Helinium, XXXIV/2, 1994, pp. 176-185

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INTRODUCTION : THERE IS MORE TO LIFE THAN BUTCHERING AND HARVESTING

Introduction

In the past years several conferences on use wear analysis have taken place, resulting in a number of publications (for Tübingen see Owen & Unrath (eds.) 1986 ; Valbonne, see Beyries (ed.) 1988 ; Uppsala, see Gräslund *et al.* (eds.) 1990 ; Liège, see Anderson *et al.* (eds.) 1993). During the eighties these meetings were very much directed towards various methodological issues (for instance the discussion about the validity of the various approaches reflected in Newcomer *et al.* 1986 *contra* Unrath *et al.* 1986). The meeting in Uppsala was the first to specifically address archeological questions ; here several papers sought to show the relevance of functional data for current archaeological issues (a.o. Aldenderfer 1988 ; Yerkes 1988).

In previous wear trace analyses much emphasis was put on subsistence activities. Especially shooting and butchering received a lot of attention : shooting experiments are among the best-documented (Fisher *et al.* 1984 ; Odell & Cowan 1986 ; Van Gijn 1990). This is not so surprising as most use wear analyses were performed on paleolithic assemblages, from a period we continue to implicitly associate with hunters. If non-subsistence activities were adressed, these were frequently related to bone or antler working, demonstrated to have taken place at the spectacular french late-paleolithic sites, or to hide scraping (Moss 1983 ; Plisson 1985 ; Symens 1986). Little thought was given to the possible meaning of the presence of wood working tools or plant processing implements. In fact, it can even be argued that there was little attention for any past activity involving plants, whether it be for food or handicraft purposes. This is partially due to the male bias towards hunting and butchering (see Owen, this volume, for a discussion of the gender bias prevailing in wear trace analysis). Another reason may be the emphasis on retouched implements in functional analyses, whereas plant working seems to have predominantly been done with unmodified implements (cf. Gero 1991 ; Van Gijn 1990).

Recently, with more and more people being preoccupied with the later periods of prehistory, the awareness is growing that there is more to prehistoric life than just looking for food. Those studying neolithic assemblages are coming across a variety of strange polishes, which fall outside the generally formulated categories ; nevertheless, they are so well-defined and conspicuous that they can hardly be dismissed as 'ambiguous' or 'uncertain'. In fact, in some cases it is such a distinct category that everybody knows what to think of when somebody refers to 'polish 23', one of the unexplained but well-defined types of wear traces. This particular polish type is found in assemblages deriving

from widely separated regions of early neolithic Northwest Europe and must be due to a circumscribed activity, relevant to entire communities. It is very likely that several of these new polish types can be associated with handicraft activities or with unknown ways of processing food. Keeley (1983) referred to such activities as neolithic novelties.

Because of the fact that we are finding so many similar traces, those working with material from the later periods of prehistory felt the need to communicate on a regular basis. An informal meeting, called together by P. C. Anderson and B. Gassin in Jalès (France) in October 1993, got many of these researchers together. It was in this fruitful get-together that the idea was put forward to have a meeting directed at enigmatic wear traces and their possible meaning in terms of complex manufacturing and food processing activities. More or less necessarily, the meeting would be directed at neolithic and bronze age assemblages. It was held at the Institute for Prehistory, University of Leiden, from November 1-4, 1994. The papers presented in this volume are based on the presentations.

