

A STUDY OF USED AND RE-WORKED STONE AXES FROM DERBYSHIRE

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INTRODUCTION

References to the re-use of stone axes in Derbyshire (Cooper, 1968; Moore and Cummins, 1974: 64), and the recovery of two re-used flakes from the excavations at Mount Pleasant (Garton and Beswick, 1983: 34-5) prompted this investigation into the types and numbers of stone axes and fragments found in the county which show clear traces of use or re-working. There are many axes and fragments dispersed in private hands; no attempt was made to locate this potentially important material, with the exception of the collection held by Mr L. Cliffe of Nottingham. Consequently, this study has been conducted almost entirely on the basis of material held in the three large museum collections in the area: Buxton, Derby and Sheffield. Many of the items in the museums were collected in the last century, or are stray finds, and so are not accurately provenanced. Hence detailed distribution analysis has not been attempted, though it is noted that most of the axes have been found in the White Peak (Moore and Cummins, 1974: 59). Many of the pieces have been thin-sectioned (Moore and Cummins, 1974: 69-73); unless indicated otherwise, the petrological identifications used here ('Groups I - XX') are taken from that work.

Stone axes have been ascribed many uses in the literature. Suggestions as to their function include their employment as symbolic or prestige items (Bradley, 1984: 54-7, 62-3), heavy and light wood-working implements and general purpose agricultural tools (Harding and Young, 1979: 104-5). However, the specific use of polished stone axes has not yet been determined by microscopic analysis of the wear traces. Since primary or secondary purposes cannot be assigned, in this study any changes to the form of an axe have been deemed to be the result of its use or re-working. I have defined such changes as significant modifications in surface angles, and have noted areas of smoothing, grinding, pecking, or re-chipping on 1:1 drawings, a selection of which are reproduced here at a scale of 1:3 (Figs 1-3: all axes are orientated with the blade uppermost; Table 1). The types of working can be divided into five categories (all examples recognised are listed in Table 2):

1. Re-chipped axes
2. Re-ground axes
3. Smooth and worn axes
4. Pecked areas on axes
5. Re-used flakes of axes

DISCUSSION

1. Re-chipped axes

Re-chipping of blade, butt, butt and blade, or a section of axe has been found in twenty-five specimens. The re-chipping of blades was probably intended for re-sharpening a blunt or broken blade (Nos. 1 and 2). This was sometimes followed by grinding (No. 3). There are only two

