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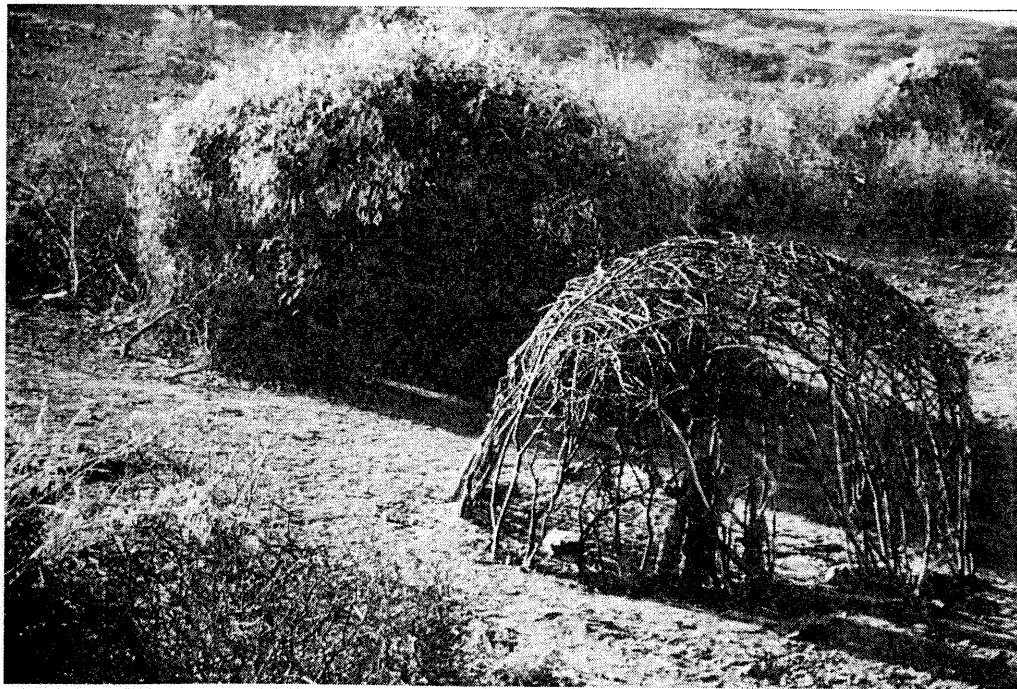
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# L'outillage lithique en contextes ethnoarchéologiques

## Lithic Toolkits in Ethnoarchaeological Contexts

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# REVERSE KNAPPING IN THE ANTIPODES: THE SPATIAL IMPLICATIONS OF ALTERNATE APPROACHES TO KNAPPING

Peter HISCOCK

**Résumé :** Des observations sur les Aborigènes australiens qui travaillent la pierre ont fréquemment suggéré des principes d'analyse différents de ceux qui sont classiques. L'un des observateurs les mieux connus, Brian Hayden (1977), a constaté que les activités de ces Aborigènes qui travaillent la pierre nous ont fourni quelques « surprises ». Ces « surprises » ont constitué un défi aux interprétations traditionnelles des styles et des fonctions des outils en pierre. La communication présente développe ce point de vue, en rapportant des observations, faites pendant les années soixante-dix, sur deux vieillards Alyawerre (Alyawara) d'Australie centrale. Des aspects de la manière dont ces hommes ont fait craquer la pierre, et des caractéristiques spatiales des débris archéologiques qui en ont résulté, sont décrits dans cette communication. Les activités de ces travailleurs illustrent un système « inverse » de faire craquer la pierre. C'est un système qui normalement n'est pas considéré dans les interprétations archéologiques, et il souligne la nécessité pour les archéologues de favoriser la recherche de modèles divers du passé.

**Abstract:** Observations of Australian Aboriginals working stone have often suggested alternatives to conventional principles used in archaeological analyses. One of the most well-known observers, Brian Hayden (1977), noted that the activities of Aboriginal knapper's provided a number of 'surprises' that constituted a challenge to common stylistic and functional interpretations of stone implements. This paper develops this viewpoint by reporting on observations, made in the 1970's, of two old Alyawerre (Alyawara) men from Central Australia. Aspects of the knapping procedures of these men, and the spatial patterning of the archaeological debris, are described. The activities of these stoneworkers illustrate a 'reverse' system of knapping that is not normally considered in archaeological interpretations, and highlights the necessity for archaeologists to seek diverse models of the past.

