Routledge
Taylor & Francis Group

Australian Archaeology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/raaa20

50 years and worlds apart: Rethinking the Holocene occupation of Cloggs Cave (East Gippsland, SE Australia) five decades after its initial archaeological excavation and in light of GunaiKurnai world views

Bruno David , Joanna Fresløv , Russell Mullett , GunaiKurnai Land and Waters Aboriginal Corporation, Jean-Jacques Delannoy , Matthew McDowell , Chris Urwin , Jerome Mialanes , Fiona Petchey , Rachel Wood , Lynette Russell , Lee J. Arnold , Birgitta Stephenson , Richard Fullagar , Joe Crouch , Jeremy Ash , Johan Berthet , Vanessa N. L. Wong & Helen Green

To cite this article: Bruno David , Joanna Fresløv , Russell Mullett , GunaiKurnai Land and Waters Aboriginal Corporation, Jean-Jacques Delannoy , Matthew McDowell , Chris Urwin , Jerome Mialanes , Fiona Petchey , Rachel Wood , Lynette Russell , Lee J. Arnold , Birgitta Stephenson , Richard Fullagar , Joe Crouch , Jeremy Ash , Johan Berthet , Vanessa N. L. Wong & Helen Green (2021): 50 years and worlds apart: Rethinking the Holocene occupation of Cloggs Cave (East Gippsland, SE Australia) five decades after its initial archaeological excavation and in light of GunaiKurnai world views, Australian Archaeology

To link to this article: https://doi.org/10.1080/03122417.2020.1859963

Published online: 05 Jan 2021.

Submit your article to this journal

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=raaa20

AUSTRALIAN ARCHAEOLOGY
https://doi.org/10.1080/03122417.2020.1859963

Routledge
Taylor & Francis Group

ARTICLE

Check for updates

50 years and worlds apart: Rethinking the Holocene occupation of Cloggs Cave (East Gippsland, SE Australia) five decades after its initial archaeological excavation and in light of GunaiKurnai world views

Bruno David[a,b], Joanna Fresløv[c], Russell Mullett[c], GunaiKurnai Land and Waters Aboriginal Corporation[c], Jean-Jacques Delannoy[a,d], Matthew McDowell[a,e], Chris Urwin[a,b], Jerome Mialanes[a,b], Fiona Petchey[a,f], Rachel Wood[a,g], Lynette Russell[a,b], Lee J. Arnold[a,h], Birgitta Stephenson[i], Richard Fullagar[j], Joe Crouch[b], Jeremy Ash[b], Johan Berthet[d], Vanessa N. L. Wong[k] and Helen Green[a,l]

[a]ARC Centre of Excellence for Australian Biodiversity and Heritage, Canberra, Australia; [b]Monash Indigenous Studies Centre, Monash University, Clayton, Australia; [c]GunaiKurnai Land and Waters Aboriginal Corporation, VIC, Australia; [d]Laboratoire EDYTEM, Université Savoie Mont Blanc, Le Bourget du Lac Cedex, France; [e]School of Natural Sciences, University of Tasmania, Hobart, Australia; [f]Radiocarbon Dating Laboratory, University of Waikato, Hamilton, New Zealand; [g]Radiocarbon Facility, Research School of Earth Sciences, Australian National University, Acton, Australia; [h]School of Physical Sciences, Environment Institute, Institute for Photonics and Advanced Sensing (IPAS), University of Adelaide, North Terrace Campus, Adelaide, Australia; [i]In the Groove Analysis Pty Ltd, Brisbane, Australia; [j]Centre for Archaeological Science, School of Earth, Atmospheric and Life Sciences, University of Wollongong, Wollongong, Australia; [k]School of Earth, Atmosphere and Environment, Monash University, Clayton, Australia; [l]School of Earth Sciences, University of Melbourne, Parkville, Australia

