THE ARCHAEOLOGY OF AUSTRALIA'S DESERTS

This is the first book-length study of the archaeology of Australia's deserts, one of the world's major habitats and the largest block of drylands in the Southern Hemisphere. Over the last few decades, a wealth of new environmental and archaeological data about this fascinating region has become available. Drawing on a wide range of sources, *The Archaeology of Australia's Deserts* explores the late Pleistocene settlement of Australia's deserts, the formation of distinctive desert societies and the origins and development of the hunter-gatherer societies documented in the classic nineteenth-century ethnographies of Spencer and Gillen. Written by one of Australia's leading desert archaeologists, the book interweaves a lively history of research with archaeological data in a masterly survey of the field and a profoundly interdisciplinary study that forces archaeology into conversations with history and anthropology, economy and ecology, and geography and earth sciences.

Mike Smith is the senior archaeologist at the National Museum of Australia. For more than 30 years, he has worked extensively across the Australian arid zone, piecing together the archaeology of this immense continental region of dunefields, sandy rivers, salt lakes, and desert uplands. His previous appointments include field archaeologist at the Northern Territory Museum in Darwin and Alice Springs, research Fellow in the Research School of Pacific and Asian Studies at the Australian National University, and lecturer in archaeology for the Department of Archaeology and Anthropology at the Australian National University. A Fellow of the Australian Academy of the Humanities and of the Society of Antiquaries (London), he was awarded the Rhys Jones medal by the Australian Archaeological Association in 2006 for 'outstanding contributions to Australian Archaeology'. In 2010, he received the Verco medal from the Royal Society of South Australia for his research.

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MIKE SMITH

National Museum of Australia

CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town,
Singapore, São Paulo, Delhi, Mexico City

Cambridge University Press
32 Avenue of the Americas, New York, NY 10013-2473, USA

www.cambridge.org
Information on this title: www.cambridge.org/9780521407458

First published 2013

Printed in the United States of America

A catalog record for this publication is available from the British Library.

Library of Congress Cataloging in Publication Data

Smith, M. A., author.
The archaeology of Australia's deserts / Mike Smith, National Museum of Australia.
pages cm. – (Cambridge world archaeology)
Includes bibliographical references and index.
ISBN 978-0-521-40745-8 (hardback)
1. Deserts – Australia. 2. Environmental archaeology – Australia. 3. Archaeology – Australia. 4. Human ecology – Australia. I. Title.
GB618.89.S65 2013
994.01–dc23 2012031958

ISBN 978-0-521-40745-8 Paperback

For Ben,

Lost in the Strzelecki Desert as a 10-year-old

and tracked through the night.

And for Moshu,

born in Alice Springs

with hair the colour of red desert sands.

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PREFACE

Whatever else it may be, a desert landscape is a historical document preserving a complex record of the interaction of past climates, geomorphic processes and cultural systems. I like to think of these landscapes as a palimpsest of different deserts. Stratified in time, stacked one above another, each has its own climate, physical landscapes and environments; each its own social landscapes and people, places of association and belonging, territories, resources and itineraries. Some features of earlier deserts project through these layers to become part of the fabric and cultural geography of later deserts. Structural features and processes are held in common: wind and water shape landforms; the basin and range topography provides the formwork of the landscape. No one desert is erased entirely by succeeding deserts – a fact that makes archaeology possible. This monograph – the first book-length archaeological study of Australia's deserts – is an attempt to map out these histories.

The past four decades of fieldwork in Australia's deserts and drylands has been an intense period of discovery, and a synthetic work that brings together the results of this research is sorely needed. This period has seen the duration of human settlement extended from 10,000 years to more than 40 millennia. At the same time, there has been a quantum growth in our understanding of the Quaternary history of arid Australia, fuelled in part by the availability of new dating techniques – such as thermoluminescence (TL), optically stimulated luminescence (OSL), electron spin resonance (ESR), amino acid racemisation (AAR), and accelerator mass spectrometry radiocarbon dating methods (AMS ^{14}C) often in conjunction with acid–base oxidation (ABOX) pretreatment. (For a description of the various dating techniques, and an explanation of terminology and abbreviations, see the Glossary.) There has also been an exponential increase in knowledge about the last 1–2 millennia of hunter-gatherer settlement and society; for the first time, this has provided a solid basis for examining the prehistory of the classic desert hunter-gatherer societies, well known in the nineteenth-century ethnographies of Baldwin Spencer and FJ Gillen.

