ARTICLES

THE LITHIC INDUSTRIES FROM STAINES CAUSEWAYED ENCLOSURE AND THEIR RELATIONSHIP TO OTHER EARLIER NEOLITHIC INDUSTRIES IN SOUTHERN BRITAIN

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1. INTRODUCTION

The lithic industries under discussion are from the neolithic causewayed enclosure at Staines, Surrey. The site was excavated between 1961 and 1963 by the Department of the Environment (then the Ministry of Public Buildings and Works), in advance of gravel extraction (Robertson-Mackay 1962 and 1965; Robertson-Mackay et al 1981). The analysis of the lithic industry was begun by the late A D Lacaille following the precedents set in the Hurst Fen and Windmill Hill reports (Clark et al 1960; Smith 1965) and the basic data from this analysis, which was largely completed by 1968, were subsequently prepared by us for publication. The definitive report will be given in the final publication. In this article the results of the analysis are outlined, and the relationship of the Staines industry to other broadly contemporary assemblages in southern Britain is reviewed. (Editor's note: for plans showing the location of the causewayed enclosure and the areas excavated see Robertson-Mackay et al 1981, figs. 1-3).

Over 24,500 lithic artefacts were recovered from the excavation; they are described in Table 1 and in section 3. Almost all seem to come from the same cultural tradition although the degree of independent dating varies. The lithic artefacts from the enclosure ditches were directly associated with earlier neolithic ceramics and were in virtually undisturbed contexts (see however 5.1 and 5.3), but the situation in the interior of the enclosure was more complex as it had been much disturbed by ploughing since Roman times. However, there was a considerable amount of earlier neolithic pottery in the interior, similar to that from the enclosure ditches, and very little other prehistoric pottery (see 5.1), so that it is likely that the bulk of the lithic assemblage is also earlier neolithic in date.

2. RAW MATERIALS

The vast majority of the artefacts are of flint. Three different types of flint were identified macroscopically and we are grateful to the Institute of Geological Sciences for their comments and descriptions.

2.1 A poor quality flint, probably obtained locally from the river gravels. It is relatively small in size with a water-worn cortex. It is mottled and predominantly, though not exclusively, dark reddish or pale sepia in colour.

2.2 A better quality flint, possibly from the chalk. (The nearest flint-bearing chalk is in the Maidenhead-Denham area about 15 miles up-stream). This flint must have been of fairly large size as some of the nodules found in the inner enclosure ditch weigh up to 4lb 12oz (2.4 kg). It has an unabraded white cortex and is mottled. It varies in colour from pale grey to a darker sepia.

Table 1. The composition of the flint industry (see note 1)

Artefact type	Outer ditch	Inner ditch	Interior
Hammerstones	4	12(+1?)	26
Abraded edge implements	-	4(+4?)	-
Cores	162	595	16,151 (includes serrated flakes); sample only analysed in detail (see note 2)
Struck nodules	48	88	
Unretouched flakes and blades	1244	5067	
Retouched pieces (unclassified)	1	18	-
Scrapers	45	108	224
Serrated flakes	37	158	x
Laurel leaves	6	23	37
Leaf-shaped arrowheads	2	5	27
Transverse arrowheads	1	2	9
Triangular arrowhead	-	-	1
Axes	1	6	14
Blunted-back knives	-	4	6
Other knives	11	27	55
Single-piece sickle	-	-	1
Fabricators	1	2	9
Awls and piercers	6	26	128
Notched flakes	12	24	82
Saws	-	-	2
Microlithic element	-	-	9
Compound tools (see note 3)	3	5	18
Graver	-	1	-
Totals	1584	6180	16799

Note 1. Non-flint lithic artefacts (hammerstones and axes) are not included in this table, but they are discussed in the text.

Note 2. A sample of the unretouched material from the interior of the enclosure was examined. Details of this sample will be given in the final report.

Note 3. The compound tools category includes artefacts with more than one tool attribute. Therefore, in the detailed typology, there will appear to be a larger number of some types (eg scrapers).

2.3 A fine quality grey flint, only used for axes, which were seemingly brought to the site as finished tools, though broken axes were reflaked.

2.4 Amongst the other raw materials not obtainable locally there are axes of igneous rocks (Groups VI and VII) and a fragmentary knife of black chert (possibly Portland) which were brought in as finished tools, and hammerstones of sarsen.

2.5 The quartzite, also used for hammerstones, and the occasional cretaceous chert flake, probably originate from the local gravels.

3. TYPOLOGY

3.1 Flaking tools

Hammerstones are the only flaking tools present, and their weights vary with the raw material. The quartzite ones are the lightest, weighing between 75 and 110g. Most of the flint hammerstones are fragmentary but the complete ones weigh between 113 and 340g, and most of the sarsen ones between 225 and 450g. Some of the flint and sarsen hammerstones have been shaped but the quartzite pebbles remain unaltered. In the case of the flint hammerstones it is not always certain whether the shaping is deliberate or simply the re-use of a core (cf Saville 1981a, 5).

3.2 Abraded-edge implements

These are large nodules characterized, when viewed from the side, by a markedly concave or 'beaked' profile. The functional end is convex in outline and heavily abraded.

3.3 Cores

The classification of the cores (after Clark et al 1960, 216) from the enclosure ditches is given in Table 2.

Table 2. Typology of a sample of cores from the enclosure ditches

Typology	Outer ditch	Inner ditch	Weight in g (sample size 383) range	average
Class A1	3	7	10-65	32.5
A2	86	367	6-300	49.7
B1	1	3	40-130	79.2
B2	23	81	5-445	53.6
B3	7	32	10-180	56.5
C	8	31	5-497	85.8
D and E	12	31	10-220	58.4
Unclassifiable	10	36	10-165	51.4
TOTAL	150	588	5-497	59

The simple cores are almost all of small size and of gravel flint (2.1), whilst the three-platform cores are larger and of better quality flint(2.2). The average maximum dimension for all cores is 66mm. The simple, partially flaked, single-platform cores have an average of only six flake scars and often have substantial areas of cortex left on them, few being systematically flaked to the point of exhaustion. Platform preparation for these cores is minimal: 53% utilized a thermally fractured surface and the rest a plain flake scar. Trimming between the edge of the striking platform and the core face was noted on about 15% of all cores, and was observed (though not quantified) on some flakes.