One of the more productive uses of ethnographic observations is as a test of archaeological principles. In some instances these observations of the contemporary world act as 'spoilers' to refute interpretative principles otherwise presumed to be universally applicable (see Walters 1990). Observations of Australian Aboriginals working stone have on occasion revealed alternatives to conventional principles used in archaeological analyses. Since there is no reason that the kinds of knapping activities observed in Australia were, in the past, restricted to Sahul they represent models which may have value in archaeological interpretations of both the Old and New World. A well-known example of this is Brian Hayden's (1977) report that the activities of Western Desert Aboriginal knapper's provided a number of 'surprises' that constituted a challenge to common stylistic and functional interpretations of stone implements (see also Hiscock 1998). This paper describes another example of Aboriginal knapping from the Australian desert that has implications for interpretation of knapping areas identified in archaeological sites. The author made these observations between 11-13 September 1978. This period was spent with Slippery Morton and Billy Dempsey, who were then old men, *Alyawerre* (Alyawarra) speakers from Amaroo, in Central Australian. Slippery and Billy were old enough to have been exposed to traditional (ie. at least pre-twentieth century) practices of stone knapping, and these practices had being demonstrated to Slippery and Billy when they were young men at the start of the twentieth century. Their knapping was performed with a distinctive twisting motion that struck flakes behind the knapper; a system that can loosely be termed *reverse knapping*.

## SLIPPERY AND BILLY KNAPPING

The lithic material they used to make these artefacts was a uniformly grained white and light grey quartzite occurring as rounded nodules encased in a soft orange cortex often several centimetres thick. These rocks naturally crop out in a variety of sizes: from pieces weighing only 800 grams up to large boulders which are usually broken down by fire cracking and pounding with other large rocks. A variety of quartzite hammerstones of various sizes were used, the smallest weighed 576 grams.

Over a two-day period Slippery and Billy spent six hours knapping stone. Further time was spent preparing resin. The outcome of this labour was the production of 12 stone knives set in resin handles. These objects were said to function as 'knives', with a strong, gradually curving circular or semi-circular edge. In size the knives varied from 6 cm to 15 cm, and shapes varied from circular to elongate with circular distal ends. All of the 'knives' were sold.

Flakes were struck from large, typically bifacial cores. Much of the preparatory knapping involved stripping the thick orange cortex from the core. The main obstacle to continued reduction was the production of large step terminated scars on the core face. Cores were usually reduced until thoroughly exhausted.

In 1978 Billy Dempsey did all of the knapping. At that time Slippery was somewhat subdued because of a recent coronary and left most of the active roles to Billy.

Slippery's incapacity may have modified their behaviour, but the activities I observed were virtually identical with the previously filmed knapping of these men. This knapping involved twisting, cross-body percussion blows to the cores.

The typical knapping posture for Billy was kneeling on the ground. The core rested on the ground to the left and front of Billy's left knee, between 0.3 and 0.8 of a metre from his body (see Figure 1). This core was positioned and manipulated by Billy's left hand. The hammerstone was held in his right hand. In the act of knapping Billy would bring the right hand round in an arc and down toward his left kidney, hitting the uppermost part of the core by his left knee.



Figure 1. Illustration of the body position of Billy Dempsey while knapping.

Successfully detached flakes would fly to the left and behind the knapper, hence the description of this as 'reverse knapping'. Figure 2 shows schematically the spatial relationship between Billy, the scatter of flakes he produced, and his field of vision when seated. This approach to knapping created an elongated cone-shaped distribution of artefacts behind the knapper. Detached flakes landed out of Billy's sight and anywhere from centimetres to twelve metres from his back. The highest density of material was found within four metres of the knapper. On occasions when Billy sat away from large plants flakes up to 8cm long landed metres from the core and showed no ill effects from their journey.

