a 'head' deposit rather than riverine.

The Wye Valley

The earliest deposits which can be related to the Wye, the 'Princes Risborough Sand and Gravel' deposits, occur in a tributary valley to the south and south-west of Risborough around Loosley Row etc. at approximately 140m OD. They probably indicate the course of an early river Wye, predating the development of the Thame in the post-Anglian period (BGS 1994: Sumbler 1995, 98 and 100).

In its 1980 mapping, BGS records 'Younger Coombe Deposits' in the headwaters of the Radnage and West Wycombe valleys which drain into the Wye. In subsequent mapping of the adjoining sheet (BGS 2005) the same deposits are recorded with slight variation as 'Head gravel: stony clay, silt and sand'. From West Wycombe downstream the valley-bottom deposits are noted as floodplain to beyond Wooburn. The only terrace deposits noted in the valley commence near its mouth around Wooburn, the Shepperton Gravel, a part of the main Thames system of terraces.

At High Wycombe, Sherlock and Noble (1922, 45) noted the alluvium to be very thin. 'At the north-western corner of The Rye, High Wycombe, 25ft of chalky gravel, resting on chalk, was found in a well.' Whitaker (1921, 170), probably recording the same well, dug about 1909 about 150' west of Pann Mill, on the Rye, notes also that the gravel contained 'thin layers of peat'.

There are four recorded finds of Pleistocene date from High Wycombe itself:

(a). The Memorial Hospital. SU 864 927. 'A hippopotamus tooth was found in Coombe rock by Mr W. Clarke during excavation for a new building.' (*Recs Bucks* **17**, 304). This does not appear to have been given to the County Museum.

(b). High Wycombe, location unknown. The Natural History Museum, London has a *Rangifer tarandus* (reindeer) metacarpal (M11562). An attached label records that it came '?from river deposit, given Tomas Thurston 1917'. The register records that it was given in March 1917 and came from '23 feet beneath the surface and about 2 foot above stream level'. Mr Tomas Thurston has not been traced in local directories of the period. However, the name may well be an error for a better-recorded Thomas Thurlow who certainly was involved in construction projects (see 'gasometer' site below). Given such a deep excavation, it might be possible to work out with which works the discovery was associated.

(c). High Wycombe. Gasometer. SU 862 929. Francis Colmer, previously noted, was an antiquary active in the High Wycombe area in the 1920s and 1930s who contributed articles to the *Bucks Free Press*. His notebooks are in the County Museum collection (1988.182). In Book I, page 5, he notes a 'Rhinoceros tooth (Newlands) found when making excavations for gasometer at … [?Harlands] in possession of Mr T. Thurlow'. '?Harlands' has not been traced but the gasworks is shown on the Ordnance Survey 62 sheet 47, survey 1875–6, published 1883, and there is still a gasometer at the same location within the area shown as 'Newland' which could be 'Harlands'. Thomas Thurlow appears in Kelly's 1903 *Buckinghamshire Directory* as an architect and surveyor in High Wycombe (see also above entry).

(d). High Wycombe. location uncertain.

Immediately subsequent to Colmer's note (above)

is some script that is difficult to read but which apparently records mammoth tusks from 'Desboro Castle' (?). The earthwork known as Desborough Castle lies some distance west of the gasometer find and well above the valley floor, so the note might refer to a separate discovery in the valley below the castle but upstream of the rhinoceros tooth find.

The Alderbourne

Two dry valleys, one leading from Bulstrode Park area, the other from Hedgerley, converge to form the Alderbourne valley about a kilometre north-west of Fulmer. BGS (2004) shows their infill as head gravel. Nearer Fulmer and downstream the infill is mapped as alluvium. Upstream of Hedgerley, Squirrell (1974) records 11m of sand and gravel near Pennlands Farm, and in the northern tributary, 5m depth near Bulstrode Park.

