A Method of Analysing the Technology of Flaking in Neolithic and Bronze Age Flint Assemblages.

Christopher Gingell
Philip Harding

In flake industries most of the evidence for the production of controlled flakes lies in the waste rather than in the processes involved in the conversion into functional tools.
Several approaches have been followed in Britain in the study of flake assemblages. S. HAZLEDINE WARREN (WARREN 1951) used measurements of angles of percussion and platform width, and contrasted results from assemblages dating from Clactonian to Mesolithic. A. BOHMERS demonstrated some techniques for recording and comparing breadth:length averages for microliths

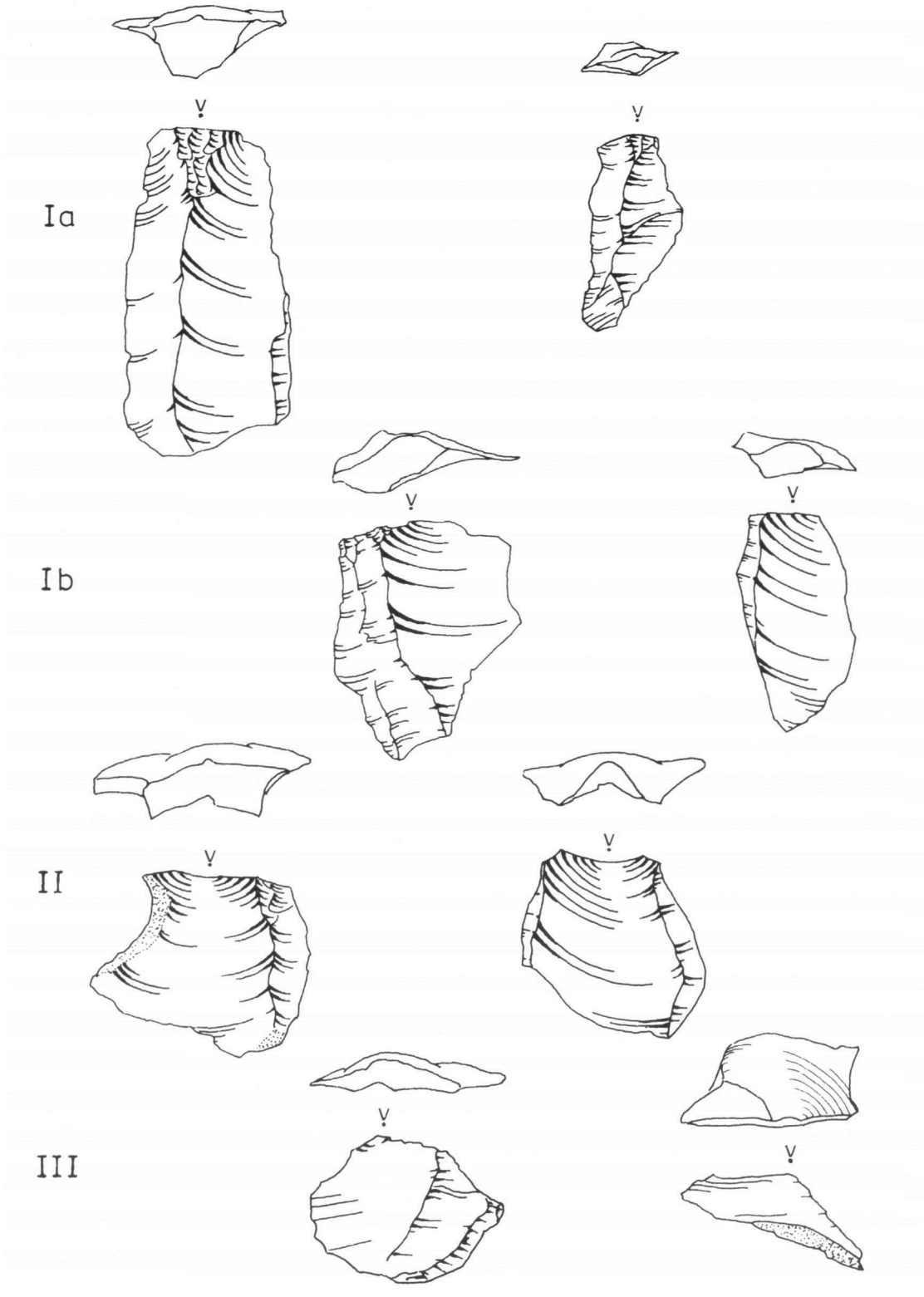

Fig. 1. Representative examples of proposed flake classification. Points of percussion indicated.

from different sites (BOHMERS and WOUTERS 1956). This approach most successfully adapted for waste flakes by ISOBEL SMITH in publishing the assemblages from Windmill Hill and West Kennett Avenue (SMITH 1965). Her work was followed by the few excavators who have published large assemblages in any detail.

