FLINT ARROWHEADS: TYPOLOGY AND INTERPRETATION

by Stephen Green

I first began work on flint arrowheads in 1965 with the preparation of an undergraduate dissertation (Green 1967) and this work was continued with my PhD thesis (Green 1977), which was substantially published as a British Archaeological Reports Volume (Green 1980). The purpose of this paper is to set out my typology in a clear and simple form and, also, to outline some of the conclusions of my work and to comment on them in the light of published reviews. My chronology of the principal arrowhead types defined is set out in Table 1.

Table 1. The chronology of the principal arrowhead types.
LEAF ARROWHEADS. A Principal Components Analysis was used to define a typology on the basis of two dimensional shape (Fig. 1). Data on the character and distribution of flaking were not included. Retouched leaf-shaped flints still retaining their striking platforms and bulb of percussion were excluded. Arrowheads with a L/B value of 0.15 or less were regarded as triangular. Laurel leaves (Clark 1960, 225; Smith 1965, 99-100), distinguished by their characteristic of comparative crudeness of manufacture, asymmetry, and the absence of a carefully worked point, were omitted without prejudice to their possible use as arrowheads in some cases.

Fig. 1. Leaf arrowheads: recorded two-dimensional variables.

The typology, defined initially through two computer-generated Component values, was transformed to one based upon simple ratios. Here, Component I was approximated by length multiplied by breadth \((L\times B)\) and Component II by length divided by breadth \((L/B)\). The distribution of leaf-arrowhead shapes and their typological division is shown pictorially in Figs. 2-3 and two trends may be seen: arrowheads decrease in absolute size from top to bottom of the diagram and increase in slenderness from left to right. The arrowhead typology thus defined (Fig. 4) has four size groups (1-4, large to small) and three shape groups (a-c, equal to slender) forming twelve 'types': 1A, 1B, etc. through to 4C. Within these types certain other characteristics have been used to permit subdivision into ogival, kite-shaped, and polished arrowhead sub-types; these are denoted by a lower case letter suffix, respectively o, k and p: e.g. 1Ap, 2Ck, 3Bo etc.

THE TYPOLOGY

The metrical basis of the arrowhead typology is as follows (measurements in mm):

<table>
<thead>
<tr>
<th>Type</th>
<th>length x breadth range</th>
<th>length/breadth range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>&gt; 1400</td>
<td>&lt; 1.75</td>
</tr>
<tr>
<td>1B</td>
<td>&gt; 1400</td>
<td>1.75-2.24</td>
</tr>
<tr>
<td>1C</td>
<td>&gt; 1400</td>
<td>&gt; 2.25</td>
</tr>
<tr>
<td>2A</td>
<td>1000-1399</td>
<td>&lt; 1.75</td>
</tr>
<tr>
<td>2B</td>
<td>1000-1399</td>
<td>1.75-2.24</td>
</tr>
<tr>
<td>2C</td>
<td>1000-1399</td>
<td>&gt; 2.25</td>
</tr>
<tr>
<td>3A</td>
<td>450-999</td>
<td>&lt; 1.75</td>
</tr>
<tr>
<td>3B</td>
<td>450-999</td>
<td>1.75-2.24</td>
</tr>
<tr>
<td>3C</td>
<td>450-999</td>
<td>&gt; 2.25</td>
</tr>
<tr>
<td>4A</td>
<td>&lt; 450</td>
<td>&lt; 1.75</td>
</tr>
<tr>
<td>4B</td>
<td>&lt; 450</td>
<td>1.75-2.24</td>
</tr>
<tr>
<td>4C</td>
<td>&lt; 450</td>
<td>&gt; 2.25</td>
</tr>
</tbody>
</table>

< = less than; > = greater than; ? = greater than or equal to

Kite-shaped arrowheads possess a value of 1.00 or less for the ratio \(a/\text{ breadth} \) and will possess a value in the range 0.00-0.25 for the ratio \([a/\text{ breadth}] - [b/\text{ breadth}]\). Some kite-shaped arrowheads may possess concave upper and/or lower sides but the similarity of shape of both upper and lower sides will distinguish kite-shaped from ogival arrowheads. (The vertical line brackets indicate that the result always has a positive (+) value).