3.4 Removals

The removals vary from small, squat flakes to blades and larger blade-like flakes, many of which were chosen for retouch (see 4). The proportion of retouched to unretouched flakes varies from about 9% in the outer enclosure ditch to about 6.5 % in the inner enclosure ditch and 7.5 % in the interior of the enclosure. In the outer ditch a further 17% and in the inner ditch 13%, were edge-damaged possibly resulting from utilization (3.5). The figure for the interior of the enclosure is over 30%.
The unretouched pieces have been subdivided as follows:

	With cortex	No cortex	Trimming and rejuvenation pieces
Outer ditch	49.4%	39.9%	10.6%
Inner ditch	40.8%	50.5%	8.6%
Interior (sample)	58.3%	33.2%	8.4%

True core-rejuvenation pieces form about 40% of the rejuvenation and trimming flakes and include flakes with keeled edges (15%) and flakes struck to renew the edge of the striking-platform (84.5%). The most common type of trimming flake has been struck to remove excessive step-fracturing on the core face. Plunging flakes, originally counted with the core-rejuvenation flakes, are now considered to be an accident of débitage rather than a deliberate technique. (Tixier 1974, 19; Tixier et al 1980, 95). They form about 6% of the trimming flakes from the enclosure ditches.

3.5 Utilization

Utilization or bevelling of Smith's type A (1965, 92) is found on 31.5% of the utilized pieces from the ditches: the other 68.5% have irregular edge-damage but it is not always certain whether this is the result of utilization (Smith's type B) or of accidental damage (cf Moss 1983). Some of these flakes also have a narrow band of high gloss along their edges and may be worn serrated pieces (see also 3.7, and Saville 1981b, 140 and 144-5).

3.6 Scrapers

The typology of the scrapers (modified from Clark et al 1960, 217) is given in Table 3, and the metrical data of the complete ones in Table 5. The contour of the retouched edge is normally rounded, but one concave example is present from the inner enclosure ditch. The retouch is mostly of 'classic' semi-convergent type. However a number of flakes have marginal retouch only, but are otherwise morphologically similar to the artefacts with 'classic' scraper retouch and have been included in the totals. The majority of scrapers have lines of step-fracturing along the retouched edge and some also have

heavy wear on part of the retouched edge. Four scrapers have had flakes removed from their ventral surfaces, possibly to prepare or thin the base (Clark et al 1960, 218).

Table 3. Typology of scraper-edges on struck flakes from the ditches and interior of the enclosure

Scraper-type		Outer ditch	Inner ditch	Interior
A	End scrapers	12	42	115
A/D	End and side scrapers	22	41	73
C	Disc scrapers	3	3	1
D	Side scrapers	5	9	21
E	Scrapers with bulbar end broken	-	5	-
F	Unclassifiable	-	-	2
G	On thermal flakes	5	12	19
	TOTALS	47	112	230

3.7 Serrated flakes

These are relatively long, narrow flakes (see 4) with fine regular denticulations along one (about 68%) or both (32%) long edges. The number of teeth per centimetre varies from 23 on the finest specimens to between 11 and 14 on 24% and between 8 and 10 on 46%. Gloss was observed on about 14%; macroscopically similar gloss was noted on some of the utilized pieces (3.5) and it is possible that they are worn serrated pieces (cf Escalon de Fonton 1979, 217-220 and Saville 1981b, 140, 144-5). Nine serrated pieces have their distal ends truncated by abrupt retouch as though they were intended to form part of a composite tool (see also Bell 1977, 26, F35).

3.8 Laurel-leaves

A shallow, invasive retouch may cover all of one or both faces. Similar pieces with only marginal retouch may be a variant form.
The examples were subdivided by retouch-type and by size:-
a) larger bifacially flaked pieces with randomly executed chunky flaking;
b) smaller (less than 60mm in length) more regularly flaked artefacts, which although falling into the same length range as some of the larger leaf-shaped arrowheads, are much heavier and thicker objects;
c) morphologically similar pieces but with marginal retouch only;
d) irregularly flaked bifacial artefacts which may be unfinished forms. (Some may even be flat discoidal cores).
Some of the laurel-leaves seem to have been made on flakes struck from discoidal cores, but none, as far as could be determined, had been made from tabular flint as was the case at Hurst Fen (Clark et al 1960, 223).

3.9 Arrowheads

Leaf-shaped arrowheads Only seven of the thirty-four examples are from stratified contexts. Most of the arrowheads are broken, only nine being complete enough to reconstruct and classify after Green (1980, 10).

Type	No	Type	No	Type	No
Class 2B	1	Class 3A	1	Class 4A	2
2C	1	3B	1		
		3C	3		

There are also two fragments of what may have been kite-shaped arrowheads (Green 1980, 22). Retouch in this category is either fine, semi-parallel flaking over all, or part of, both faces (21 examples) or edge-retouch on a suitably shaped blank (12 examples).

Transverse arrowheads The location and typology (after Green 1980, 30) of the transverse arrowheads is as follows:

	Petit tranchet	Chisel	Oblique	Unclassified
Outer ditch	-	1	-	-
Inner ditch	1	-	1?	-
Interior	1	6	1	1

One chisel-ended arrowhead was made on a flake from a discoidal core (cf Green 1974, 84).

Triangular arrowhead There is one triangular arrowhead from a feature in the interior of the enclosure. It may be an unfinished barbed-and-tanged arrowhead (Green 1980, 142).

3.10 Axes

All the axes present are ground-and-polished. Only one complete axe was found, the others are fragments or flakes. Their distribution and re-use is shown in Table 4 below:

Table 4. The distribution and re-use of flint and stone axes

Context	Amount of axe surviving					Re-use		Total
	Complete	Blade fragment	Butt fragment	Other fragment	Flake	Scraper	Core	no of axes represented
Outer ditch	1	-	-	-	1	1	-	2
Inner ditch	-	1	-	1	3 1 (Gp VI)	-	2	5
Interior	-	1	1 (Gp VII)	2	11	2	2	15

The complete axe appears to be made of an exceptionally large piece of gravel flint; it is irregularly shaped and finished. The axes of Groups VI and VII rock as well as the other flint axes seem to have been imported as finished objects and re-used on site (cf Sieveking et al 1972, 151-176; Craddock et al 1983).

