Editorial Note:

One thing not mentioned in the note is whether to take the measurement to the nearest 5 mm as Smith, I. F. (1965) or to give more exact measurements as in Alexander and Ozanne (1960).

Obviously a standard code of practise is to be preferred and it would be useful to receive comments about this, with a view to an article for a future newsletter as well as a summary for the Glossary.

ON THE MEASUREMENT OF STRUCK FLAKES AND FLAKE TOOLS

By Alan Saville, June 1980

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Attention has recently been drawn in the literature (Farley 1979; Pitts 1978) to some of the inadequacies of metrical approached to the study of struck flakes and flake tools in British post-glacial assemblages. The problems have largely arisen because of (a) failure to explain in detail the nature and methodology of the measurements used, with (b) a consequent variability in the measurements given, and (c) confusing methods of presenting the metrical data. These points will become immediately apparent to any student of lithic analysis: for example compare the flake data from Arreton Down (Alexander and Ozanne 1960), the flake and scraper data from Windmill Hill (Smith 1965), and the scraper data from Hurst Fen (Clark et al 1960). It is equally true that there are many theoretical, descriptive, and typological problems which beset these analyses, but in this note the writer will concentrate on explaining the measurement methods currently used in his own studies of post-glacial assemblages (e.g. Saville forthcoming).

The basic measurements involved are length, breadth and thickness, and these are taken in exactly the same way for all struck flakes which retain their bulb of percussion and striking platform. Only completely intact pieces are measured. The length is the maximum length along the bulbar axis at right angles to the striking platform, and is obtained by placing the flake or flake tool against graph paper ruled in mm divisions. The striking platform is aligned with the horizontal axis, usually with the dorsal surface of the flake downwards, and the measurement read at the distal tip. If the flake is thick or irregularly shaped then a set square placed against the flake will facilitate the alignment and the reading of the measurement. The breadth measurement is obtained at the same time by reading off on the graph paper the maximum horizontal distance between the lateral extremities of the flake, at right angles to the length. This is best explained by reference to fig. 1 from which it can be seen that in effect the length and breadth measurements define a rectangle around the flake. The measurements are recorded to the nearest mm, thus the flake illustrated is 59 mm long, and 29 mm broad. The thickness of the flake is measured using a slide gauge, and is taken at the point of maximum thickness between the dorsal and ventral surfaces, in a dimension which is approximately perpendicular to the ventral surface (fig. 2). The measurement is recorded to the nearest mm, or to mm subdivisions if practicable.

When measuring a sample, the values are tabulated prior to subsequent analysis. Only the length and thickness values are presented as raw data, since these suffice to describe the size of the population. (Weight can be a useful further size value for implements, but is

usually too time-consuming to calculate for large samples of unretouched flakes, though mean values are easily obtained). The values for length are usually presented grouped into cm bands, i.e. 0-9 mm, 10-19 mm, 20-29 mm, etc., and are given in both number and percentage. Whether or not any graphic method of presentation is used, it is absolutely essential that the raw data is either published or made easily availble, and the present writer prefers simple tables as in Table 1.

Table 1. Length values for sample of 1006 unretouched flakes

Length in mm	No	%
0- 9	116	11.5
10-19	444	44.1
20-29	290	28.9
30-39	126	12.5
40-49	26	2.6
50-59	4	0.4

There is as yet no consensus on the most suitable value bands for the presentation of thickness data, but it would seem sensible to always use the narrowest possible bands that the range of the population will allow to be practically presented. Thus for samples of unretouched flakes it is often possible to use mm bands, i.e. 0-0.9, 1-1.9, 2-2.9, etc., while for scrapers the bands may have to be expanded to 2, 3 or 4 mm. Because of this lack of consensus it is obviously important for the original raw data to be retained, so that it is available for re-presentation if required.

The only index of flake shape normally produced from these measurements is the breadth:length ratio, and this is probably the most controversial aspect of flake measurement. The convention so far established, largely following Smith (1965, fig. 38) is to present the data in value bands based upon ratios expressed in fifths, i.e. 1:5-2:5, 2:5-3:5, etc. To this end a series of rectangles ruled out in these ratios on graph paper can be used to effect the measurement (cf. Bohmers 1956, fig. 1), either by placing the flake against the rectangle or by comparing the length and breadth values with them. Examples are shown in fig. 3. This method obtains at best an estimate of the breadth:length ratio, and can be criticised on numerous grounds. There are also reasons for thinking that an enormous and quite unacceptable variability has resulted from the application of this method by different workers. For this reason the present writer now advocates a simple length/breadth index. The extra labour of actually dividing the length measurement of each flake by its breadth measurement is justified by the accuracy of the values obtained. Using this index, high values equal narrow flakes, low values broad flakes, (e.g. a flake with L.59 mm x B.29 mm has a L/B index of 2.03). Using the same sample as in Table 1, the length/breadth index may be presented as in Table 2.