Ogival arrowheads will, first, possess a value in the range 0.25-0.50 for the ratio \([a/\text{ breadth}] - [b/\text{ breadth}]\) and, second, be recognizable as ogival by possession of a value of 0.36 or greater for the \(a/\text{ breadth}\) ratio. The arrowhead must possess concave upper sides to qualify for description as 'ogival'. However, not all leaf arrowheads with concave sides leading to the tip may be classed as 'ogival'. In my thesis (Green 1980, 60), I made an important distinction between arrowheads which were 'ogival' and others with 'attenuated points'. Attenuation is generally a device used to produce a sharp point on small equi arrowheads of size group 4. Conversely ogival arrowheads are, I believe, a genuinely 'fancy' type and I have confined them to size groups 1-3, since I doubt the significance of examples made on very small raw material (Green 1980, 66, 74). I defined the difference between ogival and attenuated points by means of the \(a/\text{ breadth}\) ratio, with attenuated points possessing a value of 0.35 or less and ogival examples having a value of 0.36 or greater. \('t'\ is the distance from
the tip to the place on the longitudinal axis from which a line drawn at right angles to that axis would cut the point of contact of a line drawn from the tip at a tangent to the sides of the arrowhead: see Fig. 1).

Polished arrowheads are self explanatory. As a type, they are virtually confined to Ireland.

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Fig. 2. Leaf arrowheads: shape distribution as revealed by Principal Components Analysis.

Fig. 3. Leaf arrowheads: typology based upon two Principal Components.
LEAF ARROWHEADS

Type 1A 1B 1C

Type 2A 2B

Type 3A 3B 3C 2C

Type 4A 4B 4C

OGIVAL KITE (TYPE 3B) TYPE 2C

Fig. 4. Leaf arrowheads: typology.

TRANVERSE ARROWHEADS (Figs. 5-6). The term 'transverse arrowhead' is used to embrace the whole petit tranche and petit tranche derivative series. The position of measurements is given in Fig. 5.

Fig. 5. Transverse arrowheads: position of measurements.

Petit tranche type. This form consists of a section of primary flake or blade of quadrangular form with the cutting edge parallel to the main axis of the flake; the sides are bluntly vertical or steep retouched. Least one edge invariably consists of the unwaked primary flake or blade edge. In no case is there secondary working on either of the main faces of the implement.

Chisel and Oblique types (Fig. 6). A clear basis for the division of chisel and oblique types was found in the distribution of the 't' ratio, where measurement 't' is the length of the line from the primary untouched, or partially retouched, tranche edge to the base of the artefact, and 'r' is the width of the tranche (or primary flake) edge (see Fig. 5). The two distributions cross at 0.74. Chisel arrowheads generally have an r/t ratio above 0.74 and oblique arrowheads lie below this value. The chisel and oblique types correspond roughly to Clark's petit tranche derivative classes 3-D and 2-I respectively (Clark 1934). The overlap distribution has a mean of 0.70 and a standard deviation of 0.06. It is clear, therefore, that there is a zone in the range of one standard deviation (0.62-0.78) or two standard deviations (0.54-0.86) where the precise classification of individual artefacts may be uncertain. Whilst it will be impossible to refer some examples in the overlap zone to either chisel or oblique categories, there are certain characteristics which may indicate the type to which the arrowhead should be assigned. These non-metrical characteristics are:

Chisel. These missile points normally lack secondary flaking on the tranche or primary flake edge. Their shape is commonly sub-rectangular.

Oblique. The tranche edge is usually secondarily flaked to produce a point, but often only on one face or just below the tip. The shape is sub-triangular, often with a hollowed asymmetrical base and it may possess a deliberately-shaped single barb. The transverse cross-section is generally skewed, the position of maximum thickness being located off-centre and close to the FL edge (Fig. 5 and below).
Sub-types (Fig. 6). No chisel sub-types were defined metrically although a group made on Levallois flakes may be distinguished (cf. Fig. 6, top left). Oblique arrowheads can be sub-divided into three archaeologically significant classes. These are:

1. 'Ripple-flaked Oblique Arrowhead'
   This type is defined on the grounds of technology and comprises a variant of British oblique arrowheads (infra) with ripple flaking. The distribution map of these arrowheads shows a concentration on the Yorkshire Wolds.