3.11 Knives

Blunted-back knives Two sub-types are present:
a) knives with bifacial retouch thinning the presumed cutting edge, the opposite edge being blunted by retouch or cortex (cf Hurst Fen, Clark et al 1960, F51) - six examples;
b) knives with bifacial retouch on the thicker edge (cf Hurst Fen, Clark et al 1960, F54 and Windmill Hill, Smith 1965, 99 F64 and F70). The retouch may extend round the distal end of the knife forming a straight end (5 examples). Step-fracturing similar to that observed on scrapers was noted on 5 knives, and one has been worn smooth.

Plano-convex type knives These knives have invasive retouch on both sides of the blank which tends to encroach on to the surface and in two instances extends all over the surface. (11 from the enclosure ditches, 4 from the interior).

Other knives These are a heterogeneous collection of artefacts, usually blade-like flakes with one long-edge retouched. Some have regular retouch on both edges, (one edge more heavily than the other), whereas the others have light irregular retouch around most of the edge. Four have lengths of retouch rubbed or worn smooth. There is also a group of five flakes from the enclosure ditches which have wide, squared ends and have been invasively retouched. Morphologically they are not dissimilar from a group of so-called 'sickle flints' from Windmill Hill though they do not have any gloss or lustre (Smith 1965, 97 and fig. 42; see also 6.1).

3.12 Single-piece sickle

This artefact is fragmentary and heavily calcined, but appears to be the tip of a bifacially flaked single-piece sickle (Clark 1932).

3.13 Fabricators

All three fabricators have triangular cross-sections; the two from the enclosure ditches have unretouched ventral surfaces, whereas the one from the interior has flat, covering retouch on this face. Areas of heavy wear, characteristic of this tool-type, were observed on the ends of the two from the ditches. In addition to the conventional form of fabricator there are, from the interior of the enclosure, seven narrow flakes with pointed ends and steep triangular cross-sections. All had bruising on the edges, and heavy wear was observed on three. All are made of gravel flint.

3.14 Points (awls and piercers)

Two types have been distinguished:
a) those with minimal retouch on a suitably pointed blank. The retouch strengthens the point rather than modifies the blank;
b) longer and thicker points with heavier retouch. These points are more robust and the point has been deliberately shaped.
Ten points of both types have been retouched from alternate faces as rotating awls (Clark et al 1960, 217). A patch of high gloss was observed on the end of one of these.

3.15 Notched flakes

This is a miscellaneous series of irregular flakes which have in common an abruptly retouched concave area, though it is not always certain whether this is deliberate or accidental. They vary from small semi-circular hollows to shallower concave areas. In size they range from 4mm to 25mm in diameter and from 2mm to 7mm in depth, but the majority are less than 7mm in diameter and about 3mm deep. The notch is usually on the side of the flake towards the distal end, and in two instances it is on the distal end. Double notches are also present, and 11 notches are found in combination with other tool attributes (6 scrapers; 3 knives; 1 piercer; 1 serrated flake) or with utilization on the long edge of the blank.

3.16 Saws

Apart from the flakes and blades with serrations (3.7), there are two artefacts from the interior of the enclosure with larger, more widely spaced teeth, each formed by the removal of two or three spalls.

3.17 Microlithic element

One microlith of scalene form was found in a feature in the interior of the enclosure. Seven small bladelets were also found in the interior of the enclosure, some of which have been retouched, one as a scraper.

3.18 Graver

One double-angle graver was found in the inner enclosure ditch. It is on a Levallois-type blank (identified by A D Lacaille).

4. METRICAL DATA

The complete unretouched flakes as well as the utilized and serrated flakes and the scrapers were measured for length and breadth, and breadth to length ratios were also determined. The method used followed that of Bohmers and Wouters (1956) as used for example at Windmill Hill (Smith 1965, 89), though recent work has revised certain aspects of this (eg Saville 1981b; Ford 1982). The results are summarised in Tables 5-6.

The unretouched flakes have a uni-modal, but slightly skewed, length distribution suggesting that they form a homogeneous population. There is virtually no size difference between the cortical and non-cortical flakes. Although core-rejuvenation flakes were not measured as a separate category it was noted that they tended to be larger and thicker than the other retouched flakes. The unretouched flakes are smaller than the utilized and retouched pieces including the scrapers. Knives (measured only for length) are, as a group, longer than the majority of other types. Ratios of breadth to length show that narrower flakes were selected for utilization, serration and some other edge-retouched artefacts. Broader, thicker flakes were preferred for scrapers.

5. WITHIN-SITE DISCUSSION

Full discussion and interpretation of the lithic industry must await the publication of other aspects of the site in the final report. Nevertheless a few of the more interesting points can be summarised here.

5.1 Date

The typological range of the lithic assemblage indicates that it is largely homogeneous and of earlier neolithic date. In the enclosure ditches it is directly associated with ceramic evidence which confirms

Table 5.

	DITCHES					INTERIOR SURFACE				
	Cortical flakes	Non-cortical flakes	Utilized flakes	Serrated flakes	Flake scrapers	Cortical flakes	Non-cortical flakes	Utilized flakes	Serrated flakes	Flake scrapers
	1270	911	784	155	108	263	102	279	18	143
LENGTH										
10-20mm	113	84	28	6	-	69	51	40	-	-
20-30	555	462	189	25	3	104	36	128	9	9
30-40	416	286	291	52	34	71	12	88	3	67
40-50	146	63	182	51	40	13	3	14	5	48
50-60	32	10	58	19	19	5	-	8	-	17
60-70	6	3	26	2	11	-	-	1	1	1
70-80	1	3	10	-	1	1	-	-	-	-
80-90	-	-	-	-	-	-	-	-	-	-
90-100	1	-	-	-	-	-	-	-	-	1
BREADTH										
0-10mm	50	93	18	2	-	5	6	7	-	-
10-20	653	550	375	80	2	121	64	126	11	9
20-30	456	220	275	61	20	106	30	105	5	35
30-40	95	41	89	9	45	28	2	37	2	51
40-50	14	5	22	3	35	3	-	4	-	38
50-60	2	1	4	-	4	-	-	-	-	9
60-70	-	1	-	-	2	-	-	-	-	1
70-80	-	-	-	-	-	-	-	-	-	-
80-90	-	-	1	-	-	-	-	-	-	-

Table 6.

