

A MESOLITHIC FLINT WORKING SITE ON THE SOUTH COAST MOTORWAY (M27): NEAR FORT WALLINGTON, FAREHAM, HAMPSHIRE, 1972

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INTRODUCTION

THE site (NGR SU 596069) was discovered when the topsoil and clays overlying the chalk on Ports Down were being removed during the advance contract for the construction of the M27 motorway, between Fareham and Portsmouth (Fig. 1). Salvage excavations were carried out at weekends between May and July 1972 by members of the South Hampshire Archaeological Rescue Group on behalf of the Department of the Environment who kindly grant-aided the investigations. An Iron Age settlement site a few metres away was being excavated concurrently with the investigations published here (Hughes 1974).

The removal of topsoil had revealed a new exposure of the 'hundred foot' raised beach of the south coast between Arundel, Chichester and Southampton. In this particular area the motorway crosses the broad, sloping west end of Ports Down, and the cutting operation exposed about 20 metres of Upper Chalk, overlain by the raised beach and other superficial deposits (about 40 metres O.D.). The new exposure at Wallington appears to be the first in which the junction between the beach platform and chalk cliff has been observed. The raised beach deposits are thought to have been laid down during the Hoxnian interglacial period (ApSimon *et al* 1977).

On the top surface of the raised beach deposits (i.e. 1-1.5 metres below topsoil levels), over fifty features were observed and partially recorded, whose sandy fill was generally darker and greyer in colour than those of the surrounding deposits (Fig. 2). These

features were later identified as solution pipes in the Chalk. The speed of the operation made systematic recording extremely difficult and the establishment of levels almost impossible. Some of the pipes were observed and quickly recorded in one run of the machines and then were removed during the next or subsequent runs, an indication of their shallowness. None of the shallow pipes were excavated properly although some flint material was retrieved from their contents. It was only during a lull in the advance construction programme that two of the deeper pipes were examined more thoroughly, one to a depth of nearly 9 metres. A coarse sieve was used during the excavation of one of the deep features, No. 43, in order to extract microlithic artifacts.

Unfortunately, as is often the case in salvage operations of this nature, only a sample of the evidence (which may be unrepresentative) was retrieved, recorded or excavated.

This report shows the need to excavate in controlled conditions, well in advance of development. Problems and dangers also existed in the excavation of deep features, and for this reason further investigation was terminated after consultations with the motorway engineers.

THE EXCAVATIONS

Figure 2 shows the numbers of pipes recorded and subsequently lost during the topsoil removal operation and those that extended into the underlying chalk strata. The diameter and surface profile of the shallow pipes were not accurately recorded,

