

Techno-typological analysis of lithic collections from Sheppard Island and Pniel, Vaal River Valley, South Africa

Madhavi KUNNERIATH & Claire GAILLARD**

* Département de Préhistoire du Muséum national d'Histoire naturelle, Institut de Paléontologie Humaine,
1, rue René Panhard - F-75013, Paris.
lovearchaeology@gmail.com

Abstract

The present study concerns Acheulian assemblages from Pniel and Sheppard Island collected by Breuil in the late 1920s from the Lower Vaal River Valley, South Africa. In the context of recent studies of some earlier collected series and new field work in this region, the present techno-typological analysis contributes to the current topic of understanding better the South African Acheulian.

Most of the unretouched debitage products and all the big cores of the large tool blanks are missing from these assemblages (mainly composed of handaxes and cleavers) hampering the reconstruction of the complete *chaîne opératoire*. Local volcanic or metamorphic outcrops as well as Vaal River gravels provided the raw materials. The large majority of the identifiable flakes are short (side struck) for both handaxes' and cleavers' blanks. The studied assemblages match the regional technical traits with the presence of a few large flakes produced by the Kombewa or Victoria West (in its earliest stages of development) method. Shaping appears more important in Pniel than in Sheppard Island.

In the absence of stratified and datable finds in this region and as sites get lost due to erosional activities, studies on such old collections assume importance.

Keywords: Vaal River Valley, Acheulian, Victoria West method.

Introduction

Techno-typological aspects of lithic assemblages collected from South Africa in the early 1900's have rarely been studied and many sites remain obscure. The present study hopes to contribute to a better understanding of Lower Vaal River archaeology, specifically the Acheulian traits as reflected in the assemblages from 2 selected sites, Sheppard Island and Pniel, where H. Breuil and his colleagues collected many artefacts in 1929. It also will provide details on the variability of assemblages in terms of raw material, the methods followed for the production of the blanks (especially the regional Kombewa and Victoria West), the tool typology, morphology and measurements, and intensity of utilisation of the blanks.

Regional setting

Although the longest sequences of cultures known south of Olduvai Gorge come from Vaal

River Basins (Mason, 1961) forming the primary basis for the Pleistocene cultural and chronological sequence in South Africa, most artefacts collected were surface finds, especially from unfilled pits of diamond diggings by amateurs and professionals over the past many years.

The Lower Vaal River deposits dating to the Middle Pleistocene have yielded rich collections with artefacts of Early and Middle Stone Age. The Basal Older Gravels are believed to have been deposited before the advent of humans in this region while the Upper Older Gravels, probably of Tertiary age, provide a few reworked tools introduced by subsequent disturbance to the gravel (Söhnge & van Riet Lowe, 1937). The Younger Gravels have yielded an abundance of 'Stellenbosch' (I, II and III = Acheulian) factory site debris and rolled and unrolled tools at certain areas. The Youngest Gravels, as at Sheppard Island ('C' gravels) are present only in rare patches and contain mainly rolled and unrolled remains of the earliest phase of 'Fauresmith' (late

Acheulian) culture (Söhnge & van Riet Lowe, 1937).

Sheppard Island (Fig. 1), with an area of about 18 hectares, is located in the Orange Free State or the South West Transvaal. Confined by the old Vaal River bed in the north and by the new channel in the south, this site is not really an island but 'becomes one only during the rainy season, in summer' (van Riet Lowe, 1929). An assemblage, dominated by flakes studied as a precursor to the present study, was in confirmation with the Acheulian and Middle Stone Age industries described by van Riet Lowe (1929). On the basis of associated fossils of extinct elephant species, this site has been dated to Middle Pliestocene.