ABSTRACT

In this paper we report on new research at the iconic archaeological site of Cloggs Cave (GunaiKurnai Country), in the southern foothills of SE Australia's Great Dividing Range. Detailed chronometric dating, combined with high-resolution 3D mapping, geomorphological studies and archaeological excavations, now allow a dense sequence of Late Holocene ash layers and their contents to be correlated with GunaiKurnai ethnography and current knowledge. These results suggest a critical re-interpretation of what the Old People were, and were not, doing in Cloggs Cave during the Late Holocene. Instead of a lack of Late Holocene cave occupation, as previously thought through the conceptual lens of 'habitat and economy', Cloggs Cave is now understood to have been actively used for special, magical purposes. Configured by local GunaiKurnai cosmology, cave landscapes (including Cloggs Cave's) were populated not only by food species animals, but also by 'supernatural' Beings and forces whose presence helped inform occupational patterns. The profound differences between the old and new archaeological interpretations of Cloggs Cave, separated by five decades of developing archaeological thought and technical advances, draw attention to archaeological meaning-making and highlight the significance of data capture and the pre-conceptions that shape the production of archaeological stories and identities of place.

ARTICLE HISTORY
Received 11 September 2020
Accepted 2 December 2020

KEYWORDS
Capta; caves; Cloggs Cave; East Gippsland; explanatory frameworks; GunaiKurnai; habitat and economy; standing stones

Introduction

In 1971–1972, Cloggs Cave, in GunaiKurnai Country in the southern foothills of the Snowy Mountains, was archaeologically excavated for the first time (Figure 1). The excavation brought exciting new results on the occupation of the High Country, the extinction of megafauna, and changing patterns of site use following post-glacial climate change (e.g. Flood 1973, 1974, 1980). At the time, the predominant interpretative framework in Australian archaeology was firmly situated in a 'habitat and economy' school of thought (e.g. Lawrence 1969), as expounded by the British economic school (e.g. Clarke 1952; Higgs 1972), where most of Australia's first and second generations of professional archaeologists were trained (Murray and White 1981; Thomas 1981; e.g. see Jones 1968); by ecological thinking (e.g. Birdsell 1953, 1957); and by New Archaeology (e.g. Binford 1972; Binford & Binford 1968) that was emerging from the United States. By today's standards, the large-scale excavations at Cloggs Cave revealed ample details of environmental conditions (habitats) and patterns of occupation and subsistence behaviour (economy). Flood (e.g. 1980:275) interpreted the apparent shift of occupation around 10,000 cal BP, from inside the cave to the rockshelter immediately outside, as a social response to climate warming following the

CONTACT Bruno David bruno.david@monash.edu Monash Indigenous Studies Centre, Monash University, 20 Chancellors Walk, Clayton campus, Clayton, VIC 3800, Australia

