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PREHISTORIC ABORIGINAL OCCUPATION OF THE RANGELANDS: INTERPRETING THE SURFACE ARCHAEOLOGICAL RECORD OF FAR WESTERN NEW SOUTH WALES, AUSTRALIA

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ABSTRACT

Recent erosion in arid regions of western NSW has exposed large areas that are scattered with stone artefacts manufactured by Aboriginal people in prehistory. These exposures offer an opportunity for archaeologists to study the artefacts abandoned by Aboriginal people through time and to compare those artefacts that accumulate in different parts of the landscape. To reconstruct the nature of prehistoric behaviour in the rangelands, two approaches are needed. First, the geomorphological context of the artefacts needs to be considered since exposure of the artefacts is a function of landscape history. Second, large areas (measured in thousands of square metres) and large numbers of artefacts need to be considered if patterns reflecting long term abandonment behaviour by Aboriginal people are to be identified. This paper reports on the Western New South Wales Archaeological Program (WNSWAP) which was initiated in 1995 to study surface archaeology in the rangelands. Geomorphological studies are combined with artefact analysis using geographic information system (GIS) software to investigate Aboriginal stone artefact scatters and associated features such as heat retainer hearths, in a landscape context. Results suggest that apparently random scatters of stone artefacts are in fact patterned in ways which inform on prehistoric Aboriginal settlement of the rangelands.

INTRODUCTION

The archaeology of many regions of the world is described in terms of sites – locations where people lived for extended periods of time and where they deposited artefacts. The archaeological record in Australia, however, is not always like this. Australian Aborigines were hunter-gatherers and while they reused the same general location, they often did not return to precisely the same spot. Hence much of the archaeological record they left behind is spatially dispersed. This is particularly the case in the semi-arid and arid rangelands of western New South Wales.

In this paper, we outline one method for deriving a behavioural interpretation of this record despite the difficulties imposed by the nature of the artefacts (largely stone tools) and their wide dispersal across the landscape. The approach we describe is based on fieldwork we have undertaken since 1995 in northwestern NSW, at Sturt National Park, and more recently at the Fowlers Gap Arid Zone Research Station. In this project archaeological studies of artefact distribution are closely integrated with geomorphological studies of landsurface erosion and sedimentation, permitting interpretations to be developed for the many thousands of artefacts that lie exposed on the surface. We discuss the types of behavioural information that can be derived from the stone artefacts deposited by Aboriginal people in the past, and provide preliminary results from our field project.

RECENT LANDSCAPE CHANGE AND ITS EFFECTS ON ARTEFACT EXPOSURE

The rangelands offer a unique opportunity for archaeologists to study landscape use by Aboriginal people in the past. They are characterised by high levels of artefact visibility, related in part to naturally discontinuous vegetation cover under the prevailing dry climatic conditions. In addition, artefact exposure has been enhanced by accelerated erosion of topsoils and surficial sediments over the last 100 years or so (Fanning 1999). The presence of large numbers of domestic herbivores (mostly sheep and rabbits), coinciding with a prolonged period of drought conditions in the 1890s, reduced the vegetation cover. This, in turn, affected the hydro-geomorphic balance by reducing infiltration and increasing surface runoff and erosion when the drought-breaking rains finally came. Topsoil material eroded off the slopes was deposited over the valley floors and flood plains, forming a distinctive sedimentary unit variously referred to (Fanning 1999) as 'post-settlement alluvium' (PSA) or 'post-European material' (PEM). Incision of valley floors, channel enlargement and knickpoint retreat, especially in the upland catchments, subsequently destabilised the valley floors, leading to partial stripping of the PEM and the formation of scalded and lagged surfaces over extensive areas. The fine sandy and silty topsoils were washed and blown away, leaving behind the coarse clasts – the pebbles and cobbles and stone artefacts – as a kind of 'blanket'. These processes continue today, in spite of conservative stocking rates over most of the region (Fanning 1994).

