The State of the Stone
Terminologies, Continuities and Contexts in Near Eastern Lithics

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An obsidian industry from Neolithic Hagoshrim, Upper Galilee

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Abstract

We present an obsidian assemblage much larger than the ones we are used to in Neolithic sites in the southern Levant. It mostly originates in the Pottery Neolithic layers of the site of Hagoshrim and includes a full range of debitage, cores, core trimming elements, shaped tools and some debris. The preliminary study mainly includes some technological aspects. The production of bladelets removed from cores with one striking platform is the most conspicuous trajectory in the assemblage and the use of the pressure technique is another. Although the question of obsidian sources is not discussed here, we may suggest, following past research and new, not yet published results, that a shift from central to more eastern Anatolian sources seems to have taken place between the Pre-Pottery Neolithic and the Pottery Neolithic period in the southern Levant.

Introduction

Some years ago, when starting our work with the obsidian from the surface collection and later from the excavation of Hagoshrim (Fig. 1), we were excited by the fact that large quantities (thousands of items) of this imported material appear at the site – far beyond the quantities usually found in other Neolithic sites. Later on, we realised that one of the major innovations related to this industry is the use of the pressure technique to produce bladelets and blades. A survey of available obsidian from Neolithic sites in the southern Levant resulted in an understanding that this technology was imported with obsidian as early as the EPPNB (Gopher et al. 1998).

In this paper, we would like to go into more detail concerning the technology of obsidian knapping at Hagoshrim. We present, in a preliminary way, as many stages of the process of obsidian production as our data enables.

The reconstruction of geographical exchange systems and economical and cultural aspects will only be mentioned briefly. This paper, delivered in the 4th PPN lithic workshop in Niğde, Turkey (2001), does not include provenance analysis. However, a recent study of obsidian from Neolithic sites in the southern Levant provides many new (not yet published) results about the sources of these obsidians. These results, including the Hagoshrim finds were incorporated in a recent PhD thesis by S. Delerue supervised by G. Poupeau (Delerue 2007).

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The site of Hagoshrim

The site of Hagoshrim is a major Neolithic settlement in the northern Hula Valley. It has been surface collected for many years by Asaf and excavated on large scale in 1996–1997 by the IAA (Getzov 1999; Getzov 2008). The site includes a component of late Pre-Pottery Neolithic (PPNC), two Pottery Neolithic components (Lodian ["Jericho IX"] and the Wadi Rabah cultures) and a later Chalcolithic (Golanian/Ghassulian) component dated by a small number of radiocarbon determinations (Fig. 1). A similar stratigraphy was exposed at T el T e'o, some 10km to the south of Hagoshrim (Eisenberg et al. 2001).

The rich assemblages of Hagoshrim have been, and still are, under study. The obsidian collected from the surface before excavations and the obsidian collected during the two seasons of excavation form the topic of this paper.

The obsidian assemblage

The obsidian assemblage of Hagoshrim (both surface and excavated finds) consists of some 10,000 items. A preliminary survey of the obsidian finds reveals that the assemblage includes large chunks of raw material, cores prepared and reduced on-site, blanks that have been shaped into tools, used, re-tooled and used again, and, finally discarded. It is clear that pressure as well as percussion techniques were used by the producers of this industry. Apart from the stage of raw material acquisition, obviously missing in the south Levant, all other stages of the chaîne opératoire are present. We concentrate here on some technological aspects of this industry.

Technology

The strategy of core reduction can be inferred from the nature and count of the scars on debitage surfaces. The dominance of bladelet cores is clear. Cores with blade scars or flake scars are scarce (Fig. 2). It is of course clear that a core showing a dominance of bladelet scars could have been used for blade production previously. The obviously higher representation of blades in the debitage and in the tools compared to their proportion in the cores emphasises this point. On the other hand there are cores that have been originally used for bladelet production and subsequently for flakes (see category flake bladelet in Fig. 2). We do, however, think it is quiet safe to state that one of the major aims of the production strategy, if not the major one, was bladelet production.

