
Post-analysis replication of use-wear traces on stone tools from the Mesolithic site of Thatcham (England)

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RÉSUMÉ

L'analyse de microtraces des outils en pierre provenant du site de Thatcham (Angleterre) a révélé qu'un nombre disproportionné de ces outils ont été utilisés pour couper une matière tendre. La chasse et le traitement de la viande ont été virtuellement écartés, ce qui a éliminé la viande comme ressource alimentaire. Il est notoirement difficile d'identifier avec précision la matière travaillée quand elle est « tendre », car, dans ce cas, elle a tendance à moins modifier le tranchant de l'outil. Afin d'obtenir des renseignements plus précis, spécifiques du site, sur l'usage de ces outils, on a effectué une expérimentation post-analytique. On a fabriqué des copies de ces outils et on les a utilisées sur une variété de matières, de racines végétales entre autres, pour essayer d'associer l'usure de ces outils et celle des pièces archéologiques. De cette manière, on peut utiliser un système de vérification des résultats, en essayant de reproduire des traces qui ne sont pas aisément identifiables au premier abord, pour résoudre éventuellement des problèmes particuliers au site.

ABSTRACT

The microwear analysis of the stone tools from this site revealed a disproportionate amount of them as having been used for cutting soft material. Hunting and meat processing have been virtually ruled out, which eliminates meat as a food resource. It is notoriously difficult to identify the precise worked material when it is « soft », as, being soft, it tends to cause less modification to the tool's edge. In order to obtain more precise, site specific, information as to the use of these tools, post-analysis replication was carried out. Replicas of the tools were made and used on a variety of materials including root vegetables, to try to match the wear on these tools with that on the archaeological specimens. In this way, a system of checking results by attempting to replicate traces which are not at first easily identifiable can be used to try to solve any site specific problems that occur.

A number of Mesolithic sites are located at Thatcham in Berkshire, in the south of England. Thatcham is located in the Kennet Valley, which is

a tributary of the Thames (fig. 1). The site was discovered in 1920. Excavations were carried out in 1921, the late 1950's and 1989. The flint industry

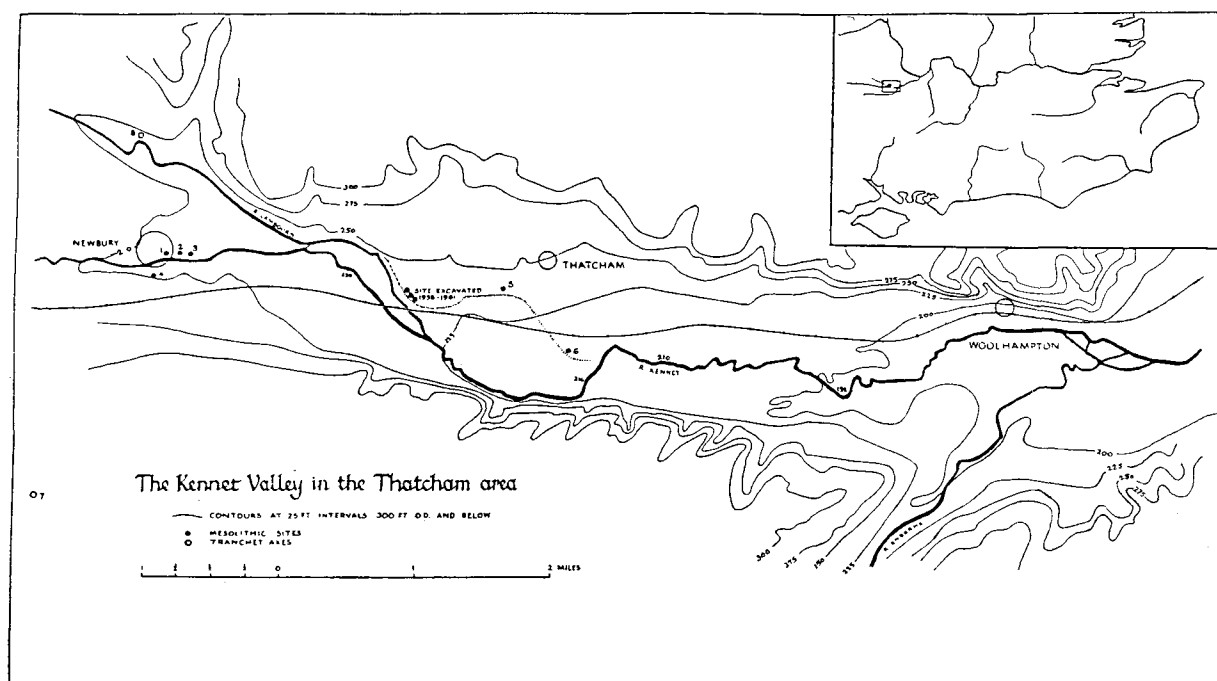


Fig. 1. Kennet Valley from Wymer 1962.

was compared to that of Svaerborg in Denmark, and similarities were also noted with microlithic industries from the Yorkshire moors. The date was proposed as being about 5 000 BC. The sites are located on the edge of what is now a reed swamp and was originally a lake. Flint was available locally (Wymer, 1962). The tool types are almost entirely microlithic and consist of points, crescents and triangles (Healey, in press) (fig. 2).