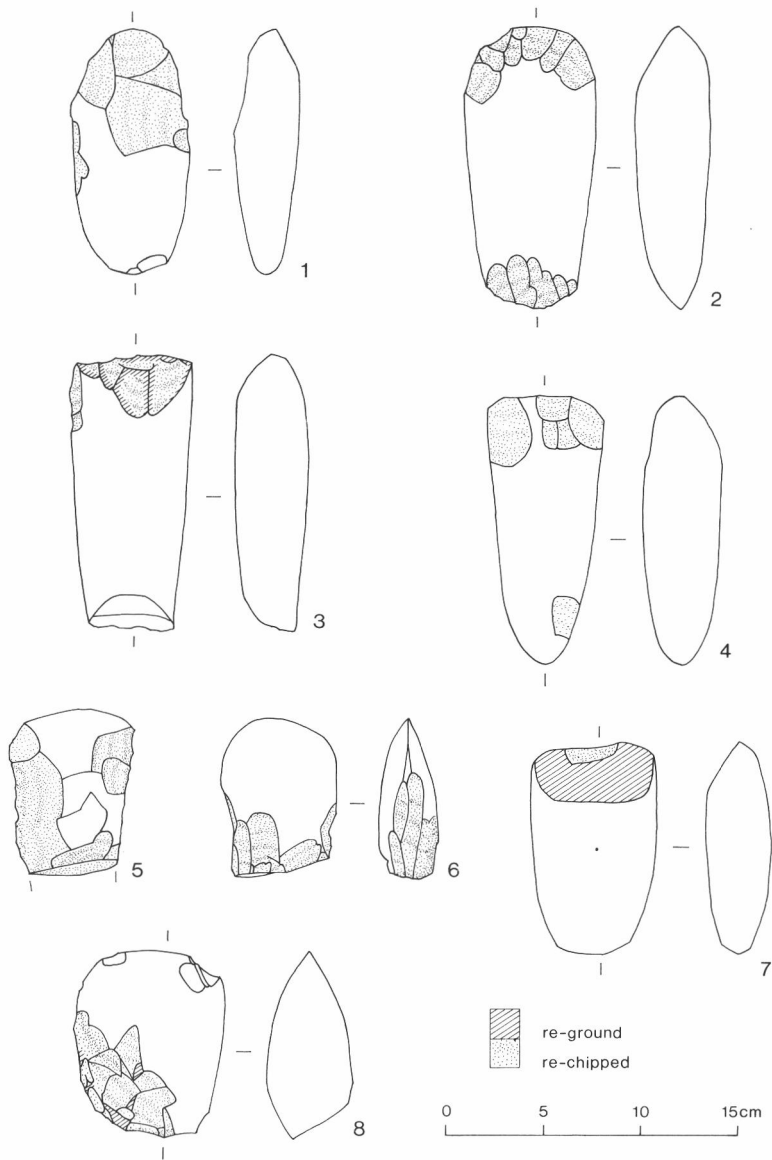


Fig. 1 Used and re-worked stone axes, Nos. 1-8: examples of re-chipped and re-ground stone axes. (Unaltered areas are left blank.) Scale 1:3.

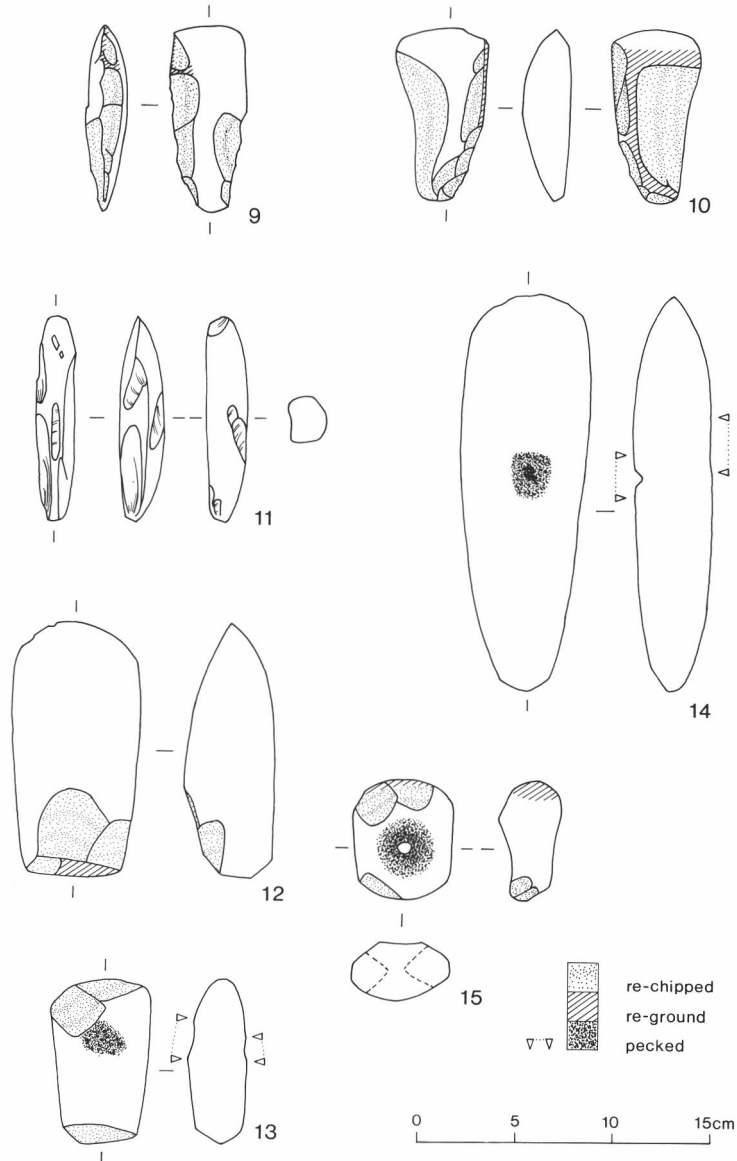


Fig. 2 Used and re-worked stone axes, Nos. 9-15: axes re-worked, or partially re-worked into new implements: 9-10, small axes; 11, chisel; 12, axe with re-formed butt; 13-15, implements with shafthole or pecked area perhaps started for a shafthole. (Unaltered areas are left blank, with the flake surface on No. 11 shown conventionally.) Scale 1:3.