More simplistic approaches to flake studies have been attempted. R. BRADLEY has divided flakes into: I) Primary (wholly cortical); II) Secondary (partially cortical); and III Tertiary (wholly non-cortical), (BRADLEY 1970). H.S. GREEN has rejected BRADLEY's classification, claiming that flakes have been over-classified (GREEN 1974). He divides material into utilized and non-utilized, but makes use of SMITH's dating of assemblages by breadth:length ratio. More despairing is BRADLEY'S classification used for example by J.C. RICHARDS. This acknowledges only a classification running roughly from good through bad to worse. 'Mesolithic: blades, blade cores and microliths; Early Neolithic: large proportion of narrow flakes; Late Neolithic / Early Bronze Age: flakes more broad and squat; Middle - Late Bronze Age: crude cores, hinge fractures, miss-hits, oblique angle of platform to bulb' (RICHARDS 1978, p.19). Visual comparison cannot replace careful technological examination of Bronze Age assemblages.

The results obtained by SMITH, using BOHMERS' method,

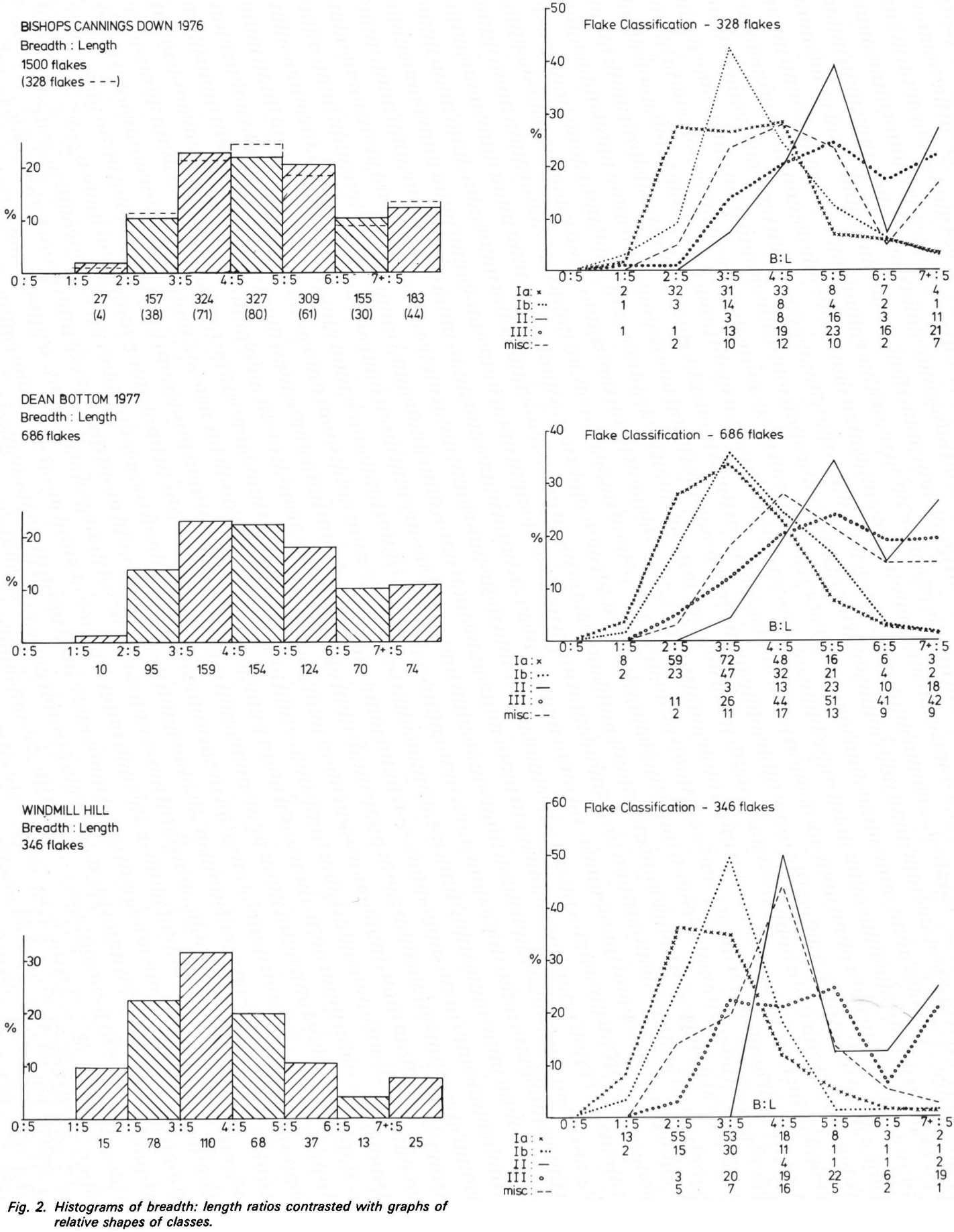

Fig. 2. Histograms of breadth: length ratios contrasted with graphs of relative shapes of classes.

