PROFESSOR F.W. SHOTTON

by John Wymer

It is sad to relate that Professor F. W. Shotton died on 21st July 1990, only three weeks after returning the final draft to me of the joint paper which precedes this note. He was in poor health physically, but, with occasional lapses, as mentally sharp as ever. This note in our modest Newsletter is the last thing he wrote on the palaeoliths found in the Midlands; his first was sixty years before: 'Palaeolithic implements found near Coventry', in the Proceedings of the Prehistoric Society of East Anglia.

Fred Shotton's health had been failing for some years. A very tall,impressive man, he had become unsteady on his legs and could no longer walk round the local pits and observe the sections, but would relish others driving him to them so that he could see as much as possible and maintain contacts with the workmen and managers. It was thus that the hand-axes were recovered from Waverley Wood Farm Pit. This discovery of mint hand-axes made of andesitic tuff from beneath 'Wolstonian' till was something of a culmination of his long research on the Palaeolithic period in the Midlands and brought him much pleasure. To the end, he maintained that these 'Wolstonian' tills were not the same as the Anglian Stage tills of East Anglia, as the British Geological Survey had concluded. Whether this is so or not, his work on the Quaternary sediments and terraces of the Midlands has been a major contribution to Quaternary studies in Britain.

As Professor of Geology at the University of Birmingham from 1949, he witnessed the gradual growth of Quaternary studies, hitherto neglected by so many academics, and in many respects he was responsible for it. He was from 1971 Chairman of the British Section of the INQUA International Geological Correlation Programme Project 24 Quaternary Glaciations in the Northern Hemisphere. I met him frequently at these meetings and he usually had some plastic bags containing flint or quartzite palaeoliths to show me. He would ask me to suggest a date for various hand-axes and I think I finally convinced him that they could only be placed in a span of time that covered the whole of the Palaeolithic.

He was a Fellow of the Royal Society. There was only one archaeologist with a special interest in the Palaeolithic period who was once F.R.S. He did not inspire confidence in his fellows on the scientific content of his observations on palaeoliths or archaeology in general. F.W. Shotton has hopefully removed any such impressions from this august establishment.

RECENT FINDS FROM RAINBOW BAR AND SOME THOUGHTS ON SITE FORMATION

by A.J.Schofield

Introduction

The site of Rainbow Bar at Hill Head, Hampshire, has been known for many years and a large collection of artefacts, both Lower Palaeolithic and Mesolithic, has been recovered (Draper 1951). As Draper has previously described, the site lies at the outlet of the river Meon and comprises an area of muds and gravels often exposed at low tide. The area is central to a broad, shallow floodplain with low gravel cliffs 300m to the north-west and south-east. The artefacts described in this paper were found by the author following the severe January gales of 1990 and provided the opportunity to reconsider the material in the light of recent research into the effect of fluvial action on the structure and integrity of archaeological sites.

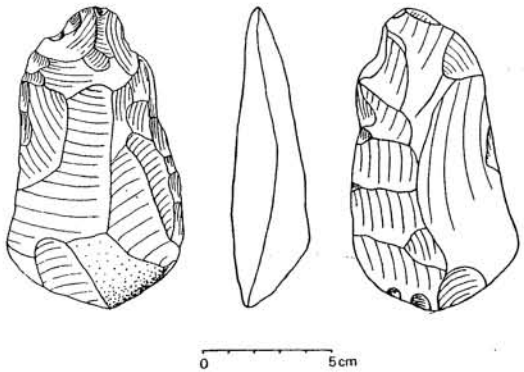
The collection of artefacts made by Draper (1951) has received surprisingly little attention, considering its size and apparent integrity (but see Roe 1981, 149-50; Shackley 1981, 6; and Jacobi 1981, 21 for brief comments). Draper described the collection as numbering over 1000 artefacts, most of which had a distinctive creamy white porcellaneous patina with slight iron stains. He suggested that the site covered an area of around two acres and was clearly defined except to the south-west, where at the lowest spring tides artefacts could still be collected some distance from the beach. Draper distinguished at least two periods of occupation, the earliest comprising very rolled Lower Palaeolithic material. This included ten hand-axes, with cores and flakes. Approximately fifty Mesolithic flakes were also found in the area, and were distinguished by the fact that, although patinated, they were not iron-stained as was the earlier material.