This extended scatter behind the knapper was only produced when Billy sat in clear areas. Sometimes Billy chose to sit in front of large and tall clumps of grass. As the knapper struck flakes, they would fly into, and be trapped by, the stands of grass. This strategy minimised inconvenience when retrieving specimens by restricting the

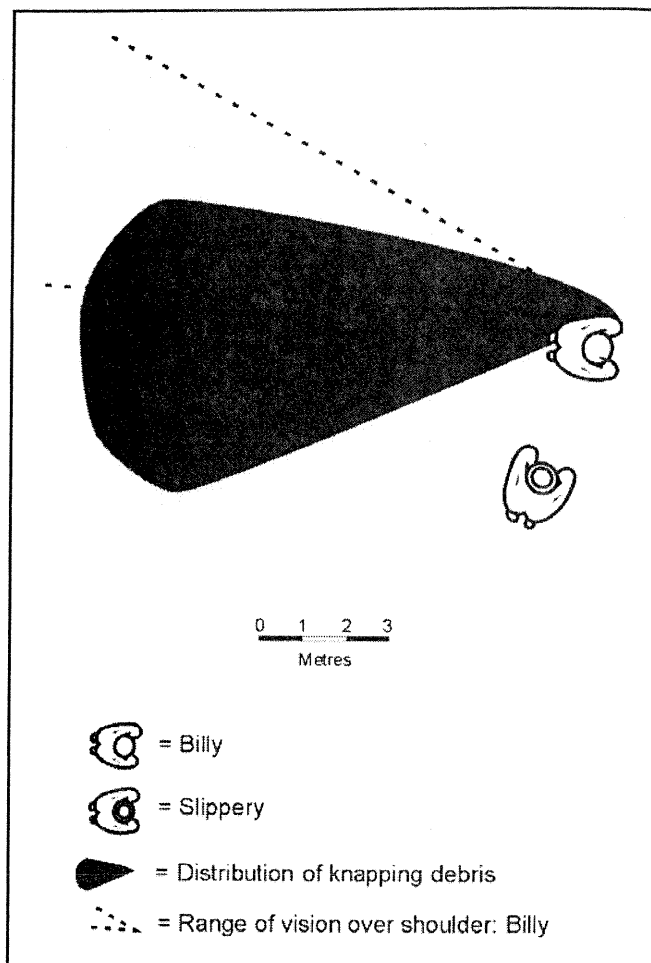


Figure 2. A depiction of the spatial distribution of knapping debris in unvegetated areas.

area of debris to a few square metres. As a result, the same knapping procedure could create a small or elongated scatter of debris behind the knapper, the size and shape of the knapping debris being largely determined by the position of the knapper in relation to objects such as rock and vegetation that could act as a barrier to the flight of flakes struck from the cores.

One consequence of this twisting cross-body reverse knapping action was that much of the flaking debris accumulated at the rear of the knapper, and could not be viewed by the knapper. Because Billy was unable to observe flakes he struck off it was his habit to have an aid, in this case his friend Slippery. Slippery looked at the flakes that had been detached behind Billy's back and retrieved some for closer inspection. Slippery sat to the right of the knapper and parallel to, or slightly behind him (see Figure 2). In that way Slippery was protected from any airborne flakes; and on occasions where he was not far behind the knapper he also had to twist his torso to examine the knapping results. This created the intriguing circumstance in which a knapper was often unaware of the flakes that were produced, and the identification of flakes suitable for use was made by someone other than the knapper. The consequence of this will be examined on another occasion. What is worth noting here is that this

reverse knapping is not restricted to any one areas or group of people in Australia.

### A SECOND ETHNOGRAPHIC EXAMPLE

It is worth noting that similar body positions and approaches to knapping have been observed widely in Australia. For example, Jones and White (1988:65) published photographs of Diltjima, a senior Marra-larrmirri man knapping quartzite blocks in 1981 at a small quarry near Ngilipitji in eastern Arnhem Land. (This region is more than 1500 km distant from the central Australian location of Slippery and Billy). In these photographs Diltjima adopted a semi-seated posture with legs separated, one leg directly under his body the other folded at right angles. Although this superficially contrasts with the kneeling posture of Billy Dempsey, the knapping procedure is otherwise strikingly similar (see Figure 3b). The right-handed Diltjima immobilised the core on the ground with his left hand and swung the hammer in an arc across his body with his right hand to remove flakes beside or behind his left side. Jones and White (1988) describe the cores knapped in this way as generating regular 'blades' from a single platform. Their description of Diltjima's knapping was as follows:

With his left hand, he secured the core in position, holding its upper surface a few centimetres back from its edge and pressing it slightly down onto the grass pad. He then struck the core with a long sideways and slightly downwards blow which travelled across the front of his body... The point of contact was at his side, with the front of his body still facing parallel to the plane of the core platform. (Jones and White 1988: 62-64)

This description alone is sufficient to indicate that this twisting, across-the-body approach to percussion knapping was employed widely in Australia during the historic period. This conclusion raises the question: "if this is a viable method of striking flakes from cores, when and where was it employed?"

