

A new geoarchaeology of Aboriginal artefact deposits in western NSW, Australia: establishing spatial and temporal geomorphic controls on the surface archaeological record

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ABSTRACT

Surface deposits of stone artefacts are the most common feature of the Australian Aboriginal archaeological record, but they remain difficult for archaeologists to interpret. Among the many reasons is a lack of understanding of geomorphic processes that have exposed the artefacts at the surface. We describe research on the geomorphic environments in arid Australia from which we have developed a new geoarchaeological framework for describing and analysing surface artefact deposits. Optically Stimulated Luminescence dating of sediments upon which the artefacts currently rest demonstrates that the landscape, and the archaeological record it preserves, is spatially and temporally discontinuous. Exposure and/or burial of artefacts is controlled by geomorphic processes operating on timescales ranging from a few decades to thousands of years and spatial scales of tens to many thousands of square meters. These same processes, operating on similar scales, also determine whether or not artefact scatters are preserved in the contemporary landscape or in the sedimentary record of past landscapes, and hence whether or not they become part of the archaeological record. Models of settlement behavior in hunter–gatherer peoples that are largely derived from analysis of surface ‘sites’ must take account of these discontinuities.

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1. Introduction

Surface scatters of stone artefacts are ubiquitous across arid Australia. They are the most common feature of the Australian archaeological record, but they have until recently remained difficult for archaeologists to interpret. Among the many reasons are the lack of understanding of geomorphic processes that have exposed the artefacts at the surface, and the lack of a suitable theoretical and methodological framework for documenting and analysing this vast record. The Western New South Wales Archaeological Program (WNSWAP), a collaborative venture between archaeologists, geomorphologists, traditional owners and cultural heritage managers, was established in 1995 to address these limitations.

Exposure and visibility of Aboriginal artefact scatters in western New South Wales (NSW) are controlled by geomorphic processes operating on time scales of a few hours (e.g. rainsplash, sheetwash) to many thousands of years (e.g. valley floor incision, alluvial fan

sedimentation) and spatial scales of a few tens to many thousands of square meters (Fanning and Holdaway, 2004). These same processes operating on similar scales also determine whether or not artefact scatters are preserved in the contemporary landscape and/or in the sedimentary record of past landscapes, and how long they survive (Fanning, 1999, 2002; Fanning and Holdaway, 2001b). In other words, these processes determine which parts of the Aboriginal material record become parts of the archaeological record and where, and for how long, they are preserved for the future. In this paper, we describe examples from arid western NSW, Australia (Fig. 1) which show that a chronology of landscape change is as equally important as artefact analysis and dating in interpreting the archaeological record of past hunter–gatherer activity. A geoarchaeological framework incorporating all three aspects of the study of surface artefact scatters is an important outcome of this research program (see Fanning, 2002).

2. The contemporary geomorphic setting of surface artefact scatters in western NSW

Surface scatters of stone artefacts and the associated remains of heat-retainer hearths are common in western NSW (Fig. 2). One reason is the arid climate which means that vegetation cover is sparse and patchy, and the proportion of unvegetated surface is relatively high. In