	DITCHES					INTERIOR SURFACE				
	Cortical flakes	Non-cortical flakes	Utilized flakes	Serrated flakes	Flake scrapers	Cortical flakes	Non-cortical flakes	Utilized flakes	Serrated flakes	Flake scrapers
	1270	911	784	155	108	263	102	279	18	143
B:L RATIO										
0:5–1:5	–	3	1	–	–	–	–	–	–	–
1:5–2:5	94	104	99	31	–	10	1	5	3	1
2:5–3:5	308	223	289	63	13	27	11	37	5	16
3:5–4:5	521	371	268	44	31	94	35	124	8	39
4:5–5:5	274	188	96	16	44	106	40	96	1	46
5:5– >	73	22	31	1	20	26	15	17	1	41
THICKNESS										
0– 3mm	–	–	12	6	–	–	–	36*	–	–
3– 5	–	–	281	60	–	–	–	96	13	3
5– 7	–	–	227	53	7	–	–	102	3	17
7– 9	–	–	138	25	17	–	–	63	1	24
9–11	–	–	84	8	27	–	–	32	1	20
11–13	–	–	22	2	10	–	–	10	–	22
13–15	–	–	10	–	17	–	–	4	–	21
15–17	–	–	7	1	16	–	–	2	–	12
17–19	–	–	3	–	5	–	–	–	–	17
19–21	–	–	–	–	5	–	–	–	–	4
21–23	–	–	–	–	1	–	–	–	–	1
23–25	–	–	–	–	2	–	–	–	–	–
25–27	–	–	–	–	1	–	–	–	–	–

* Including 66 broken flakes.

this cultural attribution. Some Ebbsfleet pottery (less than 2% by vessels) came from a very limited portion of the ditches. This was assumed to be contemporary with the earlier neolithic pottery (Smith 1965, 14). It must now be seen as intrusive (Smith 1971, 96), although the earlier neolithic industry need not necessarily be affected. No other later neolithic pottery was found. Despite attempts, a valid radio-carbon determination has not yet been obtained from the enclosure.

In the interior of the enclosure the dating is less secure, although even there virtually all of the prehistoric pottery is earlier neolithic in date, with other prehistoric pottery very restricted in distribution and quantity. There are also a number of widely distributed features which, although truncated, are similar in content to the enclosure ditches, and confirm earlier neolithic activity in the interior. The bulk of the lithic assemblage is therefore likely to be contemporary with that from the enclosure ditches, though there may be a slight admixture of later elements, of which the triangular arrowhead and the saws seem to be part. (Because the date of the flint from the interior of the enclosure is not absolutely certain, and because there is considerable difference in volume of archaeological deposit, the flint from the interior has not been used for quantitative comparative purposes). The microlith and other related pieces (3.17) suggest that there is also a residue of earlier material. The presence of 'unexpected' forms in the enclosure ditches, for example the burin, the transverse arrowheads and the 'plano-convex' type knives are discussed in 6.1.

5.2 Technology

The industry is largely one of ad hoc flakes which have been struck from simple, partially flaked cores, though there is evidence of specialised core-preparation on a small scale (cf Green 1974, 84). This includes two discoidal cores and a flake struck from a discoidal core used as a blank for a chisel-ended arrowhead, a few flakes with faceted striking platforms, keeled core-rejuvenation flakes and cores with keeled striking platforms. Blade production is minimal as shown both in the core typology and in the breadth to length ratios of the flakes. The Levallois-type flake is discussed elsewhere (see 6.1). The metrical data suggests that particular types of blanks were selected for retouch (see 4). The proportion of cores to flakes is high (1:6, or 1:8 if retouched pieces are included) which is consistent with the apparent profligate use of gravel flint suggested by the cores (3.3). However, although difficult to identify conclusively, blanks of gravel flint seem to have been used only rarely for secondary retouch and where they can be identified often have only minimal retouch. Whether any of the numerous flakes of gravel, or other flint, were used without modification for ad hoc tools, must, in the absence of microwear analysis, remain conjectural (cf Avery 1982, 36). Core typology seems to some extent to have been determined by the raw materials (see also 6.3). The numerous simple partially flaked cores tend to be of gravel flint, whereas the more extensively worked types are less common and of non-gravel flint (2.2).

The only flaking tools recognised are hard hammers (ie hammerstones) although some of the evidence on the flakes suggests that soft hammers were used (Newcomer 1971, 88-90) and they must have been used for some of the finer retouch. It is not known whether antler, wood or bone were employed, but it can be noted here that although bone survived well, no hammers or other flaking tools were recognised amongst the worked bone.

The interpretation of the presence of both local and imported lithic objects both as raw materials and as finished objects will be discussed further in 6.3. More light may be shed on this matter when further details of the ceramic and other evidence are available.

5.3 Spatial distributions

This aspect of the industry has not been described in this paper, although full documentation and discussion is in preparation for the final report. In brief, the preliminary results show that lithic artefacts occur in all excavated areas, but also show definite areas of concentration (see Table 7). For example the inner enclosure ditch had an average of about 19 flints per linear foot in it, whereas the outer and larger, ditch had only about 6 flints per linear foot. Practically no flints were found in areas excavated between the two enclosure ditches, but in the interior of the enclosure nine areas with relatively high concentrations of flint were noted, some of which were associated with neolithic features. Concentrations of flint also occur in the enclosure ditches, and sometimes coincide with concentrations of pottery and bone suggesting dumping of refuse or possible ritual deposits (Mercer 1975; Bamford 1980, 5). Some of these occur at the butt-ends of ditch segments and may indicate thoroughfares. Other concentrations are made up almost entirely of flint débitage, sometimes including hammerstones, and may be sweepings from knapping floors. There is no indication that flint was knapped in the ditches as suggested at Offham (James 1977, 214: it is much more likely that the unwanted cores were dumped in the ditch, rather than special cores being taken away. It may be noted that no hammerstones were recovered at Offham).

On closer inspection the distributions of the retouched material produce some potentially interesting features. In the inner enclosure ditch retouched pieces form a lower proportion of the industry than they do in the outer ditch. A chi-squared test indicated that the difference was significant. The reason for this is unclear but could be because some types do not occur in both ditches. Some tool-types have their distributions limited to, or focused on, the north-western sector of the enclosure and this is an area where there is also much flint in the enclosure ditches and in the interior. The increase in density of finds in one area was also noted at Briar Hill (Bamford 1980, 5) and variation in intra-site distributions was present at Carn Brea (Saville 1981b, 103-107).

With only a palimpsest of occupation remaining in the interior of the enclosure it is difficult to interpret these distribution patterns, but it is to be hoped that future research on causewayed enclosures and other related sites will elucidate the situation. Very limited, broadly contemporary, recutting of the enclosure ditches at Staines was observed during excavation (cf Smith 1971, 98), and this may account for some, but by no means the majority of the differential finds distributions.