2. 'British Oblique Arrowhead'
3. 'Irish Oblique Arrowhead'

'British' and 'Irish' oblique arrowheads are defined by the ratio UL/FL (see Fig. 5); i.e. the ratio of the length of the primary flake or trancheet edge (UL) to the length of the secondarily flaked edge (FL) contiguous to the point. The FL edge is normally of convex outline in plan and is to be distinguished from the base by the fact that the latter is frequently concave in plan, with often a distinct single barb. The UL/FL distributions of oblique arrowhead types 2 and 3 are in sharp contrast. Irish oblique arrowheads rarely have a value in excess of 1.00, whereas the bulk of the British examples have values of 1.00 or greater. British oblique arrowheads typically have the primary flakes edge (UL) as the longest side, which is frequently continued into a barb, but Irish obliques lack well defined single barbs and have only a short primary flake edge. I have followed Flanagan’s division of Irish Oblique arrowheads into 'pointed' and 'elongated' types (Flanagan 1966, 524). The r/r values of his types typically fall into the ranges 0.40-0.60 and 0.25-0.40 respectively.

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**Fig. 6.** Transverse arrowheads: typology.
BARBED AND TANGLED ARROWHEADS (Figs. 7-8). The term 'barbed & tanged' (b & t) was defined as a generic term to embrace both barbed & tanged arrowheads unless strictly and also tanged arrowheads lacking bars.

Two principal groups were recognised on the basis of whether the form was considered to have been carefully shaped ('fancy') or not ('non-fancy'). These are further sub-grouped according to size, shape, and relative proportions of barbs and tang (Fig. 7 for position of measurements).

BARBED AND TANGLED

Barb shapes (A-D), absence of barbs (E) and tang shapes (F-H) may be defined as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Shape</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>V</td>
<td>Pointed barbs.</td>
</tr>
<tr>
<td>B</td>
<td>U</td>
<td>'Squared' tang or barbs, either with sharp angles or with markedly smaller radii of curvature at the basal corners. If the basal angles of barbs are not right angles one may be acute and one obtuse: both angles should lie in the range 60-120°.</td>
</tr>
<tr>
<td>C</td>
<td>U</td>
<td>Base of barb obliquely cut, with an oblique angle nearest the tang and an acute angle at the lowest point of the barb.</td>
</tr>
<tr>
<td>D</td>
<td>U</td>
<td>Rounded or sub-square.</td>
</tr>
<tr>
<td>E</td>
<td>U</td>
<td>Barbs absent below a line drawn across the highest point of the tang and at right angles to the axis of the missile point.</td>
</tr>
<tr>
<td>F</td>
<td>V</td>
<td>Tang of triangular shape or tang with pointed base (which may be sharp or rounded).</td>
</tr>
</tbody>
</table>

Although these shapes have been idealised as geometric forms for the purposes of illustration, it should be recognised that some classes (for example, barb shapes B and D and tang shapes F and G) shade imperceptibly one into the other. The types defined are (Fig. 8):

A. Non-Fancy Arrowheads

Ballyclare type. Weight is equal to or greater than 8 grams. (Length times breadth (in millimetres) is generally equal to or greater than 1400). This arrowhead is named the Ballyclare type with subdivisions a-c.

- Ballyclare a. Unbarbed/vestigial-barbed (barb length/tang length ratio ≤ 0.19).
- Ballyclare b. Round or square-barbed (barb length/tang length ratio ≥ 0.20). Barb and tang combination E0, F0, G0.
- Ballyclare c. Pointed-barbed (HL/TL ratio ≥ 0.20). Barb and tang combination AF, AG.

Sutton type. Weight less than 8 grams, length times breadth ratio less than 1400. There are three subdivisions, a-c.