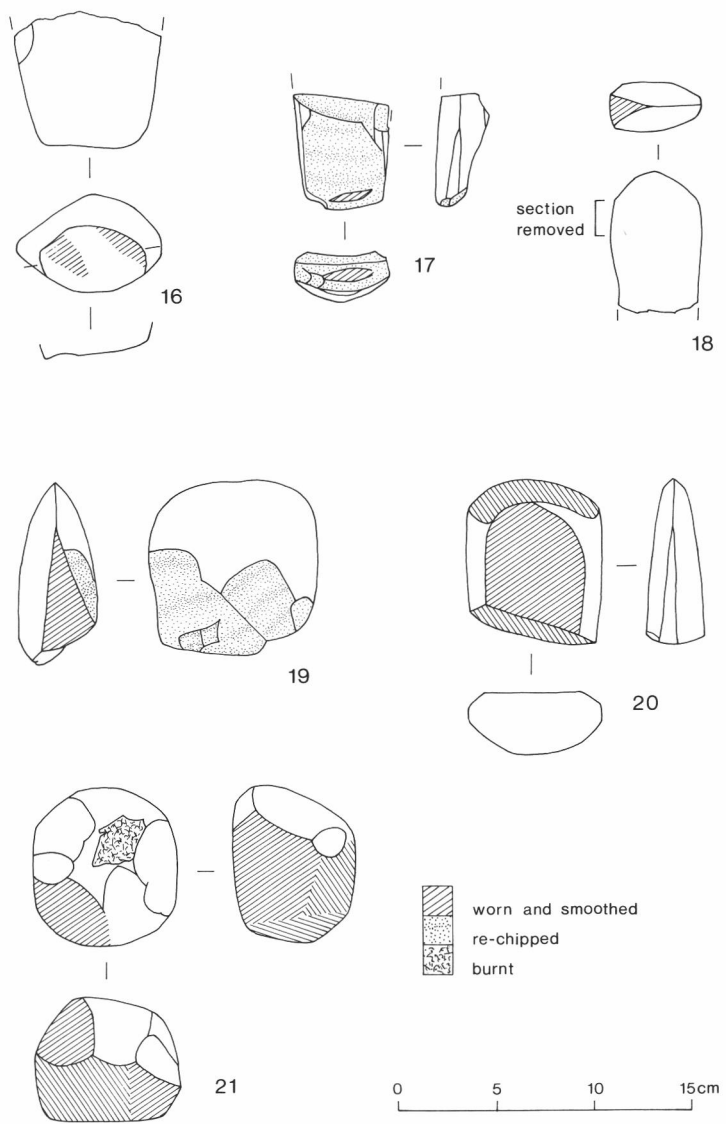


Fig. 3 Used and re-worked stone axes Nos. 16-21: axes and utilised Group VI pebble with smoothed and worn areas. (Unaltered areas left blank.) Scale 1:3.

examples of attempted re-chipping of blades from the rock types that are better worked by pecking or grinding. For example, the rounded cross-section and pecked and ground surface of No. 4 indicate a coarse-grained rock type (confirmed by macroscopic inspection) that would not flake well; the flakes are similarly weathered to the rest of the axe and are probably not recent. The re-chipping of the butt edge might have been for re-hafting (No. 5), although in some cases (e.g. No. 6) it might be suspected that the axe was being used as a source of raw material and treated as a core. Only four completely re-chipped axe fragments were found in the material studied.

Unfortunately, slices for petrological examination have sometimes been cut through re-chipped or used edges of axes (e.g. No. 18); the more recent practice of taking cores from the body of the implement should help stop this unsympathetic treatment.