6. INTER-SITE COMPARISONS

The general typological composition of earlier neolithic industries is well established (eg Piggott 1954, Clark et al 1960, Smith 1965, Whittle 1977), though its apparent homogeneity has recently been questioned (Bradley 1982). Identification of certain technological trends (Pitts 1978; Pitts and Jacobi 1978) has also raised questions of location and function of sites in terms of raw material sources (Care 1982).

The data with which the Staines industries are compared have been culled from published material and are hence subject to the limitations inherent in such sources, but there are clear implications for the future of lithic analysis.

Table 7. Spatial distribution of flint

	Outer ditch	Inner ditch	Interior
All struck flint	G/X	G/X	G/X
Cores	G/X	G/X	G
Hammerstones	X	O (but G)	G
Scrapers	G/X	G/X	G/X
Laurel-leaves	O (but G)	G/X	G
Arrowheads: leaf-shaped	X	X	G
: transverse	X	X	O
Axes	-/X	X (NW)	X (NW)
Knives: blunted-back	-	X (NW)	X (NW)
: plano-convex	X	X (NW)	O (NW)
Awls and piercers	O	G	G
Notched flakes	G	G	G
Serrated flakes	G/X	G/X	not recorded
Burnt flint	G	G	G
Stone	O	X	G

Key
- = Absent or virtually absent
O = Very few and sparse locations
X = Distribution in one or two areas (sometimes strong)
G = Generally even distribution (ie generally sparse or generally dense)
G/X = General scatter with concentrations in some areas
(N/W) = North-west half of the enclosure

6.1 Typology

Tables 8-10 show the range of tools as given in the published excavation reports of selected earlier neolithic industries. These industries differ greatly in size and, as one would expect, in range of types present. The appearance of certain types in the Staines and a few other industries which are not present in the 'standard' lists needs further comment.

Microliths (and associated debris) in fact occur at a number of earlier neolithic sites but are usually dismissed as residual finds. This is probably the case at Staines, but is discussed more fully in the excavation report.

Burins do occur in earlier neolithic tool-kits, most notably at Hurst Fen where one is made on a flake from a polished axe and is unequivocally earlier neolithic in date (Clark et al 1960, 224; see also Wainwright 1972, 68). However, the one from Staines is on a blank clearly of upper palaeolithic technology and the late A D Lacaille considered it to be residual.

Table 8.

SITE and reference	Total flint	Tools: total (%)	Ratio cores: flakes (all)	Raw material: On site	Raw material: Less than 20 miles	Raw material: Over 20 miles	Raw material: Non-flint	Hammerstones
STAINES (ditches)	7764	535 + bevelled (6.8%)	1:8	Yes	Yes	Yes	VI	16 + 4 abraded edge
ABINGDON Avery 1982	5142	536 (10.4%)	1:34	Yes	Yes	-?	VI tuff	11 quartzite sandstone
HURST FEN (sample)	16398	788 (4.8%)	1:28	Yes	-	Yes?	VI	?
" " (all seasons)	-	-	-	-	-	-	-	66
Clark et al 1960								
BROOME HEATH (primary)	9445	373 (3.9%)	1:66	Yes	-	-	-	1
Wainwright 1972, Table 3, p.48, 68								
EATON HEATH (shafts)	445	22 (4.9%)	1:87	-	?	-	-	1
Wainwright 1972, 13								
FENGATE (FNG 1) Pryor 1978	275	13 (4.7%)	-	-	-	-	-	-
ORSETT (lower levels)	329	16 (4.9%)	1:13	Yes	Yes	Yes (axe)	-	-
Bonsall in Hedges and Buckley 1978								
THE TRUNDLE Curwen 1929 and 1931	2197	59 (2.7%)	1:25	?	?	?	?	-
WHITEHAWK Curwen 1934 and 1936	?	?	?	?	?	?	?	15?
Ross-Williamson 1930								
OFFHAM (primary) James 1977	4586	6 (0.1%)	1:87	Yes	-	-	-	7 (cores utilized)
BURY HILL (lower silts)	3725	35 (0.9%)	1:99	Yes	-	-	-	8
Drewett in Bedwin 1981, 77								
ALFRISTON (primary) Drewett 1975	936	1 (0.1%)	1:95	Yes	-	-	-	-
BISHOPSTONE (all neolithic pits)	1618	117 (7.2%)	1:30	Yes	-	Yes (axe)	Yes	25
" (pit 357)	(770)	(63)(8.2%)	(1:253)	Yes	-	-	Yes	(9)
Bell 1977, Table 1								
HEMP KNOLL (neolithic pits)	2664	272 (10.2%)	1:23	Yes	Yes	-	-	6 + 2 abraded edge
Robertson-Mackay 1980, Table 8								
WINDMILL HILL (primary)	?c. 9000	786 (c.8%)	?1:5	-	Yes	Yes (axes)	XI	19 flint 21 sarsen
Smith 1965								
DURRINGTON WALLS (middle neolithic)	806	11 (1.36%)	1:72	Yes	?	-	-	-
Wainwright and Longworth 1971, 156								
KNAP HILL Connah 1965, 14	2759	68 (2.5%)	1:38	-	?	-	-	1
PAMPHILL (pit)	94	19 (20%)	1:29	Yes	-	Yes	-	-
Field, Matthews and Smith 1964								
HIGH PEAK (total)	725	67 (9.2%)	1:24	Yes	-	Yes (Beer)	IV+jadeite chert-Portland	-
" " (cache)	(30)	(11)	-	-	-	-	-	-
Smith in Pollard 1966, 48f								
CARN BREA	26382	1441 (5.5%)	1:176	-	Yes	Yes (?Beer)	Yes chert, I, IV, XVII, XVI + sandstone + greenstone tuffs	?1
Saville 1981b								
MAIDEN CASTLE Wheeler 1943	?	?	?	?	-	-	Yes	?
HEMBURY Liddell 1931-5	?	?	?	?	?	Yes (Beer)	?	?

Totals are from undisturbed contexts where possible.

Bevelled-edge artefacts are totalled with tools.

Table 9.