The assemblage from the 1989 excavation was subjected to microwear analysis. This was undertaken by Dr Roger Grace (Grace, in press). It aimed at drawing conclusions about the kind of activities which were carried out at the site. From these, it was hoped that interpretations as to site use could be made.

The results of Grace's work suggested that the site most likely represented a home base (see Grace, this vol. : fig. 4). However, the results posed several questions. For a site to be identified as a home base, a wide range of activities needs to be represented, including food collection and processing. However, according to R. Grace, only one possible projectile point was identified by use wear, which means that hunting appears to be under-represented. A disproportionately large amount of tools were identified as having been

used for cutting « soft » material. The use-wear traces on these tools do not however correspond to the traces which would indicate hide working or meat or cereal plant processing, all of which are « soft » materials. Meat processing is also considered to be an unlikely activity, due to the lack of evidence for hunting and the fact that there is no evidence for cutting bone, an activity which is usually present with meat processing.

Unable to identify the precise worked material, R. Grace proposed that these tools could represent the exploitation of root vegetables (Grace, in press). Although no organic remains are present at the site, root vegetables were available for exploitation during the Mesolithic in this area. It was suggested by Rob Scaife (Scaife, in press), the botanist who carried out the botanical analysis of Thatcham, that root vegetables could have been present. Gordon Hillman, an archaeobotanist at the Institute of Archaeology in London, has undertaken much work regarding the exploitation of root vegetables during the Mesolithic. His work has concentrated on the analysis of vegetable remains, both in coprolites and preserved in loose soil. This has shown that among other things the tuberous roots of certain reeds could have been eaten by Mesolithic people and almost certainly

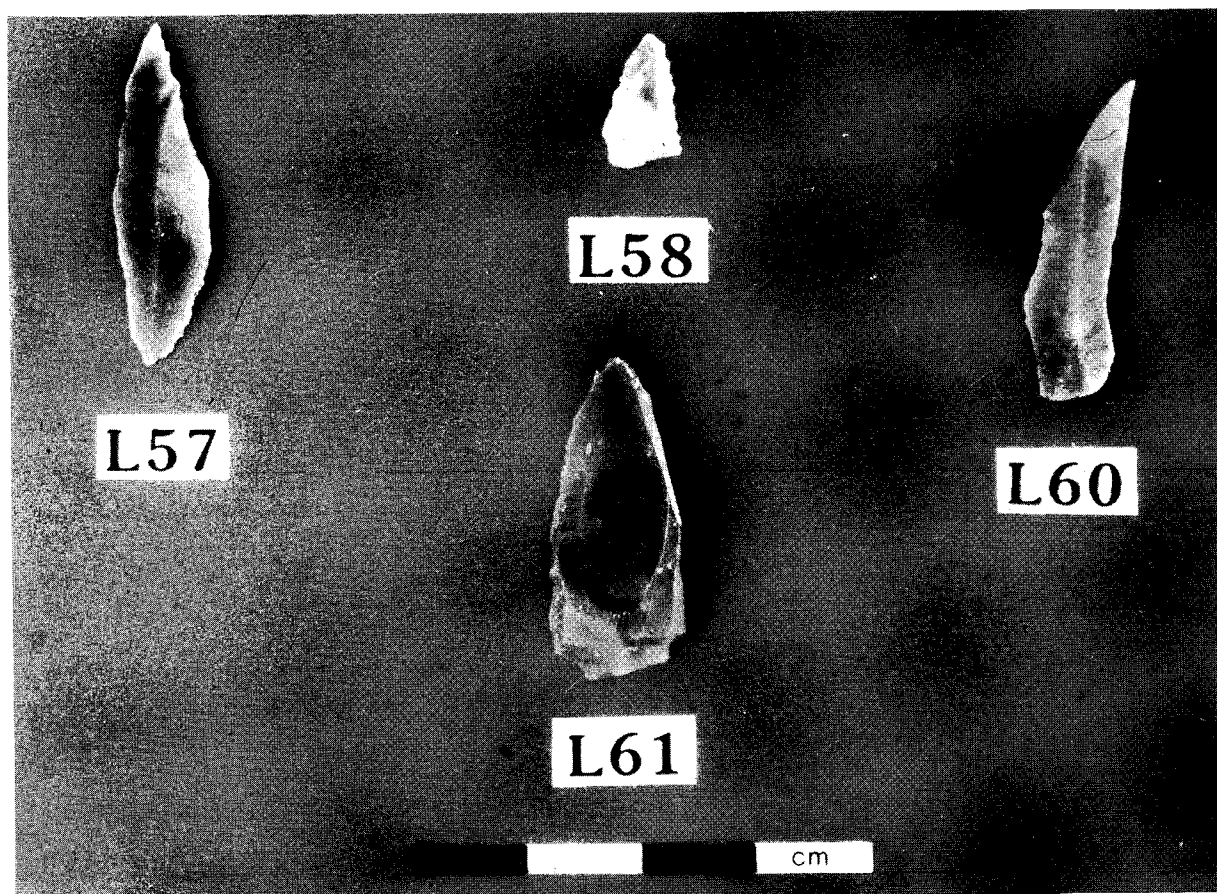


Fig. 2. Tool types from Healey, in press.