2. Re-ground axes

If axes were a prized commodity, then it is plausible that at least some small axes were, in fact, manufactured from broken pieces of large ones (cf. Manby, 1979: 69, 72; though Harding and Young (1979: 104) note that small axes are not so efficient for chopping down trees as large ones). Often this process of re-cycling seems to have been so complete that only slight evidence survives to suggest such re-working (for example, the original right-side facet of No. 9 was retained: the left side has been flaked and re-ground). On the other hand, other re-worked examples might be interpreted as partially finished, or defective specimens. In this category may belong the small adze (No. 10), which has been deeply flaked on both sides, with part of the lower surface (illustrated on right) ground and polished flat. Its section suggests that the lower surface has been reduced considerably by re-flaking and re-grinding.

Other instances of re-grinding are susceptible of rather more straightforward interpretation. The blade of No. 7 probably broke, and a new steeply-angled surface was re-ground. Partial polishing or grinding after re-chipping is found on both blades and butts (e.g. Nos. 3 and 8). Altogether, eleven examples of this treatment were found; they must represent attempts to increase the useful lifespan of these implements. However, although an apparently similar re-forming of parts of axes is clear on Nos. 12 and 13, where the butts have bevelled surfaces less weathered than the original surfaces, the slight pecked hollows on either side of No. 13 may indicate its intended re-use as a perforated implement (see below), thus leading to consideration of such bevels as either functional or stylistic features. Two examples of chisels of green stone (not sectioned but both probably belonging to Group VI) were also examined (e.g. No. 11). These may have been re-worked from axe pieces, as is suggested by the middle view of No. 11 (cf. Manby, 1979: 69), though chisels are known from factory sites (Bunch and Fell, 1949: 18).

3. Smoothed and worn axes

Twelve examples of axe fragments with smoothed and worn surfaces were found. The position of the smoothing and wear and the lack of preliminary flaking suggest that such surfaces did not result from an intention to re-form these implements, but were a consequence of their use. Where it is the butt or side of the implement that has been smoothed, this might be the result of hafting. (For example, an axe brought to the Sheffield Museum, and now in the possession of M. Murphy, has one side of the butt smoothed.) On the other hand, although one piece (No. 16) is smoothed and partially hollowed on the butt-end, it is perhaps more likely that this is the result of using the axe butt as a grinding stone. Flat, smoothed areas have developed on the sides and blades of some axes (e.g. Nos. 18 and 19). There are two examples in which a central transverse break has been smoothed, and on one of these (No. 20) the side has been polished flat and shiny too. In the

case of No. 17, a small patch of the butt (which had previously suffered the removal of a large flake) has been worn smooth with use. The flat, smoothed surfaces of these last are likely to be the result of their use in working other materials and artefacts, in a manner quite different from the cutting action traditionally ascribed to axes. Such implements are known to have been re-used in the recent past for such purposes as smoothing cloth (Sheridan, 1986: 25). An axe fragment with a worn and smoothed transverse break, discovered in the course of recent fieldwalking at Mount Pleasant, strongly suggests that such wear can also be of prehistoric origin.

Smoothed stones belonging to petrological groups the same as, or similar to, those of the axes were also found (e.g. No. 21: Group VI). No. 21, and other smoothed stones, have also been used as hammerstones. There are numerous other pebbles of probable local derivation that have smoothed and worn areas; they have not been included in this study.

4. Pecked areas on axes

Five of the axes studied have areas of shallow pecking on both flat surfaces (e.g. Nos. 13 and 14); only one example (No. 15) has been completely perforated. No. 15 has been categorised as a pebble-hammer (Roe, 1979: 47), a term usually restricted to “unadapted pebbles save for the shafthole” (Roe, 1979: 36), yet Moore and Cummins comment that it was “almost certainly fashioned from the butt fragment of an axe” (1974: 74, footnote 12), a comment with which I agree. Of the fifty or so implements attributed to Group XX (Smith, 1979: 21), four are mace-heads (Roe, 1979: 46), of which one comes from Beeley Moor, Derbyshire (Moore and Cummins, 1974: 70, Db 53). No. 13, with its re-worked butt and the pecked areas on both faces, might have been intended as a mace-head; it belongs to Group XX (Moore and Cummins, 1974: 71, Db 113). No. 15 is another Group XX implement from Derbyshire. However, neither of these implements fit easily into the standard typologies of mace-heads. No. 15 has an hour-glass perforation, rather than the almost universal cylindrical hole; and on No. 13 the perforation was started towards the wider end, when it is normally nearer the narrower (Roe, 1968: 146; 1979: 33).