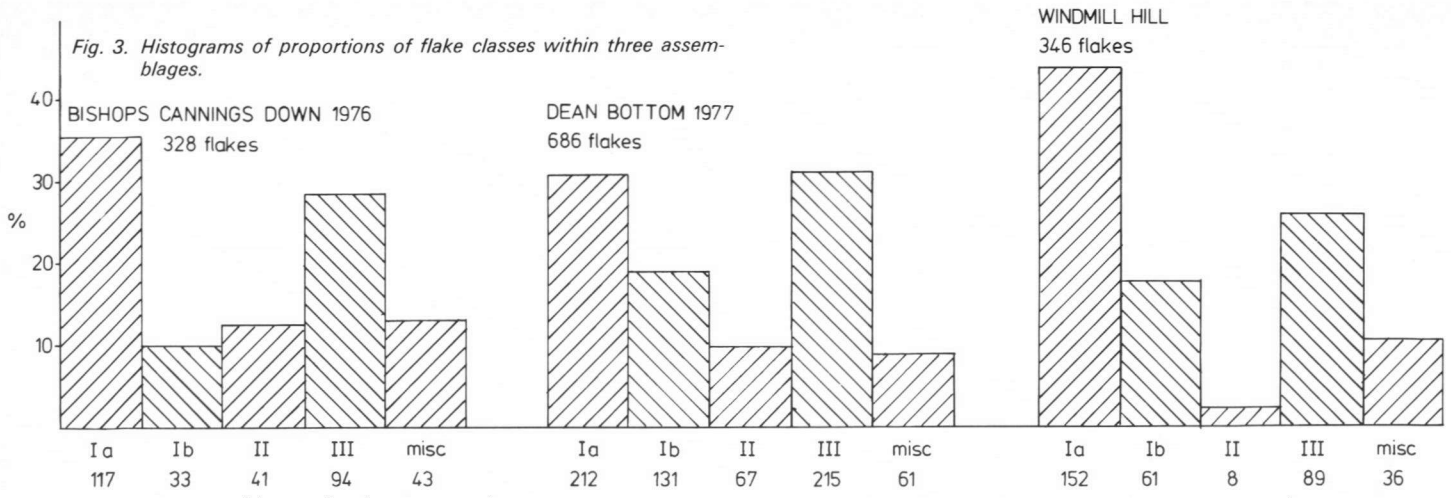

Fig. 3. Histograms of proportions of flake classes within three assemblages.

demonstrated a trend in production from quite narrow flakes in the Early Neolithic to broad, squat flakes in industries of the Late Neolithic and Bronze Age. Later excavators have confirmed SMITH's results and the phenomenon of increasing breadth of flakes has in Britain become generally regarded as a principal indicator of the date of Neolithic and Bronze Age industries. What change in knapping techniques had occurred?

An analysis was needed of the methods of production within an industry which determine the size of waste flakes. No consideration is made here of the role of platform preparation, angle of percussion or platform width; the last, preliminary investigation shows to be broader in the Bronze Age than in the Early Neolithic.

One of us (P.A.H.), making use of experience in flint-knapping, developed a classification of waste flakes from our excavations of a Middle Bronze Age settlement at Bishops Cannings Down, Wiltshire (GINGELL, forthcoming).

Illustrated by stylized examples in Fig. 1, this system groups flakes according to the relationship between the point of percussion and any dominant crests on the face of the core. This relationship may largely determine the shape of flakes produced.

Class Ia:

Flakes whose point of percussion lies directly behind the main crest. Lateral spread is minimal; a long narrow flake generally results.

Class Ib:

Flakes whose point of percussion lies to one side of the main crest, or between the main crest and a negative flake facet. Usually a straight edge forms beside the main crest, with a weakly expanding opposite side; slightly broader than Class Ia.

Both types of Class I are characterized by a single dominant crest and normally have a breadth:length ratio less than 5:5.

Class II:

Flakes whose point of percussion lies directly behind a previous point of percussion. Commonly, a double crested, dished flake results which expands laterally.