Rill and gully erosion has disturbed the integrity of part of this 'blanket' by moving some artefacts downslope, away from their original resting places (Holdaway et al. 1998, Table 3). However, statistical analysis of relationships between artefact size and topographic factors demonstrates that, outside of the rills and gullies, no lateral disturbance patterns can be detected (Fanning and Holdaway in press). The vertical integrity of the artefacts dropped by different groups of Aboriginal people occupying particular places in the landscape at different times has been lost, but rather than damaging the record, the process of erosion is a boon for archaeologists. Firstly, the erosion has 'excavated' areas two to three orders of magnitude larger than commonly tackled by archaeologists who have to deal with buried deposits. The costs of excavation by conventional means preclude those which cover thousands of square metres, yet we know from studies of contemporary Aboriginal people who live in the arid zone that this is the size of the area over which camps extend (e.g. O'Connell 1987). There is every reason to expect that prehistoric camps were of a similar size. Secondly, the lagging process has conflated the discard products of many events together in one place. Far from destroying the scientific potential of the archaeological record, the erosion-induced lagging process has greatly enhanced the ease with which it can be observed.

NEW APPROACHES TO FIELD DATA COLLECTION

The techniques described here for stone artefact recording and analysis were developed over a period of four years (1995-1998) in the Mt Wood area of Sturt National Park in far northwestern NSW. Silcrete outcrops form high points in the landscape (mesas and escarpments) and silcrete gibbers (stones) mantle the hillslopes below. The valley floors contain alluvial valley fills of Late Pleistocene to Holocene age into which the ephemeral streams have incised (Fanning 1999). One of these, Stud Creek, was chosen for detailed study because there were abundant stone artefacts lying on the eroded surface of the valley floor. Moreover, the remains of many heat retainer hearths were clearly visible. Charcoal excavated from the hearths could be used for radiocarbon dating, hence providing a temporal framework for the study.

Both archaeological and geomorphological data sets were constructed from intensive field surveys over three field seasons. Landsurface features at two scales were surveyed using electronic total stations (electronic theodolites connected to survey data recorders): macromorphology (landform elements), based on position in the landscape and dominant geomorphic process, and micromorphology, based on surface condition. Both of these factors were considered to be the dominant controls of differential artefact visibility across the landscape. Artefacts were most easily seen on the severely eroded landsurfaces on the valley margin as well as lagged surfaces on the valley floor and tributary alluvial fans, but were less visible on the vegetated slopes and depositional areas of the valley floor.

Artefacts were recorded individually in the field and then replaced where they were found. A series of technological and typological variables were described for each piece. These included the nature of the evidence for flaking (flake, tool or core), the raw material type (silcrete, quartz or quartzite, with finer divisions based on the organisation and density of quartz clasts visible in the silcrete), the presence of cortex, the overall shape of the flake or core, the form of the tool and the number of retouched edges, and measurements of flake, tool and core size. These attributes were recorded into palmtop computers using data entry software (McPherron and Holdaway 1996) and transferred each night to a relational database and GIS. This system permits the rapid recording of large numbers of stone artefacts with only minimal disturbance of the surface record (Holdaway *et al.* 1998).

Silcrete artefacts dominate the assemblages from Stud Creek, accounting for more than 90% of the individual artefacts identified at both sites. Within the silcrete assemblage, flakes dominate cores and tools. Flakes were discarded in large numbers but not the tools that have edge modification reflecting greater degrees of use, reworking and then reuse before abandonment.

ARTEFACT DISTRIBUTION IN SPACE

To understand the way the Stud Creek location was used in the past, we need to study the distribution of artefacts in space. Using the time dependent model for artefact discard, we may expect a difference in the clustering of artefacts that were curated for longer periods of time if features of the landscape encouraged people to spend relatively more time in certain locations. This can be tested by measuring the degree of clustering, firstly of tools which were reworked many times before abandonment compared to those that were used then abandoned, and secondly, flakes that were manufactured from non-clasty silcrete derived from more distant quarries compared to those manufactured from the clasty silcrete locally available as gibbers.

