Records of the Australian Museum (1993) Supplement 17. ISBN 0 7310 0280 6

The Status of the Horsehoof Core

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ABSTRACT. Since it was first identified (Tindale & Macgraith, 1931:281), the role of the horsehoof core in Australian stone tool technology has been the subject of differing interpretations. From examination of both archaeological and experimentally-replicated material, I present some observations and conclusions intended to further illuminate this question.

AKERMAN, K., 1993. The status of the horsehoof core. Records of the Australian Museum, Supplement 17: 125–127.

Noting its often neatly trimmed platform margin, reminiscent of the secondary retouch on flake scrapers, some writers see the horsehoof core simply as a tool (Tindale, 1937; McCarthy, Bramell & Noone, 1946; Mulvaney & Joyce, 1965), more specifically as a heavy planing or chopping tool. Others give an opposing view, seeing the horsehoof core strictly as a core resulting from flake and/or blade production. Among these are Kamminga (1982:85-91) who bases his views on technological characteristics, notably edge damage; and Binford & O'Connell (1986:425), who cite the evidence of exhausted cores remaining from blade knapping they had witnessed by the Alyawarra. In expressing a similar view, Flenniken & White (1985:135) suggest that the numerous step-fractures that invade the platform surfaces of typical horsehoof cores result from platform preparation techniques involving abrasion, rather than from use as a tool.

A third interpretation is that of Lampert (1981) who sees the Kartan industry as a range of core tools, made on both pebbles and blocks which, with resharpening, become progressively smaller in diameter and steeper edged. For block tools the final stage is the horsehoof core which, in this context, is the worked out remnant of a tool.

Horsehoof cores from Kangaroo Island illustrated by Cooper (1943:351-356) clearly show the extensive stacked or tiered step-flaking that generally affects the major part of the circumference of the striking platform. Multiple platforms occur only rarely. It should be noted here that no one has yet identified the massive unifacially-trimmed pebble tools with similar heavy step-flaking that occur on the island as cores for the production of flakes. On several examples illustrated by Cooper (1943:figs 3,4,7,11,14), the stacked step-fractures are so extensive that a considerable mass of the material overhangs the striking platform. These are too extensive to have been produced, as Flenniken & White suggest (1985:135), '...by rubbing the hammerstone over the edge of the striking platform'. Rather, percussion blows were directed both above the arisses of previous flake scars and between them to deliberately create the stepped effect. When one wants to remove flakes or blades, it could be said that a general rule of thumb is that the striking platform is located immediately behind the ariss. The ariss area acts as one of the controls (because of its greater mass) in

determining the dimensions of the removed flake. This takes into account, of course, hammerstone mass, the nature of the contact area of the hammerstone (pointed, flattened, etc.) and the velocity and angle of the blow in relation to the mass of the core. One cannot help but feel that if horsehoof cores were exhausted or rejected blade/flake cores, they were produced by particularly inept knappers. There is no evidence for the use of core rejuvenation techniques on the cores themselves or on flakes from Kangaroo Island. Indeed, the dorsal surfaces of illustrated utilised flakes (Cooper, 1960:fig.17-41) show no evidence at all of step-flaking about the striking platform. This suggests that when flakes were desired, platform preparation was not undertaken. Cobble chopper rejuvenation flakes, however, do exist on Kangaroo Island and provide evidence that rejuvenation strategies were employed on particular artefact types (Draper, 1987:5).

The size of the Kangaroo Island horsehoofs (mean weight 900 g: Lampert, 1977:213) suggests that, if flakes were the intended product, core rejuvenation should have been possible prior to the extensive stacking of step-fractures.

I believe that step-flaking and the regular stacking of step-fractures on horsehoofs are the result of careful resharpening of the edge of the striking platform. Resharpening is undertaken in this fashion to rejuvenate the edge while only minimally reducing the mass of the implement. Each successive rejuvenation creates a new run of step-fractures which reduce the striking platform area and accentuate the overhang. Ultimately, the step-fractures become stacked to the point where the overhang interferes with the working angle, or the mass of the artefact is reduced to a point lower than that required for the task at hand. Noone (1949:111) arrived at a similar conclusion, including the use of step-flaking to preserve the mass of the artefact whilst rejuvenating the working edge.

Kamminga (1982:88) argues against the use of the horsehoof as a tool because of the often poor nature of the material used. However, orthoquartzites weather extremely rapidly; the secondary silica matrix binding the quartz grains remains as an extremely fragile skeletal structure and bears little resemblance to the unweathered material from which the tool was originally made. Further, if the material is too coarse to be used for chopping purposes, the uses to which flakes, if produced, could be put would be limited by similar constraints.

