

The Palaeolithic sites at Limpsfield, Surrey: an analysis of the artefacts collected by A M Bell

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Summary

A collection of Palaeolithic flint artefacts from Limpsfield in Surrey, assembled around the end of the 19th century, is recorded and analysed, and a large number are allocated a site provenance. A number of discrete sites and possible sub-sites are identified, and the result of recent fieldwork in the area is also described. The finds include a high percentage of bifaces with twisted profiles which it is suggested may partly be the result of preparing a biface on a wide and thick but short flake. The finds are related to the local Quaternary geology and their significance for early human activity within the landscape is considered.

Introduction

During the later part of the 19th century a considerable amount of cultural flint material was recovered in the parish of Limpsfield, Surrey, by a local academic tutor and antiquary, A M Bell. Some of this material is of a post-glacial date, but most, some 558 pieces including 441 bifaces, is Palaeolithic. The site was briefly noted by a number of geologists and antiquarians (Prestwich 1891; Evans 1897, 609–10; Clinch 1902; Treacher 1909; Smith 1917 & 1926; Whimster 1931), and more recently by Wymer (1987, 24) but otherwise it has not received the attention that it deserves. On Bell's death in 1920 his collection was purchased by the Pitt-Rivers Museum at Oxford, where it lay unnoticed for many years. The material was subsequently transferred to the Quaternary Research Centre, Oxford (Roe 1981, 266). The collection was noted by the writers during a museum visit and later catalogued; the artefacts were sorted and allocated to each of twelve different locations (Cotton *et al* 1984; Field & Nicolaysen 1995). Field investigation of part of the Limpsfield area took place at about the same time and the accumulated evidence is presented below.

Location

Limpsfield (fig 1) lies to the south of the urban sprawl of London, adjacent to the boundary between the counties of Surrey and Kent. Croydon is situated 12km to the north, while Redhill, Sevenoaks, and East Grinstead lie at similar distances to the west, east and south respectively. Limpsfield itself is only one of a series of villages that have developed along the course of the Oxted and Darent streams that lie at the foot of the North Downs escarpment. The Palaeolithic sites all lie on and around Limpsfield Common which is situated on the gravels and dip-slope of the Lower Greensand to the south and south-east of the village.

The various Greensand beds in the area seem to have undergone considerable disturbance, being quarried for stone, probably from late prehistoric times. A mining tool of probable Iron Age date was found 'some feet underground' at an unknown site in Limpsfield, prior to 1926 (Malden 1926, 89–90), while an early Romano-British inurned cremation was deposited within an earlier quarry at Chart (Cunnington 1932, 118) on Limpsfield Common. According to the Domesday survey, two stone quarries were certainly present in 1086 (Morris 1975). Many of the quarries that remain in the Chart area of the Common are now shallow and weathered and from the surface evidence would appear to be of some antiquity. Others, however, retain a sharp profile and it seems likely that the area has been quarried for stone throughout the historic period. More recent disturbance occurred when a number of large houses were built around Limpsfield Common after the railway to Oxted was constructed in 1884, changing the nature of part of the landscape, and obscuring some of the areas in which early finds were made.

The Quaternary deposits

While more fieldwork to re-assess the Quaternary geology of the Limpsfield area is undoubtedly needed, the work described here has been restricted to the archaeology, and it is not intended on this occasion to consider the geological problems in any detail. It is necessary though to look briefly at the deposits, as their investigation is intimately associated with archaeological material and their nature may shed considerable light on the latter.

The solid geology of this part of the Weald is well enough known (Dines *et al* 1969) with the respective sand formations, the Upper Greensand, Gault Clay, Folkestone Beds, Sandgate Beds, and the Hythe Beds, running ribbon-like west to east across the area. It is bounded by the chalk escarpment to the north and the Greensand escarpment itself, which overlooks the Weald Clay, in the south. A valley has been carved, west to east, at the foot of the chalk escarpment, presumably by a proto-Darent river, with its watershed in the area of Limpsfield village separating it from the Oxted river system further to the west. To the south and east lies the Medway drainage system. The drift geology of the area is, however, extraordinarily complex and the relationship of this to

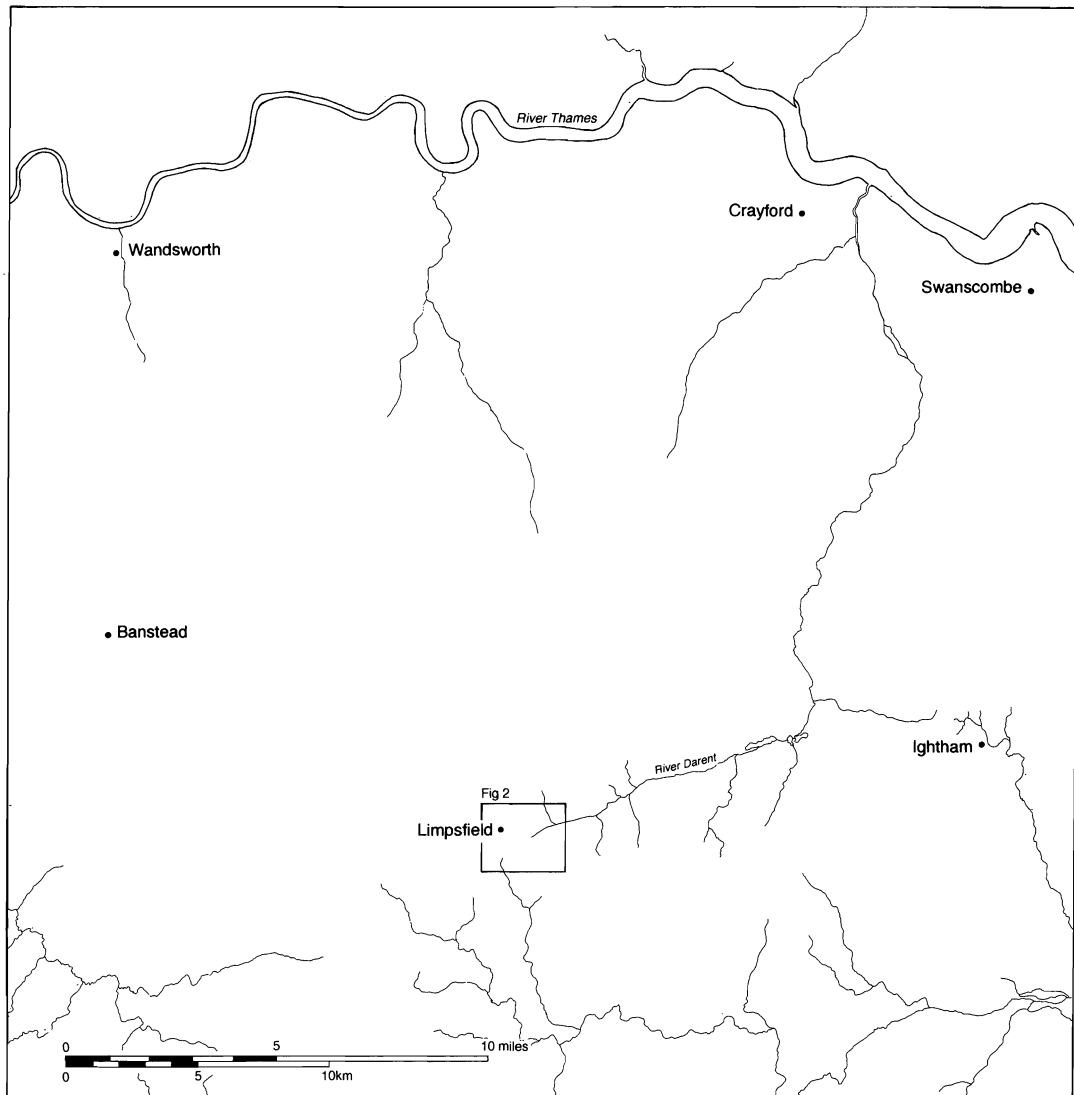


Fig1 Location map showing the Limpsfield area in relation to regional drainage

the cultural evidence is of some interest. Scattered across the solid geology are a number of patches of both river gravel and solifluction deposits, forming two main series. The latter, marked as Head on geology maps, is defined by Dines *et al* (1940, 206–7) as solifluction material, that can incorporate hillwash and aeolian deposits, and which may differ in composition even between nearby sites.

GRAVELS

The first series lies over the Gault Clay and Folkestone Beds, and is composed largely of Tertiary material that has slumped from the North Downs, and which has its main deposit to the east of Limpsfield village at NGR TQ 413 530. A few smaller patches exist further to the east at around TQ 418 532, TQ 423 534, and again to the south of the present Darent around TQ 423 527. The

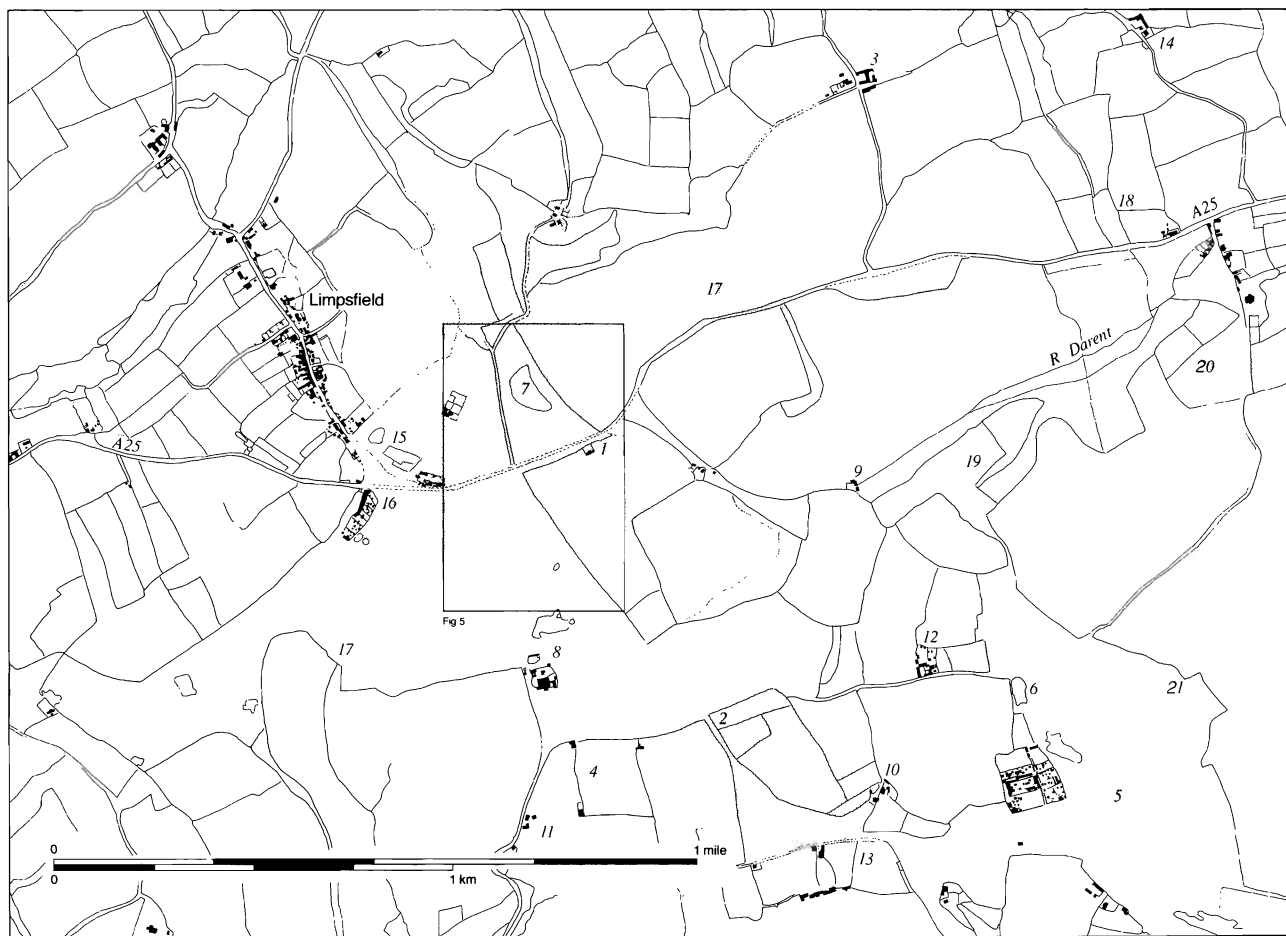


Fig 2 Map showing the area around Limpsfield based on the OS 6-inch map of 1871. Limpsfield village is in the north-west and the common stretches across the centre of the map. The High Chart is on the extreme right. Areas of gravel and 'Head' are stippled. Key to sites:
 1 Ballards, 2 Briars Cross, 3 Broomlands Farm, 4 Chapel Field, 5 The Chart (general location), 6 Whitemare Pond, 7 Limpsfield Common gravel pit, 8 Limpsfield Common brickearth pit, 9 Lockhurst, 10 Lombarden, 11 Paines Hill, 12 Ridlands, 13 Tenchleys, 14 Westwood Farm, 15 Pebble Hill, 16 Wolfs Corner, 17 The 525ft (160m) Ridge, 18 Thrift Wood, 19 Watts Hill, Roman Hill and Loampit Wood, 20 Moorhouse Common, 21 Yaldens Spring (Yaldings)

nature of this gravel has caused controversy and is still not entirely understood. Topley (1875, 161) believed that as the main deposit lay on the watershed between the present Darent and Oxted streams it could not have been laid down by the Darent in its present form, and represented a former high level river that ran along the foot of the chalk escarpment. As early as 1891 Joseph Prestwich considered that it represented the remains of Tertiary deposits that had slumped down the chalk escarpment during, or soon after, the last glaciation. He felt, however, that towards the east, the gravel began to take the form of a river deposit (Prestwich 1891, 144, 163). Soon afterwards, and perhaps influenced by this, Treacher claimed that the deposit was an ordinary river drift (Treacher 1909, 60). Later, as a result of their experience in preparing the geology map of the area, Dines *et al* (1940, 221) observed that although the gravel changed in composition according to the nature of the bedrock, it was certainly crudely bedded.