In 1972 gravel for use during construction of the M40, was extracted from a pit adjacent to the mere at Low Farm, Fulmer (SU 993 862) and a little upstream. Just prior to extraction an archaeological excavation, directed by the writer, took place adjacent to Low Farm. During a post-excavation visit a rich organic deposit which contained preserved leaves, was noted at the base of the gravel. Unfortunately no Pleistocene specialist could be found at the time to carry out further investigations and it was not otherwise recorded. The deposit would certainly repay future investigation. The County Council kindly made available a file on the initial mineral application (ER/1731/71) which contains some borehole details of the area although not apparently their precise location. In general the data indicate that the solid chalk floor of the valley lies at around five to six metres below ground level and the base of sand and gravel at around three metres. The observed deposit is, therefore, likely to have lain between these deposits. Gibbard (1985, 83 and fig. 11) using borehole data occasioned by construction of the M25, indicates a slightly shallower depth of 3-4 metres of 'Alderbourne Valley gravel'.

No Pleistocene fauna are recorded from the valley.

The Misbourne

The location of the watershed between drainage into the Vale of Aylesbury and the Misbourne is likely to have varied over the millennia. At present it is well south of Wendover village, near Road Barn Farm at a height of about 153m. The first site to be noted below lies upstream of this watershed but at earlier times is likely to have been part of the Misbourne drainage system. Downstream from Little Missenden, BGS (2004) maps alluvium with head gravel in some side valleys at Little Missenden and Amersham. Only older mapping is available for upstream deposits (BGS 1946) and the whole is shown as 'valley gravels'. No terraces are recorded in the valley but to the writer's eye there is possibly a terrace about a metre above the floodplain at Little Missenden just north of the church on the north side of the valley (SU 920 991).

The infill of the valley appears to deepen as it progresses downstream, for example: '8ft 4in of clay and gravel was proved at Deepmill Pumping Station, Little Missenden.' (Sherlock and Noble 1922). Whitaker (1921, 120) in describing wells at Amersham, notes that chalk was first encountered at a depth of 24' at the brewery (which no longer exists) just north of the church, and in another well at the southern end of the town at 15'. In another boring he records 20ft of ballast on chalk, at the mill north of Chalfont St Giles. This accords with two boreholes recorded by Squirrell (1974) with 5.6m of gravel and sand near the village and further down the valley near Chalfont St Giles 7.5m of the same, and beyond, towards the Misbourne viaduct, a depth of 8.9m. Through a study of boreholes undertaken in connection with construction of the M25, Gibbard (1985, 83 and fig. 11) notes up to 11m of gravels in the valley bottom not far distant from the previous record.

a). Wendover. SP 8748 0664 (approx. centre pit). The County Museum has an *Elephas primigenius* tusk, recorded only as from 'Wendover Pleistocene gravel' (1967.386.1), whose accession is noted in *Recs Bucks* **15**, 148. However, its findspot can be located more precisely since the donor was recorded as Sir Alan Barlow, and Sherlock (1922, 51), notes:

> Rather less than a mile south of Wendover … where a large gravel pit shows that the gravel is 25' thick and is composed largely of angular flint (see frontispiece).
>
> … Remains of mammoth now in the possession of Sir Thomas Barlow, have been found at this

locality. No flint-implements were found during a search made for them with the assistance of Mr Reginald Smith of the British Museum.

The Second Edition OS 6 inch map of 1900 shows a 'Gravel Pit' adjacent to the Wendover-Amersham road on the east side, less than a mile south of Wendover. This is the only pit in the area and there can be no doubt that it is the pit referred to by Sherlock. His report includes an illustration of 'Deposits of gravel in the Wendover Gap' (plate 1, reproduced here as Fig. 5), and although the pit is not named in the caption it is undoubtedly the same one. Notable in the photograph are a series of deep ice wedges ('piping', in Sherlock p.51–2), features that form under periglacial conditions and which must post-date deposition of the gravel deposit that contained the tusk.

Part of the pit is now occupied by a rifle range. A visit shows that although now largely infilled, it was formerly much larger than the area currently occupied by the range. Its extent is confirmed by an air photograph of 1948 (HER Run 297, image 4150). Some grassed-over faces remain. I am grateful to John Collier of Wendover for the information that the pit was certainly on Sir Thomas Barlow's land. Haulage from the pit was by Wood and Whittaker of Tring Road, Wendover, who feature in *Kelly's Buckinghamshire Directory* for 1935. According to Mr Collier they were still operating at the pit in the late 1940s.