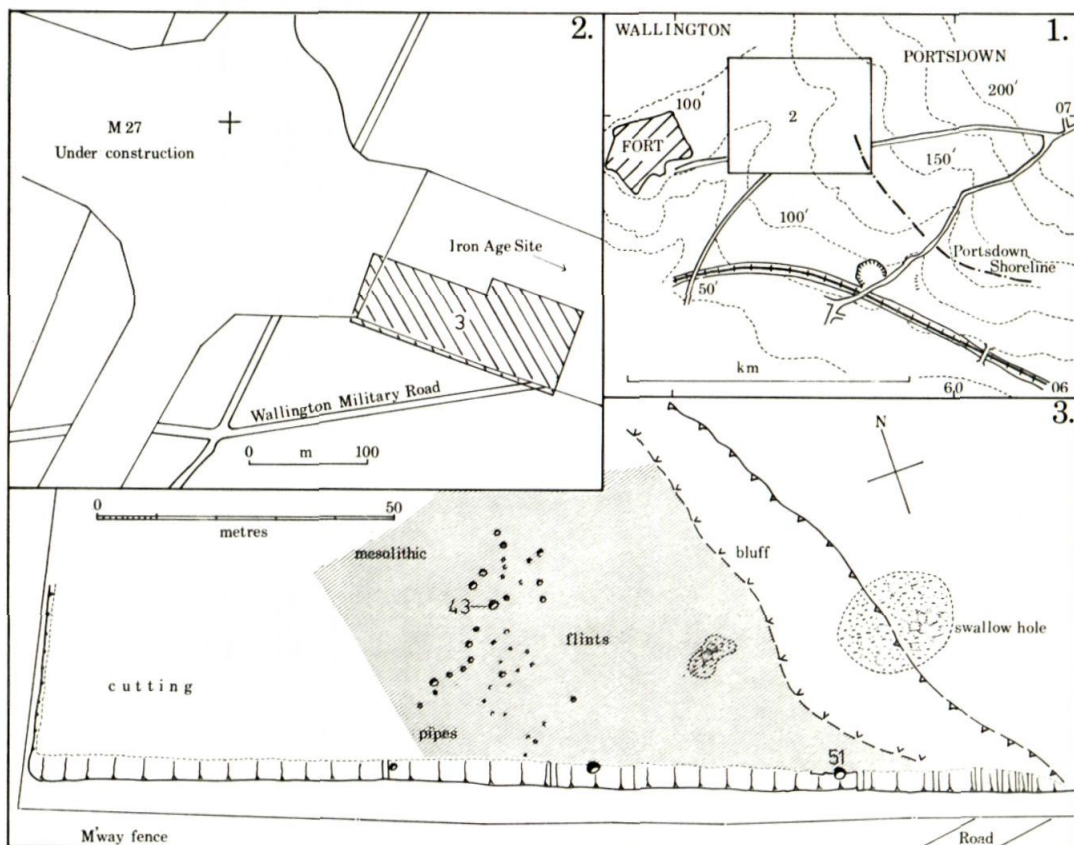


Fig. 1. Fort Wallington: Location Map.
 + Marks location of Neolithic pottery find.

for the reasons already described, and are thus only diagrammatically represented. The majority, however, were of the order of 2 metres or less in diameter, with depths varying from 1 to 3 metres. Two of these pipes were partially sectioned, indicating a pit-like profile. Those pipes that were deeper (underlined numbers in Fig. 2) were generally of 1 to 2 metres in diameter, somewhat irregular in profile, and of unknown depth.

Two pipes were investigated, one to a depth of 8.5 metres from the chalk surface and another 2 metres from an interim surface (Figs. 3, 4). The fill of the shallow pipes and the tops of the deeper examples were a grey-

brown sand (ApSimon *et al* 1977, Unit 2.4) as distinct from the surrounding orange-yellow sand deposits (*ibid*, Unit 2.2) and contained worked flints. The fill of the deeper pipes varied with depth. In the case of No. 43 (Fig. 3) the grey-brown sand deposit existed to a depth of about 5 metres. From this depth the fill consisted of a heavy red-brown clay, intermixed with yellow sand, which contained a number of flint nodules. No. 51 (Fig. 4) contained a similar fill although the heavier clay layers were not reached.

Charcoal fragments were observed in the top of the fill of No. 51, as well as in one or two of the shallow pipes, whilst burnt flints were



Fig. 2. Fort Wallington: Plan of 'features'.

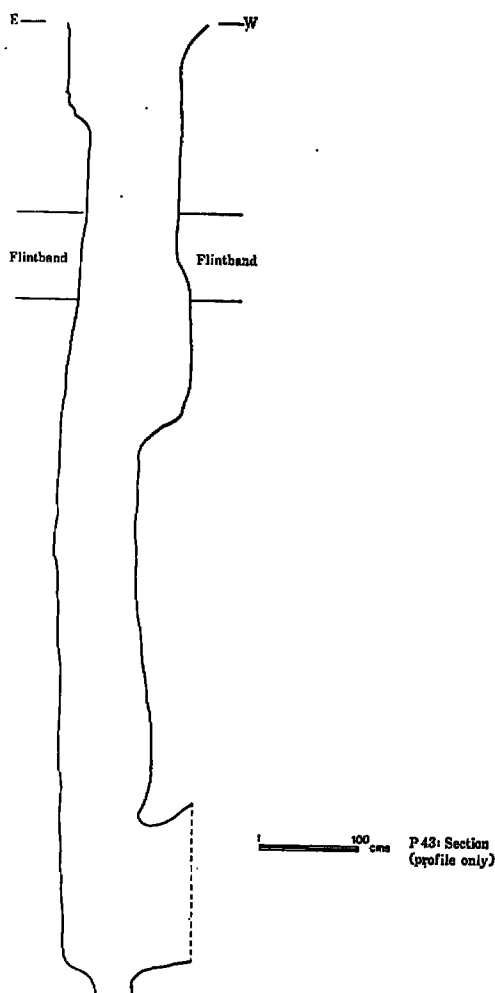


Fig. 3. Fort Wallington: Profile of pipe F43.

found in 19 pipes. At a depth of about 2 metres in No. 43, a band of flint was observed which coincided with an enlargement of the shaft to just below a depth of 4 metres. The chalk walls of the shaft were also worn smooth to this depth. Flint implements and waste material were mainly found in the upper fill of grey-brown sand, although a small number was recovered down to 6 metres.

It is possible that many of the shallow pipes

had pit-like profiles with fills of the grey-brown sands which contained worked flint material, etc.

The Solution Pipes

The pipes seem to have appeared on the machine-scraped surface at a level corresponding to the layer of clayey sand with white patinated flints seen in the section face of the motorway cutting (ApSimon *et al* 1977, Fig. 5, Unit 4). They were generally about 1-2 metres in diameter, roughly circular in plan. The excavated example, No. 43, narrowed at about 4 metres below the surface of the chalk, and showed further signs of narrowing at the lowest point reached, 8.5 metres below the surface of the chalk. Some months after the main investigation when the motorway cutting had been substantially deepened, the lower parts of two pipes were seen in section at about the same level as that reached in No. 43. Of these, one was slightly tapering, not more than 0.5 metres wide, the other was about 0.5 metres wide before bifurcating about 1 metre above its base.