Gosling (1940) considered the matter in greater detail, observing the gravels at a number of exposures and noting their differing nature. He based his thesis on the evidence from an exposure at a recently opened pit at Westwood Farm, and contrasted it with the deposits present in the older pits. He identified eleven local sites, seven to the north and four to the south of the present Darent stream, on which to support his ideas. Nine of these are relevant here (fig 2):

1 Westwood Farm (fig 2, 14)

This is situated at TQ 427 538, between 450 and 387ft (137–117.9m) OD, and is adjacent and to the east of the larger and better known Moorhouse Pit, which has since expanded dramatically, and indeed is still worked. In it was observed a section of an ancient river channel (fig 3A), lying over Folkestone Beds, with a sharp river cliff over which Gault Clay had slumped. The river gravel deposits were in turn overlaid by rootlet clays. It seems likely that this may represent the outside of a meander curve, with an element of overlying loess. Sealing this was a separate deposit of solifluction gravel.

2 Pebble Hill House (fig 2, 15)

Situated at 506ft (154m) OD, the section here was composed of very coarse gravel, with a layer of sand dividing it at the west end of the exposure, and containing Tertiary pebbles, broken flints, pieces of ironstone, and a few fragments of sarsen. During a visit to the site by the Geological Association (Gosling 1940, 341–5), attention was focused on the sandy nature of the matrix, sand lenses, and the presence of Lower Greensand and Wealden pebbles. The view was expressed that it represented a river gravel, perhaps a product of washing out solifluction material, and was to be distinguished from that in the nearby and ‘well known Old Pits’ a little to the east.

3 Wolfs Corner on Limpsfield Common, south of Pebble Hill (fig 2, 16)

An exposure at 500ft (152.4m) OD revealed 2ft (61cm) of Tertiary pebbles and small flints, but also contained siltstone pebbles and mudstones from the Weald.

4 Limpsfield Common, south-west corner (fig 2, 17)

A plateau site at 490ft (149.3m) OD, with a gravel identical to 1 and 2 above.

5 Limpsfield Common, old gravel pits (figs 2, 7; 4)

Fractured flints and small Tertiary pebbles occurred within a reddish clay matrix. These were the deposits considered by Prestwich to be essentially an altered Gault Clay with Tertiary components (Gosling 1940, 327). Prestwich, who was familiar with the Limpsfield pits, had visited the Old Gravel Pit as early as 1849 (*ibid*, 140 footnote), as well as the nearby brickearth pit (fig 3B and pages 16–17), and he recorded that ‘a fine section (of the Limpsfield Gravel) is exposed in the old pit on the north side of Limpsfield Common. It is there 8–10ft (2.4–3m) thick’. Some of these deposits, he felt, were clearly river drift, though they contained some evidence of an earlier as well as a later solifluction episode. It is likely that he was referring to the ‘Old Gravel Pit’ marked on the OS 25-inch map of 1871 at TQ 413 525, a little to the north of an ‘Old Clay Pit’, and situated at 497ft (151m) OD. However, the same map depicts an operational gravel pit at TQ 412 523 and it is

possible that his observations relate to other exposures. Gosling used the term 'Old Gravel Pits' for those shown as active on the OS 6-inch map of 1898, and which, as Treacher (1909, 60) comments, were overgrown by 1908. It is from this latter pit that Bell obtained Palaeolithic artefacts. The notes written on his flint material from this site suggests that the base of the pit was 8ft (2.44m) deep, just above a loam, and that there was a 'solid shingle' deposit part way down the section at 4–5ft (1.22–1.52m) deep.

6 The 525 ft (160m) OD ridge (fig 2, 17)

This is a deposit of gravel composed of flint and Tertiary pebbles, some up to 20cm long, capping the high ground either side of the A25 road, at TQ 417 531. It was considered by Gosling to be an original (ie, very early) solifluction deposit, on the south side of which a high-level river had encroached. If this is so, it represents the earliest evidence of river activity in the Limpsfield area.

7 Thrift Wood (fig 2, 18)

This was considered by Gosling to represent both river and solifluction deposits, although it is not clear which came first. The deposit is situated immediately south of the Moorhouse Sand Pits at TQ 423 535 at a height of 480–490ft (146.3–149.3m) OD.

8 Watts Hill, Roman Hill, and Loampit Wood (fig 2, 19)

A series of small interfluvies, each capped with gravel, situated a little above the present Darent stream. At a height of 470–475ft (143.2–144.7m) OD, they appear to represent part of a former terrace of the Darent.

11 Moorhouse Common (fig 2, 20)

According to Gosling this terrace, lying at 480ft (146.3m) OD must be an earlier deposit as it does not correlate with the Watts Hill deposits, nor with the Westwood Farm gravels.

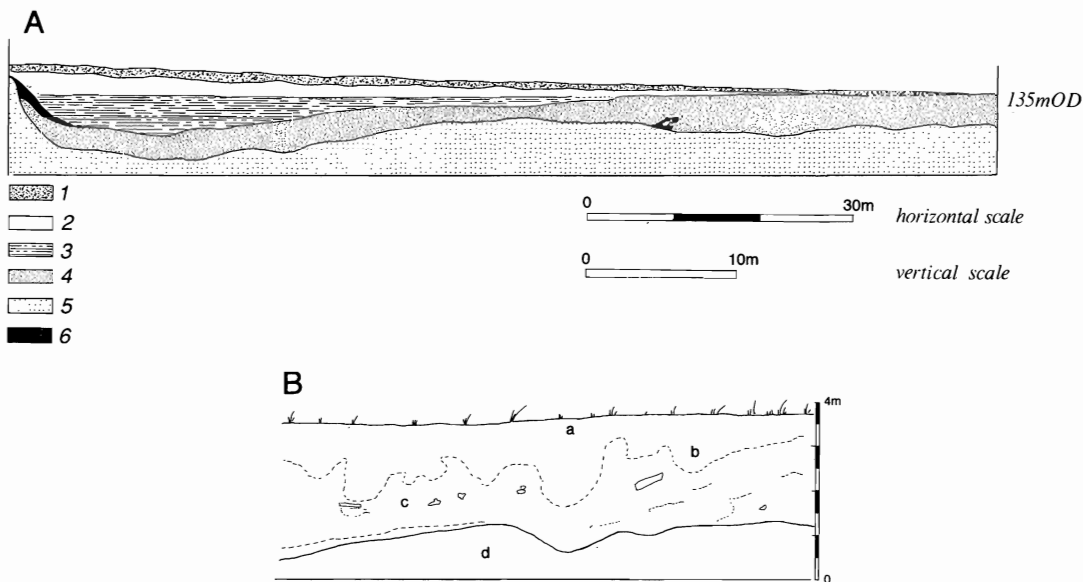


Fig 3 Limpsfield: A. Section of the Westwood gravel pit showing the ancient river channel. Key: 1 Upper gravel (solifluction), 2 Brickearth, 3 Laminated clay, 4 Lower gravel, 5 Lower Greensand, 6 Clay (after Gosling 1940a). B. Section of the Brickearth Pit at Limpsfield (after Prestwich 1891, 146). Key: (a) surface, described as 'bleached' podzol, (b) disturbed brickearth, (c) undisturbed but unstratified brickearth containing angular debris, (d) Lower Greensand

HEAD

The second series lies on the dip slope of the Greensand, to the south of these gravel spreads, and for the most part at a greater height above Ordnance Datum. They consist of a series of solifluction deposits scattered over the Hythe and Sandgate Beds that have been referred to as Head (stippled on fig 2), although Prestwich described them as 'brickearth', noting them as being very stony, comprising angular fragments of chert, ragstone, ironstone mixed with flints, and Tertiary flint pebbles all in a sand matrix (Prestwich 1891, 146). He noted that 'the bed of most importance is the one worked on the south side of Limpsfield Common, a short distance from the gravel pit. It lies in a slight depression at the head of the Darent valley, at a height of 470ft (143.2m) OD or from 10 to 20ft (3–6m) lower than the adjacent gravel bed, but nowhere are the two beds seen in superposition'. He may have been referring to the 'Old Clay Pit' marked on the OS 25-inch map of 1871 at TQ 413 525, or to the pit that lay a little north of it and was shown on OS maps as being actively worked between 1871 and 1898. This latter, situated at TQ 413 523 was certainly open in Bell's day and is probably the pit referred to by him.

Prestwich also considered that the brickearth 'exhibits possible glacial influences . . . disturbance by action from above (maybe flooding ice) causing distortion of the bed', and noted that the brickearth was at its 'greatest height at Gibbs Farm and Tenchleys, rising there to above the 500ft (152.4m) level, while it extends half a mile west to West Heath.'

Dines *et al* (1940, 220) describe this material in similar terms, and add that the deposit is often bright red in colour, perhaps as a result of the presence of oxidized glauconite from the Sandgate Beds. It may be from this that Ridlands (Redlands) Farm, situated on Limpsfield Common, obtained its name. Since the deposit is cut by coombes, it was considered to be quite early in the Pleistocene sequence (*ibid*, 220).

SEQUENCE

How this Head fits into the overall sequence is not clear. Dines (1940) believed that it is one of the older deposits of the area, by which he presumably meant that it was older than the Limpsfield gravel, although he did not recognize phases within the gravel as did Gosling. In a correlation of Quaternary deposits of the Weald, Shephard-Thorne (1975, 545) suggested that the 'Older Cherty Head' is likely to be a Wolstonian deposit, although what was meant by 'Wolstonian' in 1975 is not easy to relate to the subsequently expanded Pleistocene sequence.

While considering the gravel spreads to be of different ages, Gosling (1940) did not pursue the matter. It is impossible to be certain about which gravel spreads correlate with which, either within the Limpsfield area or further afield. However, further work may allow the deposits to be tied in to the Thames and Medway sequences (Bridgland 1996). As some of the deposits are less than 0.25km apart, the gradient between them would make it unlikely that they all belong together, and suggest that some at least can be regarded as different stages in the evolution of the Darent valley. There has been no modern investigation of lithology or fauna, but assuming that there is a straightforward flight of terraces, with the highest representing the oldest, the latest event encountered would be the solifluction deposit at Westwood Farm with its underlying loess and river gravel events. This is only some 3–4m above the height of the present Darent stream and the sequence might broadly be assigned to a recent event within the Pleistocene, perhaps to some time within Oxygen Isotope Stages 2–5. The Watts Hill terrace and Thrift Wood/Moorhouse gravel spreads at 470–475ft (143.2–144.7m) and 480–490ft (146.3–149.3m) OD respectively are likely to be separate events, each with complex solifluction and river deposit episodes, and since they follow the Westwood Farm deposits may perhaps be placed in Oxygen Isotope Stages 6–8. The Pebble Hill and Wolfs Corner exposures at around 500ft (152.4m) OD could conceivably be part of the Thrift Wood event and so for the moment are better left. Finally the 525ft (160m) OD deposit, again with both solifluction and river deposit episodes, must at present be seen as the earliest in the sequence and maybe earlier than Oxygen Isotope Stage 8. One biface was recovered from the surface of this deposit during fieldwalking. Artefacts were also recovered from the Limpsfield Common gravel pit which lies at c 497ft (151m) OD. Here the

deposits are complex, with at least two solifluction episodes and a layer of presumably water-laid shingle identified. Artefacts from the base of this sequence, at a depth of 8ft (2.4m) are described as coming from 'above the loam'. The deposits here could correlate with either the upper Thrift Wood/Moorhouse sites, or with the Pebble Hill/Wolf's Corner sites, from which it is separated by a little distance, or perhaps both. Where known, the height of artefacts recovered from the Head deposits is recorded in Appendix 5; the bulk of these artefacts derives from between 490 and 530ft OD, but how these correlate with the terrace deposits is unclear.

A M Bell, the collector

The fourth son of Margaret and Alexander Montgomerie Bell, Alexander Montgomerie James Bell was born on 24 September 1845 in Edinburgh (basic biographical details are provided in Addison 1901, 154–5 and Elliott 1934, 43). He spent three years at the University of Glasgow where he excelled at Greek, then studied at Balliol College, Oxford, until graduating at the age of 24 and receiving his MA in 1871. Bell became a teacher and was a master at Fettes College in his native Edinburgh between 1870 and 1875. In the latter year he married Anna Mary Rayne, of Newcastle-upon-Tyne. He subsequently travelled south and took up a post as lecturer in classics at St John's College, Oxford, but moved on soon afterwards, and in 1877 began work as a private tutor at Limpsfield. *Kelly's Directory* for 1882 and 1887 mentions Bell as living at the Manor House there, while census returns for 1881 describe him as the owner of an academy for preparing young gentlemen for entrance to Oxbridge colleges and to the army.