Terminology

Before proceeding, it may be useful to discuss some of the concepts used in this volume. Obviously, it is very difficult to entirely separate manufacturing or handicraft activities from those involving subsistence. Many handicrafts are performed with the ultimate aim of gathering food in a more efficient manner. Examples are the manufacture of fish traps or the making of a wooden club. Also, various objects, involving flint, are directed at the processing of food products, such as threshing sledges. It is therefore impossible to make a strict separation between handicraft and subsistence activities. This is even more so because both require a prior stage of collecting and this collection phase is usually part of a food gathering or hunting expedition : before we can process a hide for the making of a blanket, it needs to be collected from the animal, which, naturally, is probably consumed as well. Something similar pertains to plants : nettles, for example, were collected both for food (they are very rich in vitamin C) and for the production of fibres. I believe therefore that at the collecting phase it is very difficult to differentiate between manufacturing and subsistence activities (*contra* Juel Jensen 1994, 162), unless of course one is dealing with a contact material unlikely to have been connected with one or the other (for example, the cutting of reeds most likely is related to manufacturing tasks).

Several different terms have been put forward to describe those activities not directly related to subsistence. A first that needs consideration is the term maintenance. This term is a bit misleading, because it implies that objects were never made in the first place, but only had to be repaired (maintained). I would suggest that manufacturing activities is a more appropriate indication for such tasks as the making of bone awls or mats from reeds. A second

term, craft, is to some extent confusing as well, because it suggests a form of specialisation within the local community ; in that respect handicraft is a more appropriate word, because it lacks social implications. There is no evidence in neolithic Northwest Europe for formalized specialisation ; only during the bronze age can we observe the occurrence of specialists in the community. This, of course, does not mean that individuals could not be very good at something, producing their specialty for the entire community. In fact, such a form of informal, *ad hoc*, specialisation has been proposed for the production of lithic implements in bandkeramic culture (De Grooth 1987). Handicraft would include for example the making of beads from stone or shell, or the making of baskets and wooden objects and is here used almost synonymously with the term manufacturing activities.

Last, we can distinguish processing activities. Two different varieties can be differentiated, those related to subsistence and those related to handicraft, but, again, they cannot always be strictly separated. Various tools are directed at the processing of food such as the threshing sledge ; this implement loosens the grains from the husks but it is also argued that another, perhaps more important, use of the sledge was the chopping of straw for fodder or tempering material (Anderson, this volume). Processing material for handicraft tasks would include the treatment of a raw hide, to be used for various end products such as shoes or blankets. Another example is the processing of plant material, like nettles, to produce fibres ; the fibres can subsequently be used for making clothing or other objects.

The above outline makes clear that it is difficult to entirely separate subsistence from manufacturing tasks. It is especially difficult to differentiate the collection of food from the collection of raw materials ; this implies that cutting implements, which are presumably used for collecting, can usually not be attributed to either subsistence or manufacturing activities.

