

**AN ASSEMBLAGE OF MICROLITHIC ENGRAVERS FROM
THE CHALCOLITHIC LEVELS OF DEĞİRMENTEPE
(MALATYA) ***

Güven ARSEBÜK

During the 1982 campaign at Değirmentepe**, an interesting lithic assemblage of the late Chalcolithic was recovered from the room BY₁ (Pl. I/1). The assemblage (Pl. I/2) was composed of small to medium sized pebbles (Pl. III/1), cores (Pl. III/2-5), trimming debris, dedium to small flakes (Pl. III/6-10) and the actual tools (Pls. IV-V). At first glance, these tools looked as if they were all borers.

Since similiar artifacts were also encountered during the previous years at Değirmentepe, these borer-like specimens were not new to us. Therefore, until a thorough microscopic edge wear study of the sort done elsewhere in the last two decades (e.g. Hayden, 1979; Semenov, 1964) was completed in the fall of 1982, we, rather loosely, referred to these specific tools as the *b o r e r s* and assumed that they were mainly used for various drilling purposes.

Our impetuous classification of these tools as borers was based on the implicit assumption that an artifact's general morphology was more or less correlated with its dominant function. A closer look with a microscope at the working locations on the edges, i.e. points, of the artifacts, however, compelled us to revise our thoughts on the probable function of these tools. It is highly probable now

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** For the archaeological work done at Değirmentepe, see Esin, 1981 A; 1981 B; 1983 A; 1983 B.

that they were not borers but engravers which might have been employed for a specific purpose: To incise soft stone seals.

The 1982 assemblage with all its pebbles, cores, trimming debris, flakes and the actual tools totaled slightly more than 2.500 specimens. The number of the actual implements in the assemblage was remarkably high; some 85 % of the whole assemblage was made up of implements. The various kinds of artifacts encountered in the entire assemblage may be divided into the following categories :

1. *Pebbles and cores*

Only flint and chert was used as the raw material in the manufacture of the artifacts. The implements were all on flakes which were struck from various sized cores (Pl. III/2-5) made up of water worn pebbles (III/1). The raw material was not homogeneous in its composition, sometimes being vitreous, sometimes granular. This heterogeneity of the raw material strongly suggests different geological origins as well as distant formations. Since all the encountered raw material was in the form of water-worn pebbles, it seems highly probable that they were transported from various places as well as distances by the Euphrates to the vicinity of the site and then collected from its banks from among other alluvial materials.

2. *Trimming debris and 'serviceable' flakes*

Flakes struck from the raw material may be grouped into two distinct categories: Trimming debris and serviceable flakes. Both groups have rather pronounced bulbs of percussion, suggesting that the flakes were struck off by sharp and hard blows. Trimming debris were composed of the flakes and flakelets struck from pebbles, cores or even larger flakes during their coarse preparations, hence forming the waste. The percentage of the specimens that could be classified as waste was surprisingly low ($\pm 8\%$) in the 1982 assemblage, suggesting the possibility that the preliminary preparation of the raw material was completed not in our find spot but at another place and that generally only the semishaped material was brought to the site for its final preparation. Even if this were

the case, the small number of waste flakes found at the site is a direct proof of the skill of the manufacturer(s) of these tools.

Serviceable flakes were the ones struck from the already semishaped raw material, with great care and precision, to be finally used as tools. The flakes thus produced (Pl. III/6-10) seem to have needed no major alterations, except for a few notches to form a point or points, to become the actual implements. In other words, these flakes were the preforms (Crabtree, 1972:85). The total area of the serviceable flakes were always less than 12sq. cm. and were either narrowish (Pl. III/7, 10) or broadish (Pl. III/8-9) in appearance.

As a general rule, the broadish flakes were usually transformed into engravers with three or more points, the narrowish ones into single, or at most, double engravers.

3. *Implements*

The actual microlithic implements of the assemblage (Pls. II/2 and IV-V), though somewhat varying in their overall sizes and shapes, were all the same in essence. They all had one or more points; these protrusions were the only functioning parts of these artifacts. The number of points as well as their length and sharpness varied significantly. It may well be argued that this variability depended largely on the specific work that each type of tool was aimed for. The technique employed in shaping these points, however, was always the same. The points were formed by removing very small flakes or flakelets from the side or sides of the preforms. The flakelets were removed from the dorsal as well as the ventral side of the specimens. There are no indications to show that the implements were hafted.

The number of points on each flake varied from one (Pl. IV) to four (Pl. V-VI). This variability seems, on further study and reflection, to be mainly determined by the overall shape of the flake struck from the core. If the shape of the flake permitted, more than one point was made on it. Thus, the principle of manufacture seemed to be that the more ample the flake, the more points were made on it.

Specimens with a single point (Pl. IV) were the simplest tools. They were made on flakes or blades. Implements with two points were the second group in complexity. Again, largely depending on the overall shape of the flake, the two points were sometimes on opposite ends (Pl. V/1-10) and sometimes side by side (Pl. V/11-20). Three (Pl. VI/1-6) or more pointed tools (Pl. VI/7-16) were generally on rather broad flakes which were rectangular or roundish in shape (Pl. VI). The number, as well as the position of the points on each implement, though largely depending on the size and shape of the preform, must also be of functional importance.

Of all the implements taken together, specimens with a single point were most abundant ($\pm 45\%$). Implements with double points came next in the series ($\pm 35\%$), while the three or more pointed examples were the least ($\pm 20\%$) frequent ones.