His interest in prehistory seems to have developed soon after 1880. At that time Worthington Smith was investigating the terraces of the river Lea; perhaps more significantly, Benjamin Harrison was recovering material from the Ightham area which, only 17km to the east, lay in a similar topographical position to Limpsfield. Harrison himself was certainly familiar with the gravel spread on Limpsfield Common (Harrison 1928, 56), and visited the area quite regularly. He often stayed at a house named 'The Hollies' in Limpsfield, and while there would search the adjacent fields for implements. Whether he introduced Bell to this activity is not clear but the two had certainly met by 1884, when it is recorded that Harrison called on Bell and inspected his collection of implements (*ibid*, 107). Dated examples in Bell's collection suggest that he had started accumulating material by 1883, and had obtained at least nine palaeoliths by the time of Harrison's visit. The two soon became friends, meeting and corresponding regularly. In 1884 Bell drew attention to the Limpsfield area by publishing a short note on his finds in *The Antiquary* (Bell 1884). There was evidently some friendly rivalry in terms of the quantity of implements found; by 1887 Harrison had recovered some 405 palaeoliths from the Ightham area while Bell had collected nearly half that number from Limpsfield. In the years to follow, however, Bell's total eventually increased to rival Ightham numerically as a site of importance. Harrison's notebooks (Maidstone Museum) include illustrations of bifaces from Limpsfield, including at least one, a cordate found in two halves in 1885 and 1887, belonging to Bell. Also illustrated are four bifaces from Seal and Stonepits, in Kent, given to Bell by Harrison in 1887.

In 1888, Bell published the text of a lecture that he seems to have given locally. 'The later age of stone' (Bell 1888) was the first paper on stone tools in the county of Surrey, preceding Lasham's 'Palaeolithic man in west Surrey' (Lasham 1893) by five years. Among other things the article speculated on such topics as prehistoric cooking, but it presumably satisfied local curiosity at least about his strange pursuit. By this time a prominent geologist, Joseph Prestwich, had taken an interest in Harrison's work and mentioned it at a lecture to the Geological Society. Harrison himself was engaged in recovering a new category of find from the Ash district of Kent, rolled flints with flake removals thought to be 'amongst the most ancient of the known works of man' (Harrison 1928, 144–5). These he referred to as the 'old olds' although they were soon labelled 'eoliths'. Their nature caused great controversy during the following decade. Bell came down in support of Harrison in 1889, early in the debate, and they corresponded on several occasions concerning the age of the 'eolith' (*ibid*, 163–5). In January 1889, Bell wrote to Harrison suggesting that the two of them consider writing a book on the prehistory of the neighbourhood (Harrison notebook 4,

Maidstone Museum), but it appears that Harrison was not greatly interested in writing up his work or views, as Worthington Smith had also tried to persuade him without success (D Roe, pers comm), and it seems to have come to nothing. However, the two kept in touch following Bell's move back to Oxford in 1890.

In Oxford Bell continued private tutoring, supplementing his income by examining for the civil service, and for Glasgow university. His interest in the Pleistocene of Limpsfield, however, did not diminish and he continued to keep in touch with Harrison. Bell read papers to the British Association between 1890 and 1896, and publicly advocated the cause of eoliths (Bell 1894a, 226–84; 1898, 214–25; Harrison 1928, 178), while Harrison provided examples for exhibition (Harrison notebook 3, Maidstone Museum). However, he remained unsuccessful in his attempt to convert Sir John Evans to a belief in eoliths (*ibid*, 183). Bell soon turned his attention to the Oxford area, and before long was recovering material from the brick pit at Upper Wolvercote (Bell 1894b, 148–52, 192–8; 1904, 120–32; Tyldesley 1986), and was speaking at the British Association meeting at Bradford in 1900 about discoveries he had made there (Smith 1914–18, 393). Bell died on 3 July 1920 aged 75, and his collection of artefacts from Limpsfield and Wolvercote was purchased by the Pitt-Rivers Museum, Oxford. Letters dated 1920 that survive at the Pitt-Rivers Museum regarding the purchase suggest that there was also a manuscript containing Bell's 'reflections upon his collection', that was said to be in Bell's study (letter from A C Bell to Balfour 8 November 1920, Pitt-Rivers Museum archives), but it is not clear whether this was actually passed to the museum with the rest of the material. The material, which also included artefacts from Africa, Australia, India, the Middle East and Europe, was finally accessioned in 1944 when it was found scattered throughout the museum (acc no 1921-91-1-498), and it is probably at that time that original notes written on the artefacts in pencil were rewritten in ink. There is an indication that whoever performed this task had access to other information, perhaps even Bell's original manuscript, as on occasions slightly different annotations are made (eg cat no 221).

The collection

Bell collected flint implements from the fields of Limpsfield between 1883 and 1906, although dates written on some tools (nearly 400 are so dated) suggest that over half the collection was amassed during the years 1885–91. Whether he recovered all the finds personally, or acquired some from local farm or quarry workers, is not clear. The notes written on some tools suggest a first-hand knowledge of provenance although, as Benjamin Harrison certainly taught local farm-workers how to recognize flint tools and paid them quite generously for each find (Harrison 1928, 82), it is quite possible that Bell did likewise. Prestwich (1891) noted that the greater part of the collection came from a field on Ridlands Farm. 'These in his [Bell's] opinion have been brought to the surface by the circumstance of the ground having, a few years ago, been grubbed up and trenched to a depth of 1–2ft' (Prestwich 1891, 146). This is an important observation as it suggests that the material was recovered after a single agricultural episode, and this being so, that other material may still lie *in situ*.

After Bell's death in 1920, the collection was acquired by the Pitt-Rivers Museum at Oxford, although a few bifaces from the area found their way to the Ashmolean Museum and British Museum (Appendix 3) respectively. Most of the artefacts that remain in the collection are bifaces, although there are also a few Palaeolithic flakes. Also present are a good number of Neolithic ground axes, as well as arrowheads, scrapers and other tools and potsherds of later periods.

The Palaeolithic implements were marked in pencil, probably by Bell, some with more information than others, but usually with the site name and sometimes other descriptions of the locality — often the height above OD — and the date found. Of the Palaeolithic material, some 558 pieces, including nearly 450 complete and fragmentary bifaces, survive from twelve separate sites located between the 150m and 180m OD contours, all situated about the present headwaters of the river Darent, and to the east and south-east of the present village.

With the exception of an important group of apparently stratified ochreous pieces, recovered between 1888 and 1893 from a series of gravel deposits exposed in the pit on Limpsfield Common, all the material was retrieved from the surface of, or less frequently from within, the superficial deposits of brickearth or Head that overlay the Greensand to the south. The majority of these latter pieces have a weathered grey-blue/creamy-white surface patination, and while many are frost-cracked and pot-lidded, only a few appear to be rolled.

For recording by the present writers, each artefact was numbered by fixing a coloured paper spot to it. Restrictions on a numerical sequence were based on the runs of numbers available from local stationers. Thus it was necessary to sub-divide into white, blue and red, although there is no significance to this colour coding. After inspection the following attributes were noted on a record card: type of specimen; whether complete or incomplete; any inscription or accession details; present storage reference; documentary details; dimensions — maximum length, breadth, and thickness (measured using vernier calipers); weight to the nearest 5g; surface condition including staining and patination and any other additional features or comments. On the reverse of the record card an outline sketch of the plan and profile of the implement was made, aimed at describing the overall shape of the artefact rather than depicting detail, and should be accurate to c 2–3mm. Thus in conjunction with measured dimensions further measurements could be taken from this. The basic data concerning individual pieces is presented in tabular form in Appendix 6 (M24–M41).

Bifaces dominate the various site totals, with ovate, cordate and sub-cordate forms the most common, and there is a high proportion with twisted profiles, some dramatically so. A more detailed examination of the material from each site is provided in Appendix 1 (M5–M23).

The sites (figs 2–9)

Most artefacts are marked with a site name, and it is possible to sort them into twelve general locations. Invariably they are annotated with other details; in particular some are also marked with Roman numerals. These evidently do not refer to artefact types as different tools often occur with the same numeral annotated, but appear to refer to sites or areas. Unfortunately it is not absolutely clear what each numeral means. It is possible, however, to narrow the field a little, as sometimes the same numeral occurs on tools marked with different site names.

It may be that the site names themselves were in fact only a general guide to the location, or perhaps an indication of the owner of the land on which the find was made. Thus finds marked Ridlands came from a number of locations scattered around Ridlands farm, and are sometimes further annotated with, for example, heights above OD. Correlations between numerals and the written site names are given in Appendix 1.

From this, it immediately becomes apparent that apart from two finds marked IV, perhaps a misreading of XIV, and one marked XI, the gravel pit sites and those closer to the Greensand are mutually exclusive as regards the Roman numerals written on them. There is clearly some relevance in the numerals and some of them make sense as discrete sites that overlap property boundaries. Others (eg II) are found in different areas, so they will be treated here as sub-sites in order that any significance, even if not identified, is not lost. Table 1 lists the artefacts recovered from each sub-site. Further details are provided in Appendices 1 and 6 (microfiche).

SITE I BALLARDS (fig 2; M6, cat no 289)

The exact provenance of this site is not clear, but the OS 6-inch map of 1898 gives the house name Ballards at TQ 4135 5280, just on the fringe of the 151m gravel spread. The field lying immediately south of this (also referred to as Ballards) is now a housing estate. The OS 6-inch map of 1978 shows an area of housing served by Ballards Lane between TQ 4135 5280 and TQ 4150 5230. To the south-east of this is a piece of woodland named Ballards Shaw. One flake (cat no 289) is noted as coming from 'Ballards' with 'XII' marked in pencil beside it.

SITE 2 BRIARS CROSS (fig 2; M6–M10, cat nos 247–88)

A total of 42 artefacts comes from this area. Three are marked 'Briars Cross', five 'Brambles Cross', and 34 'Brice's or Bryce's Cross'. Brambles Cross almost certainly equates to Briars Cross, but whether 'Brices' is the same is less certain, for according to the tithe map (SHC) a field adjacent to Briars Cross is called Brice's. Briars Cross is not shown on the OS 25-inch 1st edition map of 1871, but it appears as a house name on the OS 6-inch map of 1898, and it is conceivable that it is a corruption of Brice's. Briars Cross itself is sited at TQ 4170 5210 on later maps, and seems to refer to the road junction of Chapel Road/Ridlands Lane with Kent Hatch Road. Immediately to the south-east of this is a house with the name Briars Cross. The site, not far from the Greensand escarpment, lies on one of the deposits of Head over Hythe Beds.

It seems unlikely that Bell's term for the area changed with time. Artefacts from Brambles Cross are dated 1885, Briars Cross 1885, 1894, 1895, while those marked Brice's or Bryce's span the years 1885–1904. There could have been further significance in the different spellings. Some of the artefacts bear Roman numerals. Thirteen from Bryce's Cross are pencilled 'III', six are marked 'XII', one is marked 'II', three 'XI', one 'IV', and one 'IX'. Two from Briars Cross are marked 'IX' while a third was also marked as coming from 530ft (161m) OD. Those from Brambles Cross all come from 525ft (160m) OD. Twenty-five of these implements appear to have been found *in situ* in the brickearth over a number of years, perhaps as the houses were constructed or the gardens landscaped. Four of these are noted as being found 2ft (0.6m) deep, two from 2½ft (0.76m), two from 3ft (0.9m), and one from 5ft (1.5m) deep. One is noted as 'probably from floor'. All these are treated as sub-sites in Appendix 1 below. Sixteen of these implements, 14 ovate and two pointed, are complete enough to be incorporated in the tripartite diagrams (fig 4).

SITE 3 BROOMLANDS (fig 2; M10, cat nos 99–108)

Whether the name Broomlands originally referred to a certain field is not clear. The OS 6-inch map of 1978 places Broomlands Farm at TQ 4210 5375, immediately north of the Moorhouse sand quarry, and it would appear that much of the farmland to the south of the farm buildings has been quarried away. Five of the artefacts from the site are marked with heights OD, two at 500ft (152.4m), one at 510ft (155.4m), one at 526ft (160.3m), and one at 528ft (160.9m) and this helps to narrow the likely area of provenance. One of those found at 500ft (152.4m) OD, was also found 'near the gravel pit', and a further example was found 'within 80 yards of the gravel pit'. This can only have referred to the gravel quarrying on Limpsfield Common. If so, the likely siting of these artefacts lay in the field to the north of the A25 at TQ 4175 5325. Lying over Gault Clay and Sandgate Beds, this rises slowly from the gravel pit in the west to a knoll slightly above 161m OD, where it is capped by a gravel terrace remnant lying over brown sand (fig 2, no 17). The currently worked Moorhouse sand pit may eventually move southwards to engulf the field.

Ten artefacts, eight of them bifaces, come from 'Broomlands', all collected during the late 1880s. The butt of a large biface (99) with shallow radial flaking was recovered 'within 80 yards of the gravel pit' in 1888, presumably from the surface, since its creamy yellow patina with tinges of pink is similar to surface finds from nearby sites. A cleaver-like implement (100) with no tranchet blow was also recovered from 'near the gravel pit' at 500ft (152.4m) OD, while a cordate with twisted profile (101) comes from 526ft (160.3m) OD. A flaked nodule from 500ft OD, possibly a cleaver but of irregular form (102), has been abruptly trimmed across a transverse break, suggesting a possible scraping function, and there is a tip of an irregularly shaped biface (103) from 510ft (155.4m) OD. The assemblage is completed by: a broken biface with twisted profile (104) from 528ft (160.9) OD; an incomplete biface of lanceolate form (105); a flaked nodule (106) perhaps the butt portion of a biface but with no discernible form and with flakes detached from all angles; a small ovate (107) with neat shallow flaking on one face and cruder on the other, and a thick cleaver-like tool (108). This latter tool is essentially a battered nodule with flakes detached in no regular manner, although a possible cutting edge has been achieved around one end and along one edge.

