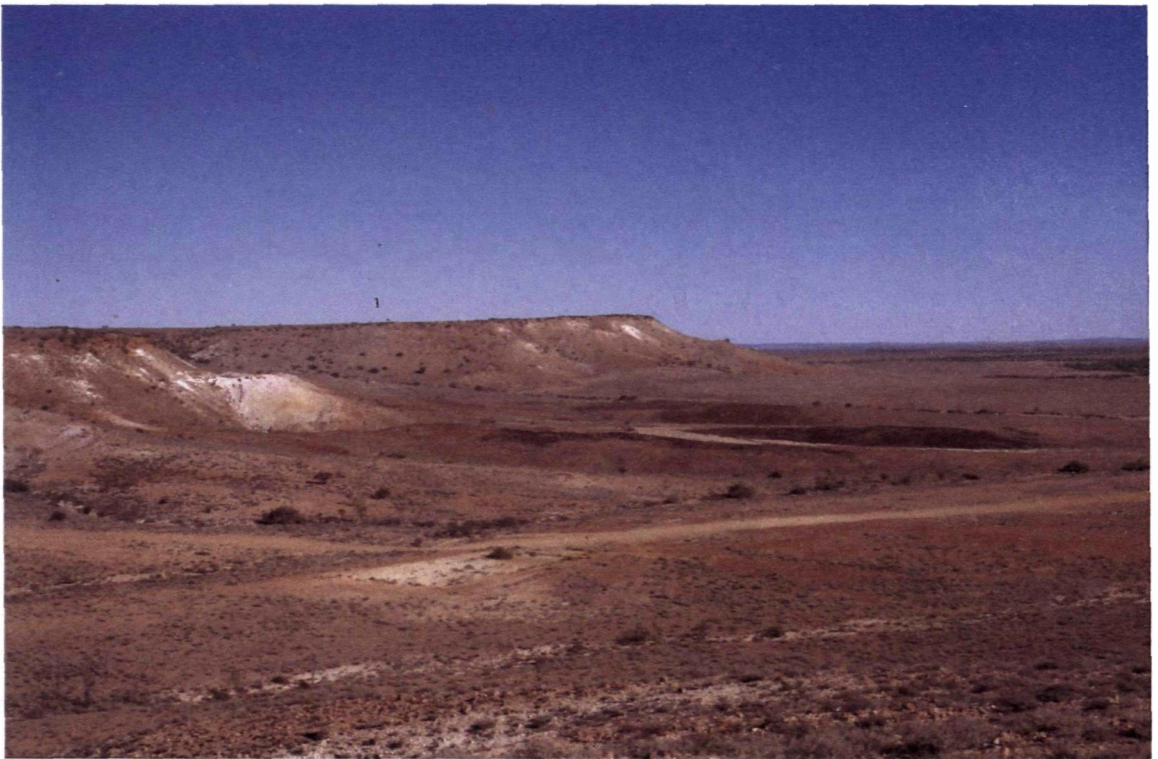


BEYOND THE DIVIDE

**A NEW GEOARCHAEOLOGY
OF
ABORIGINAL STONE ARTEFACT SCATTERS
IN
WESTERN NSW, AUSTRALIA**



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Ph.D. Thesis, March 2002

**BEYOND THE DIVIDE:
A NEW GEOARCHAEOLOGY OF ABORIGINAL STONE
ARTEFACT SCATTERS IN WESTERN NSW, AUSTRALIA**

Thesis submitted for the degree of Doctor of Philosophy in the Graduate School of the
Environment, Division of Environmental and Life Sciences, Macquarie University
by Patricia Christina Fanning B.A. (Hons) *Macq.*, M.Sc. *UNSW*, March 2002

Dedicated to the memory of my parents,

Reg and Joyce Ellis

*who gave me the opportunity
they never had
for a formal education.*

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Holdaway, S., **Fanning, P.** & Witter, D. (1997). GIS analysis of artefact distributions in an eroding landscape: the Western New South Wales Archaeological Project. In Johnson, I. & North, M. (eds) *Archaeological Applications of GIS: Proceedings of Colloquium II, UISPP XIIIth Congress, Forli, Italy, September 1996*. Sydney University Archaeological Methods Series 5.