- Sutton a. Unbarbed/vestigial-barbed (barb length/tang length ratio ≤ 0.19).
- Sutton b. Round or square-barbed (barb length/tang length ratio ≥ 0.20). Barb and tang combination E0, F0, G0.
- Sutton c. Pointed-barbed (barb length/tang length ratio ≥ 0.20). Barb and tang combination AF, AG.

B. Fancy Arrowheads

Large. These are extremely rare and do not merit separate classification. Where they occur they should be given the names of the small arrowhead classification which follows, preceded by the word 'Enlarged'; e.g. Enlarged Kilmarnock type. The definition of large is, again, that weight is > 8 grams. If the weight measurement is not available a value for LB > 1400 should be used.

Small. Weight less than 8 grams. LB less than 1400. The following names have been given:

- Conover Hill type. Barb and tang combination EP. The barbs are either shorter than the tang or may be of the same length. The overall form of the arrowhead is thus that of a convex-based or flat-based triangle.
- Green Low type. Barb and tang combinations CF, and CG; CH where barb length exceeds tang length. The barbs are always longer than the tang, giving a concave outline to the base of the arrowhead.
- Kilmarnock type. Barb and tang combinations AH, EH, CH. In the latter case tang length must exceed barb length or the arrowhead is of Green Low type. The barbs do not exceed the tang in length.
HOLLOW-BASED ARROWHEADS. This is an uncommon type in Britain. I believe them to be a genuine type, probably with Irish affinities. Hollow-based arrowheads are sometimes confused with oblique arrowheads but differ from these in having barbs of equal length, a more regular distribution of retouch and a lenticular transverse section.

TRIANGULAR ARROWHEADS. This type is defined as having an L2:L value of 0.15 or less (Fig. 1). I doubt the integrity of this type. Some examples may be variants of leaf arrowheads, whilst others are blanks for b & t arrowheads; others yet again - generally detectable by their distribution of retouch and transverse cross-section - may be variants of oblique arrowheads (see above p. 25).

DISCUSSION

The PhD thesis was begun in 1967 and had its basis in an earlier unpublished BA Dissertation which dealt with the flint arrowheads of Somerset, Gloucestershire, and Brittany (Green 1967). The bulk of the data collection was done between 1967 and 1971. The thesis was presented in 1977. The roots of the thesis lie in the intellectual framework of archaeology in the 1960s but it reflected, at its inception, a deliberate move away from the contemporary pottery-dominated culture-historical approach. It was intended - I believe rightly - to be part of a series of material culture studies designed to lay the groundwork for the understanding of British prehistory. The thesis was wide-ranging: it embraced metrical and statistical analyses - some complex - of the arrowhead types, taking account of raw material factors; distributional studies, including spatial analyses; and traditional analyses of context, chronology and associations. Overall, some 40,000 arrowheads were studied in England and Wales alone and comparative material was studied from Scotland and Ireland.

Some of the more important results of the thesis are set out below. The chapter references and/or page numbers which follow each paragraph refer to Green (1980). Only select references are given.

1. TYPOLOGY

Typologies were produced of all the common British and Irish forms of arrowhead. Study of finds from archaeological contexts along with stray finds has made it possible to differentiate between specialist ritual products and 'everyday' arrowheads. (Ch. II.)

2. RAW MATERIAL

The influence of raw material on arrowhead forms was evaluated. It was found to be a significant cause of typological variation. In particular 'fancy' arrowheads cannot generally be produced on the often small and low quality raw material typical of the north and west of Britain and shape variation in leaf arrowheads is closely related to raw material. One raw material source (Portland Chert) is virtually limited to leaf and petit tranche/chesel arrowheads and I believe the
significance of this to be cultural or chronological. (Ch. III.)

3. DISTRIBUTION

(i). The distribution of arrowheads is highly clustered with particular
high concentrations occurring in the Brecklands and on the Yorks
shire Wolds and north Cotswolds, with lesser concentrations elsewhere.
These concentrations may identify the denser population areas. In
general, the spatial frequency of the main arrowhead types - leaf and
b & t - is positively correlated. The overall picture seems to be one
of continuity with land, once settled, generally remaining in constant
or cyclical use. (Ch. VII.)