5. Re-used flakes of axes

The museum collections principally comprise complete and large pieces of stone axe (214 inspected in total); they contain many fewer flakes (60). In contrast, recent fieldwalking projects have produced a higher proportion of smaller flakes. For example, at Mount Pleasant, Kenslow, ten flakes and nine axe pieces have been found to date (1987), while Wormhill has produced twenty-six flakes and five larger pieces. In addition, recent excavations at Wigber Low and Mount Pleasant have resulted in the recovery of only flakes and very small fragments (Cummins, in Collis, 1983: 61; Garton and Beswick, 1983: 34-5).

Seventy-three flakes that might have derived from stone axes were examined; they all probably belong to Group VI or VII. The Harris collection at Sheffield City Museum includes several used stone flakes, but only two are undeniably from stone axes (one of which has wear gloss on the retouched edge). Material collected from Wormhill includes one flake that may have been used. A re-worked flake from a stone axe found at Elton was clearly intended as a knife. This flake was removed from the polished surface of an axe, then the distal ends of both ventral and dorsal sides were polished to form a narrow cutting edge (Cooper, 1968: fig. 3b).

The re-chipped blades and butts, flakes with polished surfaces, and a stone flake from Wormhill with a prepared platform indicate intentional flaking of stone axes, but there is little among the material studied here to suggest that axes were often used as raw material for flake

Fig. no.	Collection	Accession no.	Moore and Cummins no.	Petrological Group
1. 1	SCM	J93.65	Db 95	VII
2	SCM	J93.72	Db 78	VII
3	BM	602		N.S.
4	SCM	J93.63	Db 92	Ungrouped tuff
5	BM	536	Db 157	VI banded
6	SCM	J1954.81	Db 182	VI medium
7	SCM	X1969.251		N.S.
8	SCM	Wormhill		N.S.
2. 9	BM	577	Db 151	VI medium
10	SCM	J93.84		Ash, like V1-C.B.A.petrology card
11	SCM	J93.60		N.S.
12	SCM	J93.71	Db 89	Chert
13	SCM	1981.530	Db 113	XX
14	DCM	819.4.21	Db 42	Epidiorite
15	Cliffe	G/21(664)	Db 192	XX
3. 16	SCM	1972.121		N.S.
17	Cliffe	G/70/10(G8)		N.S.
18	SCM	J1929.170		Identification not located
19	SCM	1981.1298(20)	Db 20	XV
20	SCM	1981.1295(15)	Db17	VI medium
21	SCM	Burbage Moor		V1-C.B.A. petrology card

Key. SCM: Sheffield City Museum; BM: Buxton Museum; DCM: Derby City Museum; Cliffe: private collection of Mr L. Cliffe, 294, Wollaton Road, Beeston, Nottingham; N.S.: not sectioned.

Table 1: Concordance of numbering of axes illustrated with their numbering in Museum and private collections, and in Moore and Cummins (1974: 69-74)

tools (for example, relatively few of the flakes bear any apparent signs of use). This conclusion needs to be tested against excavated assemblages where a more complete range of stone axe fragments is often recovered.

CONCLUSION

This study confirms that stone axes were not always discarded immediately on becoming blunt or breaking. The attempted re-sharpening of the blade or butt on many pieces probably indicates that repair, rather than exploitation of the axe as a source of raw material, was the primary purpose of re-chipping. Both their thickness, and the indications that they underwent two periods of grinding, make it likely that some of the small axes were made from broken axe pieces.

This study positively identified re-working on nearly one-fifth of the axes inspected, compared with the few instances commented on by Moore and Cummins (1974: 64, 68) when studying the same material. This is, however, not to criticise the latter's achievements; they were, after all, primarily investigating the petrology of the axes, and they specifically note that they did not actually inspect all examples (Moore and Cummins, 1974: 74). Consequently, the results from this study cannot, as yet, be compared with data from other localities published in petrological reports; more widespread studies of axe use would have to be made before the conclusions suggested here could be deployed more generally. Such a high incidence of re-working might prosaically result from prehistoric people's thrifty use of resources; or it might