At the outset, I should explain that this book is primarily a work of historical review and synthesis; it revisits basic questions about the deep history of Australia's deserts, their Ice Age settlement and the development of Aboriginal societies in these regions. For me, the 'big picture' still has an important role in archaeological narrative. Theory and methodology are intrinsic to this book but are not my main concern here. I prefer, as historian John Ferry once said, 'to be nudged by theory rather than dominated by it' (1999: 14). In any case, methodological issues are more properly part of the internal dialogue of the discipline, best fought out in the journals. I draw on rangelands ecology, hunter-gatherer theory and mathematical modelling where it helps me understand archaeological data and have taken into account arguments about the structure and biases in the archaeological record, without making these discussions ends in themselves. However, a broad review – such as this – necessarily conflates vast stretches of time, unavoidably glossing over some of the procedural difficulties presented by the uncertainties of radiocarbon calibration, questions of site formation processes and issues of taphonomy. Nor have I structured this book as a catalogue of old battles about specific models and hypotheses. I think it is important (occasionally) to step back and ask how the data might fit together as a natural and cultural prehistory of Australia's deserts. I will be delighted if this book gives impetus to fresh research. Part of its job is to frame new questions about desert prehistory that can be tested in the field, to point to frustrating gaps in basic fieldwork, to identify targets for critical application of theory or methodology and to encourage others to complete the crucial excavation and site studies that make up the building blocks of our field. I hope this book does all of these things and (after a polite interval) is dismantled by new thinking and finer-grained data.

Any review is limited by the extent of previous work. I have found that for some questions, the data simply do not exist (I would have liked, for example, to say more about the interactions between desert people and the societies surrounding the arid zone). For others, the data exist but are yet to be collated (most regions have abundant traces of late Holocene occupation, but fine-grained regional reviews are few, limiting my ability to approach the desert as a mosaic of different histories). Where it seemed that loose ends could be easily tidied up through new fieldwork or additional radiocarbon dates, I have gone and done this (for example, the potential harvest rates in the Mulligan River *pituri* groves and the additional radiocarbon dates for Kulpi Mara). Working through excavation reports, I have been conscious of the need to stay as close to the excavator's interpretation of chronology, sedimentary history and stratigraphy as I dare. But where I found basic errors, I have run with my own interpretation. Some published reports do not answer basic questions about the character of an occupation, artefact assemblages and site inventories, or provide workable site chronologies. In these cases, I made my own assessment (here, I am grateful for the generosity of colleagues who

answered requests for unpublished field data). Many studies use only basic age-depth plots to establish a chronological framework for a site. I have stayed close to the published version, unless I felt the evidence contradicted it.

I need to add a word on the structure of this book. The chapters represent a chronological series, but their coverage in space and time shrinks. Late Pleistocene deserts were larger than those today – and my review follows the contracting drylands. It will be no surprise to learn that we have a much finer-grained record of the last millennium (Chapters 7–9) than we do for the immense period from 45 ka to 24 ka (Chapter 4), so later chapters necessarily deal with narrower time slices. Chapter 2 explores the various ways that the past of these desert landscapes and desert societies has been interpreted since colonial explorers and scientists first encountered them, and points to recurring themes that are picked up in later chapters. Individual chapters each explore a major issue in desert research: the changing nature of the desert environment, the timing of initial human settlement, the impact of the last glacial maximum on desert settlement, postglacial adaptations, rock art and religion, prehistoric trade and exchange and the social history of classic ethnographic societies. Each chapter opens with a key moment in desert research (such as the discovery of the Lake Callabonna *Diprotodon* fossils); collectively, these vignettes build to provide a pen portrait of the region and its people. Each chapter also begins with a review of issues and ideas, presented as a framework for exploring the archaeological evidence.

Structure and agency are important concepts for me: throughout the book, I focus on how changes in palaeoenvironment affected the structure of the landscape in which these hunter-gatherer groups operated – and how human actions in turn modified these environments. I am drawn to the idea of *landesque capital*, proposed by economic historian HC Brookfield, because it forces us to think about long-lived economic infrastructure, in this case, the wells, soakages, plant transpositions, fire mosaics and also (in a way) rock art that improve the amenity of a hunter-gatherer landscape. One of my aims has been to explore as far as possible changes in the political and social structure of these societies – and this book goes some way towards describing a prehistory that contains more than just economy and environment. I am not blindly committed to the idea that population growth is the primary determinant of all social change, but I do find the evidence to be more consistent with the view that the structure of these hunter-gatherer societies and their capacity to mobilise resources and actors are emergent properties of their demography. In this regard, I see economy as architecture and social life as agency.