Core type was defined by the number of striking platforms. The dominance of cores with one striking platform is clear (Fig. 3). These cores are mainly pyramidal or prismatic in shape. Cores with two striking platforms, sometimes opposed, are of note.

When correlating the aim of the core reduction strategy and the core type it can safely be stated that the most common is a core with one striking platform used for the production of bladelets (98 out of the 105 cores with one striking platform are for bladelet production). Cores with two striking platforms were also used for bladelet production (10 out of 11 cores).

Striking platform treatment introduces new elements – abrasion and/or sawing – as possible techniques for preparing cores. Although information is missing for over 40% of
the cores, it is still clear that abrasion was the major treatment of striking platforms. All other categories (Fig. 4) are minor. When omitting the missing cases, the proportion of abrasion on striking platforms is over 60%. This treatment of striking platforms was not observed for flint and is thus unique in the southern Levant. Reconstructing abrasion as a technique for striking platform preparation may raise the question of sawing too. Sawing is known in the region, mainly on stone axes from Neolithic sites (e.g. Gopher 1997). It seems justified to say that sawing has been used in shaping obsidian cores.

Of the cores with abraded striking platforms (N=45) 36 bear one striking platform and most of them (33) are for bladelet production. It thus seems that there is a high correlation between cores with one striking platform, abrasion as major striking platform treatment and bladelet production as the major strategy of core reduction.

The treatment given to the back of the core is of importance here since the use of the pressure technique raises the question as to whether a support device was used in the procedure, and consequently, had the knapper shaped his core to fit a particular device.

A variety of treatments have been observed on the back of the cores with an abraded striking platform including flat plain backs, natural cortical backs, faceted or with removals and abrasion (Fig. 5). There seems to be no clear preference in this category, however, a tendency to have a straight/flat back may be noted, and this may relate to the above mentioned device.

The treatment of the sides of the core shows a variety of possibilities – longitudinal flaking, abrasion, flat plain, faceting, use of previous faking – none of which dominates. As in the above variable the data in Fig. 6 concerns the sample of cores with one striking platform treated by abrasion. The tendency for the core sides to be straight/flat may be related to the fact that pressure technique was used.
The distal ends of the cores with one abraded striking platform are pointed, abraded or flaked (Fig. 7). The number of flat-based cores shaped by abrasion and flaking is higher than the number of pointed distal ends. This too, may possibly relate to the above observations and help to confirm the idea that the technique used for knapping correlates with the way the cores are shaped.

The basic metric data of the cores studied indicate the rate of their use and exhaustion, mainly in their average thickness (Fig. 8). The average overall size indicates a very intensive use.

Core trimming elements are present in the assemblage. These include mainly overshots, some core-base corrections and very few ridge blades and core tablets. This may indicate that percussion is less common in this assemblage.

The bladelets (and blades) in the assemblage show clear characteristics of pressure technique. Their profiles are somewhat curved at the distal end, the ridges are parallel/straight, the bulbs of percussion small/flat, and the percussion points are punctiform.

A short summary of the tool assemblage from the surface collection of Hagoshrim shows the predominance of retouched bladelets/blades and flakes, truncated elements (mostly bladelets and blades) and notched items (mostly bladelets and blades). Arrowheads, sickle blades, burins, scrapers, awls/borers and chamfered bladelets/blades appear...
in small numbers (Fig. 9). Generally, without going into
details, this is somehow a common inventory – possibly a
typical tool assemblage of the Neolithic period. It may, in
a way, tell us that the use of obsidian reflects a variety of
activities and may be accounted for not only in the context
of its high cost as an import.

The aspects of re-tooling and discard have not been
studied in detail. It seems however that caching was practised
(Locus 338, see below) but in most cases obsidian is found
throughout the site in houses, fills, courtyards, etc.

Discussion and summary
Assessing the above data, we now summarise the aspects of
the obsidian industry at Hagoshrim.