Results

Microscopic studies of the working edges, i.e. points, of the implements seem to have revealed certain interesting finds. The most significant of them, which is of value regarding function, was that the striations visible on the sides of the points were not circular and continuous lines as is the usual case with the borers. In fact, the striations were short and straight lines, some slanting and some more or less perpendicular to the cutting plane of the point (Pl. II/2), which strongly hint that these artifacts were mainly intended for some kind of incising or engraving purpose. Moreover, the tips of the points of the (used) pieces were not sharp and round but rectangular or trapezoidal in section. Furthermore, the points on their tipends had a denticulated, saw-like appearance (Pl. II/2) as seen through the microscope. These peculiarities seem to betray the direction of the artifacts main use or movement which apparently was a back and forth motion on short and straightish lines. Consequently, we came to the conclusion that the main function of these specific implements was incising and hence that they were engravers.

If they were engravers, what did they engrave? It is clear that they could have been only used to incise or engrave a material

which was softer than themselves, something which was less than 6 or 7 in hardness according to Moh's scale. The presumed usual practice in prehistoric technology was to incise either wood or bone or a soft kind of stone. Using similiar implements of the 1982 assemblage, experiments were conducted to incise certain samples of wood and bone in the laboratory. The wood used was dried boxwood (*B. balearica*) and the bone was a fresh ox-femur. Though the process of incising and engraving was successful, no clear striations as such were encountered on the edges of the implements' points. On the other hand, a slight wear was visible on the tipends of the points.

Since quite a number of stamp seals made of serpentine were found within the Chalcolithic levels of Değirmentepe (Pl. II/1), we finally tried the same experiment using antigorite. Antigorite has a hardness of 3 or 4 and was easily accesible (in the vicinity of Değirmentepe) from the former banks of the Euphrates. Experiments proved that it was possible, in fact quite easy, to engrave antigorite by using flint/chert tools. The implements used in the engraving process were then studied under the microscope. The results obtained were similiar to the ones encountered in the 1982 assemblage. Straight and broken lines, some slanting and some more or less perpendicular to the cutting plane of the points were visible. Moreover, the tipends of the points, which were unworked and sharp at the start, turned out to have a saw-like appearance at the end of the experiment.

Conclusion

Since the results of the laboratory experiments were almost identical to what were recorded on the points of the 1982 assemblage, we came to the conclusion that these implements were actual engravers and that they were mainly used in shaping the designs that appear on the stone seals. The presence of engraved serpentine seals from the Chalcolithic levels of Değirmentepe may well explain the abundant appearance of such engravers at the site.

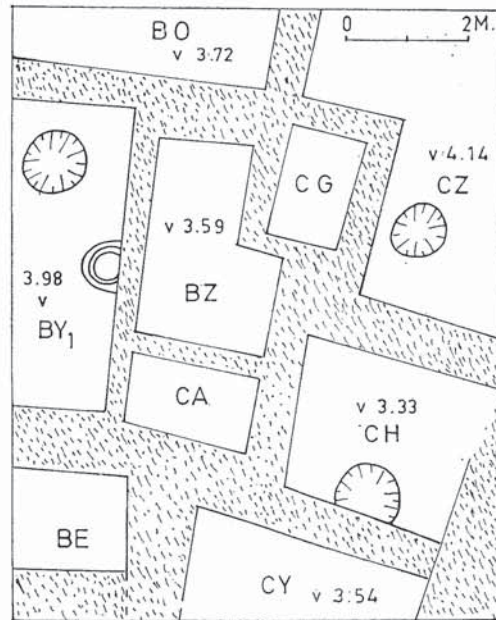
The reason for the presence of the 1982 assemblage in room BY₁ may perhaps be explained by the following hypotheses :

1. Room BY₁ was a workshop of a local seal cutter and he had used these microlithic tools to engrave his stone seals,

2. Room BY₁ was a group atelier of local craftsmen or a part of it, in which these specific tools were made, some used in the spot in designing stone seals and some traded or even exported.

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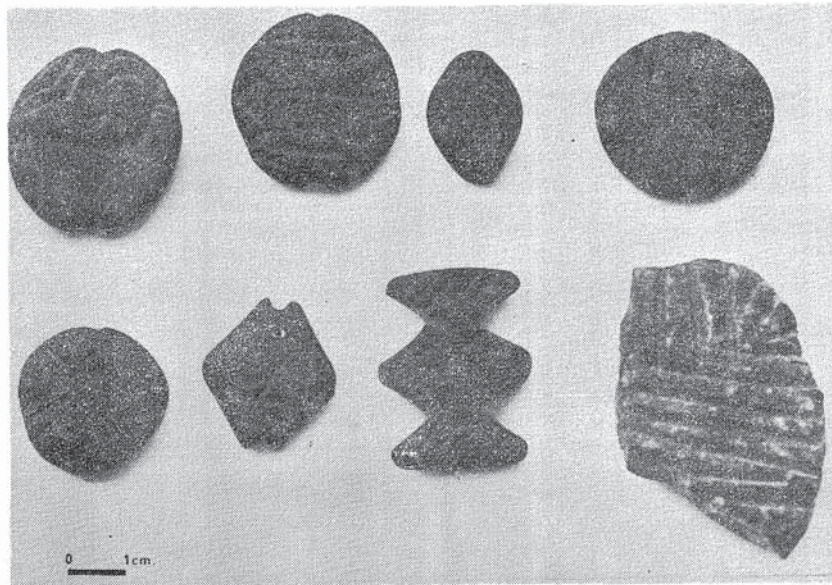
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