Throughout the book, I explicitly draw on ethnography, linguistics and Aboriginal history wherever they complement an 'archaeology of place'. Prehistoric societies were not cast in an ethnographic mould, but 'tracking back' is one method that can help establish when they took on something approaching their classic forms. The wealth of ethnographic data deserves wider critical

attention by archaeologists, and I think this can be done without archaeology necessarily becoming 'ethnography with a shovel'. I deliberately thread an Aboriginal 'voice' throughout the book. It is important, I think, to retain a feeling for the contemporary cultural landscape that swirls around these prehistoric sites.

Finally, I must say that the idea for this book began on a bush trip with Clive Gamble to Puritjarra rockshelter in 2001. With his wonderful book, *The Palaeolithic Societies of Europe* (1999), rolled up in my swag, I wondered then whether something similar might yet be done in Australia.

Centre for Historical Research
National Museum of Australia, Canberra
February 2012

ACKNOWLEDGEMENTS

The National Museum of Australia is a remarkable institution, a gem of a place to work. I am grateful for the time and intellectual space to tackle this book and the unobtrusive support of past and present directors: Dawn Casey, Craddock Morton and Andrew Sayers. I am fortunate to have a lively base in the Museum's Centre for Historical Research (CHR). I thank CHR Director Peter Stanley for his support and Libby Robin, who in many ways mentored this project. An affiliation with the Fenner School of Environment and Society (where I am adjunct professor) gave me crucial access to the e-library resources of the Australian National University. Staff at the Museum's own library also tracked down many obscure journal articles – with characteristic élan and efficiency.

The process of writing this book was an adventure in step with further field surveys, excavations, 4WD expeditions and some marvellous desert traverses with a string of pack camels – all of which helped plug gaps in individual chapters. Sitting in my study in the expectant hours before dawn, when ideas seem to flow best, I found it a revelation to re-read all the primary research papers, student theses and consultancy reports. But 'full immersion' made for slow writing, and this book took far longer than I had imagined. And so I thank Norman Yoffee and Beatrice Rehl at Cambridge University Press for their patience. Some sections of the text were initially written for other publications. I use them here (in a modified form) because they still best reflect my thinking on an issue.

Synthetic books always rely on the goodwill of colleagues. I wish to thank my 'republic of letters', those who sent me unpublished data; copies of theses or hard-to-get publications; took me to sites; gave me directions; shared the dust, flies and fatigue of fieldwork; took aerial photographs for me; or simply answered queries and shared ideas as this book took shape: Kim Akerman, Max Aubert, Alex Baynes, Claire Bowern, Jim Bowler, David Brooks, Adam Brumm, Brian Codding, Tim Cohen, Syd Coulthard, Bruno David, Iain Davidson, Nick Evans, Pat Faulkner, Judith Field, Dick Gould,

Richard (Dizzy) Gillespie, RG (ben) Gunn, Giles Hamm, Luise Hercus, Paul Hesse, Peter Hiscock, Tiger Morris Japaljarri, Diana James, Ken Johnson, Philip Jones, Luke Keogh, Dick Kimber, Roger Luebbers, John Magee, Ben Marwick, Isabel McBryde, Scott McConnell, Pat McConvell, Jo McDonald, John McEntee, Gifford Miller, Mark Moore, Kate Morse, Ken Mulvaney, Warren Murgatroyd, Gerald Nanson, Lewis Kyle Napton, David Nash, Colin Pardoe, Sheila van Holst Pellekaan, Brad Pillans, Gavin Prideaux, Richard Robins, André Rosenfeld, June Ross, Don Rowlands, Jen Silcock, Moya Smith, Mark Stafford Smith, David Taylor, Peter Thorley, Douglas Multa Tjakamarra, Sean Ulm, Peter Veth, Glenda Wardle, Alan Watchman, Esmee Webb, Steve Webb, Rod Wells, Bernhard Weninger, Allan Whiting, John Wischusen, Alan Williams, Elizabeth Williams, Martin Williams, Trevor Worthy, Boyd Wright and Andrew Harper and the cameleers and travellers with Australian Desert Expeditions. I especially thank Barry Cundy, June Ross, Alan Williams and Manik Datar for sharing the sheer adventure of the enterprise.