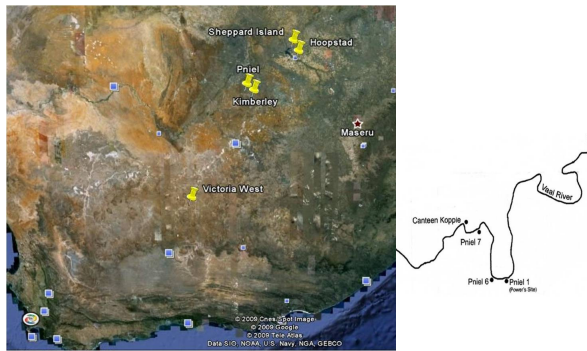


Fig.1. Location of Pniel and Sheppard Island, Vaal River Basin.

Pniel, located about 22 km northwest of Kimberley, on the southern bank of the Vaal River is one of the densest sites among the Vaal River Acheulian sites. There are many localities in Pniel (Fig. 1). The present study was done on a series from Pniel I (and neighbouring localities II to IV), a site discovered and then published by Power (1955) after more than 20 years of collection, and where he mentioned the extraordinary abundance of handaxes and cleavers, particularly the latter, along with fauna. The presence of *Elephas recki*, which disappeared from the local record around 0.8 Ma suggests a Lower Pleistocene age for the artefacts (Beaumont 1999; McNabb *et al.*, 2004). Pniel 6 has been excavated in the 1990s by Beaumont (1990, 1999) then by McNabb. They identified 4 layers and found the Acheulian material, typologically similar to that of Pniel I, in the lowest one.

Materials and Methodology

The study material is kept in the Institut de Paléontologie Humaine, Paris (71 tools from Sheppard Island, localities I, II and III, and 107 from Pniel, localities I, II, III and IV), and in the Musée de l'Homme (Muséum national d'Histoire naturelle), Paris (70 from Sheppard Island, 3 localities, and 76 from Pniel, also the 4 localities).

The assemblages were subject to technological and morphological (including metrical) analysis. Broadly divided into large cutting tools (with technical features often hidden by the shaping) and 'debitage' categories (cores and smaller flakes, retouched or not) the artefacts were described by use of various attributes like abrasion, raw material (volcanic, metamorphic and sedimentary rocks), tool type, blank, cortex, type of striking platform, previous flake scars pattern, outline, physical measurements (three dimensions and platform angle). For the cores, the type, whether it was Levallois, uni/bi facial or discoidal, and the geometry of the volume or number of faces besides the number of exploited surfaces, scar pattern, number of removal scars, length of the longest scar, proportion of exploited surface, and the nature of the non-exploited surface for all the faces were the main details noted. Shaping was characterised by invasiveness of removals, proportion of shaping on each face, length of the longest removal, location on the sides, type of edge (sharp, oblique, steep), retouches, breaks and traces of damage. For cleavers, the position (and measurement) of the cutting edge in relation to the striking platform, type and number of scars, and convexity of the tool were also taken note of. All the data were recorded and processed in Ms. Excel 2007 for analysis. Photographs and ink drawings were also undertaken for selected specimens.

Results

The analysis of Pniel specimens shows the use of volcanic, metamorphic and sedimentary rocks with preference of hornfel/basalt, while some andesite and trachyte as well as a few shale and quartzite specimens also occur. Cleavers are made only on basalt while handaxes show no such preference. Likewise, in Sheppard Island, a preference for volcanic rocks, especially

basalt/hornfel with lesser usage of trachyte, quartzite, schist and shale is observed.

In Pniel side-struck flakes were mostly preferred as blanks for the cleavers while flakes (some large ones) and slabs were used for the handaxes. The presence of Kombewa and Victoria West flake blanks (Fig. 2) has been reported from this site by Goodwin (1933, as referred in Kuman, 2001) and also in the recent studies by Sharon (Sharon, 2007). But only a few handaxes and cleavers attest these methods in the studied collection and the characteristic cores being absent, further analysis could not be done. In Sheppard Island, mainly side-struck and end-struck flakes besides slabs, nodules and cobbles form the blanks for handaxes while short and large flakes besides a single cobble blank are utilized for cleavers. Kombewa flake blanks are common in both handaxes and cleavers. One of the picks is probably on a Victoria West core. While Victoria West (Fig. 3) type of blank is absent among handaxes, the presence of a single specimen among cleavers does not give an idea of the proportion of this prepared core methodology.

