



## An amazing 50 years of Australian research: Now for greater collaboration, codesign and traditional knowledge application to developing policy and action

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## An amazing 50 years of Australian research: Now for greater collaboration, codesign and traditional knowledge application to developing policy and action

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### The last 50 years

The achievements of the last 50 years by researchers seeking to understand Australia's past are nothing less than extraordinary. Acknowledging earlier contributions, a small cohort of archaeologists have managed to explore a breath-taking number of research themes across a continent 7 million km<sup>2</sup> in size. And at the beginning of this journey radiocarbon dating was in its infancy, optically stimulated luminescence (OSL) sampling only appeared in the 1990s, and the application of genomic and complex modelling only in the last few years—each of which have led to profound refinement of our understandings and opened-up new avenues for exploration. The list of researchers is far too long to outline here, but includes the likes of John Mulvaney, Rhys Jones, Richard Gould, Isabel McBryde, Fred McCarthy, Ronald Lampert, Harry Lourandos, Charles Dortch, Mike Morwood, Mike Smith, George Chaloupka, Sylvia Hallam, and Andrée Rosenfield.

Over the last half century, research themes have been impressive in their scope and scale, reflecting the continual and progressive understanding of a hitherto massive archaeological landscape. Initially these themes focussed on the classification of stone artefacts and attempted development of a continental typology, epitomised in Fred McCarthy's *Australian Aboriginal Stone Implements* (McCarthy 1967) and subsequent debates and culminating in the *Australia's Eastern Regional Sequence Revisited* proposed by Peter Hiscock and Val Attenbrow (2005). Concurrently, a plethora of regional, now foundational, studies were being developed, such as Isabel McBryde's (1974) *Aboriginal Prehistory in New England*, and Josephine Flood's (1980) *The*

*Moth Hunters: Aboriginal Prehistory of the Australian Alps*.

Research quickly shifted to the timing, and especially first appearance, of people across various parts of Sahul. In the 1980s and 1990s, these investigations were centred on the survival of populations through the Last Glacial Maximum (LGM; ~21 ka) especially in the arid centre, resulting in the *Islands in the Interior* model proposed by Peter Veth (1993), and which remains a cornerstone of the discipline today. Into the 1990s and up to the present has been the debate over the first peopling of Australia, revolving around the interpretation of Madjedbebe and Nauwalabila rockshelters in Arnhem Land as to whether they were occupied before or after ~55 ka. While at the other end of the timescale, Harry Lourandos was proposing his intensification model for Late Holocene populations, suggesting increasing social complexity to account for changes in the archaeological record. It would be remiss not to mention the earliest interred human remains discovered at Lake Mungo in the late 1960s by Jim Bowler, leading to near continuous investigation of the region ever since, and showing it to be a key locale for occupation during the LGM; or not to highlight the interrogation of megafauna extinction by humans first proposed by Rhys Jones (1969), and which has formed a highly contentious debate—often focussed upon the key site of Cuddie Springs—since the 1990s.

Rock art research, another critical facet of our discipline, has changed markedly over the last 50 years, shifting from documentation and classification by researchers such as Leslie Maynard and Robert Edwards to efforts to explain patterning across space and time. With contrasting environmental conditions and changing social networks in

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the past, the concept of rock art playing a role in information exchange was widely adopted from the 1980s. Large and varied rock art assemblages have been perceived as resulting from the aggregation of people at particular locations, as a means of highlighting identity, and/or social geography. Environmental change, notably sea-level rise, is seen as an explanation for diversity of subject matter depicted in some assemblages, while others have proposed rock art as a product of ritual. Concurrently, there has been a complementary focus on developing robust chronologies for assemblages using multiple dating techniques—although attempts for pre-LGM rock art remain elusive. Recent research is focussing on rock art assemblages following Contact and continues to emphasise the significance of knowledge held by Indigenous Traditional Owners.

In the last decade, new avenues of research have been initiated, including the use and manipulation of large datasets of radiocarbon data to explore demographic change—with an increasing focus towards quantitative, rather than qualitative, outputs. Results are now being applied to complex stochastic and geospatial modelling to identify how populations entered and moved across the landscape. And perhaps the greatest leap forward has been the application of genomic research to archaeological and contemporary samples, providing a profound new understanding of past populations.

### The next 50 years

The research ideas and concepts outlined above provide a solid foundation upon which to base future research and investigation. So where to from here?