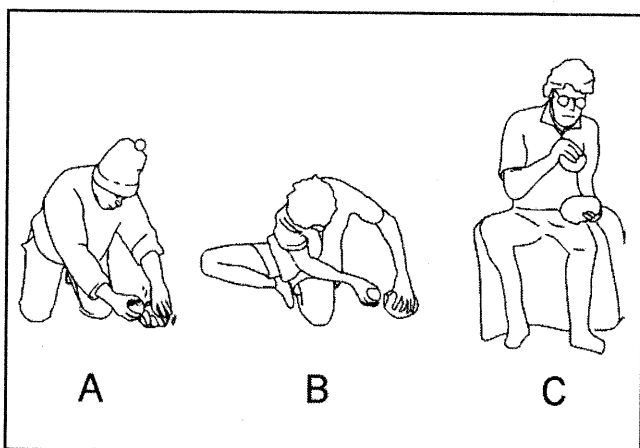


Figure 3. A comparison of the knapping actions of: a) Billy Dempsey, b) Diltjima (after Jones and White 1988), and c) conventional western approach (after Fischer 1990).

### DISCUSSION

This question is significant because the twisting reverse knapping practice differs from the knapping procedure employed by western replicators and used by most archaeologists modelling prehistoric activities (Figure 3). Archaeological interpretations of knapping have conventionally assumed the prehistoric knappers did what modern archaeologists do: sit on a chair (or rock), striking downward with a hammer to remove flakes which fell in front of the knapper, between his/her legs (see Figure 3c). The capacity to distinguish between these two approaches, the 'reverse' and the 'frontal', is important if archaeologists are to infer the position and orientation of ancient knapper's within archaeological sites. Figure 4 illustrates that the twisting approach discussed here can create scatters the range from small and circular to large and elongated, depending on the circumstance; but no matter what the shape of the scatter may be it is positioned to the side and rear of the knapper. This contrasts to the location of debris in front of the seated, western knapper (Figure 4c).

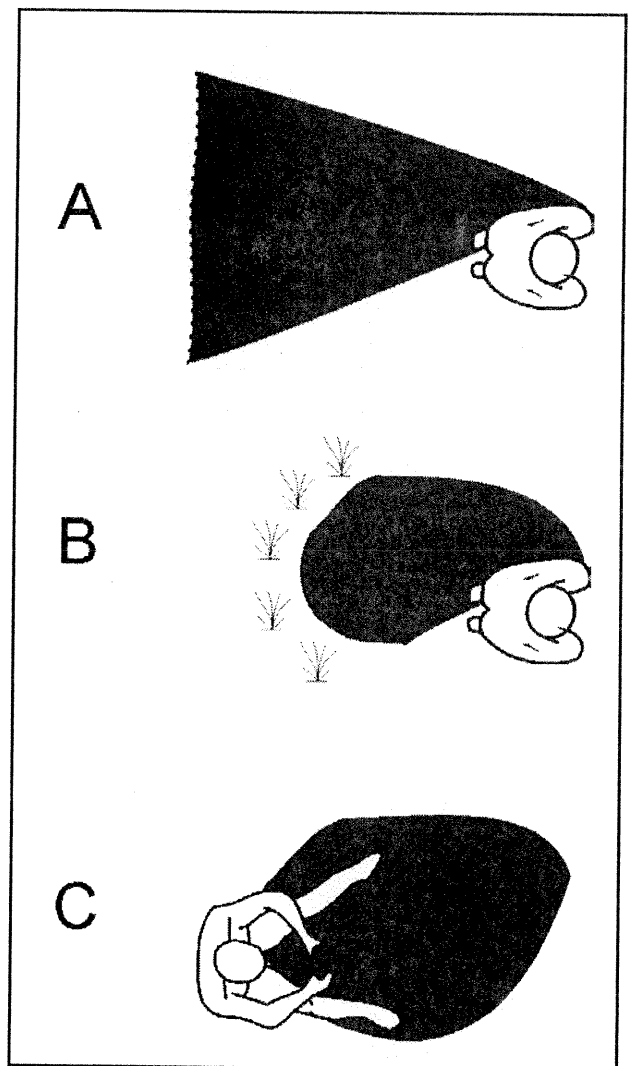


Figure 4. A comparison of the relationship of knapper and knapping debris: a) Slippery and Billy in unvegetated areas, b) Slippery and Billy near barrier vegetation, and c) conventional western approach.