The results of applying nearest neighbour statistical analysis indicate that tools that were resharpened often before abandonment (adze slugs including tula, and scrapers) are more clustered than utilised flakes with only light retouch. Both groups of tools are more clustered than non-clasty flakes (which have an R value indicating a random distribution), but these are in turn more clustered than clasty flakes (that are uniform). Of course, the clustered, random and uniform designations are dependent on the area over which clustering is assessed (held constant in each case), but it is the relative order implied by the R statistic rather than the absolute magnitude that is of interest in this case.

ARTEFACT DISTRIBUTION IN TIME

While stone artefacts cannot be directly dated, we can determine the envelope of time during which they were discarded by dating the charcoal from heat-retainer hearth remains associated with the artefact scatters. A thorough search of the Stud Creek valley provided us with charcoal from twenty eight hearths which we sent to the Waikato Radiocarbon Laboratory in New Zealand.

All 28 charcoal samples from Stud Creek returned radiocarbon ages of less than 1700 radiocarbon years. These fall into two distinct phases of hearth construction separated by a period when no datable hearths were formed. The length of this period can be estimated using Bayesian statistical techniques and indicates that there is a gap of at least 200 calendar years, and perhaps as long as 400 years, between each phase of hearth construction. The existence of such a gap is a surprise. Current models for late Holocene occupation of the arid zone have Aboriginal occupation entering a period of reduced mobility as the ethnographically attested social and exchange systems were developed. It is hard to reconcile these models with the results of the Stud Creek dating program.

IMPLICATIONS FOR UNDERSTANDING PATTERNS OF ABORIGINAL OCCUPATION

The distribution of artefacts in the Stud Creek valley may appear to form a randomly distributed carpet, but in reality artefacts are clustered in a number of different ways. The thousands of artefacts that are scattered across the surface were manufactured from silcrete obtained from stone pavements and nearby quarries. Much of this material was knapped in place to provide large numbers of sharp-edged flakes that were used with little further modification. A few tools were also left by the Aboriginal people who used these locations in the past, most with only minor edge modification but a few with sufficient evidence of reuse to indicate that they had been resharpened many times before deposition.

The locally available silcrete gibbers were worked, but not as intensively as the stone imported from quarries. Stone may have been brought directly to Stud Creek from its source, but based on comparative studies of hunter-gatherers from around the world, it is likely that stone procurement was embedded in other activities (Binford 1979). Thus, the artefacts deposited at Stud Creek that were not produced from materials available at the site may have been taken to a number of locations before being deposited there.

Spatially, there is a tendency for the more curated artefacts to be more clustered. This is also a function of time since people were drawn to particular geographic features on the landscape, such as waterholes, and occupied the ground adjacent to these features more frequently. The concentrations of curated artefacts at Stud Creek are adjacent to what appears to be infilled waterholes in the Stud Creek channel. This is inferred from the presence of grey sandy clay sediments underlying 'post-European material' in the valley fills, exposed by recent entrenchment of the valley floors (Fanning 1999). Such sediments commonly line semi-permanent waterholes in the region today and indicate that the waterholes which existed in the Stud Creek valley in prehistory may have contained water for considerable periods of time. People dropped curated tools more often in places where they spent more time and this explains the concentrated patterns in the distribution of tulas and scrapers when compared to more lightly utilised tools. It also helps to explain the more concentrated distribution of non-clasty versus clasty silcrete flakes. Thus, it seems that access to water, then as now, controls settlement in the rangelands.

Stud Creek warrants intensive archaeological and geomorphological study because it is a good example with which to illustrate the way behavioural inferences may be drawn from deflated, spatially extensive, scatters of stone artefacts that to the uninitiated may appear to resemble so much road gravel. The prehistory of the Tibooburra region will not be written from the Stud Creek sites alone, but from a comparison of the artefact composition of many such sites distributed across a region. Much specific information has been lost through deflation and erosion of archaeological sites in the rangelands, but this is only an issue if behavioural reconstruction is concerned with historical moments in the past. From a long term, geomorphological perspective, the time transgressive nature of deflation is a boon, not a detriment. Archaeologists have only begun to see the potential historical erosion has given us.

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