Enigmatic wear traces and the interpretation of tasks

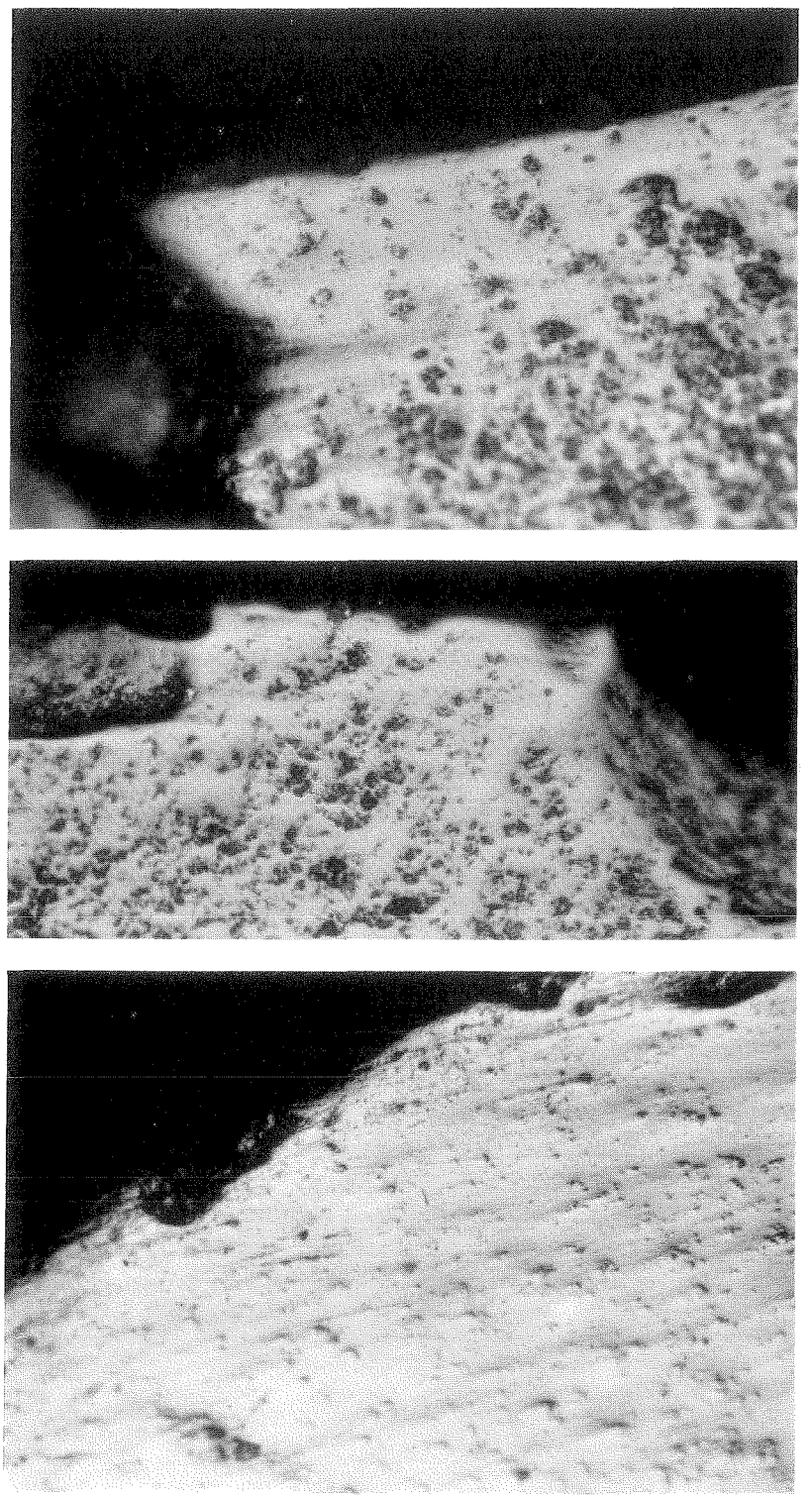
As mentioned above, the analysis of flint assemblages from the later periods of prehistory has produced quite a lot of enigmatic wear traces. Several types of wear are known which are very well-developed and very distinctive, but for which we have, as yet, no reference in the experimental collections. The analysis of paleolithic material has not posited serious problems, perhaps because the tasks the flint tools were involved in turned out to be relatively straightforward, involving only one contact material and a simple motion, or because the traces on paleolithic tools were so ambiguous that they could be dismissed as 'unknown' or 'not interpretable'. It is also possible that, because most paleolithic assemblages were examined during the optimistic, initial phase of microwear research (cf. Juel Jensen 1988a, 59), some ambiguous traces may have been overlooked or put in 'standard' categories as hide or bone.

The dependancy of functional analysis on experiments is an aspect many (general) archeologists are insufficiently aware of. Just because traceologists make use of microscopes does not mean they are practising a 'hard' science. By carrying out various experiments we create a reference collection which defines and circumscribes the limits of our inferences : we can only interpret wear traces we are familiar with, because we have done experiments with tasks causing such traces. Even so, empirically observable similarity does not exclude the possibility that similar traces may be caused by yet another, unknown activity. This implies that a functional inference must always be seen as the best explanation at the time and not as a factual statement with an indefinite validity.