Flint Artefacts from the Site, 1990

The collection made by the author in January 1990 has much in common with Draper's material: four of the artefacts are heavily patinated, while three, including a hand-axe and an unpatinated flake, have iron stains. The material from the beach (NGR SU 5280 0240) includes a hand-axe and a heavily patinated flake. The hand-axe (Fig. 1) is 115mm long, 66mm wide, 29mm thick and weighs 230g. An area of cortex, visible at the butt end, appears to suggest a large pebble as the raw material and, if so, this might have been derived locally. Heavy patination covers the surface of the hand-axe except at the tip where two breaks have recently occurred, probably shortly prior to its recovery.

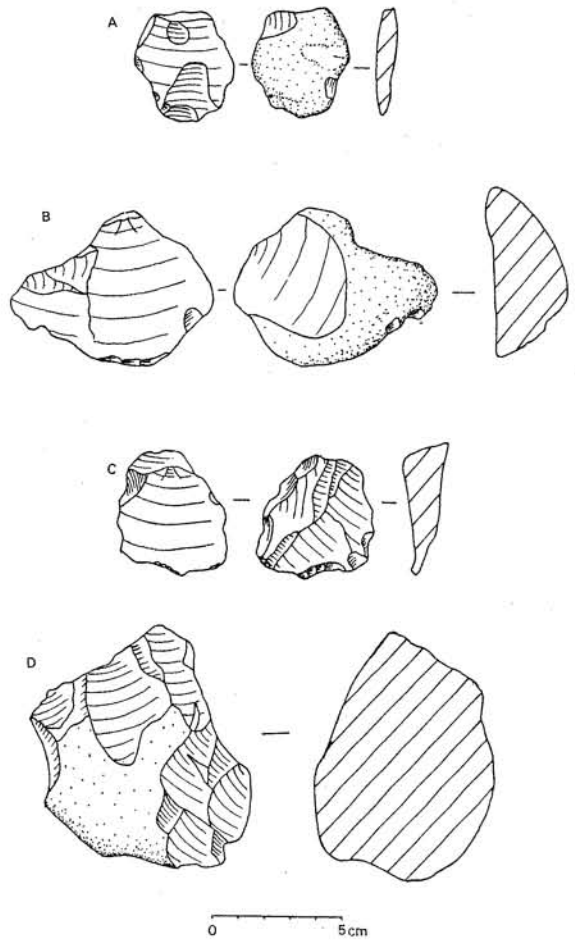
Shape is best described by a series of indices defined by Roe (1964, 261). The three most useful measures for the present implement are as follows: B/L = 0.57; L1/L = 0.17; B1/B2 = 0.55. The hand-axe is therefore relatively broad in outline and the shape best described as cordate, type JKf/vi in Wymer's (1985, 4)

terminology, a tranchet flake having been removed to sharpen the tip. As regards a date for the implement, flake scars are shallow and were thus produced by the soft-hammer flaking technique, once thought to be a feature of the more developed Acheulian industries in Britain (Roe 1975, 3). Indeed the survival of cortex on one face and the unworked butt would also have been thought characteristic of a later date. Recent finds from Boxgrove, Sussex, from probably pre-Anglian deposits (Wymer 1988, table 2), suggest, however, that an earlier date may be just as plausible.



1. Hand-axe collected from Rainbow Bar 1990

The flakes include one recovered from the beach (Fig. 2:a) and two (Figs 2:b, c) from a spit at NGR SU 5305 0210, described by Admiralty Charts as between -1.07 and -3.06m OD. The former is a primary flake, apparently soft-hammer struck, heavily rolled and patinated and derived from a flint pebble. The latter are larger flakes, both with pronounced bulbs of percussion, characteristic of reduction by hard stone hammer (i.e. in contrast to the soft-hammer mode suggested for both the axe and the flake recovered from the beach). The larger unpatinated flake (Fig. 2:b) is particularly crude and its cortex suggests that it is chalk-derived and probably local. The remaining flake (Fig. 2:c) is tertiary and, although rolled, has clear evidence for retouch at the tip. The final artefact recovered (Fig. 2:d) was a large flint core, possibly used as a chopper. This is heavily patinated



2. Flakes and a core collected from Rainbow Bar, January 1990

but had not been rolled to the same extent as the flakes described above. Bulbar depressions are pronounced and cortex on the butt end suggests a large pebble as the source. Opposite the butt is a roughly pointed tip formed by the apparently deliberate removal of three flakes.