would have been available in the marshes near the site. His list of vegetables available in the Mesolithic, in the south of England, includes the roots of the following reeds : catstail/reedmace (*Typha*, spp.) common reed (*Phragmites*), sea club rush (*Scirpus maritimus*) and bulrush (*Schoenoplectus* spp.) (Hillman, *et al.*, 1989). Wild parsnips, wild carrots and a wild form of salsify would also have been available in drier areas, on base-rich chalk downland ; the « pig-nut », which is another root food, would have been available throughout most deciduous woodland.

The location of Thatcham near what is at present a reed swamp and was originally a lake supports this idea. R. Grace has shown that the reeds themselves were clearly not exploited as « reeds » are silica-rich and produce a significant polish quite quickly, and this is not the case with these « cutting soft tools » (Grace in press).

Tools which have been used on soft material are particularly difficult to identify as to specific

worked material, as soft materials « produce less stress and abrasion on the tool's edge and so produce less use wear making precise identifications extremely difficult, especially if these tools have not been used for long periods of time » (Grace, in press). It was suggested by R. Grace that one way of obtaining greater precision in the identification of these traces was to carry out a post-analysis replication.

Traditionally, microwear analysis is undertaken by comparing the results of use-wear traces on archaeological tools with those on experimental tools, that is experiments are carried out, use-wear traces are recorded, and archaeological pieces are matched as closely as possible to the traces on the experimental tools. In this case, however, the situation has been reversed. Having located some use-wear traces which were not immediately identifiable, a possible use has been suggested by paleoenvironmental evidence.

The experiments

Fifteen tools were made based on Thatcham tools with unidentified use-wear traces. Five tool types were selected, and three replicas were made of each. The replicas were used either on hide wood, antler, parsnip or carrot. They were all used for 5 minutes each and were used in a cutting motion (fig. 3 and 4). Some of the tools



Fig. 3. Experimental use, hide.



Fig. 4. Experimental use, carrot.

were hafted, using beeswax and resin. The tools were all quite small, and all had edge angles of less than 35° . The use-wear traces on the archaeological tools were not studied by the experimenters.

After initial microwear analysis of the experimental tools, those used on antler were discarded. The large amount of edge damage they produced after such a short amount of time indicated that these tools were inefficient for the task of cutting antler. The use-wear traces on the tools used for cutting wood, parsnip and carrot were recorded.

Eleven more replicas were made, some of the original five pieces were replicated again, and four new tools were incorporated into the study. These tools were again used for 5 minutes on either wood, hide, parsnip or carrot. The results were again recorded.

The use-wear traces were analysed according to the method of functional analysis developed by Roger Grace (1989).

The results

As the traces left by wood are known and are incorporated into Grace's functional analysis method, wood traces were recorded as a verification of the correctness of the interpretations. Hide was tested as another soft material in order to compare the traces left by it with those left by the vegetable materials. The traces left by hide are few fractures, invasive polish and edge rounding. This is due to the flexibility of the material. Other known soft materials are all flexible and therefore produce wear traces similar to this; meat is softer than hide and so produces fewer fractures and so on. The traces left by the parsnips and carrots were entirely different and very distinctive even after such a short time. An almost continuous line of micro-snap fractures was the main indication of use. Very little polish was evident, sometimes there was a rather undeveloped polish along the very edge of the piece, and there was no edge rounding. Parsnips, carrots and other roots are brittle, they are not pliable like other soft materials. They are not however medium hard like wood. This is indicated by the lack of polish and rounding.

Conclusion

Having identified the distinctive traces left by these vegetable materials on the experimental pieces, the results were handed on to R. Grace. He was then able to compare the experimental results with the traces he had found on his archaeological pieces. He found that there was a high degree of correspondence between the use-wear traces on the two sets of pieces based on the preliminary examination.

It is not possible, based upon such preliminary experiments, to claim that this indicates that root vegetables were processed at Thatcham. The post-analysis method of studying unidentified use-wear traces has however suggested a use, and the experiments undertaken have indicated that root vegetables appeared to leave distinctive use-wear

traces. A more detailed experimental programme has been shown to be necessary, after which a clear identification of the use of the Thatcham tools will hopefully be possible. As with any other organic remains, the identification of their presence or use at a site can often rest entirely on the use-wear traces they have left on the stone tools used to process them.

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