The enigmatic traces on neolithic implements clearly ask for an interpretation, and thus for new experiments, but it is very difficult to imagine which experiments should be carried out and in what way. The fact that we cannot attribute an interpretation to these traces confronts us on the one hand with our lack of inspiration, on the other hand with a lack of rich contextual data which could have directed our experimental investigations. Our lack of imagination is a very crucial problem relating to the neolithic and later periods. It is clear that most of the activities, whether related to food-processing or handicraft, are complex, involving a compilation of different steps and procedures. Ethnographic information is of little help because traditionally little attention has been given to material culture studies. Most of the detailed descriptions about procedures used therefore derives from ethnohistoric sources. Because of our dependence on experiments and obscure ethnographic and ethnohistoric information, meetings such as the one reported in this volume or the CNRS research group on plant working (1) are essential for exchanging information. It is also very important that researchers from a variety of countries participate in these gatherings because of the local knowledge, pertaining to farming or handicraft customs, they bring in. Only by integrating the experimental programs can we vary sufficient variables and procedures, enlarging the chances of finding explanations for the different enigmatic traces.

It would, of course, be most helpful if more corroborative, contextual information were available, deriving from other find categories in the site. If we want to go beyond statements about motion and contact material, but would like to know the task the tool was involved in, the task almost needs to be preserved : manufacturing debris from the making of bone tools or shell beads (cf. Van Gijn 1990 ; Calley & Grace 1988). This implies that it is essential to integrate wear trace analysis with the study of other find categories and spatial analysis.

(1) Project by the Centre de Recherche Archéologiques du CNRS "Etude fonctionnelle des outils de silex taillé mis en œuvre pour la récolte et le traitement des végétaux" (P. C. Anderson, L. Astruc, V. Beugnier, S. Beyries, B. Gassin (coordination), A. L. van Gijn, J. E. Gonzalez, J. J. Ibanez, H. Juel Jensen, S. Philibert and A. Rodriguez.