Where they entered the chalk, the sides of the pipes were relatively smooth, below about 5 metres the sides of No. 43 showed an irregular 'blocky' appearance where blocks of chalk had become detached, but there was no evidence of tool marks. The pipes, including the upper parts of Nos. 43 and 51, which were seen to pass through the overlying raised beach deposits, were lined with reddish-brown clay up to about 10 centimetres thick. The fillings of the pipes were generally sandy above, more clayey below, but no humic material or chalk was noted. The basal part of one of the pipes seen in section showed clear slumping structures, with lenses of brown clay in a reddish-brown sandy matrix.

The pipe No. 43, deeply excavated, showed some tendency to a stepwise profile, and appeared to connect with another at about 8 m down.

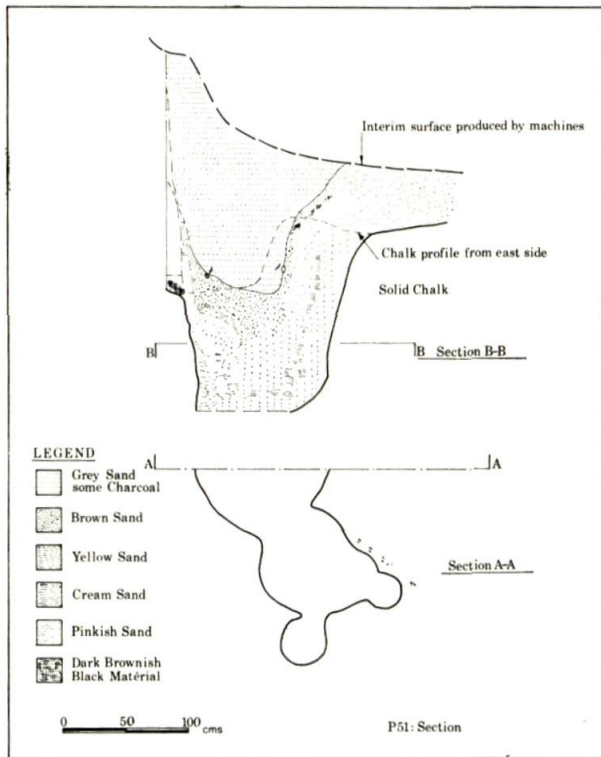


Fig. 4. Fort Wallington: Section and plan of pipe 51.

Nineteen of the pipes contained a number of burnt flints, and three flint hammerstones were also recovered. Two of the scrapers (Fig. 6, no. 26) are almost certainly post-Mesolithic. They may, however, be associated with other evidence of late Neolithic activity (pottery, flint, hearth, etc.) recovered during topsoil stripping operations on an adjacent section of the motorway, some 100–150 metres to the west (Hughes 1978).

THE FLINT INDUSTRY

Table 1 shows the overall composition of the flint assemblage recovered during the excavations, from the fills of the pipes and the general surface of the Pleistocene deposits. There is no evidence to suggest that the material from either location, apart from the scrapers mentioned below, is of more than one period.

Most of the flints of Mesolithic facies are fresh and unabraded, with light, whitish patina. A few have a distinctive light blue-grey patina. Most of the flint is grey, some has cherty inclusions.

TABLE 1

| IMPLEMENTS | No. | Percentage | BY-PRODUCTS | | WASTE | | | |
|----------------------------|-----|------------|-----------------|------------|-------|------------------|------|-----|
| | | | No. | Percentage | No. | Percentage | | |
| Axes (including roughouts) | 15 | 31 | utilised blades | 15 | 3 | cores | 108 | 4.2 |
| Microliths | 7 | 14 | blades | 452 | 97 | axe sharp flakes | 21 | 0.8 |
| Microburins | 2 | 4 | | | | flakes | 2419 | 95 |
| Picks | 3 | 6 | | | | | | |
| Scrapers | 14 | 29 | | | | | | |
| Gravers | 5 | 10 | | | | | | |
| Borers | 2 | 4 | | | | | | |
| Saw | 1 | 2 | | | | | | |
| | 49 | 100 | | 469 | 100 | | 2548 | 100 |
| Total assemblage | | 1.6% | | | 15.4% | | 83% | |
| 3064 | | | | | | | | |

Axes (Fig. 5)

1. Core axe, probably broken in manufacture. Grey flint. Large chert-like inclusions.
2. Roughout for core axe, broken.
3. Small tranchet axe, triangular section. Greyish.
4. Pick? Dull, marbled grey.
5. Core axe, unfinished, triangular section, broken in manufacture. Grey, with chert-like inclusions.

