Centre for Archaeological Science

Key Research Project

Out of Africa and into Australia: robust chronologies for turning points in modern human evolution and dispersal

This 5-year Discovery Project (2006–2010) to Bert Roberts and Zenobia Jacobs has been funded by the Australian Research Council to establish the timing of major turning points in modern human evolution and dispersal from Africa to Australia.

Africa is widely viewed as the cradle of anatomically modern humans (people who looked like us), but no consensus exists over when or where our species first started to think and behave like us. Nor there is agreement on the pattern or speed of dispersal of humans around the rim of the Indian Ocean after they had left Africa. When and where did our species first show signs of technological innovation and symbolic expression, in the manufacture of sophisticated stone tools and the creation of personal ornaments, art and abstract images?

The age and behavioural significance of changes and differences in stone tool technology, and in symbolic items of material culture, have long been disputed because of the lack of well-dated archaeological sites. To address these fundamental questions in human evolution, Zenobia and Bert have used a range of modern dating techniques, and in particular single-grain optically stimulated luminescence (OSL) dating, to construct a robust timeframe for the behavioural and technological turning points in Africa, India and Australasia.

Southern Africa has been the initial focus of attention because of the existence of two pulses of sophisticated and distinctive Middle Stone Age technology (the Still Bay and the Howieson’s Poort) and a range of associated symbolic artefacts. These include pieces of ochre and fragments of ostrich eggshell with engraved designs, and gastropod shells that had been deliberately pierced to make into beads.

By systematically applying OSL dating to sites in South Africa, Lesotho and Namibia, Zenobia and Bert have found that the Still Bay and Howieson’s Poort each only lasted a few thousand years between about 72,000 and 60,000 years ago. The rise and fall of these two technologies are not obviously linked to any climatic changes, but might be due to expansions and contractions of human populations and their social networks at around this time, as reconstructed from the genetic structure of modern Africans.
Clockwise from top left: 70,000 year old serrated bifacial points from Umhlatuzana rockshelter, South Africa. (photo M. Lombard); Excavations at Sibudu Cave in KwaZulu-Natal, South Africa. (photo L. Wadley); Still Bay bifacial foliate stone points, bone points and engraved ochre from Blombos Cave, South Africa. (photo C. Henshilwood); Ntloana Tsoana rockshelter, Lesotho. (photo R. Roberts).

Main collaborators

- Rex Galbraith: Dept of Statistical Science, University College London, UK
- Rainer Grün: Research School of Earth Sciences, Australian National University, Australia
- Marlize Lombard: Dept of Anthropology, University of Johannesburg, South Africa
- Alex Mackay: School of Archaeology & Anthropology, Australian National University, Australia
- Peter Mitchell: School of Archaeology, University of Oxford, UK
- Ralf Vogelsang: Institute of Prehistoric Archaeology, University of Cologne, Germany
- Lyn Wadley: Institute for Human Evolution, University of the Witwatersrand, South Africa

Key publications