TABLE 1 Limpsfield: list of artefacts, grouped by type, recovered from each sub-site

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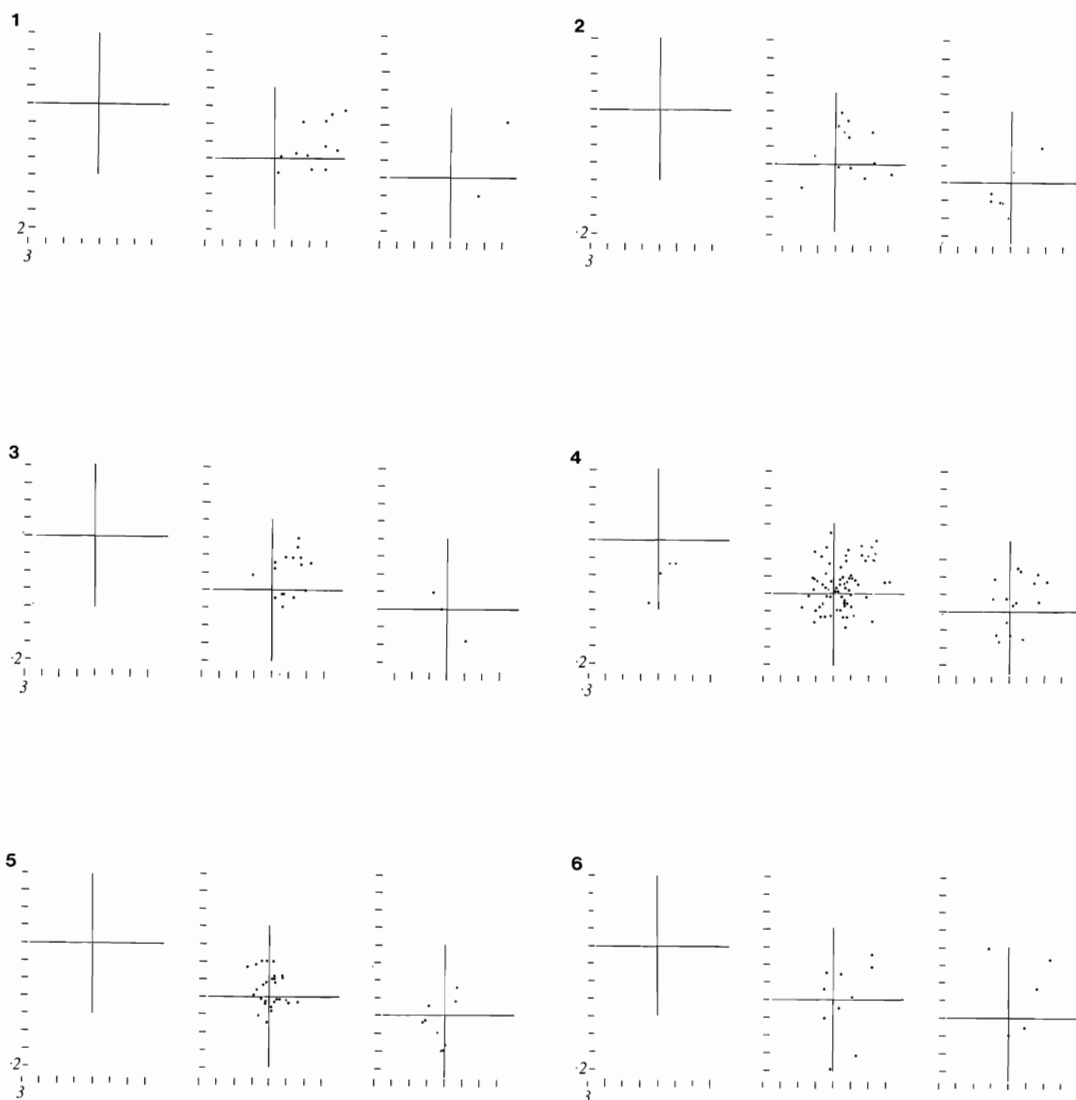


Fig 4 Limpsfield: tripartite diagrams of bifaces from 1 Briars Cross, 2 Lombarden, 3 Chart, 4 Ridlands, 5 Limpsfield Common Gravel Pit, 6 Trenchleys. All after the method devised by Roe (1968) to demonstrate visually the size, shape and refinement of bifaces. Each diagram is divided into three. Bifaces with $L1/L$ above 0.550 (cleavers) are plotted on the left, those between 0.351–0.550 (ovates) are plotted in the centre, and those below 0.351 (pointed) are plotted on the right. Horizontal divisions, representing B/L , are in cm starting at 0.3 and vertical divisions, representing $B1/B2$, are in cm starting at 0. In each case narrow artefacts fall on the left and broad examples on the right, while more pointed artefacts occur in the upper part of each diagram and blunt-ended forms in the lower part. The crosshairs are visual co-ordinates (see Roe 1968 for details).

SITE 4 CHAPEL FIELD (fig 2; M10, cat nos 114–6)

Chapel Road runs from Paines Hill in the west, to the crossroads at Briars Cross, and there is a chapel towards the western end of it at TQ 4150 0525. Chapel Field itself, however, remains unidentified. In all probability it was the name applied to the field, plot no 375, to the south of the

Baptist chapel shown on the Limpsfield tithe map (SHC), adjacent to Brices Field, plot no 376 (TQ 414 519). The area is situated on Hythe Beds but towards Briars Cross a patch of Head encroaches. The artefacts, a retouched flake and two bifaces, were found in 1884/5. One biface was noted as coming from the Greensand escarpment at 510ft (155.4m) OD. The second was found at 520ft (158.4m) OD.

SITE 5 CHART/CHART FARM AND VARIANTS (fig 2; M11–M13, cat nos 290–325)

The Chart is a large wooded area to the south of the A25 road reaching as far south as the Greensand escarpment, and bounded in the east by the Surrey/Kent county boundary. The High Chart is located by the Ordnance Survey at TQ 4330 5245. Much of the area is now owned by the National Trust, but a housing estate to the west of this area, and to the south of Ridlands Farm house, at TQ 4245 5200, is also known as 'The Chart'. Chartlands Farm buildings are placed at TQ 4265 5135, just off the escarpment and there is a house to the south-west of them named simply 'Chartlands'. The underlying geology over most of the area is Hythe Beds with extensive patches of Head, all of which has seen quarrying in the past.

Thirty-one implements come from this area. Implements marked simply 'The Chart' appear to have been found on the surface at five different points, as two bifaces are marked 'VI', one is marked 'VII', one 'VIII', one '9', and two, together with a flake, are marked 'XVII'. Seven bifaces were recovered from 'near Chart', six of which are noted as coming from the surface of 'II'. One biface is described as coming from 'near Yaldings, Chart', and was apparently found in a quarry, the implement also being noted as 'found about seven feet from the surface' and pencilled 'I'. A gravel pit is shown adjacent to Yalden Spring, at TQ 428 522, on the OS 6-inch map of 1898. Two bifaces come from Chart Farm, one at 400ft (121.9m) OD the other at 430ft (131m), the former bearing the note 'water-parting'. A further biface comes from Chartlands Farm (TQ 425 512), probably the same area, but is also noted as being found 'near the escarpment edge; probably fallen'. It also bears the note 'VI'. Only one artefact, the butt of a rough biface, comes from the High Chart. Despite the opportunities provided by the extensive quarrying in the area, most of the finds here appear to have been on the west side of the Chart.

SITE 6 LIMPSFIELD COMMON GRAVEL PIT AND VARIANTS (figs 2, 5; M14–M16, cat nos 1–57)

This is the site of extensive quarrying at TQ 412 530, shown to the east of the road leading to Grub Street, on the OS 1898 map. The various OS editions show that work started on extraction immediately north of what is now the A25, prior to 1871, and between then and 1898 spread northwards to the east of Grub Street (fig 5). Artefacts from the gravel pit with dates written on them suggest that Bell was collecting there by at least 1889, for in that year three artefacts were recovered. Little activity followed until 1893 when four artefacts were found, again followed by two lean years. In 1896 eleven artefacts were recovered but thereafter activity slumped with a slight renewal in 1901, when again eleven were found. Bell therefore started collecting just before the Ordnance Survey surveyors revised the plan of the area and it is likely that his finds were recovered from the northern part of the pit at around TQ 412 530. The Geological Association visited the site in 1908 (Treacher 1909, 60). They found it apparently disused and overgrown. While there a Mr Martin exhibited some Palaeolithic implements that he had found in the face of the pit.

Evans (1897, 610) claims that the implements were found between 3ft and 7ft (0.9m and 2.1m) deep, but the notes on Bell's artefacts from this site suggest that they were found in at least three separate levels. Many were found *in situ*, often in a bed of shingle, most of them 1.2–1.5m deep. A second series consisting of five abraded or rolled flakes were recovered from or at the base of the gravel, some 8ft (2.4m) deep. Altogether, 55 pieces come from the gravel pit on Limpsfield Common. A total of 38 bifaces were complete enough to be incorporated in the tripartite diagrams (fig 4).

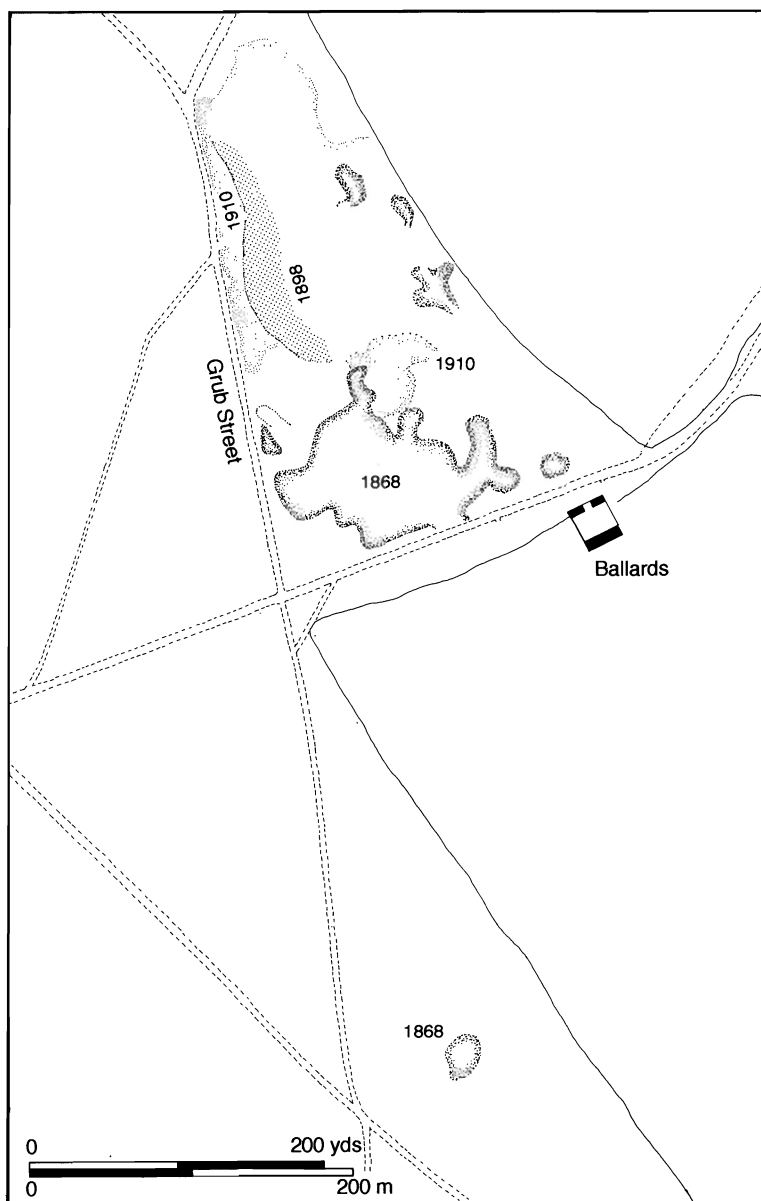


Fig 5 The extent of the Limpsfield Common gravel pit, taken from OS 25-inch map 1st edn, 1884 (surveyed 1868) and 2nd edn 1912 (surveyed 1910).

SITE 7 LIMPSFIELD COMMON BRICKEARTH PIT (figs 2, 3B; M16, cat nos 4, 24)

This is almost certainly the large pit shown at TQ 413 523, north of the brickyard, on the OS 25-inch map 1871. The yard was still in use in 1898, but the pit had not changed shape much during that time. However, Prestwich recorded a brickearth pit 'a short distance from the gravel pit' (Prestwich 1891, 146), presumably that shown as the Old Clay Pit immediately north of the yard at TQ 413 525 on the OS 25-inch map of 1871, and he noted that A M Bell had found a few Palaeolithic flakes there. Treacher (1909, 62) along with members of the Geological Association visited the site on 26 September 1908 and described a 'much talused section of so called brickearth' seen near the old brickyard. The same meeting also noted that 'flint implements are also found here, Mr Martin having quite recently discovered several in the face of the pit'. Two flakes from

Bell's collection (4 and 24) were found in the debris of the pit, one marked 'XII'. Some pieces from Briars Cross nearby are similarly marked 'XII'.