In recent decades it has been fashionable to build detailed reconstructions of short moments in prehistoric life, in which the archaeological manufacturing debris is used to interpret the actions of individual artisans, and so archaeologists have discussed where and how the knapper worked within the site. Despite the numerous elaborate and well described studies of the spatial distribution of lithic material in artefact scatters, often aided by extensive conjoining, the interpretations of prehistoric knapping is often built on the seated model of knapping behaviours, which is presumed to be universally applicable. In such a context the existence of alternative models of knapping behaviour, such as the reverse knapping described here, creates a challenge to archaeologists to avoid ethnocentric assumptions when modelling artefact manufacture.

A short commentary on some European interpretations of knapping floors can illustrate the common assumption of frontal body positions and the potential of reverse knapping to create similar archaeological patterns. Many artefact scatters that have been interpreted as knapping floors covered are 1-8 metres in length (eg. Bergman et al 1990; Collcut, Barton, and Bergman 1990; Cziesla 1990; Fischer 1990; Gilead and Fabian 1990; Roeboeks and Hennekens 1990; Schon 1990; Weiner 1990; Ziesaire 1990). Knapping floors of this size could have been created either by frontal or reverse knapping, but have normally been explicitly interpreted as a product of frontal flaking. This explanation has been bolstered at some sites where structural features have been interpreted in terms of a frontal model of flaking. For example, when blocks of stone have been found in or on the edge of knapping floors they have often been interpreted as 'seats' for the knapper (eg. Fischer 1990; Weiner 1990), although one plausible alternative is that these objects are barriers to the flight of flakes in reverse knapping, in which the knapper knelt on the ground facing away from the rock. Reverse knapping could be invoked to explain elongated rather than circular shaped knapping floors that some researchers have noted (eg. Roeboeks and Hennekens 1990), single outlying flakes a few metres outside the cluster of artefacts forming a knapping floor, or even the cone-shaped distribution of refitting sequences that have cores positioned at the apex of the cone, as documented by Gilead and Fabian (1990). Even the discovery of conjoined flakes even 10-15 metres from the core need not indicate that people carried flakes from the knapping floor to a second locality. Indeed, many of the features of Old World archaeological knapping floors may be explicable as the product of either frontal or reverse knapping. It is not the purpose of this paper to suggest what method of knapping took place at any particular locality. Rather, the point is that the archaeological patterns could conceivably be produced by a knapping approach other than the frontal model that is traditionally applied, and interpretations have often not considered plausible alternatives such as those revealed in ethnographic descriptions.

Differentiating the archaeological signatures of frontal or reverse systems of knapping may require more detailed information than simply characteristics such as scatter size and the presence of large rocks. The distribution of flake size, and even microdebitage density across an artefact

scatter may be the sort of evidence that is required to distinguish the most appropriate model in a specific instance. Experimental trials will probably be necessary to define the principles relevant to such studies. Given the ethnographic observations of different approaches to percussion knapping the claims of archaeologists to have identified the location and orientation of prehistoric knappers may suffer problems of equifinality if detailed measurements of archaeological knapping floors, grounded in experiments, are not made.

## CONCLUSION

There is no single approach to percussion knapping, and consequently there is no single spatial association between a knapper and the position and shape of the scatter of debris resulting from knapping. The reverse knapping methods documented here reveals that some approaches to knapping create a concentration behind rather than to the front of the knapper. The existence of an alternative way of striking flakes from a core may be described as yet another 'surprise' deriving from observations of Australian Aboriginal knappers. The implications of observations such as the one reported here must be incorporated into archaeological studies if our interpretations of prehistoric knapping are to be robust and well founded. Failure to consider such antipodean alternatives would condemn archaeological interpretations to reproduce only one of a number of possible images of the past; an outcome that could obscure variability in past hominid behaviour.

## Author's address

Peter HISCOCK  
School of Archaeology and Anthropology,  
Australian National University  
Canberra, AUSTRALIA

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