Class III:

This group comprises uncrested flakes, those with a flat dorsal surface and primary cortical flakes. The resulting flake is often short and broad, forming together with Class II the majority of flakes with breadth:length ratio more than 5:5.

Flakes with characteristics of two of the above classes are listed as *Miscellaneous*. These represent only a small proportion of the whole assemblage.

This classification was used as the basis for an examination of three assemblages from a small area in Wiltshire: from the Middle Bronze Age settlement at Bishops Cannings Down, from an Early Bronze Age storage pit of the Beaker period from another recent excavation at Dean Bottom, and for comparison from the Early Neolithic levels at Windmill Hill, from Cutting IV excavated by SMITH in 1957.

In Fig. 2, beside conventional histograms of the breadth:length ratios of the assemblages, are graphs indicating the respective shapes (in terms of breadth:length) of flakes in Classes Ia-III and miscellaneous flakes. In Fig. 3 the proportions of the classes found in each assemblage are presented. Flake length has been measured perpendicular to the platform, breadth parallel, (with OZANNE in ALEXANDER et al. 1960 p. 287n.). The greatest dimension system (BOHMERS 1956 and SMITH 1965) would not produce comparable results when used with the classification suggested here.

A number of general conclusions can be drawn from our results tabulated in Figs. 2 and 3. In their breadth:length ratios Bishops Cannings Down and Dean Bottom are very similar, both containing a large proportion of broad flakes; 41% 5:5 and over at Bishops Cannings Down, and 39% at Dean Bottom. The earlier flakes from Windmill Hill are much narrower: 21,5% are 5:5 and greater. In the graphs in Fig. 2 it can be seen that crested flakes of Classes Ia and Ib tend to lie in the narrower part of the range, whereas those of Classes II and III are broader flakes. In Fig. 3 it is clear that whereas at Bishops Cannings Down flakes of Classes II and III form 41.1% of the assemblage, and at Dean Bottom 41%, at Windmill Hill they comprise only 28%.

In the graphs in Fig. 2 it may be noted that most of the Early Neolithic assemblage from Windmill Hill is concentrated in the narrow part of the range. In all cases it is clear that flakes of Class Ia are slightly narrower than those of Ib, conforming with the description of the classes. Note that the graph results above 6:5 are out of scale, only indicating the total of flakes between 7:5 and 12:5 or more.

Whereas Class Ia and Ib represent the crested flakes, and Classes II and III the uncrested, the dished flakes of Class II form only a small proportion of each assemblage. At Windmill Hill the predominant uncrested flakes of Class III may be seen as primary core preparation flakes, rejuvenators etc. These need not be controlled flakes, but on a prepared core control was maintained in the production of secondary flakes of classes Ia and Ib. However, in the Bronze Age assemblages of Bishops Canning Down and Dean Bottom, flakes of Class III form a somewhat larger proportion of the whole and are not only primary material; they may be produced from a flattened core-face caused by loss of knapping control.

We hope that the analysis of which some of the results are summarized above has provided some technological explanation of the phenomena observed by BOHMERS and SMITH.

ACKNOWLEDGEMENTS:

We are grateful to the late Faith de M. Vatcher and her successor, M.W. Pitts, Curators of Avebury Museum, for generous assistance in providing material from Windmill Hill for examination.

REFERENCES

ALEXANDER, J., and OZANNE, P.C., and A., 1960 - 'Report on Investigation of a Round Barrow, Arreton Down, I.o.W.' Proc, Prehist. Soc. *26, 263-302.*

BOHMERS, A., and WOUTERS, A., 1956 - 'Statistics and Graphs in the Study of Flint Assemblages'. Palaeohistoria *5, 1-38.*

BRADLEY, R., 1970 - 'The Excavation of a Beaker Settlement at Belle Tout, E. Sussex' Proc. Prehist. Soc. *36, 312-79.*

GINGELL, C.J., forthcoming - 'The Marlborough Downs in the Bronze Age: the first Results of Current Research' in ed. Barrett, J. and Bradley, R. 'Later Bronze Age Settlement Archaeology in Britain'. Brit. Archaeol. Rep.

GREEN, H.S., 1974 - 'Early Bronze Age Burial, Territory and Population in Milton Keynes Bucks, and the Great Ouse Valley'. Archaeol. J. *131, 76-139.*

RICHARDS, J.C., 1978 - Archaeology of the Berkshire Downs'. Reading.

SMITH, I.F., 1965 - 'Windmill Hill and Avebury'. *Oxford.*

WARREN, HAZLEDINE S., 1951 - 'The Clacton Flint Industry: a New Interpretation'. Proc. Geol. Ass. *62, 107-35.*

Christopher Gingell and Philip Harding,
Devizes Museum, Wilts (England)