SITE 8 LOCKHURST (fig 2; M17, cat nos 109–13)

Five bifaces are described as coming from Lockhurst. Two, however, have 'IV' marked on them, and one from 'Lockhurst Barn' is also noted as 'near Ridlands'. An implement from Briars Cross is similarly marked 'IV'. Amongst the Ridlands material (below) there is also a reference to 'Lockhurst Barn' which is said to be 'near Westerham Road'. A field named 'Lockhurst seven acres' is shown on the Limpsfield tithe map and sited at TQ 4235 5295. The site of Lockhurst Barn is shown on both the 1871 and 1898 OS maps at TQ 4205 5275.

SITE 9 LOMBARDEN (fig 2; M17–M18, cat nos 204–46)

Lombarden Farm is shown at TQ 421 519 on both the 1871 and 1898 OS maps. A house of this name is situated a little south-west of Briars Cross at TQ 4213 5182, on the junction of Hythe Beds with a patch of Head. A total of 42 pieces, including 34 bifaces, come from this area. Most pieces are labelled simply 'Lombarden' with one biface having an additional note '540ft' (164.5m) OD, and a flake '560ft' (170.6m) OD. Four other bifaces come from the 'surface, Lombarden', one of them from 550ft (167.6m) OD. The remainder add little further information about the site. Seven bifaces come from Lombarden 'hopfield', one of them at 560ft (170.6m) OD and two of these are noted as being found on the surface. A further Lombarden biface is described as coming from 'close to Combers Field'. This field name does not appear on the 1841 Limpsfield tithe map, but in the 1881 census (SHC) Thomas Coomber (farmer) is recorded as living at 'Lumbardens Farm'. The height above OD alone is no guide to the location of these sites as the ground is undulating. Other pieces are marked with Roman numerals and treated here as coming from sub-sites. Apparently these are all surface finds, but 27 other pieces come from the area. Five of these are cordates, four with twisted profiles (204, 209, 210, 212, 246) and four ovates (207, 223, 227, 234). There are two pointed types (206, 223), as well as two unclassified (225, 228), and five fragmentary bifaces (213, 217, 229, 235, 236). Nine flakes are also present (224, 231, 237, 240–1, 243–4). The patina common to all these finds is creamy grey to buff with a slight yellow stain. Three pieces have a pink tinge. All are very weathered and many have frost cracks and pitting. Most have damaged edges and two appear to be slightly rolled. Twenty-two bifaces from this location were sufficiently complete to be incorporated in the tripartite diagrams (fig 4).

SITE 10 PAINES HILL/PAYNE'S HILL (fig 2; M18 cat nos 117–8)

Paines Hill sits on the edge of the Greensand escarpment at TQ 4135 5175 on Hythe Beds. The adjacent north-south road is also called Paines Hill. One flake and a biface come from this site. The latter, an ovate, is sufficiently complete to allow incorporation in the tables below.

SITE 11 RIDLANDS (fig 2; M18–M22, cat nos red 1–160, blue 1–74)

Ridlands Farm buildings, now a private house, were at TQ 4225 5225, just off of Ridlands Lane. West of the old farmhouse is a more recent house called 'Ridlands'. The former fields of Ridlands Farm once extended as far north as the A25, but are now all part of Broomlands Farm. The former farmhouse and buildings were on Hythe Beds, though patches of Head intrude on the high ground to the south-west, south-east and east. To the north there is a band of Sandgate Beds, with thin patches of gravel marking terraces of the Darent and, further north, a large expanse of Folkstone Beds to the south of the A25, itself covered by two patches of Head. On one of these, straddling the Westerham Road, thin patches of gravel can be identified on the surface. Ridlands is by far the most prolific site, with 234 recorded artefacts which include 193 complete or fragmented

bifaces. All finds come from the former lands of Ridlands Farm, but although the area is large the notes on some of the implements provide help in allocating a closer provenance. After describing the brickearth, Prestwich (1891, 148) states that 'it is in a field on Ridlands Farm over which there are traces of this brickearth trail, that Mr Bell has found the greater number of implements in his collection. These in his opinion have been brought to the surface by the circumstance of the ground having, a few years ago, been grubbed up and trenched to a depth of 1 to 2 ft.'

Other than the word 'Ridlands' or 'Ridlands Farm', which are the only details on 66 bifaces and 15 flakes, pieces are annotated in a number of ways (Appendix 1), but as the ground undulates considerably the heights above OD are particularly valuable. They vary from 430 to 540ft (131–164.5m) OD; there are 12 implements from 490ft (149.3m) OD, 19 from 500ft (152.4), 14 from 510ft (155.4), and 13 from 530ft (161.5m) OD. All this enables us to suggest that the finds were made in the southern part of the farm, either around the farmhouse or to the south of it. The reference to 'brickearth trail' suggests that the site lay between the farmhouse and Lombarden to the south-west.

SITE 12 TENCHLEYS (fig 2; M22–M23, cat nos 58–98)

This site probably lies within the grounds of Tenchleys Park, a large house situated on the Greensand escarpment at TQ 4190 5165. The house called Tenchleys was built by Thomas Anthony Teulon after 1806 (Drucker 1912). It lies within a small park close to the crest of the Greensand escarpment. Tenchleys Wood lies further down the escarpment at TQ 4200 5150. The underlying geology here is Hythe Beds, though the northernmost tip of Tenchleys Park clips the Head deposit occupied by Briars Cross and Lombarden.

Of the artefacts from the site, 18 bifaces, five flakes and a retouched nodule are simply noted as coming from 'Tenchleys'. Two bifaces come from the 'edge of the Greensand escarpment', and one from '560ft' (170.6m) OD. A further biface came from a field on the 'Medway side of the escarpment', ie on or below the scarp itself and on the Weald clay, but it would seem likely that this had slipped down the slope, for the meagre evidence from the remaining artefacts suggests that the site lay close to the scarp edge.

Other than this, there are few indications of the precise location of the Tenchleys finds. Where heights are given, recovery is between 530 and 548ft (161.5–167m) OD, with the exception of no 70 above. Of the remaining finds, two flakes (60 and 84) are of interest as they possess prepared platforms; the tip of a biface (68) is carefully knapped and rounded; a sturdy secondary flake (80) with some cortex is retouched on one edge; a small cordate biface (81) has a dramatically twisted profile giving a keeled appearance; a pointed biface (83) has shallow flaking, retouched towards the tip; an ovate (88) may also be retouched; a broken keeled ovate (90) is also present, as is a retouched nodule (92) with one face forming the scraping edge. A further flake (95) with retouch on the ventral surface near the shoulder is also present. Fifteen bifaces, 5 pointed and 10 ovate, from this location have been incorporated in the tripartite diagrams (fig 4).

Recent fieldwork (figs 6–8)

The annotations on implements from the Ridlands Farm site, particularly the heights above OD, provided small clues to their original provenance, and four possible localities seemed worthy of investigation:

- 1–2 the areas either side of the A25 road at TQ 417 532 which rises to 161m OD, and occupies the site of Gosling's 525ft (160m) gravel terrace
- 3–4 the areas immediately around the former Ridlands Farm house at TQ 422 523.

These areas are now part of Broomlands Farm, and as a result of the kind co-operation of the Titsey Estate, and of Mr Skinner, the farmer, the fields were searched for artefacts in the autumn and winter of 1987–8. Further work in the areas around Ridlands Farm took place in 1989 and 1990.

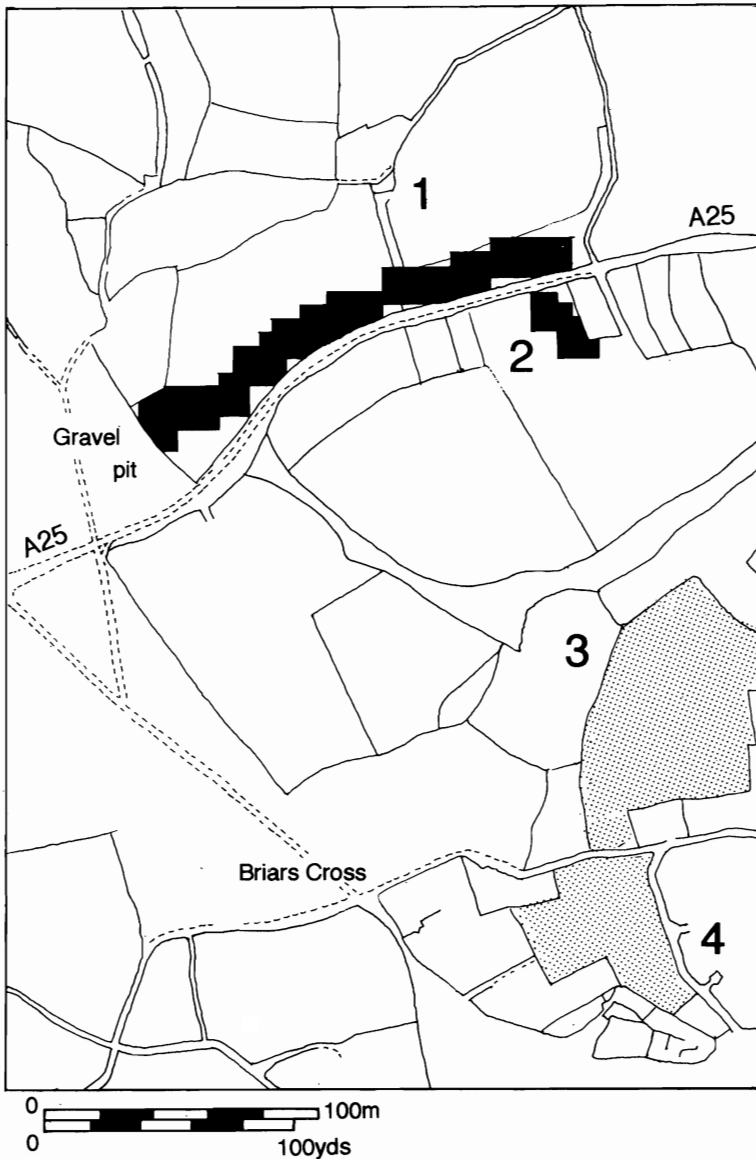


Fig 6 Limpsfield: map showing areas fieldwalked. (Reproduced from the 1970 Ordnance Survey 1:10,000 scale map with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright MC87175M)

AREA 1

Situated to the north of the A25, this field lies between 149m OD in the west and c 161m OD at its highest point in the east. At each level, gravel spreads incorporated large rounded flint nodules that strongly suggested an element of fluvial action. That in the east was the deposit recorded by Gosling and termed the 525ft terrace. The field was divided into 25m grid squares and all prehistoric artefacts retrieved. In the event, little material was recovered, and mainly exhibited Mesolithic traits. However, one complete biface (fig 8) was found lying on the surface at TQ 4204 5259, and the tip of another at TQ 4192 5255.

AREA 2

South of the A25, gently sloping to the Darent stream, the field was gridded and searched for artefacts. No Palaeolithic artefacts were found.

AREA 3

In 1989 the fields to the north and west of the former Ridlands farm house were investigated, and line-walked at 5m intervals. The topography here slopes to the present Darent stream, at first gently and then more steeply, the height of the fields being between 145m and 160m OD. The soil here is red with oxidized glauconite, which may have been responsible for a pink hue that stained some artefacts. Again no Palaeolithic material was recovered.

AREA 4

The field to the south-west of Ridlands farmhouse, abutting Lombarden Farm, was subsequently investigated in 1990. This too was line-walked, but only artefacts of Holocene age were recovered.

THE MATERIAL (fig 7)

Aside from three flakes of probable Palaeolithic age, two pieces of note were recovered, both of flint:

- a) an ovate biface (fig 7,a) with reverse-S twisted profile, from TQ 4204 5259, creamy-white patina, slightly weathered and edges dulled, with some frostcracks. The flaking on one face is slightly coarser than the other, but the object is neatly finished with fine soft-hammer work. An area to the right side of the tip has been worked in to form a slight notch, providing the tip with a 'beaked' appearance.
- b) a pointed biface (fig 7,b) from TQ 4192 5255, with the butt half missing, evidently broken in antiquity, for the white patina covers the break. The piece appears to be unfinished, as a small patch of cortex covers part of one edge. Since the raw material is fossiliferous, it is conceivable that the piece broke during manufacture. Alternate flaking was used on both edges with a soft hammer.

Discussion

THE MATERIAL (figs 5, 7–10)

The raw material utilized at Limpsfield during the Lower Palaeolithic is all flint, although a small number of pieces have a rather cherty appearance, and may in fact be a product of weathering. The alteration of the surface, by patination, staining and frostcracking, invariably obscures the characteristics of the fresh flint. While there are a number of large rolled nodules lying on local fields, probable remnants of the former high level Darent terraces, that could have been utilized, and solifluction may have brought others on to the Greensand, the flint source is more likely to have been direct exposures of the North Downs Chalk, now a little over 1km to the north.

Flakes and general waste material are noticeably absent, less than 100 flakes being present in a collection of 558 pieces, whereas the manufacture of just one good ovate biface may yield hundreds of waste flakes, as modern experiments have shown. It is always possible that this represents some kind of collection bias, but Bell certainly recovered some flakes, methodically noting their findspots. The Greensand is prone to surface drifting and erosion, and while it could be that the lighter material has been washed to the valley and subsequently been covered with alluvium, the lack of flakes from the gravel quarry cannot be so explained. Recent fieldwork too, recovered only three flakes that could be considered Palaeolithic. No cores were recovered, either by Bell, or during the recent fieldwork, although a few retouched nodule fragments (eg W316 from Chart), occur as part of Bell's collection.