Fundamentally, regional investigations need to continue, with many of the established archaeological models based on limited field data. My research compiling radiocarbon data, and its subsequent evolution into SahulArch, has shown that there are only 2,318 dated archaeological sites across Sahul. That equates to only 1 site per  $\sim 3,200 \text{ km}^2$ . These data are heavily skewed towards the coastal edges of modern Australia, with massive gaps across the main arid zones, inland portions of Queensland and Northern Territory, and western New Guinea. Even at a local scale, few places have any form of systematic investigation or documented sites. With recent hypotheses proposing that populations used cryptic refugia—micro-regions of persistent resources—during the LGM, a far greater scale of data is necessary to confirm and refine these latest ideas.

In addition to investigations on land, we are now seeing the beginning of exploration of the inundated continental shelf. Some 2 million  $\text{km}^2$  of Sahul was

lost following sea-level rise, and upon which a significant portion of pre-LGM occupation undoubtedly occurred. Recent discovery of artefacts dating to  $>7.5 \text{ ka}$  at Murujuga has shown that submerged archaeological material can be recovered with modern approaches. With improving technologies and increasing access through Australia's renewable energy investment in offshore wind-farms, this area of archaeological research will significantly expand in the coming decades and provide an important window into previously unknown parts of the Sahulian landscape. However, strong engagement with government is needed since there is currently limited requirement or legislation to investigate or protect inundated archaeological landscapes.

Significant temporal gaps in our knowledge also require interrogation. While there has been an extended focus on first peopling and the LGM, there is very little understanding about the populations or their activities between  $\sim 45$  and  $25 \text{ ka}$ . Our knowledge of the immediate post-LGM societies and their response to the Antarctic Cold Reversal and/or rapid sea-level rise is similarly only just becoming apparent. This paucity of on-ground data extends into the Early Holocene where modelling predicts rapid populations and expansion of landscape use, but which is not evident in the extant record.

Alongside these spatial and temporal research themes is the continued evolution of methods and techniques that improve our understanding. There is no way to predict what the next 50 years will bring, but the recent use of genomic research to inform modelling about past populations has provided a revolutionary change in our understanding of facets of evolution, migration, and regionalisation, and will continue to do so into the future. To date, investigations have focussed on human samples, such as bone and hair, but the potential for DNA to be extracted directly from sediments would be a real game-changer. If achievable, every excavated site could have both an archaeological and genomic record to compare and correlate past activity with the added benefit of direct connection between sites through genetic relationships. Exploration by Luke Gilganic and colleagues of OSL dating *surface* stone artefacts is also a technique that may result in significant impact to our research (Gilganic et al. 2021), with chronological understanding of the many palimpsests of stone artefacts a potential outcome. There is also a plethora of current techniques that will hopefully become more readily available and widely adopted, including high-performance computational modelling, artefact residue analysis, palaeoenvironmental (e.g. palynology, phytoliths, charcoal, faecal biomarkers, etc.) and soil analyses (e.g. geochemistry such as ITRAX and X-Ray

Fluorescence, micromorphology etc.), all of which would provide greater context about people's past activity and landscape use.

In tandem with research, it is critical for greater collaboration across the archaeological community. It is imperative to see meaningful partnerships between the academic and cultural heritage management (CHM) sectors. While recent surveys have shown that >65% of professional archaeologists work in CHM, there remains limited interaction across the sectors, nor are there readily available journals or repositories to disseminate CHM findings. Further understanding of the legal obligations of CHM publication is also going to be critical here, with intellectual property and commercial constraints frequently limiting researchers in their distribution of data. Externally, we need to have far greater engagement across the palaeoenvironmental/climatic, anthropological, and genomic research communities. Many of these are working in isolation and producing results that are divergent from the extant archaeological record. Increasing interactions across these research teams will only strengthen our discipline, rather than lead to debate and conflict.

While Indigenous Traditional Owner involvement in research has occurred since at least the 1970s, only in recent years have they had a more active voice in their interests, concerns, and interpretation of archaeological, or deep-time, material culture. The concept of codesign—Indigenous Traditional Owners as equal partners in the direction of research—is only just being explored, but is an exciting and important direction for our discipline and one I very much hope will expand into the future. The policy shift and application of traditional burning methods to offset catastrophic bushfires is just one example of the success that can be achieved

from this closer collaboration. Indeed, with the ecological and environmental collapse predicted in the coming decades, wherever feasible the archaeological community must convert our knowledge of past traditional practice and behaviour into useable direction, policy, and public outreach initiatives to inform and assist Australia's future.

### Disclosure statement

No potential conflict of interest was reported by the author.

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