SITE	Cores	Unretouched flakes	Edge-damaged flakes	Bevelled edges	Scrapers	Serrated flakes	Leaf-shaped arrowheads	Transverse arrowheads	Polished axes	Flaked axes	Laurel-leaves
STAINES (ditches)	757	1750	947		153 (28%)	195 (36%)	7 (1.3%)	3	7	-	29 (5%)
ABINGDON	120	4160	326	44	166 (31%)	272 (58%)	17 (3.1%)	-	11	-	5
HURST FEN (sample)	570	14500	540	-	342 (43.4%)	356 (45%)	← see Table 10 ---				
" " (all seasons)	-	-	-	-	736	?	58/70	1	6+	-	42/44
BROOME HEATH (primary)	140	8931	-	-	254 (68%)	-	7 (1.9%)	2	7 + 21 chips (7.5%)	1?	4 (1.1%)
EATON HEATH (shafts)	5 + 27 frags	417	-	-	14 (63%)	-	-	1	-	-	-
FENGATE (FNG 1)	irreg waste 39	110	114		6 (46%)	2 (15.4%)	-	-	-	-	1 (7.7%)
ORSETT (lower levels)	24	289	-	-	4 (25%)	2 (12.5%)	-	-	1	-	3 (rough-outs) (18.75%)
THE TRUNDLE	86	2052	-	-	12	28	2	← see Table 10 ---			
WHITEHAWK	?	?	266	2	49 + 6 hollow	277	5	1	5	2	-
OFFHAM (primary)	52	4523	5		-	2	4	-	-	-	-
BURY HILL (lower silts)	36 (+ 123 flaked nodules)	3523	-	-	20	6	1	-	1	1	2

ALFRISTON (primary)	10	889 + 26 'waste'	10		-	-	-	-	-	-	-
BISHOPSTONE (all neolithic pits)	47	1243 + 141 (chips)	45		22 (18.8%)	50 (43%)	2	-	1	3	-
" (pit 357)	(3)	(661)	(34)	-	(11)	(43)	(2)	-	-	(1)	-
HEMP KNOLL (neolithic pits)	109	1919	356	73 (incl. misc. ret.)	42 (15.4%)	147 (54%)	-	1	1	-	-
WINDMILL HILL (primary)	446 + 77 unused nodules	sample 2430 (excl. spalls)	?	187 (23.8%)	218 (27.7%)	314 (40%)	19 (2.4%)	-	7+ (in 32 frags)	-	6 (0.76%)
DURRINGTON WALLS (middle neolithic)	8	787 irreg waste	-	3	4 (36.4%)	-	1 (9.1%)	-	1	-	-
KNAP HILL	69	2542	79		12 (17.4%)	5	-	-	-	-	-
PAMPHILL (pit)	3 + 27 frags	46	21	4	-	9 (47.3%)	1 (5.3%)	-	1 (in 7 frags)	-	-
HIGH PEAK (total)	28 + 1	601 + 22	6 (lustre)	9	27 (40%)	-	3 (4.4%)	-	5 (7.5%)	-	1
" " (cache)	-	(19)	-	(2)	(7+)	-	-	-	-	-	-
CARN BREA	86 + 41 frags	20311	633	6	131 (9%)	3	751 (52%)	-	6 (in 42 frags) + 38/45 stone	-	-
MAIDEN CASTLE	?	?	X	?	X	X	X	?	X	-	?-
HEMBURY	?	?	X	X	X	X	X	-	X	-	-

X indicates presence, but numbers unknown.

Table 10.

SITE	Blunted-back knives	Edge-retouched knives	Plano-convex type knives	Single-piece sickles	Fabricators	Awls and piercers	Notched flakes	Burins	Microliths etc.	Miscellaneous retouch	Choppers
STAINES (ditches)	4	27	11	-	3	32	36	1	-	19 + 8 compound tools	-
ABINGDON	10	2	-	1	2	5	-	-	1	-	-
HURST FEN (sample)				90 (11.4%)							
" " (all seasons)	10	1 (polished edge)	-	1	8/10	18	-	11	1 micro-burin	-	-
BROOME HEATH (primary)	-	68 (18.2%)	-	-	-	4	1	1	1	-	1
EATON HEATH (shafts)	-	6 (27.3%)	-	-	-	-	-	-	-	-	-
FENGATE (FNG 1)	-	1	-	1	-	-	-	-	-	2	-
ORSETT (lower levels)	1	-	-	-	-	-	1	-	-	4	-
THE TRUNDLE				17							
WHITEHAWK	-	-	-	1(?)	-	1(?)	-	-	-	-	-
OFFHAM (primary)	-	-	-	-	-	-	-	-	-	-	-
BURY HILL (lower silts)	-	-	-	-	-	2	-	-	-	2	-
ALFRISTON (primary)	-	-	-	-	-	-	1	-	-	-	-
BISHOPSTONE (all neolithic pits)	-	1	-	1? (F95)	-	1	12	1	-	23	1
" (pit 357)	-	-	-	-	-	-	-	-	-	-	-
HEMP KNOLL (neolithic pits)	-	-	1	-	-	5	1	-	-	1 saw	-
WINDMILL HILL (primary)	7	11	-	-	2	15	-	-	-	-	-
DURRINGTON WALLS (middle neolithic)	-	1	-	-	-	-	-	-	-	-	1
KNAP HILL	-	-	-	-	-	-	-	-	-	51	-
PAMPHILL (pit)	-	-	-	-	-	1	-	1 (?)	-	1	-
HIGH PEAK (total)	7 (10.4%)	2 (3%)	-	-	-	2	-	1	-	10	-
(cache)	1	-	-	-	-	-	-	-	-	-	-
CARN BREA	-	17	1	-	-	87 (6%)	-	-	9 3 micro-burins 5 truncated	420	-
MAIDEN CASTLE	X	?	-	-	-	-	-	-	-	-	-
HEMBURY	?	?	-	-	-	X	-	-	X	-	-

X indicates presence, but numbers unknown.

Transverse arrowheads have their floruit in the second millennium, but, though rare, do occur with sufficient regularity in earlier industries for them to be regarded as part of the earlier neolithic tool-kit (Green 1980, 111).

'Plano-convex' type knives are usually seen as a product of early bronze age technology (Clark 1933, 271; Smith 1965, 107) but similar flaking on knives can be documented in other earlier neolithic tool-kits including Hemp Knoll (Robertson-Mackay 1980, 135) and Carn Brea (Saville 1981b, 140; see also Pierpoint 1980, 125-6). Of course the technique and style of flaking is well known from leaf-shaped arrow-heads.