(ii). Hollow-based arrowheads, whilst rare, show a preferential west
erly distribution on the Cumbrian and Welsh coasts, suggestive of a
link with Ireland where they are common. (pp. 146-147.)

(iii). Most regions possess fairly even percentages (about 40% each)
of leaf and b & t types. In Wessex, the Peak District, and possibly
the Yorkshire Wolds, there are high frequencies of transverse arrow
heads. (p. 147 and Table VII.1, p. 256.)

(iv). An analysis of the relationship between quality of land and
arrowhead density shows that arrowheads tend to occur in similar den
sities over all grades of land. (pp. 156-156.)

(v). Large 'arrowheads' - more probably spear-points - occur commonly
in Ireland. In England and Wales they are commonest in the highland
zone. (pp. 75 and 118.)

4. LEAF ARROWHEADS

(i). Analyses of finds from the Windmill Hill causewayed camp show
none to be exceptional in size, refinement, or typology. By contrast
special arrowheads sometimes occur in sepulchral and other contexts.
(pp. 166-169.)

(ii). Oval arrowheads occur most frequently on the Cotswolds and in
the Somerset/North Devon regions. (pp. 74, 96-99.)

(iii). Kite-shaped arrowheads are commonest in Ireland and Scotland
and, to a lesser extent, in Northern England. (pp. 74-75.)

(iv). Small leaf arrowheads are commonest in Western Britain. This
probably reflects rarity of large raw material there. (pp. 67-68.)

(v). Early neolithic pottery is invariably associated with leaf arrow
heads. (p. 83.)

(vi). Leaf and transverse arrowheads are both associated with Peter
borough ware. (pp. 84, 108.)

(vii). Large leaf arrowheads are commonly associated with 'Torthorpe
tradition' burials in East Yorkshire. In the same area, kite-shaped
arrowheads typically appear with 'Cogglesby phase burials. The high
frequencies of large and kite-shaped arrowheads from these contexts are
not reflected by a similar level of representation among surface finds.
(pp. 93-96.)

(viii). Leaf arrowheads occur in neolithic earthen barrows (long
and round). Arrowheads from chamber tombs, by contrast, tend to be un
usual and are absent from the Severn-Cotswold tombs and in
Cheviot-Cromarty tombs where specialist products seem to be present.
Tomb-robbing may be relevant here. (pp. 84-85, 92-93.)

(ix). Leaf arrowheads appear with male burials rather than female bur
ials in the ratio 3:2. A few of the female associations occur in
bronze age contexts, a pattern mirrored by certain barbed & tanged
arrowhead associations, hinting perhaps at the possibility of changes
in social patterning in the bronze age. (p. 91.)

(x). Leaf-arrowhead associations of full early bronze age date are
attested, apparently indicating continuing use of the type. (pp. 93-
97.)

5. TRANSVERSE ARROWHEADS

(i). There is no certain evidence that petit trancheart arrowheads
formed part of British neolithic assemblages. There are none from
sealed neolithic contexts and almost every neolithic site to have
produced petit trancheart has also produced neolithic/bronze age flint
work. (pp. 100, 111.)

(ii). Petit trancheart are rare in Britain, only some 300 being known.
They are very rare in the highland zones and are absent from Ireland.
Concentrations occur in the Windmill Hill area, near Bath, in Surrey,
Sussex, and on the Yorkshire Wolds. (p. 103.)

(iii). Both chisel and oblique arrowheads have high-density finds in
Wessex, the Brecklands, and the Yorkshire Wolds, evidencing the long
accepted relationship between the two series of artefacts. (p. 103.)

(iv). Two-thirds of all ripple-flaked oblique arrowheads (n = 135)
come from a small area of the Yorkshire Wolds west of Bridlington.
These specialist products may well have been the product of a single
craftsmen's workshop. (pp. 103, 119-115.)

(v). Irish arrowheads are typologically distinct and are proba
ably uncopmenected with the British series. (p. 39.)

(vi). Transverse oblique arrowheads seem to be virtually the only type
known from 'pure' grooved ware settlement sites. (p. 106.)