Aboriginal knappers in some areas refer to unweathered orthoquartzites as 'proper fat one'; that is, the material has body or homogeneity. Other terms used include 'clean one', for stone that is not only unflawed but texturally sound and even. Tests of material, apart from visual scrutiny of freshly fractured surfaces, include 'ringing' the stone or hefting it to determine its mass/density qualities. The former test allows one to determine if gross flaws or dead spots, not visible, exist. If a stone is unflawed, a clear tone may be elicited when it is tapped with another rock; flawed material will emit only a dull knocking tone. The latter test requires great familiarity with a wide variety of materials that is only acquired through experience. Naturally, as both the archaeological record and experience show, such qualitative tests are not infallible, and work is often commenced on material that is inferior for the task at hand. It should be noted that many peoples who did not have access to better quality materials produced and used a range of implements that may appear inferior to similar tools of high grade material. The ability to work with poor quality materials may demonstrate, in fact, a better understanding and control of stone than is usually recognised.

As Kamminga notes (1982:87), the edges of horsehoofs are often too deteriorated to determine wear patterns. My own observations of cryptocrystalline silica horsehoofs in the Great Sandy Desert show that both wear polish and striations may occur on the basal or striking platform surface.

There is no doubt that many artefacts called horsehoofs are in fact exhausted or rejected pyramidal cores. This is particularly so with regard to the smaller cores. Mulvaney & Joyce, for example, illustrate a 'horsehoof' from Kenniff Cave (1965:183, fig.17c) that clearly bears scars left by the removal of linear flakes. Step-fractures occur, but not the stacked step-fractures that should be a determining factor when designating a core artefact as a horsehoof. Kamminga (1982:fig.26) quite correctly identifies another example from Kenniff cave as a core from which flakes were obtained. Schrire (1982:fig.41a) illustrates a core 'best described as a horsehoof'. This artefact appears to be the only horsehoof excavated by Schrire in an area where the lithic tradition is based on a flake/blade technology. Its overall morphology suggests a flake/blade core, with localised and minimal stacking of step-fractures on areas of the margin and apparently marred by a flaw that has caused several larger flakes to terminate as step-fractures.

At an early stage of reduction it may be difficult to distinguish between a horsehoof and a pyramidal core, particularly if one examines the artefact in isolation. However, an examination of the total assemblage can make matters clearer.

The presence of large cores with stacked step-fractures about the circumference of the striking platform suggests a true horsehoof tradition. This conclusion is reinforced by Lampert's (1981:146) examination of the areas of affinity and disparity between the Kartan and small tool sites of Kangaroo Island. Evidence from Kangaroo Island clearly separates the core tool and small flake traditions. On mainland Australia the possible contamination of large tool assemblages by later small tool industries may cloud the issue. My own examinations of a number of quarries, where blades and linear flakes were produced, have not substantiated the view that horsehoof cores are reject or exhausted cores.

In early 1987 I replicated a series of Australian stone implement types for the Australian Museum. After preparing a variety of tools I proceeded to replicate Kangaroo Island style horsehoof cores. It was not that simple. I found I needed to maintain not only my image of a horsehoof, mentally, but also control my inhibitions

against both creating and maintaining stacks of step-fractures. This control was necessary in order to avoid (a) regular removal of linear flakes and blades, thereby creating pyramidal cores, and (b) rejuvenating the face of the core by removal of step-fractures, both of which alter the mass of the core and do not result in a horsehoof.

From this evidence I am convinced that step-flaking, as it occurs on the horsehoof, was a deliberate act undertaken with the intention of rejuvenating the working edge. By regular controlled step-flaking, a strong working edge was maintained with minimal loss of the mass necessary to the tool's efficient function.

In conclusion, I return to the question of whether the horsehoof is a core, a core-tool or the worked out remnant of a core-tool. As I discuss above, certain characteristics on the specimens I have examined argue for their status as tools. Yet, other equally valid interpretations may be due partly to the fact that we are not always examining the same kinds of specimens. 'Horsehoof', as a broad category, could be cores in one context but tools in another. Perhaps it is our Western obsessiveness with rigid taxonomies that makes us want to put them all in one group or all in another. Ethnographic observations among desert Aborigines (Hayden, 1977:183) suggest that stone tool users, who are less inclined to respect the classes so dear to archaeologists, will use a particular block of stone as a chopping tool on one occasion and as a core for the detachment of flake tools the next.

ACKNOWLEDGMENTS. I wish to thank both Ron Lampert and Jo Kamminga for their constructive criticism and advice provided whilst this paper was in the draft stages.

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Accepted October 22, 1991

F.D. McCarthy, Commemorative Papers (Archaeology, Anthropology, Rock Art)

Edited by

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