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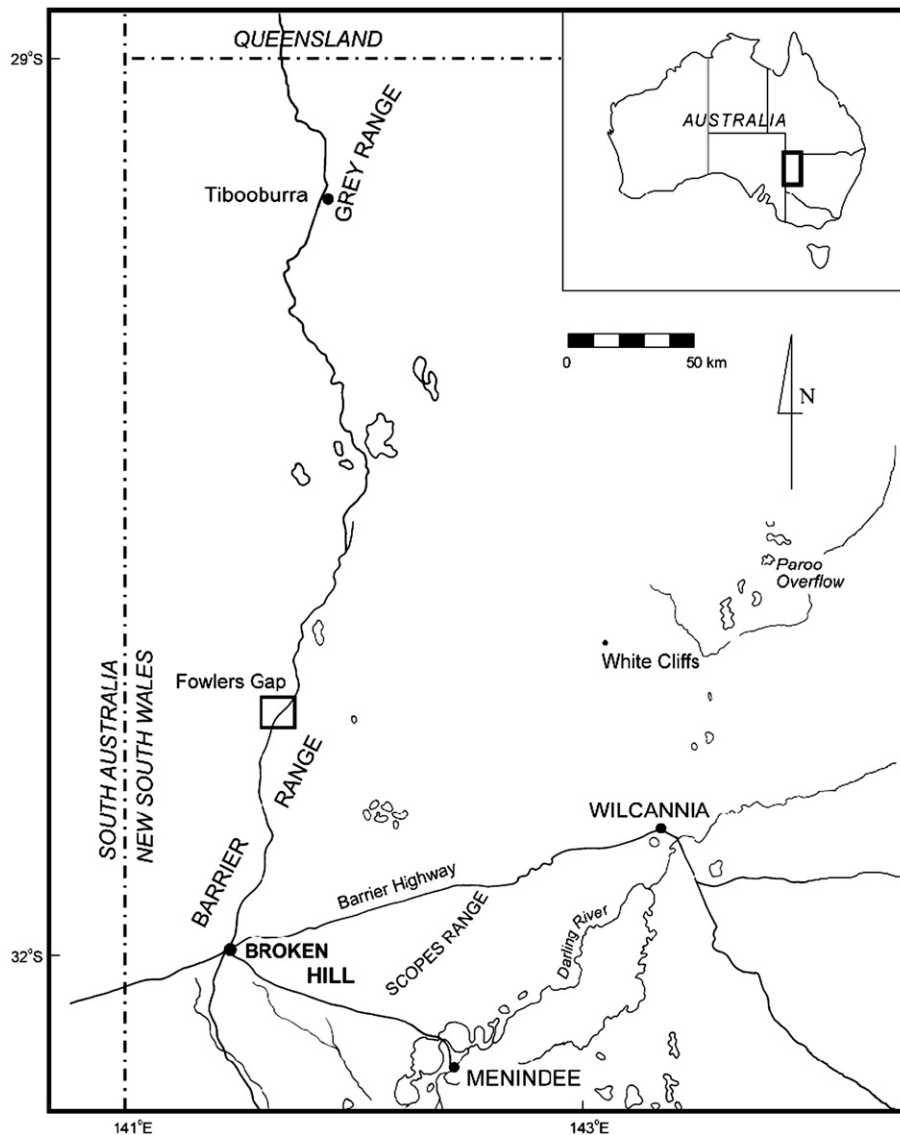


Fig. 1. Location of the study area in western New South Wales, Australia.

addition, the generally high level of exposure of stone artefacts as surface scatters is a result of the acceleration of geomorphic processes, and consequent landform evolution, which has taken place since the introduction of sheep grazing by European pastoralists in the mid nineteenth century (Fanning, 1999; Holdaway et al., 2000).

Evidence for topsoil stripping, ground surface lowering, valley floor incision, channel enlargement, and knickpoint retreat is widespread across the region (Fanning, 1999). Historical accounts, stratigraphic evidence, and radiocarbon determinations on charcoal from some of the Aboriginal heat-retainer hearths that have either been exposed by erosion or buried by valley floor sedimentation, indicate that these processes of landscape evolution were accelerated in the region in the last 150 years or so since the introduction of sheep grazing (Fanning, 1999). This has, in effect, 'excavated' many thousands of square meters of ground surface in any one place, removing the fine sediments and leaving the coarse clasts, including artefacts, as a lag (or 'blanket') on the surface (Holdaway et al., 2000). In some places, erosion has removed the artefacts completely while in other places sediment transported from upslope and/or upstream has buried them.

Landscape change of this type and magnitude, however, is not just confined to the last two hundred years. Stratigraphic evidence from

valley fills in western NSW (Wasson, 1976, 1979; Wasson and Galloway, 1986; Williams et al., 1991; Fanning, 1999; Fanning and Holdaway, 2001b,) indicates that episodic erosion and sedimentation were characteristic of the landscape history of this arid margin region throughout the Late Quaternary. While the evidence points to land use change by European pastoralists as being a primary trigger for this latest episode, it is not the causes of landscape change which are of particular relevance for the research reported here but the effects this change has had on preservation, exposure and visibility of the archaeological record.

The following example from this research illustrates the importance of incorporating the landscape setting into the survey and analysis of surface artefacts. The research was conducted at Fowlers Gap Arid Zone Research Station, a pastoral property of approximately 39,000 ha located 110 km north of Broken Hill in western NSW (Fig. 1). Six locations were chosen for detailed survey (Fig. 3). The original aim was to investigate the Late Holocene archaeological record from a variety of landscapes as a way of assessing variation in Aboriginal occupation intensity, mobility and resource use. We found, however, that this story was not simply one of variations in Aboriginal 'use of place' (after Wandsnider, 1989), but was complicated by the different geomorphic histories of each of the locations surveyed and hence

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