The collection made early in 1990 therefore has much in common with the 'very rolled . . . Acheulian . . . pieces' recovered from the site by Draper (1951, 147). The patination is the same as he described, at least for the pieces found on the beach, while the dimensions appear to correspond with those presented in Draper's article. He described the ten hand-axes as being between 3" and 6" long and the large flakes as 4" across. He also described pebbles or boulders selected for their natural handgrip, on which a cutting edge had been worked. All three classes of artefact are represented in the small collection described above.

Technology, Fluvial Displacement and Site Formation

Two points can be made about the flint collections from Rainbow Bar. First, it would appear from the level of technology and the nature of the raw material that flint was being obtained locally, either on an ad hoc basis in the area of the Solent river, now submerged, or as part of an embedded procurement strategy from the chalk ridge 6km to the north-east. The second point relates to site formation and concerns recent experimental work by Schick (1986) on the effect of fluvial action on archaeological sites. Her premise, following on from that of Shackley (1978) and Fahnestock and Haushild (1962) is that the behaviour of archaeological material in a fluvial context will depend on a combination of factors. These include flow characteristics (velocity, depth, duration), bed conditions (particle size, bed form) and the physical characteristics of the archaeological material (size, shape, density). For example, with velocity at 2.5'/sec., flakes and cores less than 150mm long will exhibit continuous or near-continuous movement. Indeed, in some cases cores of considerable size may display transport rates equivalent to or even greater than smaller flakes of less weight (Schick 1986, 49). This is due to the fact that larger artefacts extend further upward into the turbulent boundary layer where higher flow velocities help compensate for their greater mass.

Two points made by Schick are particularly relevant to understanding site formation at Rainbow Bar. First, that at all levels of fluvial disturbance, larger artefacts will display better rates of recovery. Indeed for flakes and debitage recovery rates tend to diminish with size (Schick 1986, 81), while recovery of large flakes will equal or exceed that of heavier cores. Thus in an assemblage of known proportions, the recovery of large flakes and cores may be magnified several times over, while the proportion of smaller flakes will be severely reduced, often to less than half their original number. This is a discrepancy relevant not only to Rainbow Bar but to the overwhelming majority of Lower Palaeolithic sites. Indeed, Shackley has observed that

over 95% of Lower Palaeolithic artefacts in northern Europe have been found in fluviatile deposits (1978, 55). The second point concerns what Schick describes as 'additive distortion' (1986, 85). This involves the mixing by fluvial action of two or more separate sites which have occurred within the same stream system. A variety of artefact classes have been recovered from Rainbow Bar, and it is clear from the collections that a number of cultural episodes are represented.

To appreciate fully both the likely extent of additive distortion and the extent of visibility of archaeological material, the depositional history of the Solent river should be understood. Obviously sea level fluctuations have occurred during the period under investigation, and various stages of occupation will have become buried during the periods of deposition which accompany rising sea levels. Thus material appearing on Rainbow Bar was incorporated into silts and gravels below Mean Low Water Level, possibly representing the surface of a buried Pleistocene channel (Roe 1981, 149). This has been disturbed by storm action and erosion of a type prevalent within any active river system, although possibly enhanced in this case by wave action caused by the large vessels which frequent the Solent estuary. As for a date, Jacobi (1981, 21) has observed identical patination and staining on Clactonian material, blades, blade cores, a core adze and a barbed and tanged arrowhead from the gravel spit at Rainbow Bar. He thus argues for a late submergence, possibly in the later prehistoric period. Indeed, a date of 3689 ± 120 BP for a peat sealed beneath estuarine clay at -2.75m OD at Fawley (Godwin and Switsur 1966, 394) may be a useful comparison.