Laurel-leaves, first clearly defined as an earlier neolithic type at Hurst Fen (Clark et al 1960, 226), though recognised sporadically before that, are found over a wide area, but are by no means ubiquitous (cf Bradley 1982) and do not usually occur in such great numbers as at Hurst Fen. However, there is possible confusion in identification between them and flat discoidal cores and it may be that this has, in some instances, artificially inflated the totals in one or other category.

Blunted-back knives seem to be an earlier neolithic type, and are found over a wide area, though are by no means ubiquitous.

Single-piece sickles originally thought to be predominantly later neolithic, (Clark 1932), are now well established in industries with earlier affinities (Clark et al 1960, 226; Avery 1982, 38-9).

Sickle-flints have in fact been totalled with knives because their definition is vague, and seems to depend on the presence of surface-lustre which is of uncertain origin (Saville 1981b, 140).

Abraded-edge tools are recorded at only one other site namely Hemp Knoll (Robertson-Mackay 1980, 130).

Hammerstones of various raw materials are recorded in several, but not all industries, although quantities vary tremendously. For example industries like Bishopstone and Hurst Fen have a large number (Bell 1977, Table 1; Clark et al 1960, 225), whilst at other sites including Offham (James 1977) and Carn Brea (Saville 1981b, 144) they are virtually absent.

6.2 Composition

From Tables 8-10 we have seen that not all types are present in all industries and it is also clear that proportions of tool-types present vary, especially those of scrapers, serrated flakes, arrowheads and to a lesser extent axes, laurel-leaves and blunted-back knives. Explanations tend to be functional. A pastoral economy will require a different tool-kit from an agricultural one (cf Bradley 1978, 56-60) and a domestic industry is likely to have a very different range and proportion of tools from an industrial one. Both are likely to differ from industries on sites which seem to be centralised gathering places (eg some causewayed enclosures). We must also bear in mind that some types have restricted on-site distributions (5.3 and see Saville 1981b) and the fact that they appear to be absent, may indicate only that a particular area of a site has not been excavated (ie the absence is more apparent than real). Bradley has suggested that the increased proportion of axes and arrowheads to scrapers in enclosed settlements may indicate some sort of special status for those sites, and has shown what appears to be a relationship between the incidence of decorated vessels and the proportions of axes, laurel-leaves and arrowheads (Bradley 1982, 32), but the numbers involved are in some instances low or from mixed contexts.

On a more general level it can also be demonstrated that proportions of tools to cores and flakes vary from industry to industry. From the evidence to hand the following three patterns can be isolated.
a) Those with a high proportion of tools (about 7% or over) - possibly domestic industries (Bamford 1980, 5, 8). They include Staines, Abingdon, Bishopstone, High Peak, Hemp Knoll, Pamphill, Whitehawk and ? Carn Brea.
b) Those with tools forming about 4 or 5% of the industry - Wainwright's expected proportion (1972, 66). They include Hurst Fen, Broome Heath, Fengate, Orsett and Eaton Heath.
c) Those with a low proportion of tools (less than 2%) - described as 'industrial' or 'core-preparation' sites (James 1977, 217). They include The Trundle, Offham, Alfriston, Bury Hill, Durrington Walls and Knap Hill.

A wide range of tool forms is often present in groups a and b; some of these industries, for example Staines, Hurst Fen and Carn Brea also have a very large number of flints present. The three groups cannot be immediately explained by geographical location, though it is true that industries of type c occur in areas where chalk flint is immediately available; and those of type b are all in East Anglia. Monument type does not seem to be significant either; causewayed enclosures, for instance, have industries of all three types. Pit groups however tend to have a very high proportion of tools, and so do industries where there is little or no local flint.

6.3. Technology and raw materials

It is self-evident that the type of raw material used will partly determine the technology; conversely certain types of raw materials must have been sought after, precisely because they were most suited to a particular technology. Other factors, including the concept of the end-product, may also have influenced the choice of technology employed. In the archaeological record this can be partly assessed from the composition of the tool-kits as we have implied in 6.2, and also from the relationships of the raw materials used to various attributes recorded on the unretouched (unmodified) flakes and on cores and tools. The use of several different types of flint and other stone, some or all of which has been imported on to the site, is recognised in a number of industries including Staines, even if its precise origin cannot be identified (Table 8). The exploitation of good quality quarried flint is only known in the West Country at this time and is documented by the use of Beer flint at Haldon and Hembury and possibly Carn Brea. In other areas chalk flint was exploited from surface or sub-surface deposits (cf Barrett et al 1981) and the use of mined flint restricted to the manufacture of axes which were imported to sites as finished tools. Unfortunately it is only relatively recently that the use of different types of raw materials is being quantified in lithic reports, and examination of the technology of each raw material is rarely detailed (for a noteworthy exception see Saville 1981b, 107-9). But on a general level, Care (1982, 277) has suggested that narrow flakes, which predominate in the industries of Devon and Cornwall, result from a need to use raw material efficiently, particularly in the West Country where resources are poor (but see below on core typology). Table 11 shows the incidence of flake shapes(defined by a simple breadth-

Table 11. Breadth to length ratios of unretouched flakes (as % of each total)

	0.5-1.5	1.5-2.5	2.5-3.5	3.5-4.5	4.5-5.5	5.5+
Staines	-	9	24	41	21	4
Whitehawk	16	31	25	14	7	7
Hembury	10	30	29	13	8.5	9.5
Alfriston	18	55	22	5	-	-
Carn Brea	-	6.1	28.3	23.9	20.1	21.6
Knap Hill	-	5	19	28	20	29
Offham	X	7	23	26	16	28
Broome Heath (fossil soil)	-	6	39	35	15	5
Broome Heath (pits)	-	9	46	30	11	4
High Peak	-	16	46	24	7	6
Durrington Walls (middle neolithic)	-	5	30	30	23	12
Windmill Hill	0.4	11	29	25	21	13
Bury Hill	4	17	28	25	17	9
Abingdon*	3	25	29	10	33	

*ratio classes differently grouped.

to-length ratio) in several industries. About half of these have a high proportion of relatively wide flakes, including Staines, where it could be explained by the use of a virtually inexhaustible supply of gravel flint (Abingdon, Carn Brea, Offham and Knap Hill have an exceptionally high proportion of flakes with a ratio of 4:5 or over). Only three industries have predominantly narrow flakes. One of these is Alfriston which is unexpected since chalk flint was readily available, also the core typology seems more suited to the production of wider flakes (although this is based on a small sample of 10 cores).