(vii). There is some evidence to suggest that chisel arrowheads tend
to be associated with the Woodlands sub-style of grooved ware and
oblique arrowheads with the Glacton and Durrington Walls sub-styles.
The explanation of this is probably chronological. (p. 106.)

(viii). Ten henge monuments have produced arrowheads and transverse
types are the dominant or only form present at eight sites. This re
flects, in part, the association with grooved ware noted at settlement
sites. (p.109.)

(ix). Transverse arrowheads are the commonest type in late neolithic flint mine contexts and, at Grosses Graves, there are stratified finds of oblique arrowheads and grooved ware. (pp.105-110.)

(x). Radiocarbon dates suggest an origin for chisel arrowheads in the earlier third millennium bc and their disappearance by 1500 bc at latest. (pp.111-114.)

(xi). Petit trancheurs generally occur in later neolithic contexts and are possibly not always a distinct type but, rather, a simple form of chisel arrowhead. (p.113.)

(xii). Chisel arrowheads occur in some chambered tombs of passage-grave type or affinity. (p.113.)

(xiii). Where early beaker pottery (steps 1-2) is associated with transverse arrowheads, the commonest types are petit trancheur/chisel. Conversely, in later beaker associations (steps 3-7) oblique arrowheads are commonest. This distinction is probably chronological. (p.114.)

(xiv). Oblique arrowheads seem to be confined to the period 2000-1550 bc. (pp.114-115.)

6. BARBED AND TANGED ARROWHEADS

(i). The so-called 'Sutton' type of arrowhead is not, overall, more densely distributed, as some might expect, in the non-flint areas of Britain. This may imply that some traffic in 'fancy' forms took place. The highest concentration of fancy arrowheads is in East Anglia where contemporary flint mining was taking place, and large high-quality flint was available. (p.112.)

(ii). 'Triangular' arrowheads are a rare form in Britain (n = 46). I suspect that many of these are no more than blanks for Conygar Hill arrowheads.

(iii). The distribution of Green Low arrowheads, within Britain, is virtually restricted to England and Wales. (p.119.)

(iv). Kilmarnock arrowheads are essentially Scottish in distribution. Their dating span appears to be 1500-1000 bc. (pp.119, 141.)

(v). Only b & t arrowheads occur in graves with beakers. (p.129.)

(vi). In settlement contexts, where beaker is the only pottery type represented, b & t arrowheads are twice as common as other types. However, some oblique arrowheads are present with early beaker associations (steps 1-2) and oblique arrowheads with later, typically 'southern', beakers. (p.120; Table VI.4i p.243.)

(vii). Typical Conygar Hill arrowheads are absent from beaker graves but occur commonly with food vessels. (p.139.)

(viii). Green Low arrowheads are typically associated with southern beakers. (p.150.)

(ix). There is no one b & t arrowhead type typically associated with collared urns, except that the Green Low type is absent. (pp.150-51.)

(x). The evidence of bronze associations suggests the collapse of archery as a common or prestige method of warfare in the early bronze age and its replacement by hand-to-hand combat using bronze weapons. (pp.152, 192.)

(xi). Analysis of arrowheads associated with inhumations and cremation graves demonstrates patterning. The ratio in the case of the long-lived Sutton type is 1:1. However, the Green Low type generally occurs with beaker inhumations, the Conygar Hill type with food vessel cremations, and the Kilmarnock type with urned cremations. (p.156.)

(xii). B & t arrowheads from beaker graves are generally associated with male skeletons placed on their left side, whereas Conygar Hill arrowheads (generally absent from beaker contexts) occur with skeletons placed on their right side. (p.152.)

(xiii). The Stonehenge grave-group (Grimes 1963) presented the anomaly of one or more Conygar Hill arrowheads in association with a beaker skeleton, but it is now clear that they were not grave-goods but the cause of death. This demonstrates warfare between people of different material culture and suggests that social inferences may sometimes be validly made from such artefactual data. (pp.159, 192.)