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Fanning, P.C. & Holdaway, S.J. (2001b). Temporal limits to the archaeological record in arid western NSW, Australia: lessons from OSL and radiocarbon dating of hearths and sediments. In Jones, M. and Sheppard, P. (eds) *Australasian Connections and New Directions: Proceedings of the 7th Australasian Archaeometry Conference*. Research in Anthropology and Linguistics 5, 85-104.

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SUMMARY

Surface scatters of stone artefacts are the most ubiquitous feature of the Australian Aboriginal archaeological record, yet the most underutilized by archaeologists in developing models of Aboriginal prehistory. Among the many reasons for this are the lack of understanding of geomorphic processes that have exposed them, and the lack of a suitable chronological framework for investigating Aboriginal 'use of place'. This thesis addresses both of these issues.

In arid western NSW, erosion and deposition accelerated as a result of the introduction of sheep grazing in the mid 1800s has resulted in exposure of artefact scatters in some areas, burial in others, and complete removal in those parts of the landscape subject to concentrated flood flows. The result is a patchwork of artefact scatters exhibiting various degrees of preservation, exposure and visibility. My research at Stud Creek, in Sturt National Park in far western NSW, develops artefact and landscape survey protocols to accommodate this dynamic geomorphic setting. A sampling strategy stratified on the basis of landscape morphodynamics is presented that allows archaeologists to target areas of maximum artefact exposure and minimum post-discard disturbance. Differential artefact visibility at the time of the survey is accommodated by incorporating measures of surface cover which quantify the effects of various ephemeral environmental processes, such as deposition of sediments, vegetation growth, and bioturbation, on artefact count.

While surface stone artefact scatters lack the stratigraphy usually considered necessary for establishing the timing of Aboriginal occupation, a combination of radiocarbon determinations on associated heat-retainer ovens, and stratigraphic analysis and dating of the valley fills which underlie the scatters, allows a two-stage chronology for hunter-gatherer activity to be developed. In the Stud Creek study area, dating of the valley fill by OSL established a maximum age of $2,040 \pm 100$ y for surface artefact scatters. The heat-retainer ovens ranged in age from 1630 ± 30 y BP to 220 ± 55 y BP. Bayesian statistical analysis of the sample of 28 radiocarbon determinations supported the notion, already established from analysis of the artefacts, that the Stud Creek valley was occupied intermittently for short durations over a relatively long period of time, rather than intensively occupied at any one time. Furthermore, a gap in oven building between about 800 and 1100 years ago was evident. Environmental explanations for this gap are explored, but the palaeoenvironmental record for this part of the Australian arid zone is too sparse and

too coarse to provide explanations of human behaviour on time scales of just a few hundred years.

Having established a model for Stud Creek of episodic landscape change throughout the late Pleistocene and Holocene, right up to European contact, its veracity was evaluated in a pilot study at another location within the region. The length of the archaeological record preserved in three geomorphically distinct locations at Fowlers Gap, 250 km south of Stud Creek, is a function of geomorphic dynamics, with a record of a few hundred years from sites located on channel margins and low terraces, and the longest record thus far of around 5,000 years from high terrace surfaces more remote from active channel incision. But even here, the record is not continuous, and like Stud Creek, the gaps are interpreted to indicate that Aboriginal people moved into and out of these places intermittently throughout the mid to late Holocene.

I conclude that episodic nonequilibrium characterizes the geomorphic history of these arid landscapes, with impacts on the preservation of the archaeological record. Dating of both archaeological and landform features shows that the landscape, and the archaeological record it preserves, are both spatially and temporally disjointed. Models of Aboriginal hunter-gatherer behaviour and settlement patterns must take account of these discontinuities in an archaeological record that is controlled by geomorphic activity.

I propose a new geoarchaeological framework for landscape-based studies of surface artefact scatters that incorporates geomorphic analysis and dating of landscapes, as well as tool typology, into the interpretation of spatial and temporal patterns of Aboriginal hunter-gatherer 'use of place'.

CERTIFICATE OF ORIGINALITY

Except where otherwise indicated below or in the text herein, the work described in this thesis is entirely my own, and has not been submitted, in any form, for a higher degree at any other institution.