Cores (Figs. 5-6)

6. Blade core, single platform. Bluish-grey. Chert-like inclusions.
7. Blade core, double-ended, with blade beds on opposite sides of core. Heavy patina.
8. Blade core, double-ended. Dull, grey.
9. Flake core, large, good quality. Mottled, whitish-grey. Previous use as a hammer stone.
10. Blade core, single platform. Dull, grey, retaining large areas of cortex.
11. Blade core, double-ended. Lustrous, brownish-grey. Finely worked all round the striking platforms.
12. Blade core, single platform. Bluish-grey. Retaining large areas of cortex.

Scrapers (Fig. 6) (ES—End scraper)

13. ES on thick blade, dull, whitish.
14. ES on thick flake, fire-damaged.
15. ES on broken blade. Lustrous, medium grey.
16. Concave ES on thick blade, grey, slight patina.
17. Flake, worked at end and one side. Lustrous, grey.
18. Dual purpose scraper-cum-knife on large flake with bulb removed. Whitish with chert type inclusions.
19. ES on large flake, flint as 6.
20. Side scraper on flake, broken, dull, whitish.
21. ES Lustrous, medium grey.
22. Convex scraper broken, on flake. Lustrous, whitish.

23. Convex scraper on flake. Lustrous, grey.
24. Side scraper, finely worked, on thin flake. Lustrous, grey.
25. ES on thick flake. Lustrous, weathered grey.
26. End and side scraper on flake. Grey. Thin cortex. Post-Mesolithic in characteristics.

Axe sharpening flakes, burins, etc. (Figs. 6-7)

27. Axe sharpening flake. Cutting edge showing double tranchet facet. Lustrous, speckled grey.
28. Axe sharpening flake. Cutting edge damaged. Semi-lustrous, grey.
29. Axe sharpening flake. Cutting edge much used. Lustrous, greyish-white.
30. Axe sharpening flake. Cutting edge showing moderate use. Dull, whitish. Chert inclusions.
31. Medial angle burin, part of large flake. Lustrous, greyish-white.
32. Blade, both edges and end utilized. Lustrous, grey.
33. Blade, both edges utilized. Lustrous, creamy.
34. Multiple angle burin on thick flake. Lustrous, greyish-white.
35. Burin, light, on small flake. Lustrous, greyish-white.
36. Dual purpose saw-cum-borer, on large flake. Lustrous, grey. Slight patina.
37. Borer, on flake. Lustrous, light brown.
38. Borer, made from core reject. Grey, Chert-type inclusions. Slight patina.

Microliths etc. (Fig. 8) (following Clark's classification, Clark 1933)

| | | |
|---------------|--------------|------------|
| 1. Microlith | Form A | 21 × 6 mm |
| 2. Microlith | — | 13 × 11 mm |
| 3. Microburin | — | 20 × 10 mm |
| 4. Microlith | Form A | 36 × 13 mm |
| 5. Microlith | Intermediate | 22 × 9 mm |
| 6. Microlith | Form B1 | 30 × 13 mm |
| 7. Microlith | Form D1(A) | 17 × 5 mm |