Firstly the stages of raw material acquisition is presently
much better known than in the past thanks to the work in
Capadocia by a French-Turkish teams (M.-C. Cauvin et al.
1998; Binder and Balkan-Atlı 2001; Delerue 2007 and many
references therein). The quarry and workshop found at
Kaletepe indicate intensive use of obsidian in the PPN and
a systematic and standardised industry for the production
of blades for export (Binder and Balkan-Atlı 2001). These
were most probably exported as blanks and marketed in the
region or farther afield. This may be taken as an indication
for some sort of specialisation and of differentiation between
small scale and large scale obsidian production and market-
ing. The model we are suggesting for Hagoshrim, and for the
Pottery Neolithic period in the southern Levant in general
(mostly the 8th and 7th millennia cal. BP), is however different
(see below).

Secondly, the way these materials were moved through
the geographical and cultural landscapes and reached the
southern Levant are not a major issue in this paper – whether
it was by indirect chain contacts, marketing by mediating
agents, by travelling agents or by experts. However, the
simple “down the line” model suggested by the pioneers of
obsidian studies in the 1960s (Renfrew et al. 1966; Renfrew et al. 1968) cannot simply be adopted.

Thirdly, the raw material available to the Hagoshrim people included large chunks of raw material. In one case (the Pottery Neolithic, Wadi Rabah stratum IV, Locus 338) a concentration of burnt pieces of obsidian was found including parts of a large core and core trimming elements as well as many chips and chunks, flakes and bladelet/blades and a few tools. It seems that a considerable part of the obsidian was damaged post depositionally by fire. An attempt to put some of these pieces together was partially successful (Fig. 10). The core (both parts, although not yet refitted to each other) weighs 1.5kg. Together with all other pieces of obsidian in Locus 338 the obsidian weighs over 2kg. It seems to us that the material was brought in either as a large natural (cortical) nodule or as a core that was then used and maintained. It is not clear whether the core was used to produce large (target) blanks or was to be split into large flakes and/or blades which themselves were to become cores. We have no large obsidian blanks that can match the size of this core had it been used as a core for the production of blanks. Nor do we know of such blank sizes in any Neolithic lithic assemblage in the region. Moreover, for a valuable material such as obsidian it would be difficult to assume that such large blanks, used for whatever function, would not have been further (secondarily) used. In this context we should mention Kabri – another Pottery Neolithic, Wadi Rabah site in the western Upper Galilee (Prausnitz 1969) in which a large obsidian core (some 40cm in length) was found (Fig. 11). The size of this core and its nature accord well with the option mentioned above that it was not a mere core for blank production but rather a “storage” of expensive raw material used to produce smaller pieces which would become cores.

Fourthly, preparing the cores was an integral part of the industry at Hagoshrim as indicated by the large chunks of raw material, the core trimming elements and the cores themselves.

Fifthly, knapping trajectories included both percussion and pressure techniques (Fig. 12). Mention should be made of a separate trajectory for producing items of bijouterie. This usually made use of waste items for the production of small beads or pendants. However, among these various trajectories there was another sub-trajectory which may be of great importance – producing large items like the “mirror” from the Pottery Neolithic, Wadi Rabah strata at Kabri (Fig. 13) which may indicate the use of obsidian for the production of luxury/prestige goods.

We should also draw attention to the fact that the early stages of production in this industry start with percussion, and only later it splits into two different trajectories (pressure
An obsidian industry from Neolithic Hagshirim, Upper Galilee

and continued percussion) and in some cases ends with going back to percussion.

Conclusion

Raw material was imported from Anatolia (according to the analyses of the 1970s and 1980s by Perlman and Yellin; see also Delerue 2007 and references therein); brought in as large chunks or cores; split or shaped into smaller cores (or perhaps large bijouterie items, if these were imported as pre-shaped items); knapped in two major trajectories to produce mainly bladelets and blades but also flakes; shaped into tools and used in different contexts; re-tooled when needed and later discarded. The different uses of the material seem to have completely exhausted its potential.

This raises a number of important questions. Did obsidian reach the southern Levant with the information/knowledge needed for reducing and using it, especially the pressure technique, which is pretty well unknown around the southern Levant? Did it come in with travelling people or with experts? Was it traded through the system by different agents? All these questions need to be considered through further work on the obsidian industries throughout the Near East which will hopefully be conducted in the near future.

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