This general lack of knapping waste might encourage a view that primary knapping was carried out elsewhere, closer to the source of raw material (but see below). Of the few flakes that were recovered, only four are primary, and nine secondary with cortex remnants. The rest can easily be accounted for as biface trimming flakes, perhaps removed in re-shaping broken artefacts. Only three display any clear preparation at the platform, and despite some parallel-sided segments, there is no clear evidence of Levallois technique; perhaps W60 from Tenchleys, W231 from Lombarden, W273

from Brices Cross, B33 and 58 from Ridlands, and possibly W22 from the Limpsfield Common gravel pit come into this category. Of the various locations, Ridlands is the most prolific in flakes, accounting for 25. There are also eleven from Brices Cross, a high percentage at that sub-site, and nine each from Lombarden and Trenchleys. Thirteen were recovered from the Limpsfield Common gravel pit, one from the solid shingle bed (sub-site XIX) at the same level as the bifaces, but there were also five from the base of the gravel, just above loam at 8ft (2.4m) deep.

Nine flakes have some form of retouch. Two of these, from Trenchleys, are probably scrapers (W59, W92), and there is also a side-scraper from Ridlands (B68), while two other scrapers (W126, W162) have no provenance other than 'Limpsfield'. One scraper from Chart (W305) formed on a nodule fragment has an exaggerated D-shaped profile. Knife-like implements also occur. One of these is from Brices Cross (W253) while two implements, one from Ridlands (B67), and another from Trenchleys (W60) have scraping and knife-like attributes, although the latter may simply be a scraper. One retouched flake from Paines Hill (W117), and a second from Lombarden (W224) form awl-like implements.

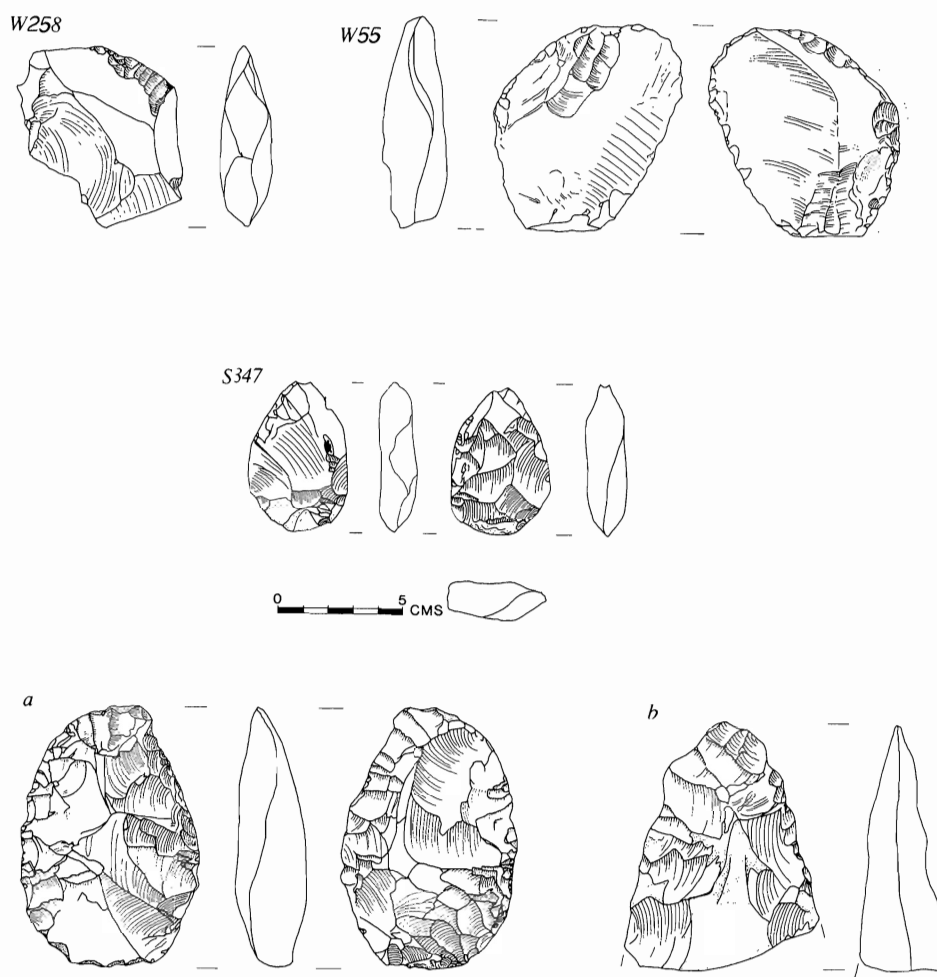


Fig 7 Limpsfield: scrapers from the Bell Collection, W258, W55; biface from the Sturge Collection with platform on one side S347; bifaces from fieldwalking, (a) ovate from TQ 4204 5259, (b) tip of pointed biface from TQ 4192 5255

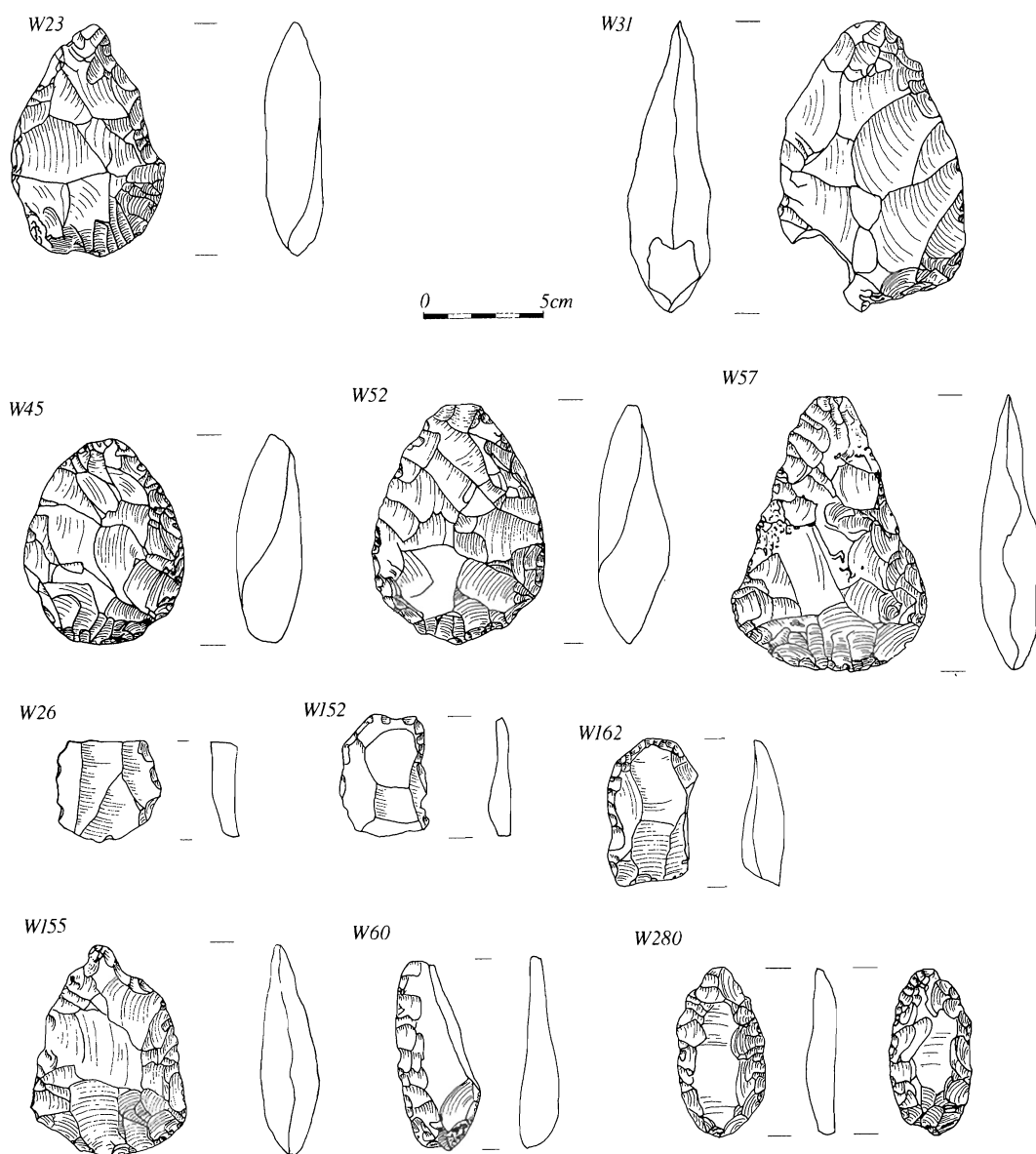


Fig 8 Limpsfield: bifaces from Bell's collection, W23, 31, 45, 52, 57, all from Limpsfield gravel pit; W155 from Limpsfield; flakes W26 from the gravel pit, W152 Limpsfield no provenance, scraper W162 Limpsfield no provenance, and knives W60 from Trenchleys, and W280 from Briars Cross

The greatest part of the collection consists of bifaces. In terms of size and weight there is a tendency to smaller, lighter implements (fig 4), and although there are exceptions, most are very finely made, carefully knapped with a soft hammer. A number are cruder on one face than the other, hinting perhaps that one face was of greater importance than the other, but whether this has a functional implication is not clear. In shape, most are cordates or ovates and, while these accepted terms divide the implements into categories, in fact there is no distinguishing line between them, and the variation is such that there is a continuous range from one extreme

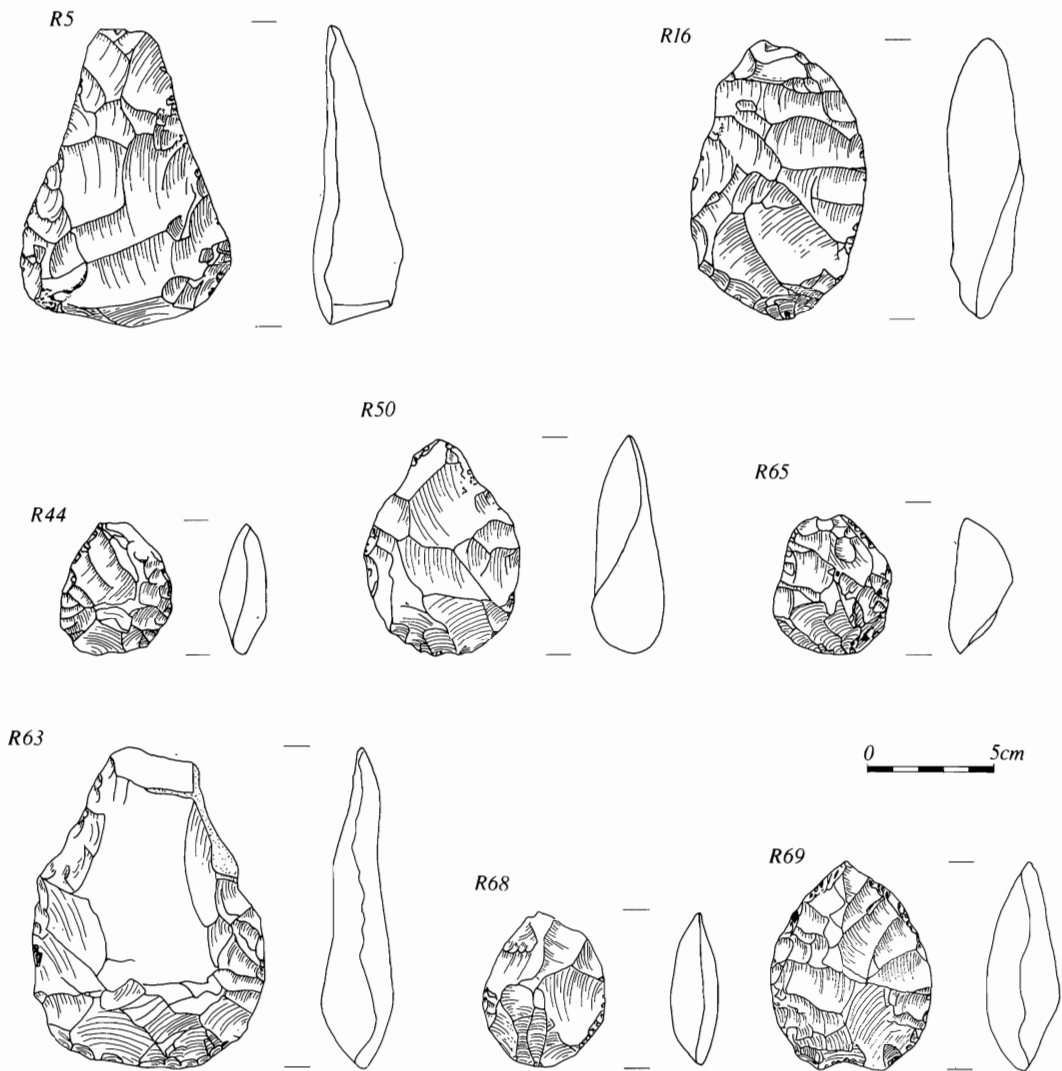


Fig 9 Limpsfield: bifaces from Bell's Collection, R5, 16, 44, 50, 65, 63, 68, 69 all from Ridlands Farm.

to the other. Many display distinctive knapping techniques, with two or three long, well controlled blade-like flakes being struck obliquely across the implement to form a central ridge (eg W125, W197). Here, implements are described broadly according to the typologies devised by Wymer (1968) and Collins (1978, 32), cordates being bifaces with convex sides having their widest point near the base, ovates having convex sides with widest point near the middle, lanceolate bifaces being pointed with straight sides, and Micoquian bifaces (or ficrons) being pointed with concave sides.