Use type and position	Collection: SCM	DCM	BM	Cliffe	Mount Pleasant
Re-chipped: butt	J1954.81, TG3 J93.65 J93.63, 1981.1299(21)	Gratton 2F3	533, 536	G/70/6, G/70/4	83.F4.S4, 83.F3.10B, 86.F4.931
blade	J93.65, J93.63, 1981.1299(21)	1894-1968	609, ?618, 492		
butt + blade complete	J93.72, TG1 TG5, 1972.126, Wormhill J93.71, Elton MM, 1972.121, 1981.530	Elton 73	599		84.F8.DN
Re-ground: areas	J93.69, X1969.251, Wormhill J93.89		585, 602, 480		
small axes	J93.73, J1959.6/C/18, J93.84		577, 591		
Smoothed/worn: butt	J93.71, Elton MM, 1972.121, 1981.530	Bonsall 1			
blade side face	J1929.170 1981.1298(20) 1981.1295(15)		495 473	G/70/10(G8)	84.F8.388
Pecked area:	J93.59, J1947.358, 1981.530	819.4.21			
Re-used flakes:	1981.535.1, 1981.535.2, 1981.542.2, 1981.534, 1981.549.1, 1981.549.2 Wormhill				
?Re-worked implement:	J93.60, J93.89	841.M1191.69	Display chisel	G/21(664)	
Pebbles: smoothed smoothed + hammerstone	1981.541 J93.122, Burbage Moor, 1972.749				

NB: In the case of Sheffield City Museum, neither the Wormhill collection nor the M. Murphy collection from Elton Common ('Elton MM') was accessioned at the time of examination. The Mount Pleasant material continues to be collected by fieldwalking; it will eventually be deposited in Sheffield City Museum.

Table 2: List of stone axes in the collections examined with apparent use or re-working

be related to more dynamic social or geographical imperatives such as restricted access to supplies or relative isolation from the axe-factories. If the incidence of re-working was recorded nationally, along with such parameters as axe length (McVicar, 1982), this might help to identify the routes along which axes were moved and/or the subjective distances of the communities concerned from the collection centres postulated from the sourcing of stone axes (Cummins, 1979: 9).

The complete re-working of axes into different implement types is rare and was noted in only four possible cases (two chisels: including No. 11; a "pebble-hammer": No. 15; and a knife) although four other examples of initial re-working for probably different implement types were

noted (including Nos. 13 and 14). The re-working of two Group XX axes into mace-heads or mace-head pre-forms (Nos. 15 and 13) may have chronological implications for the use of Group XX axes (Smith, 1979: 14), or simply suggest that this rock was recognised as suitable for this implement type whether for the practicalities of working or aesthetic reasons. The typological irregularities already noted above may suggest that these implements were local copies of an unfamiliar product.

Many axes have been smoothed and worn. When such abrasion occurs on the butt or side, it could have resulted from hafting, but some specimens have clearly been used for grinding and rubbing of other materials or artefacts (Nos. 16 - 20). However, given the doubtful provenance of most of the museum specimens examined in this study, the possibility that this wear is of recent origin cannot be discounted. Items from known contexts are needed to further such study.

Moore and Cummins (1974: 64) note that many of the Group VII axes are broken or re-used. Of the material studied here, Group VI was the commonest re-worked rock type (17 instances), a fact that perhaps reflects numerical dominance of Group VI axes in this area, and the ease with which this stone can be re-shaped by flaking (cf. Clough and Green, 1972: 128; Manby, 1979: 72). Re-worked specimens of Groups VII, XV and XX, and ungrouped cherts, basalts, tuffs and epidiorites, are also represented. If the rock types are divided into those that can be worked by flaking and those that are best worked by pecking and grinding (Coope, 1979: 100), the re-worked specimens come largely from the flaking group; only two examples may be cited from Coope's groups best worked by pecking and grinding where re-working (flaking) has been attempted (Nos. 4, 19). Some of the axes, particularly the coarse-grained Cornish axes (Group I), are so heavily weathered that no original surface survives. No secure identification of re-use has been found on any of the Cornish axes which, in the collections studied, are almost always complete specimens (cf. Pierpoint, 1980: 190).

The accumulation of predominantly complete and large pieces of axes in the museum collections has clearly biased the results of this study. Only future careful fieldwalking and excavation can remedy this bias.

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