STUDYING BIFACE UTILISATION AT BOXGROVE: ROE DEER BUTCHERY WITH REPLICA HANDAXES

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Introduction

The butchery of a roe deer carcass was recently undertaken with replica Boxgrove handaxes as part of a wider investigation into Lower Palaeolithic flint handaxe function. The techniques of use-wear analysis are being adapted and employed in this study which centres on material from the site of Boxgrove in West Sussex. Large numbers of delicately crafted ovate handaxes have been discovered at the site with an abundance of associated flake material and faunal remains, together with the well known hominin teeth (Roberts 1986; Roberts et al., 1994) and the more recent finds of two hominin teeth. A large amount of the flint material at Boxgrove is actually in situ, making it of particular value for use-wear analysis as the effects of post-depositional weathering and erosional processes are likely to be at a minimum.

Preliminary investigations have shown that use-wear traces are to be expected on the surfaces of handaxes. Keeley’s (1980) analysis of handaxes from Hoxne found polish and edge damage consistent with traces formed during his experimental butchery activities. More recently Binneman and Beaumont (1992) found micro-wear consistent with plant processing activities on two handaxes from Wonderwerk Cave in southern Africa. Apart from these two studies, it appears that to date few detailed investigations have been made specifically into handaxe use. Details of experiments are given by Jones (1980; 1994) and Whittaker (1994), but neither is a general or specific study of handaxe usage.

As part of the investigation outlined above, the techniques of use-wear analysis have been applied to a number of recently excavated handaxes from Boxgrove. The exceptional preservation of the lithic material at the site makes this an ideal data set for use-wear examination, and the abundance of such large numbers of well preserved handaxes affords a great opportunity for investigating their usage. While the analysis is still in its early stages, detailed study, including both macroscopic and microscopic examination, has already revealed use-wear traces thought to be consistent with those formed during meat and bone cutting experiments undertaken by the author. Since Lawrence Keeley’s original experimental flint tools are available for re-analysis by the author, a good match has also been made with traces formed during his butchery experiments. The butchery experiment outlined below was undertaken in response to these findings and involves very detailed recording of all activities undertaken during the skinning, disarticulation and boning of a carcass, allowing a full understanding of the use-wear traces formed.

New experimental data

As noted by Gorman and Mitchell (1994), experimental work plays an important role in use-wear analysis; without access to experimentally produced use-wear data, analysts really have nothing on which to base their interpretations. It is usually necessary for new experiments to be undertaken with specific reference to each set of archaeological material under investigation. In relation to this a programme of experiments has been devised to investigate handaxe use in the Lower Palaeolithic. These experiments have two primary functions. The first involves the use of flint tools in controlled experiments in order to produce use-wear traces for comparison with traces seen on archaeological implements.

The second function is to investigate handaxe use by utilizing replica Lower Palaeolithic implements to discover how practical and efficient they are in accomplishing tasks which are thought likely to have been carried out in the Lower Palaeolithic. These two functions are combined in the experiment outlined below, as the use of replica handaxes in specific tasks naturally produces use-wear traces on the working edges of the tools in question.

A preliminary analysis of a number of handaxes from Boxgrove indicated their use as butchery tools. This, coupled with the close associations of lithic and faunal material at Boxgrove, and the fact that some of the bones bear stone tool cut-marks, suggests butchery as worthy of detailed investigation. Therefore replica Boxgrove handaxes were chosen to butcher a whole animal carcass.

Methodology

Tool manufacture. For the purposes of the experimental programme eighteen handaxes were made by Mr. Phil Harding (Trust for Wessex Archaeology) from flint nodules collected from the Boxgrove region. Mr. Harding replicated, as closely as possible, the handaxe forms found at Boxgrove. This involved manufacture of most of the implements as bifacial core tools, though in a few cases smaller handaxes were made on large flakes. Each tool was finished with a trametlt removal, since this device was very frequently employed by the original Boxgrove knappers. From this collection eight handaxes were selected for use in the butchery experiment based on implement size and shape, giving a good representation of the forms available at Boxgrove. For reasons of comparison three larger and two smaller flakes were also selected, so that their efficiency could be tested against that of the handaxes during the experiment.