The lessons to be learnt from this are straightforward enough. Lithic collections from fluvial sites may bear little relation to the original assemblage in terms of density and composition, irrespective of how recently the assemblage became incorporated into a fluvial context. Thus two interpretative problems might arise:

1. The high proportion of large artefacts may not be representative of the assemblage as a whole, a point of particular relevance to the collection of Mesolithic material from Rainbow Bar.

2. Additive distortion may merge chronologically and/or spatially discrete artefact distributions. The latter may be overcome by incorporating the likely extent of fluvial displacement and the tidal regime into the interpretative framework. The former is a straight case of archaeological problem-solving and may be overcome by distinguishing material on the basis of technological indices. It is interesting, for example, that the two artefacts recovered from the beach in 1990 display the characteristics of soft-hammer reduction, while those from the spit are distinguished by prominent bulbs and bulb scars, a feature of hard stone hammer production.

Heavy storms therefore have the velocity to erode the silts/gravels in which artefacts have been deposited and move

large particles rapidly and sometimes over long distances. That Draper's (1951) collection and that made by the author in 1990 both followed heavy storm events combined with the fact that, from the recent collection, artefact clusters with distinct technological traits were separated by a distance of some 200m, suggests that discrete artefact concentrations are present within the fluvial environment of this part of the Solent estuary. It also suggests that, provided fieldwork is conducted to coincide with optimal visibility and following periods when the widest range of size and shape classes will be represented, sites eroding below Mean Low Water can produce meaningful results. The value of these results can, however, only be fully understood when the nature of the fluvial regime is known and the likely effect on an archaeological assemblage is documented.

Acknowledgements

I am grateful to Arthur ApSimon and Mike Newbury for commenting on the artefacts described in this paper.

REFERENCES

Draper, J.C., 1951, 'Stone industries from Rainbow Bar, Hants', Archaeol. Newsletter **3**, 147-149

Fahnestock, R.K., and Hauschild, W.L., 1962, 'Flume studies on the transport of pebbles and cobbles on a sandy bed', Bull. Geol. Soc. America **73**, 1431-1436

Godwin, H., and Switsur, V.R., 1966, 'Cambridge University natural radiocarbon measurements VIII', Radiocarbon **8**, 390-400

Jacobi, R.M., 1981, 'The last hunters in Hampshire', in Shennan, S.J., and Schadla-Hall, R.T., (eds), The Archaeology of Hampshire: from the Palaeolithic to the Industrial Revolution, Hampshire Field Club Archaeol. Soc. Mono. **1**, 10-25

Roe, D.A., 1964, 'The British Lower and Middle Palaeolithic: some problems, methods of study and preliminary results', Proc. Prehist. Soc. **30**, 245-267

Roe, D.A., 1975, 'Some Hampshire and Dorset hand-axes and the question of the early Acheulian in Britain', Proc. Prehist. Soc. **41**, 1-9

Roe, D.A., 1981, The Lower and Middle Palaeolithic Periods in Britain (London, Routledge and Keagan Paul)

Shackley, M., 1978, 'The behaviour of artefacts as sedimentary particles in a fluviatile environment', Archaeometry **20**, 55-61

Shackley, M., 1981, 'On the Palaeolithic archaeology of Hampshire', in Shennan, S.J., and Schadla-Hall, R.T., (eds), The Archaeology of Hampshire: from the Palaeolithic to the Industrial Revolution, Hampshire Field Club Archaeol. Soc. Mono. **1**, 4-9

Schick, K.D., 1986, Stone Age Sites in the Making: Experiments in the Formation and Transformation of Archaeological Occurrences, Brit. Archaeol. Rep. **S319** (Oxford)

Wymer, J.J., 1985, The Palaeolithic Sites of East Anglia, (Norwich, Geo Books)

Wymer, J., 1988, 'Palaeolithic Archaeology and the British Quaternary Sequence', Quaternary Science Review **7**, 79-98