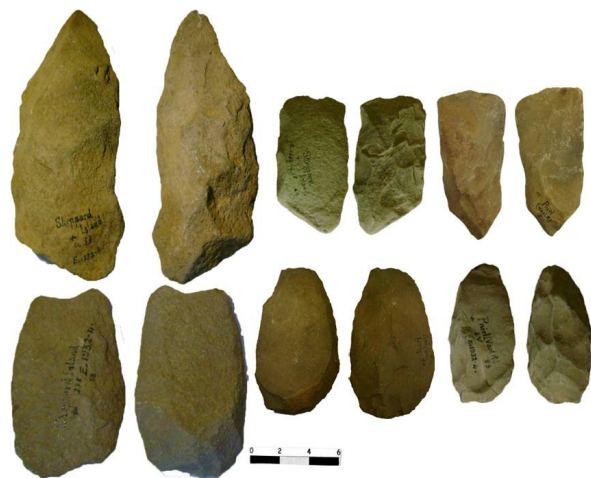


Fig.2. Victoria West and Kombewa specimens from Pniel and Sheppard Island.

Shaping of the large cutting tools was of invasive nature in both the sites, which removed most of the cortex and the striking platform. While plain striking platforms are noticed at Sheppard Island, Pniel specimens, in addition, have faceted and dihedral examples. Cleavers from the latter site have their cutting edge mostly on the right, sometimes along two of the previous scar removals on the dorsal face. Bifacial shaping with an average of 2 generations is seen on both

cleavers and handaxes at both sites. While removals are generally medium or shallow for both assemblages, they usually range between 10 and 20 on each face at Pniel while an average of about 10 removals was observed at Sheppard Island. Only in the former site, scars covering the entire surface of the tool are observed in the handaxes alone. Bifacial convexity and bilateral symmetry was observed for both assemblages, although bifacial symmetry was lacking.

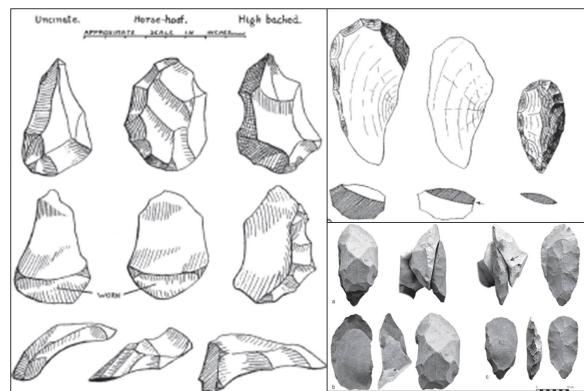


Fig.3. Victoria West Method and type of blanks (Sharon, 2002).



Fig.4. Acheulian tools from Sheppard Island.

In the assemblages from Sheppard Island (Fig. 4), besides the typical Acheulian handaxes and cleavers, some particular types, like a partial handaxe and four handaxes with cleaver cutting edges, a cleaver rounded into a handaxe point and a cleaver with a pick on one end do occur (Fig. 5). Although handaxes and cleavers occurred in various sizes, the latter are never smaller than 110 mm and are mostly broader. Interestingly, the average thickness remains the same for handaxes and cleavers.



Fig.5. Composite tools from Pniel and Sheppard Island.