Butchery Technique. It was decided that a person experienced in butchery technique should undertake the experiment as there is a specific technique for the efficient removal of the most nutritious parts from a carcass. If it is assumed that butchery was taking place in the Lower Palaeolithic it is likely that flesh removal would have been done efficiently, by a standard technique for which specific implements were made (Bunn and Kroll 1986). Thus, any
attempt by the author, who has no experience of butchery, seemed unlikely to be properly replicative of practices in the Lower Palaeolithic. Fortunately the head butcher of “Fellers and Son and Daughter” of Oxford, Mr. Peter Dawson, agreed to undertake the work, providing both the carcass and a location for the experiment. Obviously, Mr. Dawson had no previous experience with stone tools, which proved to be something of an advantage, as his ability to use handaxes as tools was not clouded by preconceptions gained from the archaeological literature. His knowledge of butchery and his experience with modern butchery tools enabled him rapidly to familiarise himself with the capacity of handaxes to accomplish the necessary tasks.

The butchery experiment

The animal provided had been killed four days prior to the experiment and had been gutted and cleaned, with the head and the lower parts of the limbs removed. As noted above, the intention was to remove the most nutritious parts from the carcasses. This involved skinning, boning and jointing the meat in the way practised by modern butchers. Thus, Mr. Dawson decided that it would be best to tie the carcass on a wooden table rather than butcher it on the ground or hang it from the roof of the barn. This is the usual way in which carcasses of this size are butchered. Due to the constraints of space, it is not possible to give a full account here of the butchery technique used by Mr. Dawson, but below are outlined details of the stone tool usage in the experiment.

Tool Use. Mr. Dawson was initially very sceptical about the implements with which he was presented on arrival. Having only ever used steel tools for butchery, including knives, choppers and saws, he initially thought the flint tools would be rather blunt, difficult to use and unlikely to accomplish the tasks involved. Despite this, he decided to use each implement in turn, in order to “get a feel for the tools” and then to select one (or more) which he found to be the most useful and comfortable to work with. In the event the implement he chose was a medium sized ovate with a sizeable truncet flake removal, though he continued to try out the other implements during the experiment.

Despite his initial scepticism, Mr. Dawson in fact had no trouble accomplishing most of the tasks involved in the skinning and butchery of the carcass. He was amazed at how sharp and robust the edges of the handaxes were. There was no difficulty making the initial cuts through the hair-covered hide, though it was necessary to remove hairs which adhered to the implement across the cutting edge. On two occasions (both within the first twenty minutes of the experiment) he made accidental cuts through the hide while skinning the animal which he attributed to his lack of experience with the tools and to his initial belief that they were not as sharp as modern butchery tools. As became obvious to the observers, Mr. Dawson quickly gained experience with the tools, working out for himself which were the best edge shapes for certain tasks and how to manipulate the tools. His vast experience of butchery practices was clearly a great advantage, allowing him to concentrate on the tool use rather than spending time working out the best way to proceed with the butchery, as would have been the case with a less experienced person.

One of the most interesting features of the experiment was the way in which Mr. Dawson held the handaxes. As noted above, he had no pre-conceived ideas about how to hold and use the tools. He naturally held the handaxes in a finger and thumb grip. There was no contact between the implement and the palm of his hand. This might seem the obvious way to hold an implement which has a sharp edge all the way round but, where heavier-duty activities are involved, it might be thought that putting pressure on the implement with the palm of the hand, perhaps using leather for protection, would be helpful. During this experiment this was found to be unnecessary. With the finger and thumb grip, it is possible to exert enough pressure for all the tasks involved in the butchery of a carcass of this size. It is also interesting to note that the pressure exerted in butchery is mainly applied by the hand which is not holding the implement. While holding the implement in the right hand, the butcher pulls or pushes the skin and flesh with the left hand, putting them under tension. The skin/meat then parts more easily under the slicing action of the implement, literally parting in the path of the implement. This action has another important implication, namely that it keeps the implement free from fat and grease. Only the cutting edge is in contact with the skin/flesh. Even where the skin/flesh was not under tension the area being cut was pushed/pulled away from the path of the implement with the left hand. This is apparently standard practice, as generally small knives (15 to 20 cm in length) are used to butcher carcasses of this size and, as with flint implements, an accumulation of fat and grease on the handle of the implement would make the grip slipperier and so reduce the efficiency of the ask. Thus, worries about handaxes becoming slippery with fat and grease during butchery would seem to be unfounded, when the task is accomplished by an expert.