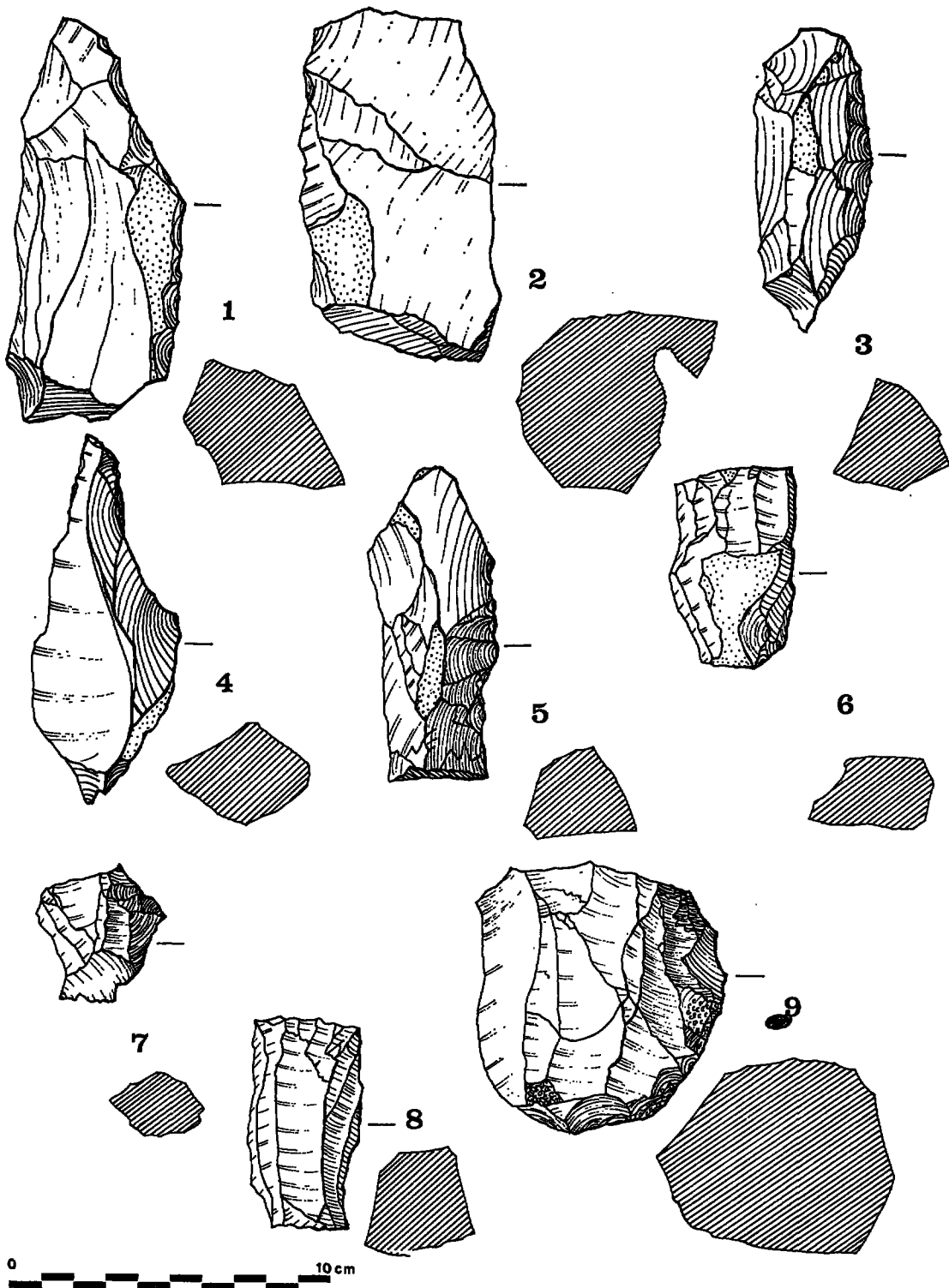


Fig. 5. Fort Wallington: flint implements, 1-5, axes, 6-9, cores. Scale $\frac{1}{2}$.