The use of breadth-to-length ratios or indices to determine preferred flake shape in an industry, however, does not allow either for the possibility of different knapping methods or for the presence of different types of flake, both of which may alter the picture given in Table 11. Gingell and Harding (1981) have demonstrated that different manufacturing methods can alter the shape and size of a flake. Burton (1980), by describing the different manufacturing stages (using a number of variables) has shown that raw material type and availability can affect technology, and clearly more work is needed in this area. For example, the description of flake shape and type has not yet been satisfactorily resolved, but clearly cannot rest on a simple length-to-breadth (or v.v) ratio. Indices of length-to-breadth, compared to those of length to thickness, have proved satisfactory in distinguishing the different stages in one blade-industry (Manley and Healey 1982) but this has not yet been applied elsewhere.

One would expect the core typology (following Clark et al 1960, 216) to match the type of flake produced, but it is difficult to match these two types because cores tend to undergo a change of form before being discarded (eg about half of the A2 cores at Carn Brea had evidence of earlier use: Saville 1981b, 122), and the classificatory scheme is based on surviving platforms. Table 12 suggests that there is a certain

Table 12. Core typology (% cores)

	A1	A2	B1	B2	B3	C	D	E	Unclassified
Knap Hill	1.4	43.5	1.4	26.1	4.3	3.0	10.1	10.1	-
Windmill Hill	3.7	42.1	0.4	17.7	12.9	8.6	8.6	5.5	-
High Peak	14.3	21.4	-	17.8	14.3	7.1	21.4	-	3.6
Hemp Knoll	1.2	43.4	-	21.7	19.3	9.6	2.4	2.4	-
Hurst Fen	2.2	38.7	0.2	19.0	1.9	4.9	14.7	18.4	-
Broome Heath	11.4	50.7	2.9	2.9	7.9	4.3	13.6	2.1	4.2
Offham	5.8	15.4	7.7	3.8	13.5	30.8	11.5	11.5	-
Bury Hill	2.8	52.8	-	33.3	2.8	8.3	-	-	-
Staines (ditches)	1.3	61.4	0.5	14.1	5.3	5.3	5.3	-	6.2
Alfriston	20.0	10.0	10.0	10.0	50.0	-	-	-	-
Abingdon	10.8	67.5	3.6	2.4	8.4	2.4	-	-	4.8
Carn Brea	4.7	43.1	-	31.4	1.1	17.5	1.1	1.1	-

amount of uniformity amongst the cores in earlier neolithic industries (see also Whittle 1977, 69). All sites except High Peak, Offham and Alfriston have a majority of type A2 cores. Staines and Abingdon have a particularly high proportion possibly because of the type of raw material available (see above). Hemp Knoll and High Peak have almost equal proportions of A2 and B2/3 or D type cores. Industries with more extensively flaked cores tend to occur in areas where flint is scarce and include sites like High Peak and Carn Brea (cf Saville 1980, 20) but also on sites where chalk flint is immediately available, such as Bury Hill, Offham and Alfriston (see also above). The dimensions and/or weights of cores are not consistently given, but one would expect them to reflect the availability and type of raw material.

Core-to-flake ratios (Table 8) are interesting, though not completely reliable because of the multi-use of some cores and because of such factors as differential recovery and intra-site distribution. However, even allowing for such distortions the same sort of patterns seem to emerge. The industries with a low core-to-flake ratio tend to be in areas where flint is scarce (eg Carn Brea), and those where flint is plentiful and cores are elaborately flaked, some possibly being removed for use elsewhere (James 1977, 217). The conjoining of struck pieces and the re-fitting of flakes to cores will ultimately enable core-reduction sequences to be better understood and assessed.

Saville has indicated that for the late neolithic-early bronze age at least, there is a definite relationship between core size and type, flake shape, and raw material supply and availability (1980, 20; 1981a). For example, in areas where flint is scarce, small multi-platform cores will predominate, whereas in industries where special conditions apply (ie where there is a good supply of good quality flint) large prepared cores have an increased importance in the industry. Both types of core tend to produce broad flakes. There are indications that similar relationships apply in the earlier neolithic although the possibility has not been researched in detail.

Absolute size of artefacts and cores within industries have not been discussed here. How far size is attributable to raw material and how much influence 'cultural' preference has, is a matter for further research especially in the light of the findings at Carn Brea (Saville 1981b, 146).

From the evidence discussed above it is clear that there is some relationship between raw material type and availability, and the technology and composition of industries. However, clarification of classificatory methods, and study of the flaking potential of various raw materials is needed before detailed conclusions can be drawn.

7. SUMMARY AND CONCLUSIONS

This necessarily brief investigation of the relationships of the Staines lithic industry has shown that, though superficially homogeneous, earlier neolithic industries do show marked variation in detail, some of which may be interpretable in the light of ceramic data, (cf Bradley 1982). Definition of these variations using the published data, however, has been hampered by differences in terminology and levels of analysis as well as by scale of excavation and numbers of artefacts recovered. Nevertheless, even though the results are frustratingly inconclusive, two points do seem to emerge.

Firstly, patterns of variations can be detected in several technocomplexes. It is suggested that instead of looking for a 'norm', each industry should be examined on its own merits and interpreted initially in the light of its own environment, rather than in the light of other incompletely understood industries. In this way it may be possible for example to identify specialized sites, and to distinguish between temporary and permanent occupation.

Secondly, there seems to be a relationship between raw material, technology and composition of industries. Care (1982) has suggested that raw material supply and distribution accounts for much of the variation within the earlier neolithic and that certain sites, especially those with imported lithic objects and raw materials have a key role to play. Some of these sites seem to coincide with Bradley's (1982 and see 6.2) special status sites, even though there are insufficient basic data to document this precisely. However, the reasons for techno-typological variations between industries must be complex, and involve a number of unquantifiable factors including cultural bias (Saville 1981b, 146), skill and idiosyncracies of individual knappers as well as functional and environmental factors. Thus it seems unwise, at this stage in our knowledge of lithic industries, to draw up such models to explain variations.

What is clear is that more uniform, refined, quantitative and analytical methods, showing the inter-relationships between size, type and availability of raw materials, technology and typology, urgently need to be evolved and rigorously applied (cf Saville 1981b, 146). In the interpretation of these data the effects of economic, environmental and socio-political factors on the processes of intra-site distributions, accumulation, and discard or exchange, must be considered. Allowances must also be made for differences in taphonomy, excavation and post-excavation analysis. Lithic industries will then have an important role to play in the interpretation of the prehistoric record.

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