Study of Pniel assemblage (Fig. 6) shows more variations of the large cutting tools like partial handaxe, a unifacial handaxe and handaxes with cleaver edges, double cleavers, cleaver-cum-pick, and cleaver-cum-handaxe, besides cleaver with proximal bifacial and unifacial shaping (Fig. 5). Cleavers are relatively less in number than handaxes. In length, breadth and thickness, there were not many differences between the cleavers and handaxes, although some of the cleavers were much bigger. The maximum breadth and thickness for both the tools are usually located in the middle and butt regions, probably due to minimal lateral and bifacial trimming here. Most of the handaxes have traditional forms fitting into broad almond, oval, pear triangular, sub triangular, tear shape and biconvex shapes with very few deviating into rare forms of cordiform or discoidal at Pniel. Cleavers are with more rounded U-shaped and straight, diagonal or splayed cutting ends. Other common forms include the pointed V-shaped ones, oval, rectangular and quadrangular. Bilateral symmetry is maintained in most tools to give them these standard 'traditional' forms.

Apart from these large cutting tools there are thirteen flakes (tools as well as unmodified) and six cores (mostly discoidal with 2 Levallois examples also from localities II and IV) from Pniel while there are six cores (mostly discoidal) and two flakes in the Sheppard Island assemblage. Pniel, with slightly more elaborated tools and a few Levallois cores is, probably a later phase of Acheulian as compared to

Sheppard Island. It is also richer in terms of tool variability and number.

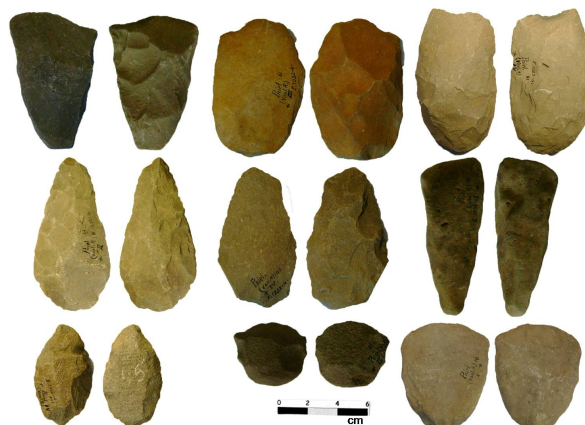


Fig. 6. Acheulian tools from Pniel.

Discussion and Conclusion

Heavily patinated and weathered (due to wind, heavy rains, gravel erosion as well as Vaal River action) assemblages from both sites show the use of selected raw materials from local resources of volcanic, metamorphic and sedimentary rocks as well as Vaal River Gravels to procure flake blanks for the large cutting tools. However, the circumstances of collection (diamond digging rejects) imply that most of the debitage is missing (huge cores left at the sites as Breuil says in his autobiography - unpublished). The minimal representation of tools on Victoria West blanks (as opposed to the finds of the earlier studies) probably points to the production of the blanks elsewhere or may have resulted from different technical stages according to the depth of the layer in the stratigraphy. The analysis of the six cores, mostly discoidal in nature, suggests removals of medium to small flakes and does not conform to the type of flake blanks used for the tools. The cleavers are outnumbered by handaxes in all the localities of both the sites and does not reflect the Power's (1955) report of presence of numerous cleavers at Pniel. However, many handaxes show a short cutting edge at the tip.

Historically significant for preserving and documenting the research interests of early pioneers of archaeology, these assemblages help in understanding the technical behaviour of their makers although their complete *chaîne opératoire* cannot be reconstructed. The Victoria West method of large blank production, well known from the Vaal River sites but with

minimal representation in the studied collections, has not been identified so far in other Acheulian assemblages from elsewhere (except maybe in East Africa; Kuman, 2001). This is interesting in the light of Acheulian discoveries in other parts of the world displaying the characteristic traits, especially when the question of Acheulian diffusion comes into the picture. The detailed knowledge of the technological as well as typological features of the assemblages (as seen in the Victoria West blanks and composite tools of the presently studied material) will contribute to the debate regarding the definition of the Acheulian and also help in reconstructing its evolutionary trends and tracing the diffusion pattern through further comparative studies.

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