Each time Mr. Dawson picked up a new implement he studied it very carefully, noting the shape and length of the edges, before beginning to use it. He then chose the area of the edge which he thought best suited to the task in hand. Of interest here is the fact that he did not necessarily see the tip edge as the most useful. It is also true to say that the slicing motion utilised larger areas of the edge than might have been expected. This motion involved the movement of the implement in an arc, perhaps with contact initially at the “but” end and finishing the action with contact at the tip. The effect was a smooth, continuous curvilinear motion rather than a long, straight, slice through the skin/flesh using only one section of the edge, as would be expected with a steel butchery knife. In this way Mr. Dawson was making the best use of the long curved edges of the handaxes.

Due to this arced slicing motion and the tension under which the skin/flesh was put, it appeared that the butchery process essentially involved...
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repeated, skilfully placed, and relatively gentle motions. There was no evidence of a need for vigorous slicing or sawing of flesh. If in the Palaeolithic period skill and technique similarly overcame the need for more robust actions this must have implications for the rate of blunting and re-sharpening of flint tools.

The only task for which the handaxes seemed inadequate was cutting bone. This was attempted three times during the experiment, twice as part of the actual butchery task and once as an experiment to see whether or not cutting bone would blunt an edge. An attempt was made to saw the rib cage in half in order to produce "spare ribs," for this a large handaxe was selected, because of its weight and the length and robustness of its edges. An attempt was made to saw across the ribs, but after a number of strokes it became clear that the handaxe would not accomplish this particular task. However, the bones were quite deeply scored as a result and were snapped by hand in the right places for the removal of the "spare ribs." The same result was found when sawing through the spinal column. When this was found to be ineffective, a chopping motion was used which pulverised the bone, but did not cut through it. An attempt was then made using a large hard-hammer flake, but again the tool was of little use for this task and suffered quite extensive edge damage. Perhaps the task could have been accomplished if Mr. Dawson had persevered for longer, but in the interests of efficiency it was decided once again to snap the bone by hand. Obviously, the pulverisation of the vertebrae contributed to this process and ensured that the break was in the right place.

Recording the experiment. The experiment was recorded using video filming, still photography and hand-written notes, in order that all possible evidence relating to the use of the tools be noted, to assist their future micro-wear analysis. The video tapes are currently being edited to make a short film showing the experiment, which can be used for demonstration and educational purposes; it should be of great value to those interested in the use of Palaeolithic tools and in use-wear analysis. This will include the most interesting edges of the experiment and the more informative sections of dialogue. Overall, this was a successful method of recording the experiment, allowing a total analysis of all aspects of the tool use, after the event, including use of slow motion.

Conclusion

Mr. Dawson found the handaxes comfortable to hold, well balanced and unexpectedly sharp. As noted above his lack of experience with stone tools proved no handicap, as his practical skills and experience enabled him to use the handaxes as effective tools, utilising their edges to the best advantage. The arced slicing motion (see above), for example, is not necessary when cutting with a straight steel knife, but is very efficient when cutting with the curved edge of an ovate handaxe. Interestingly Mr. Dawson did not express much enthusiasm for the flakes which were available for his use in the experiment.

He suggested that the handaxes not only had much more robust edges, but also offered a wider variety of edge types, including the razor sharp flake edge produced by the tranchelet flake removal (a feature seen on so many Boxgrove handaxes). He therefore saw no reason to test the efficiency of most of the flakes despite appeals from the author.

The implements used in the experiment are now being analysed for use-wear traces. Preliminary results indicate that the clear use-wear traces formed during the experiment are very similar to those recorded on a growing number of handaxes from Boxgrove. It may be that a consistent picture can be built up from the large amounts of butchered bone found at the site in close association with lithic artefacts, the use-wear analysis of the Boxgrove artefacts themselves, and the experimental evidence outlined above. At this stage it might be suggested that ovate handaxes were made at Boxgrove specifically with the many and varied tasks involved in butchery in mind as they were (and are) very efficient at accomplishing these tasks. It is hoped that further experimentation and use-wear analysis of a larger sample of the artefacts from the site will demonstrate whether this suggestion is correct.

Acknowledgements

Mr. Peter Dawson is acknowledged for the key role he played in the experiment and Dr. Jackie Waldren is thanked for making the initial contact with Mr. Dawson. Thanks also go to Dr. Bill Waldren for filming the experiment, Mr. Phil Harding for making the implements and to Dr. Nigel Spencer, Dr. Robert Payne and Dr. Ruth Charles for their comments and assistance during the experiment. I am grateful to Dr. D.A. Roe for his help and encouragement in setting up the experiment and for his valuable suggestions in relation to this manuscript. The experiment was financed by N.E.R.C. and the Research Laboratory for Archaeology and the History of Art, University of Oxford.

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