The area around the pit to the east and south is relatively level at around 157m OD, just a little higher than the present watershed height. It seems possible that the whole is a relict river terrace. The deposit is nearly 80 metres higher than the previously-noted Quarrendon terrace associated with the Thame to the north, so cannot be part of that terrace sequence. Geological Survey map 238, dated 1946 but surveyed much earlier as previously noted, shows the deposit as 'valley gravels'. They are noted by Sherlock (1935) who suggests that the material represents run-off from a glacier edge and an accompanying lake to the north. Sumbler (1995, 108–9) notes both the Wendover gravels and the Princes Risborough Sand and Gravel deposit attributing them to a pre-Thames Wye, noting the drainage system of 'consequent' streams flowing down the dip-slope of the chalk and entering the Thames to the southeast.

The valleys of this early drainage system are truncated to the north by the Chiltern scarp, which forms the south-eastern margin of the Thame valley; therefore they must pre-date the develop-

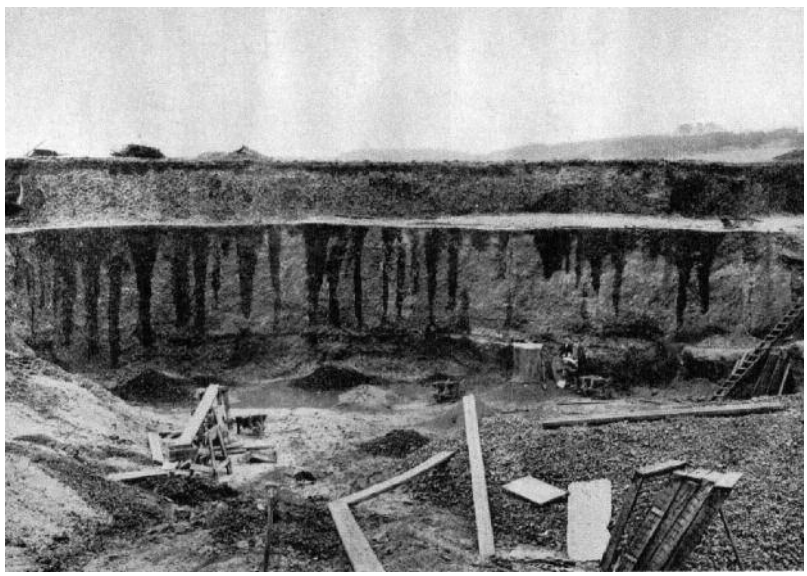

FIGURE 5 Wendover gravel pit, from Sherlock 1922 (plate 1)

ment of the River Thame and could well have formed, or been modified, when there was a substantial body of ice to the north (Sherlock 1960). This would have been the Anglian ice sheet (for its probable extent see Sumbler 1996, fig. 32). In view of the height difference between the highest point in the present town of Aylesbury (the parish church is at *c*.82m OD) and the Wendover deposit at *c*.157m (present ground level), there must locally have been a substantial mass of ice, at an absolute minimum 75 metres thick, above the site of Aylesbury in order to provide the run-off that produced the Wendover gravel sheet. Arkell (1947, 111), suggests an ice sheet 'several hundred feet thick 'pouring meltwater down the counter-scarp of the Cotswolds, the Chilterns and the Downs'. A 'mammoth' tusk would not be expected in a deposit of this early Anglian date. The Wendover gravels would obviously repay re-examination.[12]

b). Great Missenden? The Minute Books of the Bucks Archaeological Society (March 1987 to Sept 1907), record a committee meeting of 20 July 1905 as follows: 'Votes of thanks on the motion of Mr Cocks here directed to be presented to W. Callow Great Missenden for mammoth tusks some fossils from chalk P…[?]'. No mammoth remains from Great Missenden appear in the County Museum accession register, but there are two fragments of a horn core, possibly from ?*Bos Primigenius* (1905.434.1-2), obtained from W. Callow in 1905 with a label implying their discovery in 1898. It appears that the minute may be an error. If correctly identified here, *Bos Primigenius* is found in late Pleistocene deposits (e.g. Jacobi 2004, table 34) but examples are also not uncommon in subsequent Mesolithic and Neolithic contexts (O'Connor and Sykes 2010, 26–35).