The grey literature contains a wealth of information, and the following generously made consultancy reports or student theses available to me: Elizabeth Bradshaw; ben Gunn; Fiona Hook; Phil Hughes; Ken Mulvaney; Rio Tinto Australia; Birgitta Stephenson; Lynda Strawbridge; the Department of Archaeology and Palaeoanthropology, University of New England; and the Department of Archaeology, University of Western Australia. The artefact distribution maps in Chapter 6 are more detailed than usual because they draw on field diaries from my 30 years as a field archaeologist in the arid zone – and on Kim Akerman's unparalleled knowledge of these things.

I appreciate the help of colleagues who read and commented on the manuscript: David Brooks, Sarah Dunlop, Guy Fitzhardinge, Marg Friedel, Tom Griffiths, Paul Hesse, Dick Kimber, John Kinahan, Isabel McBryde, Steve Morton, John Mulvaney, Jim O'Connell, and Libby Robin and my feisty, iconoclastic Manik – her love of the craft of writing augmented my own interest in words.

It takes a surprising amount of work to turn a manuscript into a book. In Canberra, Robert Nichols expertly edited the manuscript and Denise Sutherland created the index. Kay Dancey (ANU Cartography) drew the major base maps, and Alan Williams produced the time-series radiocarbon plots. Most other figures are from my own hand. At the National Museum, Anne Faris and Almaz Berhe helped clear copyright in the photographs. For permission to reproduce photographs in this book, I thank Peter Eve (Monsoon Studio), Museum Victoria (Spencer and Gillen collection), the South Australian Museum (EC Stirling collection), Wilfred Shawcross, Robert Edwards, Richard Robins, the Australian Institute of Aboriginal and Torres Strait Islander Studies (BJ Wright collection), Michel Lorblanchet, June Ross, the Western Australian Museum (Wilgie Mia collection) and the Northern

Territory Archives – Alice Springs (HH Finlayson collection). Darwin photographer, Peter Eve, graciously allowed me to use one of his striking desert images on the cover of this book.

Finally, I must thank Mike and Jan Sexton for their 'philanthropy without strings'; their generosity allowed me to chase ideas rather than money.

NOTE ON CALIBRATION OF RADIOCARBON DATES

Almost all archaeological research in Australia's deserts has relied on an uncorrected radiocarbon chronology. However, calibration of the radiocarbon timescale is now unavoidable, if archaeological records are to be fully integrated with palaeoenvironmental and climate data, or with global marine isotope stages (MIS). Few archaeologists today would be unaware that fluxes in atmospheric ^{14}C have distorted the radiocarbon timescale, so that radiocarbon years are not calendar ages. However, calibration programs to convert radiocarbon ages (years BP) to sidereal years (years cal. BP) over the full span of the last 50,000 years have only recently become available.

In this book, I have attempted to put everything on a common timescale by working primarily with calibrated ages (quoted as 'ka' or 'years cal. BP'). Ages were calibrated using OxCal 4.1 and the INTCAL09 dataset. Marine09 has been used for shell dates, applying a marine reservoir correction of 450 ± 35 years, plus a regional offset delta-R correction 70 ± 70 for samples younger than 8 ka. For samples older than 8–7 ka, shifts in sea levels and currents may have affected rates of mixing, so the delta-R correction is effectively unknown. For these samples, I rely on the base correction of 450 ± 35 years, widely used in reporting Pleistocene shell dates from archaeological sites. The SHCal04 data set and calibration curve allows for a Southern Hemisphere offset of 55–58 years back to 11,000 BP. A full listing of the original radiocarbon ages for Australian desert sites is available in the *AustArch1* database, at http://palaeoworks.anu.edu.au/databases.html.

For most archaeological use, a centre-point age estimate is more convenient than the unwieldy, non-normalised, 2SD age ranges routinely generated by calibration programs (even if these are technically more correct). Following Telford et al. (2004), I use the median of the calibrated age-distribution (median IntCal09 age ± 1SD), which is more robust than mode or intercept methods and not as sensitive to small changes in the calibration curve. Throughout this book, calendar ages are quoted as 'ka' (thousands of years ago) and rounded up, to avoid implying more chronological precision than the context allows.