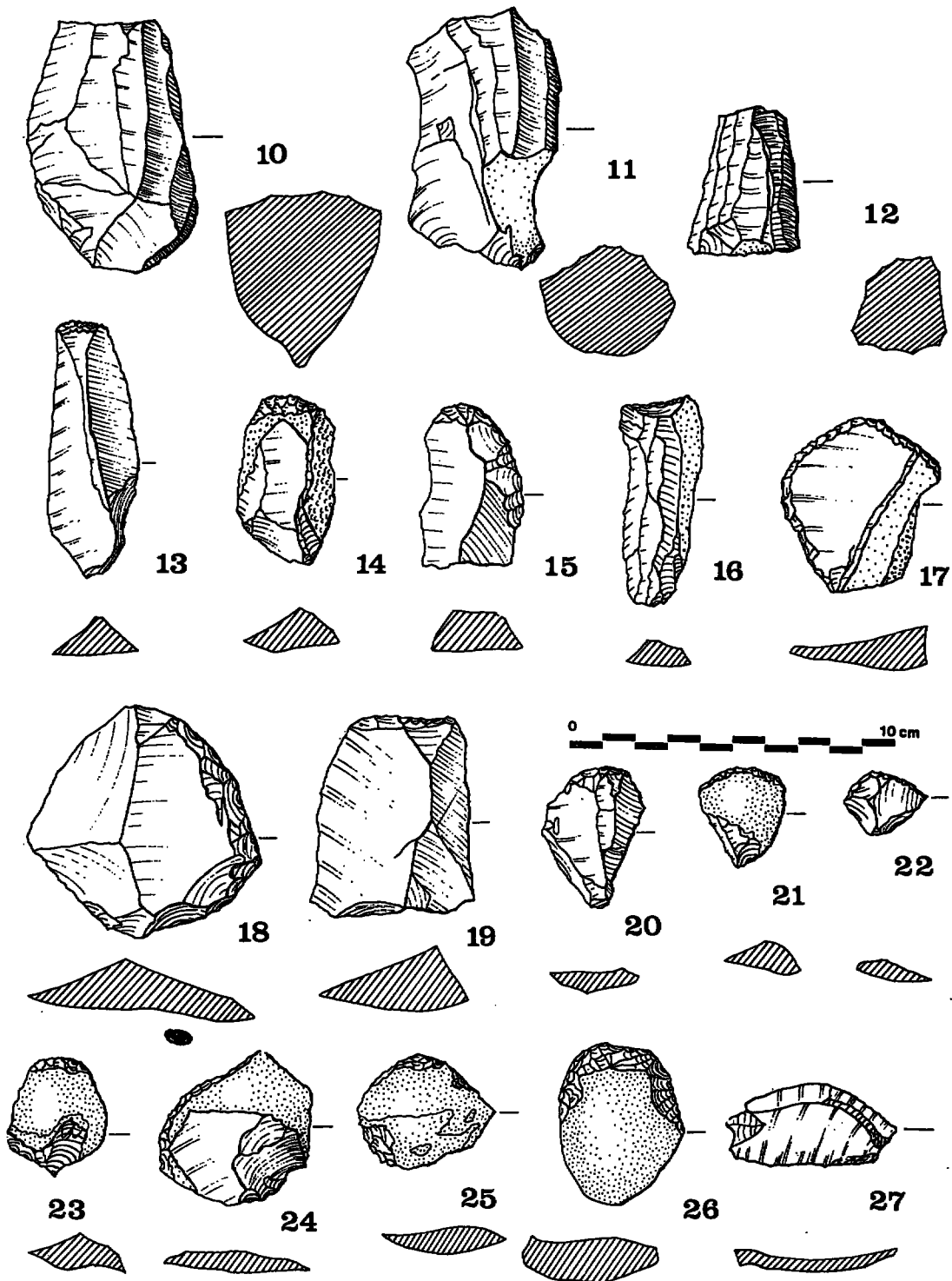


Fig. 6. Fort Wallington: flint implements, 10-12, cores, 13-26, scrapers, 27, axe sharpening flake. Scale $\frac{1}{2}$.