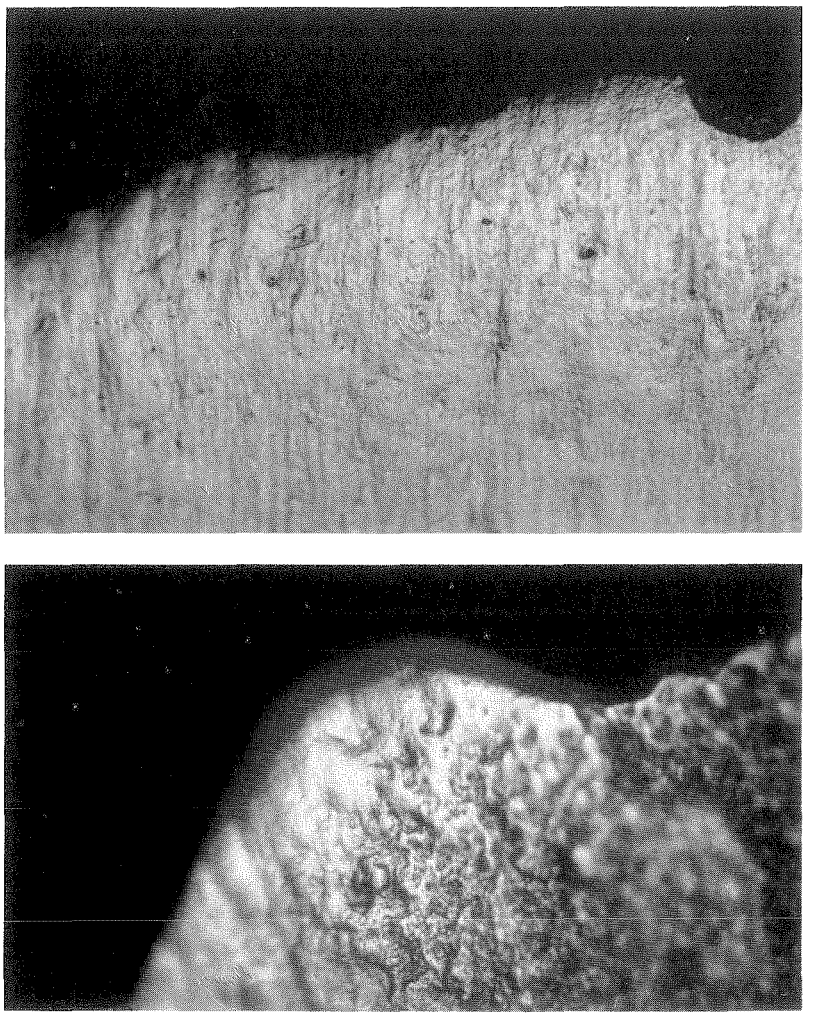


FIG. 1. — Variation in highly reflective experimental polishes. a) polish from harvesting barley (200 ×), b) polish from cutting *Phragmites* (200 ×), c) polish from cutting turves (100 ×), d) polish from scraping leatherhard clay tempered with fine sand (200 ×), e) polish from scraping a fresh deerhide with powdered ochre (200 ×).

CONTENT OF THE ARTICLES

Enigmatic polishes play a central role in many of the papers presented here. One of the issues is the variability in 'sickle gloss' (fig. 1). This has been an issue for quite some time (cf. Anderson 1992 ; Van Gijn 1988, 1992 ; Juel Jensen 1988b, 1994 ; Unger-Hamilton 1985) and various experimental programs are making it increasingly clear that not all 'sickle gloss' is related to the harvesting of silicious plants, be it cereals (fig. 1a) or reeds (fig. 1b) and cane. For instance,

the intense gloss on the bronze age sickles from the Netherlands is not the result of a great deal of harvesting, but from cutting turfs for building material (fig. 1c) (Van Gijn 1988, 1992). Apart from soil, various mineral contact materials cause a highly reflective polish as well. Scraping leatherhard pots (fig. 1d) (see also Gassin 1993), various soft stones (see Astruc and Rodriguez, this volume) or scraping hide to which, for example, ochre powder has been added (fig. 1e) all produce an intensive gloss on a tools' edge, visible with the naked eye. The highly glossy inserts for threshing sledges constitute another example (Anderson & Inizan 1994).

Threshing sledge flints form one focus in this volume. Three articles deal with threshing sledge flints (Anderson, Skakun and Yerkes & Kardulias). It turns out that the intense gloss displayed by some blades or blade fragments found in Near Eastern and also Southeast European neolithic and bronze age sites can sometimes be attributed to their use as threshing sledge flints. The primary purpose of a threshing sledge may be to separate the seeds from the chaff, but it is also a very suitable tool for finely chopping straw. Anderson argues that the production of straw may even be equally important and notes a synchronous increase in building activities in the Near East. The chopped straw could have served as tempering for mudbricks and plastering. Here, again, we see the interrelationship between food processing and craft activities. The paper by Yerkes and Kardulias forms a good example of the integrated use of historical information, ethnographic data and an analysis of archaeological implements. Skakun has a more culture-historical perspective and relates the appearance of agricultural tools to the question whether agriculture could have been indigenously developed in eastern Europe.

Highly reflective 'plant polish' is another functional puzzle addressed in this volume. Various 'plant-like' polishes are discussed by Gassin and Van Gijn. Gassin describes a very bright, fluid polish with a perpendicular directionality, which, he argues, results from straightening arrow shafts from cane. Van Gijn reports on plant-like polishes as well as different manufacturing traces and argues that their differential presence in the lowlands and uplands of the Netherlands may reflect the existence of different cultural traditions. Gonzalez and his colleagues report on various cereal harvesting experiments and contribute to the question whether or not we can differentiate between polish from cereals and that from reeds and other silicious plants.