(xiv). The Armorican arrowheads from the First Series barrows in Brittany are quite unlike the 'fancy' Green Low and Conygar Hill types which actually have a lower frequency in Wessex than elsewhere. These fancy types also occur in various contexts in Brittany with respective frequencies of 2% and 1.7% (n = 250) and Conygar Hill arrowheads are associated with Breton beakers. I am quite sure that the Armorican arrowheads are a wholly Breton phenomenon; that none occur in Britain; and that the only possible point of contact is the shared custom of producing objets d'art in flint for placing with the dead. (pp.193-194.)

WARFARE, THE SECONDARY NEOLITHIC, AND THE RING-O-CLACTON COMPLEX

Two reviews of my published thesis have appeared (Kimes 1961; Bradley 1972a) with further comment elsewhere in the literature. I propose to restrict my comments to three subjects - warfare, the secondary neolithic, and the Ring-O-Clacton complex - as it is these which have generated the most comment. I shall confine myself here to a brief statement in anticipation of fuller discussion of these problems in the future.

I suggested in my thesis that the primary function of arrowheads in neolithic/bronze age Britain was for warfare. My view was based on direct and unambiguous evidence for their use against human targets and, also, on the relative rarity of the bones of wild animals on
nal sites combined with the absence of convincing direct evidence of arrowhead wounds in animal bones. There have been no new studies in the last few years which would encourage me to reconsider this position (Ride Burrell 1960, 264). There is no doubt, however, that the raw data are in urgent need of reassessment by faunal specialists. Moreover, the likelihood of local variability in food procurement strategies makes it desirable that such a study should be as nationally-based as possible.

I shall treat the secondary neolithic and Ringo-Clacton (RC) problems separately since my socio-economic view of the complex does not depend upon my suggestions as to its possible origins.

I suggested that the RC complex might be 'secondary neolithic' in status. By this I meant that the complex, as represented artfactually and monumentally, was composed of a self-aware, recognisable human group, which was composed of the descendants of the autochthonous mesolithic hunter-gatherers. In calendar years this would mean that the population remained substantially intact over a period of some 1000 years (from at least circa 4300 BC to 3000 BC). The general proposition of the possibility of such survival can surely not be in doubt. The propensity of human beings to form socially and often economically distinct groups within the same geographical territories is a matter of everyday observation and it is easy to cite examples of such groups who have survived - distinguished often by religious practice, language, or race - for centuries or even millennia. Given that there were such communities throughout the world, the many Indian peoples of the Americas, the Celtic peoples of Britain, the 'white' peoples of southern Africa, the Copts of Egypt, or the Circassians of Jordan. In short, I believe that archaeologists must propose hypotheses to account for the indigenous peoples where colonization has taken place. Such colonization might involve the arrival of whole communities or families with plants and livestock or merely of adult males, similarly equipped, who would have taken wives from among the indigenous population. This latter process was typical of much of the Spanish colonization of Central America. I would suggest, however, that agriculture sensu stricto is generally a sufficiently complex activity to require some movement of population, particularly since British mesolithic peoples were not adapted to the processing of seeds for food. It is difficult also to envisage the sort of pressures which might have induced a British late mesolithic population, perhaps numbering no more than 5000 souls (Brockwell 1972, 79), to adopt arable cultivation sua sponte.

The possible links which I saw between the mesolithic peoples and the RC complex were always tenuous and I would now remove the artefactual evidence - so-called petit tranche derivative arrowheads and pebble maceheads - from account as neither type is certainly derived from a mesolithic prototype (Green 1980, 100, 111, 115; Roe and Bailey 1968, 174-175). The other possible links were economic - the involvement of BC as formerly mesolithic, 'people' in long-distance traffic in raw materials and the apparent exclusive pastoralism of the BC 'people'. These links remain. I will take up two specific points in later. First, it is stated (1960b, 29) that 'Stacey Bushes report (Green 1976) that 'the consistent association between grooved ware and pig bones is explained by allowing these pastoralists to live away from other groups, on the edge of the forest (Green 1976)'.
In sum, there is considerable scope in lithic research whether on an artefact type or regional basis, or as a component of a wider regional or national study. I look forward to producing my own synthesis of the British Neolithic within the next few years, taking my results into account.

Acknowledgements

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REFERENCES