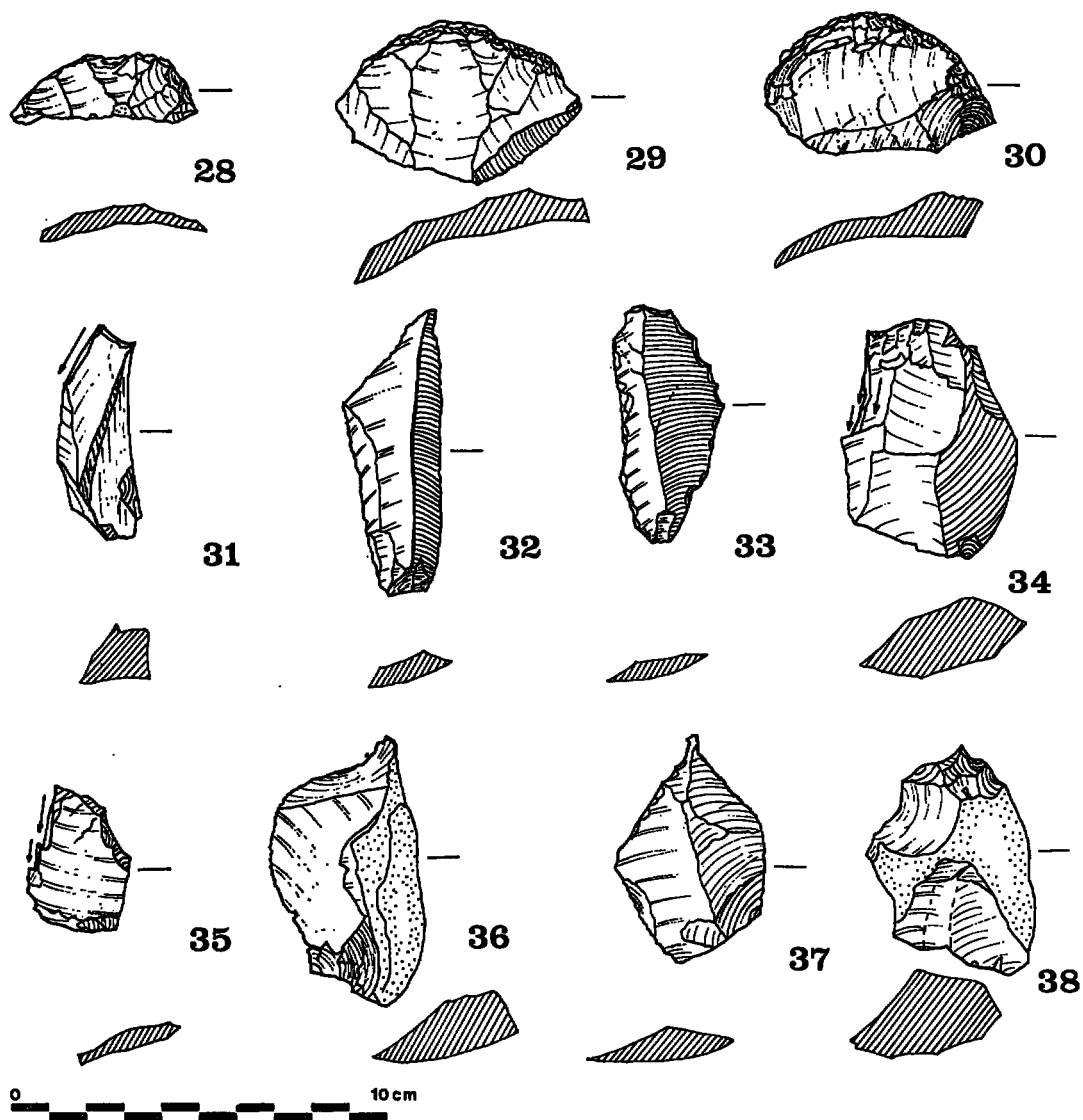


Fig. 7. Fort Wallington: flint implements, 28-30, axe sharpening flakes, 31, 34-5, burins, 32-3, utilised blades. 36-8, borers. Scale $\frac{1}{4}$.

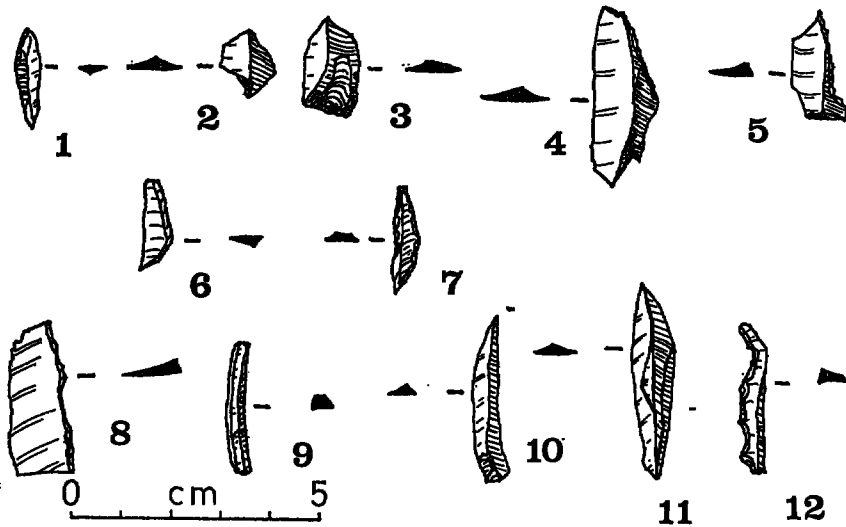


Fig. 8. Fort Wallington: flint microliths. Scale 1/1.

| | | |
|--------------------------|-------------------|-----------|
| 8. Microlith | Form B2 | 20 × 4 mm |
| 9. Burin spall | | 26 × 4 mm |
| 10. Blade, fine | | 31 × 6 mm |
| 11. Blade, fine | (Microlith blank) | 38 × 9 mm |
| 12. Blade, core trimming | | 29 × 6 mm |

It has been observed that pipes are generally found in areas where the Chalk is covered by permeable deposits of limited thickness, and are absent in areas long free from overlying deposits, implying their subsequent removal by erosion. Small *et al* (1970) bring forward evidence suggesting that piping may be triggered by the presence of such deposits, especially if their composition should tend to increase the acidity of the percolating water.

DISCUSSION

There is a substantial body of literature on the subject of solution pipes in the chalk and overlying formations, from Prestwich (1855) onwards. A recent contribution (West and Dumbleton 1972) discusses pipes discovered during construction of the M4 and M40 motorways in Berkshire and Buckinghamshire and brings forward evidence showing that piping may be actively under way at the present, and that where percolation becomes localised pipe formation may proceed rapidly. Thus if run off is concentrated within an area of 1 per cent of the whole, pipes such as those at Wallington (up to 10 metres deep) might be formed within 2,000 years, while the general chalk surface would be lowered by no more than 10 mm, or less if solution mainly proceeded interstitially within the Chalk.

Piping implies localisation of percolation. This may be influenced as much by the susceptibility of the Chalk to deep fracture by frost (Higginbotham and Fookes 1970) as by the joint structure of the Chalk, although the stepwise profile of pipes at Downend (ApSimon *et al* 1977, Fig. 2) suggests control by the joint and bedding plane structure of the Chalk. Such stepwise profiles make junctions between adjacent pipes possible. Piping, unlike the formation of collapse features (Sperling *et al* 1977) probably begins at the surface of the Chalk or overlying calcareous formation and proceeds downward, so that the older, upper part of the pipe may be wider, than its lower, younger part. The commonly limited and relatively uniform

depth, generally 7–10 metres suggests that localisation of vertical percolation is only effective above the local water table, while bifurcation near the base should mark the transition from vertical to lateral percolation.