Table 2. Length/breadth index values for sample of 1006 unretouched flakes

L/B index	No	%	
0 -0.5	6	0.6	
0.6-1.0	285	28.3	broad
1.1-1.5	423	42.0	
1.6-2.0	208	20.7	medium
2.1-2.5	55	5.5	
2.6	29	2.9	narrow

The length/breadth index values presented in this way give a far more reliable and valid basis for the statistical comparison of flake shapes than is possible with the use of breadth:length ratios.

In passing it should be noted that a very high proportion of tiny flakes are included in the samples used in Tables 1 and 2. Flakes shorter than 20 mm cannot reliably be expected to provide information on preferential flake shapes, since they naturally tend to be broad, and since they cannot normally be regarded as an intentional product of core flaking. For this reason it is important to express separately the length/breadth index for the sub-sample of flakes larger than 20 mm. Again using the same sample as in Tables 1 and 2, Table 3 does this, and demonstrates in this case a significant increase in the percentage of narrow flakes.

Table 3. Length/breadth index values for sample of 446 unretouched flakes

L/B index	No	%	
0 -0.5	-	-	
0.6-1.0	61	13.7	broad
1.1-1.5	177	39.7	
1.6-2.0	137	30.7	medium
2.1-2.5	47	10.5	
2.6	24	5.4	narrow

Separate consideration of flakes larger than 20 mm also alleviates the problems caused by potential recovery biases against small flakes during excavation. Given good recovery conditions, and assuming in situ knapping, tiny flakes should always predominate in a true flake population. Failure to consider this aspect of sample composition invalidates much of the work carried out to date on inter-assemblage comparison using flake shape.

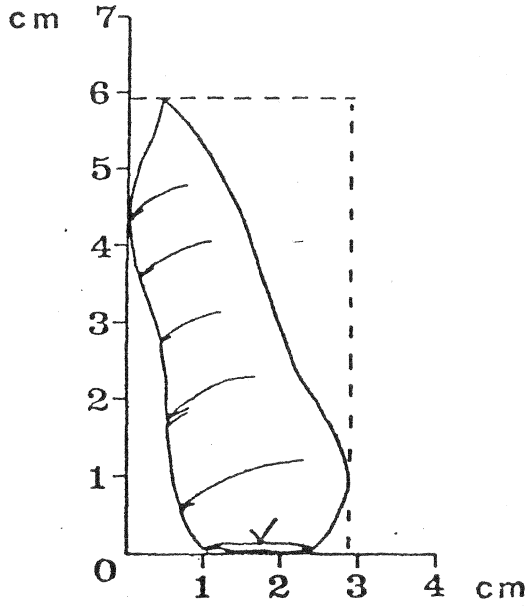

Fig. I

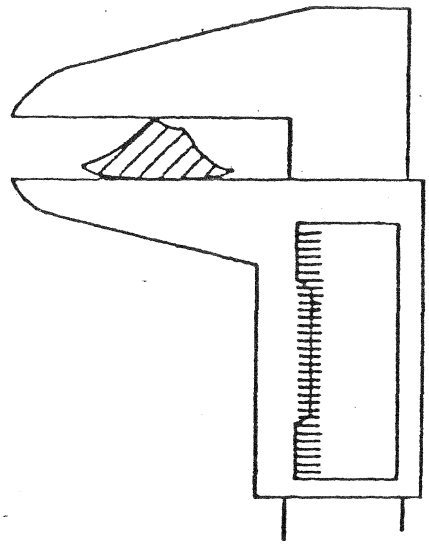

Fig. 2

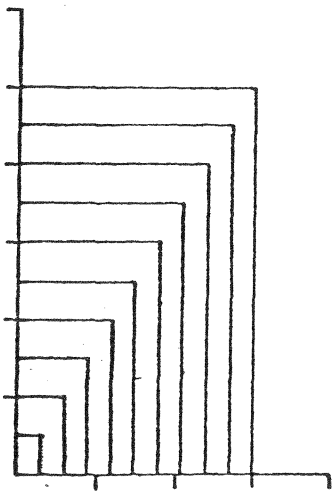

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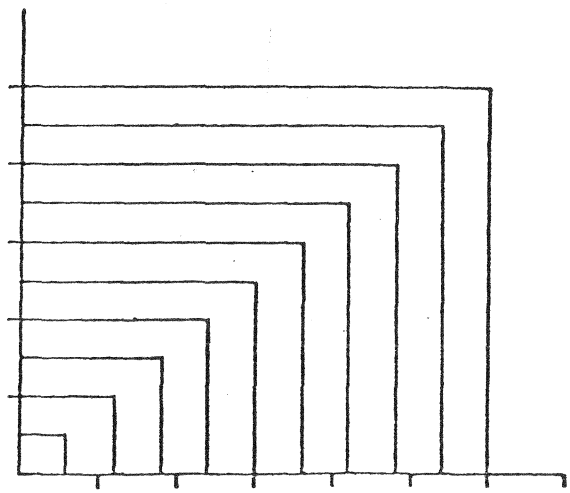
Fig. 3



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