The bifaces were all measured according to Roe's system (Roe 1968) and tripartite diagrams prepared for the major sites (ie sites with more than twelve measurable artefacts) in order to illustrate size, shape and refinement. All the sites compare quite well and share common features. At Brices Cross (fig 4, no 1) all but two appear on the central 'ovates type' diagram, predominantly on the upper right quadrant. The two pointed types are both on the right hand 'pointed type' diagram. Those from Chart (fig 4, no 3) provide a similar picture, with the majority of artefacts on

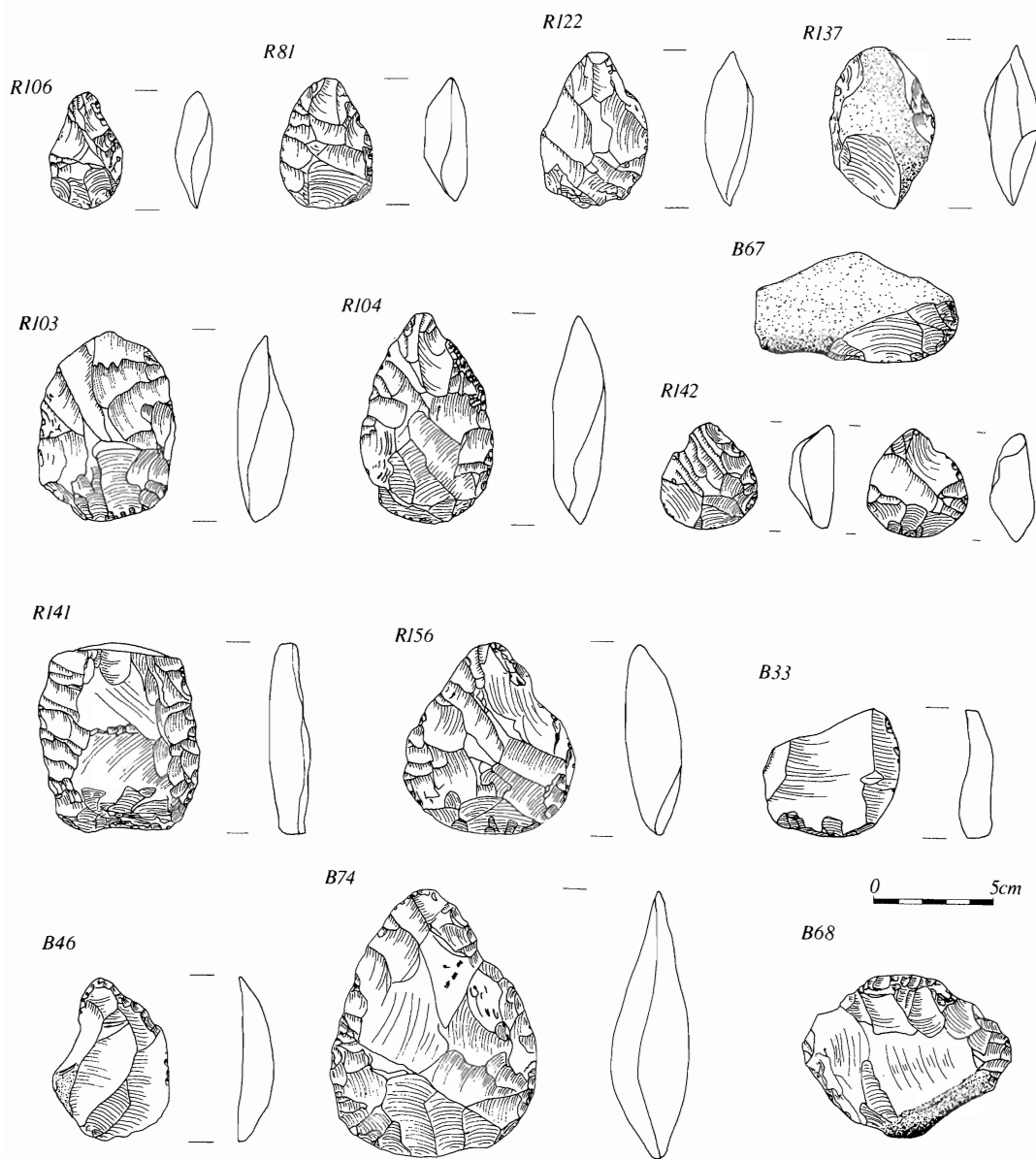


Fig 10 Limpsfield: bifaces from Bell's Collection, R106, 81, 122, 137, 103, 104, 142, 141, 156, and B74; flakes B33 and 67, and scraper B68, all from Ridlands Farm

the central 'ovates' diagram, and with a tendency towards the upper right hand quadrant. Only three examples lie in the 'pointed' diagram.

At Limpsfield Common gravel pit (fig 4, no 5) the trend continues with a greater percentage lying on the central 'ovates' diagram, but the division is not as marked and ten examples are plotted on the right. The ovates are centrally placed, but the 'pointed' types lie mainly in the lower left quadrant. Lombarden (fig 4, no 2) displays a similar trend, though with a slightly higher proportion in the right hand 'pointed' diagram. The pointed types here are thinner and more pointed. This pattern is again seen at Ridlands (fig 4, no 4) with most examples in the

central 'ovates' diagram. The examples are closely spaced and cluster about the centre, but with a slight tendency towards the upper right quadrant. The right hand 'pointed' diagram with seventeen, more widely spaced, examples also shows a slight tendency towards the upper right quadrant. For the first time four examples are plotted on the left hand 'cleaver' diagram. At Tenchleys (fig 4, no 6) the trend is not dissimilar, that is, towards the centre 'ovate' diagram and here the examples are well spaced with a slight tendency towards the upper right hand quadrant. The right hand 'pointed' diagram with only five, widely spaced examples shows a tendency to the upper right.

Taking all sites together, the assemblage falls clearly within Roe's Ovate Tradition, but it is not easy to place it within either Group VI or VII, that is, more or less pointed. The tripartite diagrams suggest that there is a slight tendency towards the upper part of the diagrams and thus more blunt forms, but it is rare for ovates in Group VII to have twisted profiles, and implements with a tranchet finish, which are strongly represented in Group VII, are with one possible exception absent from Limpsfield.

One of the most marked attributes of the assemblage is that a large number have a twisted profile. This is usually in the form of an S or reverse-S, but on some of the smaller disc-like ovates the twist is so dramatic that it is C-shaped, forming a keeled implement, and these are termed here 'keeled ovates'. Six of these are present, all relatively small, but of similar proportions, and found at different locations: B11 and R35 and R65 (fig 9) from Ridlands, W260 from Brices Cross, W290 and W312 from Chart.

As referred to above, a large number appear to feature similar knapping techniques with prominent diagonal detachments, and the percentage with twisted profiles suggests that there was a deliberate attempt at creating this form (see White forthcoming). Most of the Limpsfield examples are relatively small and could have been made on flakes rather than nodules. If this were so it may be that the natural curvature of a flake was utilized to provide a twist, and thus the twisted profile is merely a technical response to the presence of nodules large enough to provide good-sized flakes. One example adds support to this view. This is a small cordate, only 6cm long, collected by Bell from 500ft (152m) OD at Ridlands, and now in the British Museum, which was figured as part of the Sturge collection (Smith 1931, 82, no 347). It has a reverse-S twisted profile with a wide striking platform along one edge rather than at the butt (fig 7). This not only suggests that it is unfinished, but also provides a valuable indication that much of the biface assemblage may also have been made on flakes, and in fact the step fracturing seen on a number of examples could indicate removal of the bulb and platform. Considered as a flake, the British Museum example is short, very broad, and relatively thick. There is a tendency to assume that if bifaces were made on flakes, the striking platform would be utilized as the butt, or thick end of the biface. That it is not is surprising, and leaves the way open to suggest that as a technique, twisted ovates were manufactured on short, broad, squat flakes, not long narrow ones, and that the natural curvature of the flake profile then influenced the overall shape of the artefact. However, even should this be so, there was still a cultural choice to create a longer flake or shorter one, or to use the bulb as a butt. Such use of flakes at Limpsfield may help explain the low numbers of 'flakes' compared with bifaces. All this is also of interest in view of recent suggestions that the availability of good flint, rather than cultural preference, was responsible for the overall shape of bifaces (Ashton & McNabb 1996, 235; White 1995).

There is a further feature common to many of the Limpsfield twisted bifaces, that of a notched or steeply retouched area to one side of the tip, which has the effect of emphasizing the shoulder. This appears to be deliberate working rather than ancient damage, and appears to be additional to the process of creating the twist. It usually appears on the right side of the tip, which suggests that it was influenced by 'handedness' and was of importance in the practical use of the implement. A number of examples illustrate this: W23, W155 (fig 8), B74 (fig 10) and particularly W149 (not illustrated), and the example found on the surface during fieldwalking (fig 7, a) is a case in point. It is heavily retouched for some 20mm to the right of the tip, leaving the implement slightly asymmetrical, and giving the tip a 'beaked' appearance. Although others retain this feature as a simple notch provided by a single blow — R104, R142 and R156 (fig 10) — on some, retouch is steeper than others, almost indicating that it

might have served a scraping purpose. Indeed the function of some twisted bifaces, particularly the small 'keeled' ovates, is unlikely to be purely for butchery.

In terms of numbers the proportion of twisted profiles at Limpsfield is very high indeed. Details are listed for the various sites in Appendix 2, the highest being Ridlands Farm at 63.3% and the lowest near Chart at 28.5%. These percentages recall the assemblages at Allington Hill, Cambridgeshire, with 46% twists, Swanscombe Upper Loam, Kent, noted as having 22% twists, and Bowmans Lodge, Kent, with 27% twists, while according to Callow (1986, 6) twisted ovates are also dominant at Ricksons Pit, Kent, Tilehurst, Berkshire, Wansunt Pit, Kent, and Elveden, Suffolk. It is difficult to ensure like comparisons when using the literature, but whichever figures are used, the Limpsfield sites would appear to provide one of the highest percentages of twisted profiles in the United Kingdom. The bifaces from Elveden, in particular, with a very high percentage of twisted profiles, appear to compare closely. Although the results of recent excavations are likely to throw considerable light on the Elveden assemblage (Ashton & Lewis 1997), according to Paterson and Fagg (1940) the biface component comprised:

- a) 29% smaller foliate types, of which 50% have a reverse-S twist;
- b) 22% cordates, of which 33.3% have twisted profiles, particularly the smaller examples;
- c) 20% ovates, of which 50% have twisted profiles;
- d) pointed types. Some of these were manufactured using a nodule or core, but like Limpsfield a good number were manufactured on flakes.

SITES AND LANDSCAPE

The assessment of clusters of surface material is quite unusual in British Palaeolithic archaeology, it usually being considered that topography may have changed to such an extent that the position of such material bears little relationship to the original point of deposition, although elsewhere surface material has been used to attempt to provide detail of patterns of hominid land use (Blezer *et al* 1996, 33). At Limpsfield, at least some of the surface scatters appear to be directly related to sub-surface deposits from which material has been recovered *in situ*, and the surface scatters therefore have some significance as indicators of activity. The recovery of bifaces during field-walking is also considered important, as the experience of the writers elsewhere on the Greensand formation is that recovery of bifaces is extremely rare. That two should be recovered at Limpsfield is significant and supports the view that these are genuine clusters of activity.

A number of the site locations at Limpsfield are evidently of considerable interest. One such is the Limpsfield Common gravel pit, which has produced an important group of stratified pieces. At least five abraded or rolled flakes were recovered from the base of the gravel at some 8ft (2.4m) deep, which have presumably travelled some distance with the gravel. However, the majority of finds appear to have come from a bed of solid shingle at a depth of 4–5ft (1.2–1.5m). The presence of shingle implies comparatively slow moving water, and the condition of the artefacts suggests that they have not moved far. Much depends on whether the bifaces were recovered from the top of the shingle, or from within it, for they may have been washed in from an adjacent bank, or represent activities taking place at the water's edge.

The brickearth sites too are quite extensive. The most important is probably Briars Cross, where material was found *in situ* within the deposit. This was recovered from a depth of 2–3ft (0.6–0.9m), although some was as much as 5ft (1.5m) deep, and it is of particular interest that one piece is marked as having been recovered from a 'probable floor'. Flakes were also reported as being found at depth in the Limpsfield Common brickearth pit, suggesting perhaps that the Briars Cross site extended for some distance to the north. Surface material found to the east of these sites, at Lom-barden and Ridlands, could equally be part of one large site, and if so, would indicate that the site was quite extensive, perhaps covering as much as 30ha. The Ridlands evidence is particularly interesting, not only because of the large number of bifaces, but because of the possibility that a fossil land surface still remains *in situ* there. The area would benefit from further fieldwork incorporating more detailed mapping of geology, topography and artefacts, using geographical information systems (GIS) to contrast lithology with finds (Horsfield 1996).