The clay lining of the pipes at both Wallington and Downend is a characteristic feature, and may be partly a product of decalcification, though its presence round the sides where they pass through the raised beach suggests that it is mostly due to translocation of clay within the filling. The main filling of the pipes, showing well marked banding in places, is clearly derived by slumping of the overlying raised beach and superficial deposits.

Whereas the large solution features at Wallington (ApSimon *et al.*, Figs 3, 4) showed signs of cryoturbation of their fillings and were probably therefore at least as old as the last glaciation (Devensian), the pipes showed no such signs and are therefore likely to be of postglacial (Holocene) age. This suggestion agrees with young ages attributed to similar pipes by many authors (Small *et al.* 1970, Sperling *et al.* 1977).

However, these pipes appear in a Chalk surface which was probably eroded by the sea during the Hoxnian Interglacial (ApSimon *et al.* 1977) and which apart from the few large solution features, was not grossly affected by solution until the inception of numerous solution pipes in the postglacial. This suggests that some novel factor was operative in this period. One possibility is that wholesale clearance of forest and cultivation, beginning in the Neolithic (note the presence of Late/Final Neolithic pottery on the site—Hughes, 1978), led to increased percolation and possibly to greater acidity of percolating water, thus triggering pipe formation. The calculated rates of formation noted above suggest that pipes of the dimensions observed could easily have formed within the 5,000 year period implied by this hypothesis. On this view the presence of Mesolithic flints

in the pipe fillings results from slumping of material deposited on the surface, and not from quarrying or mining.

If the solution pipes are of post-Mesolithic age, they could not have functioned as flint quarries. If pipe formation had already begun in Mesolithic time, it is possible that the upper parts of the pipes could have been temporarily open, since recent observations show that slumping of pipe fillings may be very rapid (West and Dumbleton 1972). However, if that were so (or if the fillings had been dug out by man) one would expect to find humic material in the fill, and also collapse of the upper parts of the pipes where they passed through the raised beach sand, unless the period of exposure was very brief. But although charcoal fragments were found in the upper fills of some pipes there was no evidence of either. On balance it seems improbable that the pipes were ever open deeply enough to permit access to the chalk flints, and the presence of Mesolithic flints to a depth of about 5 metres suggests that much, if not all, of the formation of the pipes has taken place since Mesolithic times.

However, the possibility of obtaining fresh flint in the Mesolithic either by digging for it or by access to natural features, such as solution pipes should not be entirely excluded even if the present evidence is very tenuous. Neolithic flint quarried from the chalklands of southern England represented a source of good quality, unweathered material which was more durable than weathered flint. The axes and the majority of other flint artifacts from Wallington are fresh and no more than lightly patinated. The material may have therefore been obtained possibly from exposed flint bands close to the surface, such as appeared at the tops of some solution pipes, if the evidence of pipe No. 43 can be accepted. Perhaps the tradition of extracting unweathered flint stems not from the Neolithic but from the late Mesolithic. Once the increased durability of unweathered flint had

been recognised then its continued use was ensured and increased demand resulted in more sophisticated quarrying techniques. Whether or not flint from Wallington was for local use or for a wider distribution is an interesting but unanswered question.

In passing it may be observed that unless there is positive evidence (tool marks, nature of filling) or unless the base of the shaft or pipe is seen in section it would be very easy to mistake such pipes for artificial shafts. The authors suspect that this may be the case with the shafts at Eaton Heath, Norwich (Wainwright 1973) developed in Crag sands and gravel overlying Chalk, which contained Middle (?) Neolithic and Bell Beaker pottery, and perhaps also with others among the shafts cited by Wainwright. In contrast the chalk rubble and humus in the fillings of the shafts at Maumbury Rings, Dorchester (Bradley 1976) speak strongly for their being artificial, though even there some of the features observed are not easily accounted for.

The Flint Industry

The flint industry will not be discussed in detail since much of the evidence from the motorway was recovered under imperfect conditions, and thus may not be representative. The high percentage of waste material can be compared with similar results from other Mesolithic flint working sites, for example at Oakhanger (Rankine 1952). The majority of cores produced blades which were presumably used subsequently for the manufacture of microliths. A greater number of microliths would probably have been recovered if similar sieving techniques to those used at Broom Hill (O'Malley and Jacobi 1978) had been adopted at Wallington.

Examination of the waste flakes tends to suggest that on the whole they are the waste products of axe, pick and large scraper manufacture.

Over the past three decades numbers of flint implements have been collected from the ground surface of local sites near Shedfield, Fair Oak, Boarhunt, Butser Hill, Chalton and East Meon, for example (Draper 1951, 1953, 1955 and 1968). These collections are similar to the types of implement recovered from Wallington, although not in number, composition or percentage.

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The flint material will be deposited with Portsmouth City Museum.

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