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Australian dig finds evidence of Aboriginal habitation up to 80,000 years ago

Artefacts in Kakadu national park have been dated between 65,000 and 80,000 years old, extending likely occupation of area by thousands of years

Team leader Chris Clarkson with Richard Fullagar and Elspeth Hayes examining a rare grindstone from the lowest layers of the excavation at Madjedbebe rock shelter.

Helen Davidson at Madjedbebe and Calla Wahlquist
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A groundbreaking archaeological discovery in Australia's north has extended the known length of time Aboriginal people have inhabited the continent to at least 65,000 years.

The findings on about 11,000 artefacts from Kakadu national park, published on Thursday in the Nature journal, prove Indigenous people have been in Australia for far longer than the much-contested estimates of between 47,000 and 60,000 years, the researchers said. Some of the artefacts were potentially as old as 80,000 years.

The new research upends decades old estimates about the human colonisation of the continent, their interaction with megafauna, and the dispersal of modern humans from Africa and across south Asia.

“People got here much earlier than we thought, which means of course they must also have left Africa much earlier to have traveled on their long journey through Asia and south-east Asia to Australia,” said the lead author, Associate Prof Chris Clarkson, from the University of Queensland.

“It also means the time of overlap with the megafauna, for instance, is much longer than originally thought – maybe as much as 20,000 or 25,000 years. It puts to rest the idea that Aboriginal people wiped out the megafauna very quickly.”

Clarkson said the Madjedbebe rock shelter where the artefacts were found – which has been excavated four times since the 1970s – had been controversial in the past but the processes used to date the artefacts meant the team could say “precisely” that the area was occupied 65,000 years ago and “hopefully put the controversy to rest”.

The findings also suggested people crossed over from south Asia at a time that was cooler and wetter, with lower sea levels allowing easier sea crossings.

The significant trove of thousands of artefacts, was buried in 2.6m of sand and sediment on the western edge of the Arnhem Land plateau. The site at Madjedbebe is on the traditional lands of the Mirarr people, but currently within the confines of the Jabiluka uranium mining lease, and surrounded by the 20,000 hectares of the heritage-listed Kakadu.

Madjedbebe site custodian May Nango and excavation leader Chris Clarkson in the pit. Photograph: Dominic O'Brien/Gundjeihmi Aboriginal Corporation

Much of the success of the five-year long project is credited to a unique and benchmark-setting agreement between the researchers and the Mirarr, who retained total control over the dig and the artefacts discovered.

The discovery adds western scientific evidence to Indigenous cultural knowledge about the length of time their ancestors have occupied the land.

“We’d like to tell people we were here long enough – tell all the Balanda [non-Indigenous people] about the stories, that people were here a long time,” Mirarr traditional owner May Nango said.

More than 10,000 artefacts were uncovered in the “zone of first occupation”, including ochre and reflective paint substances, as well as the oldest unbroken ground-edge stone axes in the world, by about 20,000 years, and the oldest known seed-grinding tools in Australia.

“What we found was it’s not just one kind of hatchet head we’ve got, but four or five quite different kinds,” said professor Richard Fullagar from the University of Wollongong.

Fullagar also said there were significant consistencies in the discovered technologies, throughout the timeframe.

“There’s a huge variety of these things spread over thousands of years. In some ways there are strong similarities with what happens at the very beginning, but there are also remarkable changes.”

Edge-ground hatchet head being excavated

In the deepest levels of sediment, some artefacts were estimated to be about 80,000 years old – or at least 95% likely to be older than 70,000, the report noted. This did not necessarily indicate occupation, and there was some chance artefacts had shifted in the movement of the earth. However the layer of earth at 65,000 years was found to

Clarkson and traditional owner Nango at the dig. Photograph: Glenn Campbell

be a dense occupation layer, with multiple experiments finding no suggestion the earth had shifted.

Artefacts were both carbon dated and dated using optically stimulated luminescence, a technique that measures the radiative signature of a grain of sand to measure when it was last exposed to sunlight.

That dating method meant samples had to be extracted in complete darkness, under red lights.

“We worked in darkroom conditions,” University of Wollongong research fellow Prof Zenobia Jacobs said. “The moment we expose it to UV or sunlight it will reset that signal within seconds.”

That date was confirmed by researchers at the University of Adelaide, who tested a blind sample, and at New Zealand’s Waikato University.

The site has been excavated twice by Clarkson’s team, under a special agreement with the Gundjeihmi Aboriginal Corporation, in partnership with the current leaseholders, Energy Resources of Australia.

Under the agreement, which Clarkson described as one of the strongest in Australia, the Mirarr have total control over the extent of the dig, and veto power. All discoveries must be reported to them and all artefacts must be returned to the Mirarr at the end of the project.

“They have to bring it back here, it belongs to this place,” said May Nango, a Mirarr traditional owner. “We trust them to work this place.”

Nango said the country had to be protected for the younger generations, and she was worried about non-Indigenous people coming in and clearing out trees or mining.

“We like to stay forever, we’re buried here to. We like to stay forever on our land, and we like to teach our young kids too so they remember our old people who gave us the stories.”

David Vadiveloo, a lawyer and consultant to the corporation, said the agreement set a benchmark for “hard and fast obligations” on the university to ensure control over the site remained with the Indigenous custodians.

“Most [Australian] agreements we were able to sight when we were trying to draft this gave a sort of looser understanding that the university would respect the rights of the traditional owners and would do their very best,” he said.

“It was very clear in our minds that the Mirarr did not want this to be a project about them, they wanted this to be a project that was partnership with them.”

The strength of the agreement benefited the researchers, fostering trust to the extent that many members provided information about the origins of materials or the specific uses of implements, drawn from their own cultural knowledge.

It also potentially saved the project from a premature shutdown, when human bones were found very early on in the dig.

“The Aboriginal community wanted things stopped, and the agreement allowed them to then enter into discussion from a position of control,” said Vadiveloo.

“If there had no been an agreement, I would hazard a guess that the community would have shut the dig down, but because the agreement was so robust, because they knew they could control what was done with everything that was removed, how it was going to be removed, how it was going to be stored – particularly in relation to bones of ancestors – they were then cautiously happy for the dig to proceed.

“That means you get a great outcome for the research and a great outcome for the community feeling they maintained control over what’s happening on their country.”

Researchers are now systematically surveying the surrounding area to find additional sites, to see if even older evidence of occupation can be found.

Simon Mudjandi, a Mirarr traditional owner, said his family had travelled through the area and camped at Madjedbebe for generations.

“I feel proud to come from here because country is important and country needs people,” he said.

“It’s special because it has a lot of sacred sites, and back in the old days our old people used to walk over here looking for bush tucker. They used the rocks and axes.”

Mark Djandjomerr, a Bininj elder and family to Mirarr, said he camped at Madjedbebe as a boy, taking shelter with his family as they walked between communities, avoiding nearby hunting safari sites.

“Mirrar people own this country,” he said. “This is Mirarr home, we need to protect it.”