The papers by Astruc and Rodriguez deal with a different aspect of manufacturing activities : making stone objects with flint tools. Astruc observes a combination of traces related to the working of stone objects. Rodriguez studied several blades displaying abrasive polish and rounding from southern Spain ; after an extensive experimental program, she arrives at the hypothesis that the implements were used for either shale or hide working.

More general in content are the papers by Fullagar, Owen and Hurcombe. Fullagar, working in Australia, where formalized tool categories are rare and well-developed wear traces even more so, argues strongly for a more integrated

approach of functional analysis, involving residue studies as well. He also examines the relative importance of handicraft through time. Owen has reviewed previous wear trace analyses and experimental programs and concludes that the choice of experiments and the conclusions drawn are heavily influenced by a male bias. Hurcombe has made an inventory of the craft activities which could have been carried out with stone tools and evaluates the tool type needed for various stages in craft production.

Conclusion

To a certain extent this volume reflects the current 'state of the art'. In the mid-eighties much of the argument was directed at a determination of the limits of inference imposed by the method (Unrath *et al.* 1986). The realization that postdepositional surface modifications frequently impeded an interpretation, that short-term use hardly caused any interpretable wear traces and that wear traces from various contact materials overlapped, caused many people to question the validity of the method. The situation stabilized more or less in the late eighties, when promising results kept appearing and wear trace analists made an effort to address relevant archaeological issues. One 'hot topic' was the functional differentiation of sites within a settlement system (permanent settlements, basecamps, extraction sites and so forth). However, it has proven very difficult to determine which activities are characteristic for which type of site (cf. Van Gijn 1990, 129-130).

Nowadays we continue to try to push the limits of inference but we may be asking the wrong questions. For example, the possibilities of wear trace analysis in the reconstruction of activity areas are considerably less than initially thought because of palimpsest problems. The same pertains to questions related to the reconstruction of the economic basis for a particular location. With more and more data becoming available, it is possible, however, to study large scale patterning or observe developments through time in the way flint was used by various prehistoric communities. To answer such broad questions it may already be very useful to determine the frequency in which implements display traces of use and how this relates to the type of raw material the implements are made of. Variations herein may be suggestive of the existence of changing alliance networks.

The fact that so few articles really arrive at conclusions about handicraft activities supports the thesis of Juel Jensen (1994) that, unless corroborative evidence is available, tasks are very difficult to interpret. She has rightly contested that butchering, harvesting cereals and hunting are the only tasks we are able to trace solely on the basis of the wear evidence, because the relation between the traces and the task is simple and direct. This is not the case with a wood working implement, because all sorts of objects could have been produced by it. Generally, the level of resolution of the functional data is simply not sufficient in and by itself to arrive at statements about tasks.

We can only assume that tools with a plant polish oriented in a perpendicular direction in relation to the working edge were involved in craft activities with plantmaterial ; which task was actually carried out is impossible to determine. Nevertheless, I believe we should continue to attempt to reconstruct tasks. In order to do so, we need a growing awareness of the interrelationships between various find categories, indicative of technological choices (cf. Lemonnier 1990). Wear trace analysis from this perspective is just one aspect of an interdisciplinary, integrative analysis of the prehistoric remains.

Acknowledgements

The meeting at the University of Leiden, in November 1994, could not have taken place without the generous financial support of the Royal Dutch Academy of Art and Sciences, the Leiden University Foundation and the Faculty of Pre- and Protohistory of the University of Leiden. Monique van den Dries, Channah Nieuwenhuis, Serge Polman, Marie-Claire Schallig and José Schreurs assisted with the organisation. W. Boer and J. J. M. Uitendaal greatly contributed to the congenial atmosphere by cooking good food for us. I thank my colleagues at the institute, especially Leendert Louwe Kooijmans who regularly came to listen, for their support. Foremost, I wish to thank all participants for their enthusiasm and for contributing towards the discussions and microscope sessions.

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