The research in this thesis has been carried out under the umbrella of the Western NSW Archaeological Program, established to undertake interdisciplinary research on Aboriginal stone artefact scatters in western NSW, Australia. Together with archaeologist Dr Simon Holdaway, I am co-director of WNSWAP and co-Chief Investigator on a Large ARC grant which has partially funded this research. As the geomorphologist on the this team, it has been my sole responsibility to describe and measure the effects of geomorphic processes and landscape evolution on the preservation, exposure, visibility and lateral integrity of the surface archaeological record and to devise and develop survey protocols for artefact scatters that take account of their geomorphic landscape setting. I have also been fully responsible for the detailed description, analysis and absolute dating of the sediments of the valley fill underlying the artefact scatters, interpreting the results in terms of present and past landscape dynamics, and integrating the outcomes into a two-phase chronology of late Holocene Aboriginal occupation for this part of arid Australia.

The following list summarises my particular contribution to the joint papers in this thesis.

Chapter 1:

Holdaway, S., **Fanning, P.** & Witter, D. (1997). GIS analysis of artefact distributions in an eroding landscape: the Western New South Wales Archaeological Project. In Johnson, I. and North, M. (eds) *Archaeological Applications of GIS: Proceedings of Colloquium II, UISPP XIIIth Congress, Forli, Italy, September 1996*. Sydney University Archaeological Methods Series 5. Conception 50%, writing 50%

Holdaway, S., Witter, D., **Fanning, P.**, Musgrave, R., Cochrane, G., Doleman, T., Greenwood, S., Pigdon, D. & Reeves, J. (1998) New approaches to open site spatial archaeology in Sturt National Park, New South Wales, Australia. *Archaeology in Oceania* 33, 1-19. Conception 20%, data collection 20%, analysis 20%, writing 50%

Chapter 2:

Holdaway, S.J., **Fanning, P.C.** & Witter, D.C. (2000). Prehistoric Aboriginal occupation of the rangelands: interpreting the surface archaeological record of far western New South Wales Australia. *The Rangeland Journal* 22, 44 - 57. Conception 50%, data collection 20%, analysis 20%, writing 30%

Chapter 3:

Fanning, P.C. & Holdaway, S.J. (2001a). Stone artifact scatters in western NSW, Australia: geomorphic controls on artifact size and distribution. *Geoarchaeology: an International Journal*, 16(6): 667-686. Conception 80%, data collection 50%, analysis 30%, writing 50%

Fanning, P.C. & Holdaway, S.J. Stone artifact exposure and visibility at open sites in western New South Wales, Australia: a geomorphic framework for survey and analysis. *Journal of Field Archaeology* (submitted December 2001). Conception 100%, data collection 50%, analysis 50%, writing 50%

Chapter 4:

Fanning, P.C. & Holdaway, S.J. (2001b). Temporal limits to the archaeological record in arid western NSW, Australia: lessons from OSL and radiocarbon dating of hearths and sediments. In M. Jones and P. Sheppard (eds) *Australasian Connections and New Directions: Proceedings of the 7th Australasian Archaeometry Conference*. Research in Anthropology and Linguistics 5, 91-111. Conception 100%, data collection 80%, analysis 80%, writing 50%

Holdaway S.J., Fanning P.C., Witter D.C., Jones M., Nicholls G. & Shiner, J. (2002). Variability in the Chronology of Late Holocene Aboriginal Occupation on the Arid Margin of Southeastern Australia. *Journal of Archaeological Science* 29.
Conception 50%, data collection, 20%, analysis 20%, writing 50%

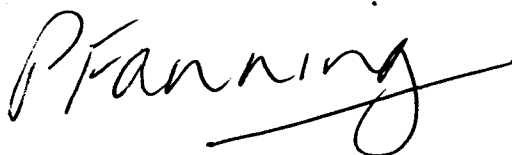
Specific contribution of joint authors:

S.J. Holdaway: co-director of WNSWAP; collaborator on all aspects of the research program; Principal Investigator on ARC Collaborative Grant; co-Chief Investigator on Large ARC Grant; assistance with statistical analyses; GIS map production; associate supervisor of this thesis.

D.C. Witter: represented Industry Partner in ARC Collaborative grant which funded the research; responsible for hearth identification and excavation

M. Jones & G. Nicholls: Bayesian statistical analysis of the hearth dates.

J. Shiner, G. Cochrane, T. Doleman, S. Greenwood, D. Pigdon & J. Reeves: assistance with field work and some data analysis.



Patricia Fanning, B.A. (Hons), M.Sc.
March 2002

I certify this to be a true and accurate statement of the originality of the work presented in this thesis.



Simon J. Holdaway, B.A. (Hons), M.A., PhD
WNSWAP Co-Director and Associate Supervisor
March 2002

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