There is no clear evidence that any of these Limpsfield sites are contemporary, or near contemporary, and cumulatively they need only represent one discarded artefact every 500 years. Difficulty occurs in filtering out the 'background noise' — not only that of the Holocene, but of earlier and subsequent Palaeolithic activity as well — in order to determine whether these are genuine 'sites' or simply a series of casually lost pieces. Even where clusters of contemporary artefacts occur it is likely that occasional discards from successive visits will obscure the picture (Isaac 1981, 133–50; Roebroeks *et al* 1992, 9–14). However, the overall knapping technique, and the general condition of the artefacts, suggests that amongst many of the pieces there is at least a broad, if not close, contemporaneity and as such the various sites could easily be seen as evidence for successive visits to the same area by one group of hominids. The accumulation of bifaces suggests quite intense activity, presumably involving actual use of these artefacts rather than fabrication of them. It is possible that the area was particularly attractive to animals and was a favoured kill and butchery site. Evidence from Boxgrove indicates that large numbers of bifaces could accumulate at such sites, presumably as a result of repeated visits (Pope 1996, 8). Isaac (1981, 131, 152) has termed such sites 'nodes', that is accumulations of material from a series of visits to a particular locale for a common purpose, eg a flint source, or a fruit tree. Alternatively, if these areas represent some kind of encampment or gathering place, it may be suggested that bifaces were used in quantity at locales other than purely at kill sites. As such they cannot be considered as 'tools of the moment' made on the spot to assist in dismemberment. Nor are they likely to represent the lost tool kit of one or two individuals. The fact that such a large number of bifaces were discarded suggests either that they were of no great intrinsic value, maybe because the raw material source was close at hand, or that they were losses or occasional discards from a large group over a period of time. It is conceivable that some may represent a cache or store of such tools. While modern hunter-gatherers are known to leave caches of tools away from base as part of the gathering cycle (Binford 1977, 33), one would not expect to find so many examples of one tool type at one location. All this points, then, to some kind of area of regular activity.

The sites themselves lie at c 400m above the present springs, and the location at the head of the valley may also be significant, for the Limpsfield watershed, at least in its present form, not only acts as a common bridge between the chalk and the Weald, but also between the Oxted and Darent rivers. The streams themselves would encourage the presence of watering animals. The valleys form a natural west–east route that may have acted as a game corridor and, assuming open vegetation, both chalk and Greensand ridges act as superb vantage points for noting the progress of game and predators alike. Even today the location is well placed for access to flint on the North Downs chalk, although the escarpment has migrated northwards by up to 500m (Fagg 1923), and would formerly have been even closer to the Limpsfield gravels. The ribbon-like Greensand deposits of clays and sands would support differing vegetation, which even in different climates would provide a variety of habitats. Access to the Wealden clays and the Medway river system is also close at hand. To early hominids, a variety of landforms were within range. What we may be witnessing, as Gamble (1996) would put it, is everyday routine rather than structured encampment, whereby the topography, structure, and geology of the landscape encourage similar activities to recur in the same place.

DATING

In view of suggestions that the assemblage might be assigned to, (or include) a Mousterian of Acheulian Tradition (MAT) horizon (Roe 1981), it seemed important to investigate this point, and in particular compare the Limpsfield material with the assemblage excavated by Collins at the nearby Oldbury site at Ightham (Collins & Collins 1970), for which a Mousterian date was claimed. Although Collins himself (1970) has argued that any system of analysis should aim to solve specific problems, the measurable bifaces from Limpsfield were nevertheless also analysed using methods advocated by him (Collins & Collins 1970; Collins 1978, 29). However, the results were inconclusive and neither support nor deny an MAT date. While some of the Limpsfield bifaces approach the *bout coupé* form (eg fig 8, W155), Tyldesley has recently

rejected them as classic *bout coupés* (1987, 72–3). She did however consider that some of the ‘smaller cordiform bifaces, several steep edged side scrapers and a limande-like tool suggest that there is a Mousterian component’.

The topographical location of the Palaeolithic finds at Ightham is of some interest. Little more than 14.5km to the east, situated on identical geological beds, and lying on a watershed between the Darent and Medway rivers, the area is identical in all respects to Limpsfield. A collection of material was made from a wide area by Benjamin Harrison, at the same time that Bell was collecting material from the fields at Limpsfield. Many of the high level sites around Ightham contained ovates (Roe 1981, 210) and there are also *bout coupés* from the area (Roe 1981, 260–1). However, Tyldesley reports (1987, 64) that the ‘Mousterian status of the site rests purely on typological and technical arguments, depending on the prepared core component and the presence of well-made flake tools and typical Mousterian implements’.

In terms of context, Wymer (1993, 120) has observed that the presence of bifaces in river gravel at a considerable height above the present river Darent implies an early date. For reasons outlined above, both gravel and Head at Limpsfield are considered to be relatively early in the Pleistocene sequence, and implements were found within both.

The site at Elveden in Suffolk that produced a high percentage of twisted bifaces is now considered to be immediately post-Anglian in date (Ashton & Lewis 1997, 92–5), while other well-known sites with high proportions of twisted ovates might now be placed within the later stages of OIS 11 or early OIS 10 (White forthcoming), and for the moment the greater part of the Limpsfield material is best placed within this category. However, on purely typological grounds alone, it is difficult to place the Limpsfield material into any particular time frame with any degree of certainty, particularly as there remains the possibility of some mixing of material. All that can be said from analogies with other assemblages which themselves are not precisely dated, is that the height of some of the gravels above the present river Darent would suggest that some antiquity is attached to at least some of the sites. The sequence of terrace and solifluction deposits suggest that a long time period is involved, and consequently a broad time range within which there may be concentrated phases of activity.

Conclusions

The Palaeolithic flint material from Limpsfield can be assigned to a number of discrete locations and, in the case of finds from the Gravel Pit, from discrete layers as well. In some cases possible sub-sites can be identified. These sites, which may have been broadly contemporary, are grouped around the present headwaters of the Darent and, if not favoured butchery sites, may have been attractive and repeatedly visited locales. In regional terms, the nearest comparable concentrations of Palaeolithic artefacts are those from the North Downs at Banstead, Surrey (Walls & Cotton 1980), and Ightham, Kent (Harrison 1928), both about 13km distant to east and west respectively. At Banstead a number of sites on the chalk plateau have been located around Walton Heath, Banstead Heath and Lower Kingswood, all grouped around the headwaters of the river Wandle. At Ightham, cordates and ovates with the familiar creamy-yellow patina, were recovered from the Bewley Valley, from Fame Hill, Conyfield, and from Ivy Hatch (Harrison notebooks, Maidstone Museum) as well as Oldbury, again in a very similar topographic position to that at Limpsfield. Both Ightham and Limpsfield lie close to the ancient headwaters of the Darent, which joins the Thames at Crayford, and a string of finds lie along the valley, particularly around the confluence with the Thames. In addition finds occur throughout the Medway drainage system, indicating that this riparian environment was of importance to early hominids (Wymer 1993, 118–37).

The material from each of the Limpsfield sites is remarkably consistent. Each assemblage is characterized by a high percentage of bifaces, many of small size and apparently manufactured on flakes. Ovates and cordiforms predominate, and there is a remarkably high proportion of bifaces with twisted profiles. The latter could have a functional or even aesthetic purpose, but it is suggested here that in part it may be a technological response to the natural curvature of a flint flake. The collection may comprise a mixture of material representing a considerable time-frame. However, analysis suggests that there are at least as many Acheulian as Mousterian attributes present. The closest parallels

for the major part of the assemblage are sites like Elveden in Suffolk, Bowmans Lodge in Kent, or Allington Hill in Cambridgeshire. The latter two sites might now be placed, with caution, between the later stage of OIS 11 and the earlier OIS 10 (White forthcoming), traditionally the later part of the Hoxnian or earlier part of the Wolstonian complex, and dated to a considerable time span either side of 362,000 years ago.

Further work

Apart from the Broomlands site where the Moorhouse sand pit is encroaching, the Limpsfield sites are safe for the moment. Both the gravel and brickearth pits are owned by the National Trust and, although overgrown, would repay further work. The surface sites, especially Ridlands, appear to have been discovered during a single episode of deep trenching, probably to destroy the pan. It is likely, therefore, that much remains *in situ* just below the ploughsoil, and will remain so unless it is deep-ploughed, or the pan is perforated again. Excavation here may prove interesting.

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APPENDIX 1

The sub-sites at Limpsfield

See M5–M23

APPENDIX 2

Profiles of bifaces from Bell's collection of Palaeolithic artefacts from Limpsfield

Profile	Straight	Twisted	Total	% Twisted
Chart	10	9	19	47.3
Nr Chart	5	2	7	28.5
Chart Farm	1			1
Chartland Farm		1	1	
Combers Field	1		1	
Gravel Pit	20	21	41	51.2
'Limpsfield'	15	22	37	59.4
Lockhurst	4		4	
Lombarden	14	10	24	41
Paines Hill		1	1	
Ridlands Farm	48	83	131	63.3
Nr Yaldings	1		1	
Tenchleys	8	8	16	50

APPENDIX 3

Palaeolithic artefacts from Limpsfield in the British Museum**Kitchen Collection** (acc nos 1916, 11-4, 1-7)

Kitchen was a local collector living at Oxted, Surrey. Part of the collection appears to have found its way to the British Museum via Sir Hercules Read who, according to the British Museum register, acquired it from the collection of 'the late Mr Underwood of Ipswich'. All were noted in the register as having been found at 624ft OD.

- 1 Cordate. Ochreous stain over creamy yellow patina; very twisted, almost keeled profile; cortex present. Very steep, almost scraper-like retouch to one side of tip.
- 2 Cordate with twisted profile. Notch to one side of tip; ochreous stain over creamy yellow patina. Appears to have been knapped from a natural flake; rolled.
- 3 Ovate with twisted profile. Ochreous stain over creamy yellow patina; rolled; broken and refitted. Old label reads '42 Limpsfield'.
- 4 Cordate with twisted profile. Slightly abraded; old label reads '74 Limpsfield'.
- 5 Cordate with twisted profile. Slightly abraded; old label reads 'Palmer Coll, Limpsfield'.
- 6 Small cordate with twisted profile. Neatly knapped, but broken; very weathered with an ochreous stain. Old label reads '73 Limpsfield'.
- 7 Cordate with wide base and twisted profile. A steeply retouched notch occurs on the shoulder to one side of the tip; weathered with an ochreous stain. Old label reads '75 Limpsfield'.

Kitchen Collection (acc nos 1916 7-31)

- 1 Irregular 'core tool', 14cm in length, creamy white patina; marked 'Broomlands, Limpsfield'. Register reads 'Found by donor on surface at Broomlands, Limpsfield, Surrey

Wellcome Collection (acc nos PI982 10-4)

- 2051 Ovate with twisted profile (L 69mm, B 59mm, T 26mm, Wgt 82g); creamy white patina with iron staining on arrises; marked '511 Limpsfield'.
- 2052 Small lozenge-shaped biface with twisted profile (L 59mm, B 52mm, T 20mm, Wgt 58g); weathered; white patina; marked 'Ridlands'.
- 2053 Broken biface (L 70mm, B 47mm, T 24mm, Wgt 69g); creamy yellow patina; very weathered.
- 2054 Crude biface that has much remaining cortex and which seems to have been made on a 'pebble'; abraded; creamy yellow patina with an ochreous wash. Marked 'Ridlands'.
- 2055 Very small *limande* with white patina (L 58mm, B 35mm, T 18mm, Wgt 38g). Marked 'Ridlands'.
- 2056 Crude biface, only partly knapped, and with some cortex remaining. White patina but damaged in recent times. Marked 'Ridlands 1888'.
- 2057 Partly knapped biface, with crude butt, and with some cortex remaining, probably made on a 'pebble' (L 78mm, B 69mm, T 37mm, Wgt 179g); ochreous stain; too short to function as an axe. Marked 'Limpsfield Glacial Gravel' and 'Limpsfield Common'.
- 2058 Ovate with twisted profile, and with a notch to one side of the tip (L 93mm, B 76mm, T 28mm, Wgt 209g); creamy white patina with a slight ochreous wash in places. Marked 'Limpsfield'.

Sturge Collection (unreg — Sturge no 347)

- 347 Small cordate with twisted profile (L 60mm, W 40mm, T 15mm). White patina, more creamy on one face than the other. Marked 'Ridlands Fm, Limpsfield, Surrey. 500. OD Prest by Mr A M Bell Aug 1889'. Noted in the Sturge Collection catalogue as a 'diminutive handaxe . . . much twisted, with (reverse-S) side edges, one of which has a platform in the middle' (Smith 1931, 82).

APPENDIX 4

Dates of recovery of artefacts from Limpsfield gravel pit

Site	XIII	XIV	XV	XVI
1889				
1890	1			2
1891				
1892				
1893				1
1894	1	1		2
1895				

Site	XIII	XIV	XV	XVI
1896	3	2	3	3
1897		1	1	
1899				
1900				
1901	2		2	
1902				
1903				1

APPENDIX 5

Heights of sites above OD taken from annotations on artefacts in Bell's collection

Site	Brices Cross	Broomlands	Lombarden	Tenchleys	Ridlands	Chart
Height OD						
560			3	1		
550			2		1	
540			1	3		
530	1			2	13	
520	5	2			5	
510		1			14	
500		2			19	
490					12	
480					2	
470					1	
460					1	
450						
440						
430					1	1
420						
400						1

APPENDIX 6

Table of measurements of artefacts from Limpsfield in Bell's collection

See M24–M41

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