The Chess Valley

No Pleistocene remains appear to have been recorded from the valley. Its headwaters around Chesham are only recorded in an early survey (BGS 1946), as valley gravels and alluvium, and south of this BGS (2005) later maps only alluvium. Sherlock (1922, 52) records 8-9 feet of gravel 500 yards west of Hazeldean Farm, 1½ miles NW of Chesham church. An archaeological excavation of a Mesolithic site (Stainton 1989, fig. 3) and an interim report on an adjacent site, recorded poorly-sorted flint gravels at a depth of about a metre below ground level.

Colne Valley

The Colne divides Buckinghamshire from the former county of Middlesex. Lacaille (1963, 178) observes that the river is 'the main constituent of a complicated hydrographic system with many feeders and subsidiary channels'. Both the Misbourne and the Alderbourne feed into its lower course. In describing Mesolithic material recovered from pits at Iver and Denham, Lacaille notes the extensive use of dredgers to remove gravel whose use would have limited direct observation of the deposits. No early-middle Pleistocene remains appear to have been recorded from the Buckinghamshire stretch of this valley.

Using borehole information, Gibbard records up to 6m of 'Denham Village gravels'. (1985, 51, 81 and figs 30 and 50). He notes the presence of terraces higher up the Colne towards Rickmansworth that have produced palaeoliths.

The presence of late Pleistocene faunal material was noted in the lower valley by Lacaille (1963, 178), and Gibbard (1985, 120) recorded a Late Devensian organic-rich sediment at Colnbrook. Two archaeological evaluations in the area (Lakin 2006 and Wessex Archaeology 2005), to date unpublished, record Upper Palaeolithic material. An important account of finds of this date including fauna uncovered during an excavation at Three Ways Wharf, Uxbridge, just across the river, has recently been published by Lewis and Rackham (2011).

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Library, to the Milton Keynes City Discovery Centre, Dennis Mynard and The Geological Society of London. John Collier of Wendover and his brother, kindly provided information about the Wendover gravel pit. Dr Barbara Silva looked over a draft text, as has Dr Michael Oates. Finally M.G. Sumbler, who has written extensively on the area for the British Geological Survey, kindly looked at an early version and helped the author avoid some elementary errors, but none of the above bear any responsibility for those which undoubtedly remain.

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NOTES

1. It is understood that Drs Barbara Silva and Danielle Schreve commenced a review of this and other Buckinghamshire material as part of a wider study.
2. A number of bricks have been recorded around Aylesbury stamped 'HL', including one which is set into the fireplace wall of 'The Harrow' in Bishopstone, stamped 18 HL 37. I am grateful to George Lamb for this information. Presuming a Hartwell link, the date is apparently earlier than commencement of the pit described here. It is possible that these bricks come from an earlier brick kiln in operation in the mid eighteenth century, to the north of Hartwell House (HER 06684).
3. I am grateful to Mike Palmer of the County Museum for this information.
4. I am grateful to Diana Gulland for noting this reference.
5. I am grateful to Mike Sumbler for confirming that the apparent presence of hippo at Hartwell would be anomalous as the remainder of the material is predominantly a 'cold' fauna. He suspects that if hippo is present it would have been incorporated from an older deposit.
6. I am grateful to Mike Sumbler for the latter observation.
7. I am grateful to John Broad for confirming this.
8. I am grateful to Maureen Brown for the information that he was also a member of the Bucks Archaeological Society and Leighton Buzzard's doctor.
9. Maureen Brown writes that E.C. Lewis was the National Schoolmaster in Leighton, and Treasurer of the Working Men's Institute.
10. Wyatt *et al* (1998) note a functioning sand pit at Ascott Farm, but this appears to have been opened in recent years.
11. I am grateful to Mike Sumbler for the suggestion that the finds probably came from First or Second terrace deposits.
12. Mike Sumbler observes that a check for erratic lithologies in the gravels would be of value.