© 2020 Australian Archaeological Association

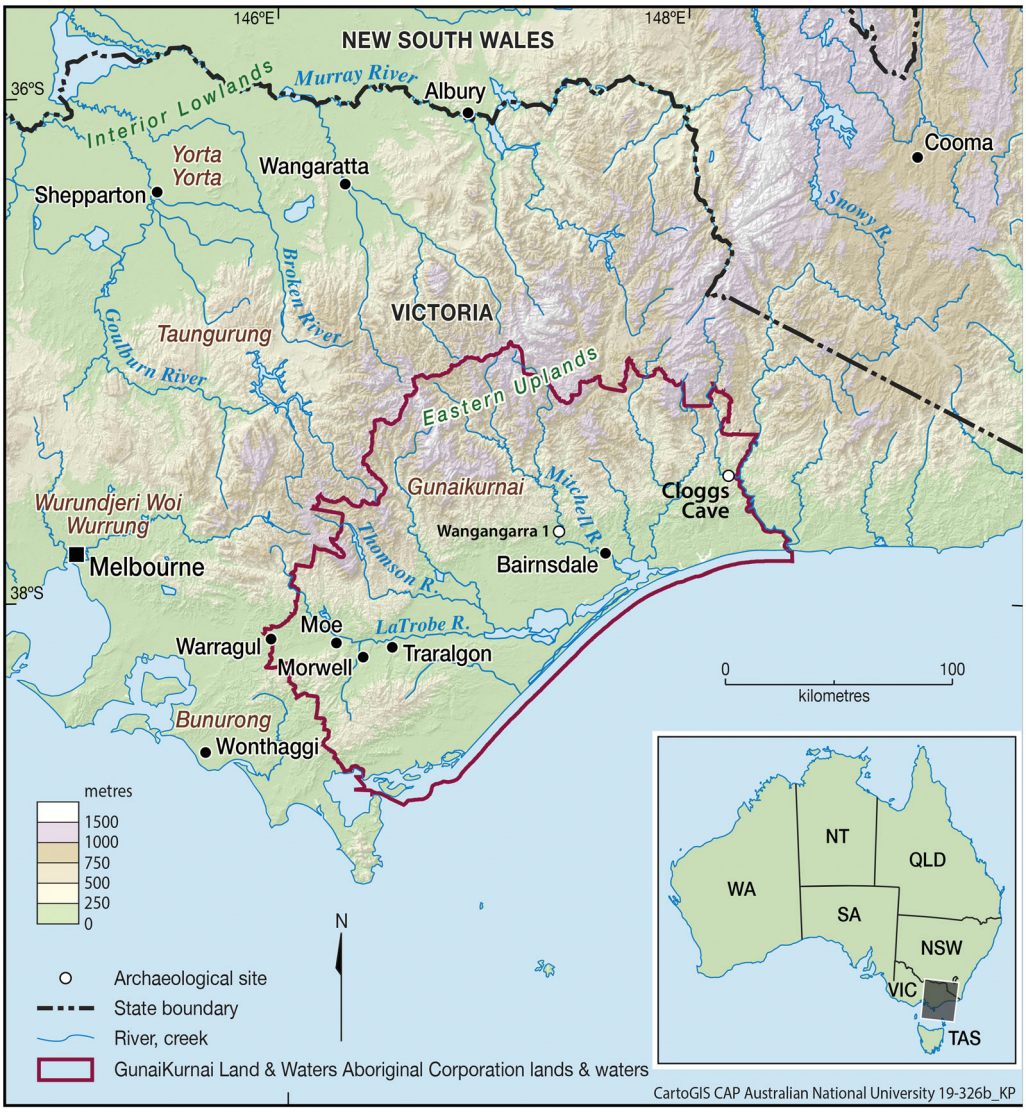

Figure 1. Location of Cloggs Cave in GunaiKurnai Land and Waters Aboriginal Corporation Country, southeast Australia (artwork by CartoGIS Services, College of Asia and the Pacific, Australian National University).

Last Glacial Maximum. She also interpreted the archaeological sequences of Cloggs Cave and 12 other Southern Uplands sites (Bogong Cave, Bogong Shelters 1 & 2, Caddigat Shelter, Front Paddock Shelter, Hanging Rock I, Nardoo, Rendezvous Creek Shelter, Sassafras I & II, Yankee Hat I & II) through a reasonably rich nineteenth century documentary record on subsistence practices. Flood concluded that during the Late Holocene, the High Country was occupied to take advantage of the annual summer migration of millions of fat-rich Bogong moths (*Agrotis infusa*) (Flood 1974:180, 1980:268, 275, 2007:52).

New excavations at Cloggs Cave undertaken in 2019 and 2020 enable us to revisit the ideas that underscored these interpretations of Cloggs Cave in the 1970s, and the nature and timing of the cave's Holocene occupation. This paper will not examine the Pleistocene story (for such details, see Delannoy et al. 2020; further results are in progress), but, rather, its most recent occupational phases only. The story we present takes advantage of new technologies that now enable finer-grained mapping and dating than was previously possible; 50 years of reflection on archaeological interpretations; and, most importantly, the incorporation of GunaiKurnai voices – the Aboriginal Traditional Owners of Cloggs Cave – enabling the occupation of the cave to be understood in local cosmological perspectives. All of these new details come from the application of highly specialised methods and knowledge sets, in archaeology, cartography, geomorphology, Quaternary dating, archaeozoology, and GunaiKurnai cultural knowledge.

Cloggs Cave: The 1971–1972 excavations

Flood's (1973:Figure 37, 1974, 1980) excavations at Cloggs Cave took place in four locations outside and inside the cave. Outside she excavated a quarter (7.5 m^2) of the available (c. 30 m^2) floor area (Flood 1980:259). Squares G and H were located under an

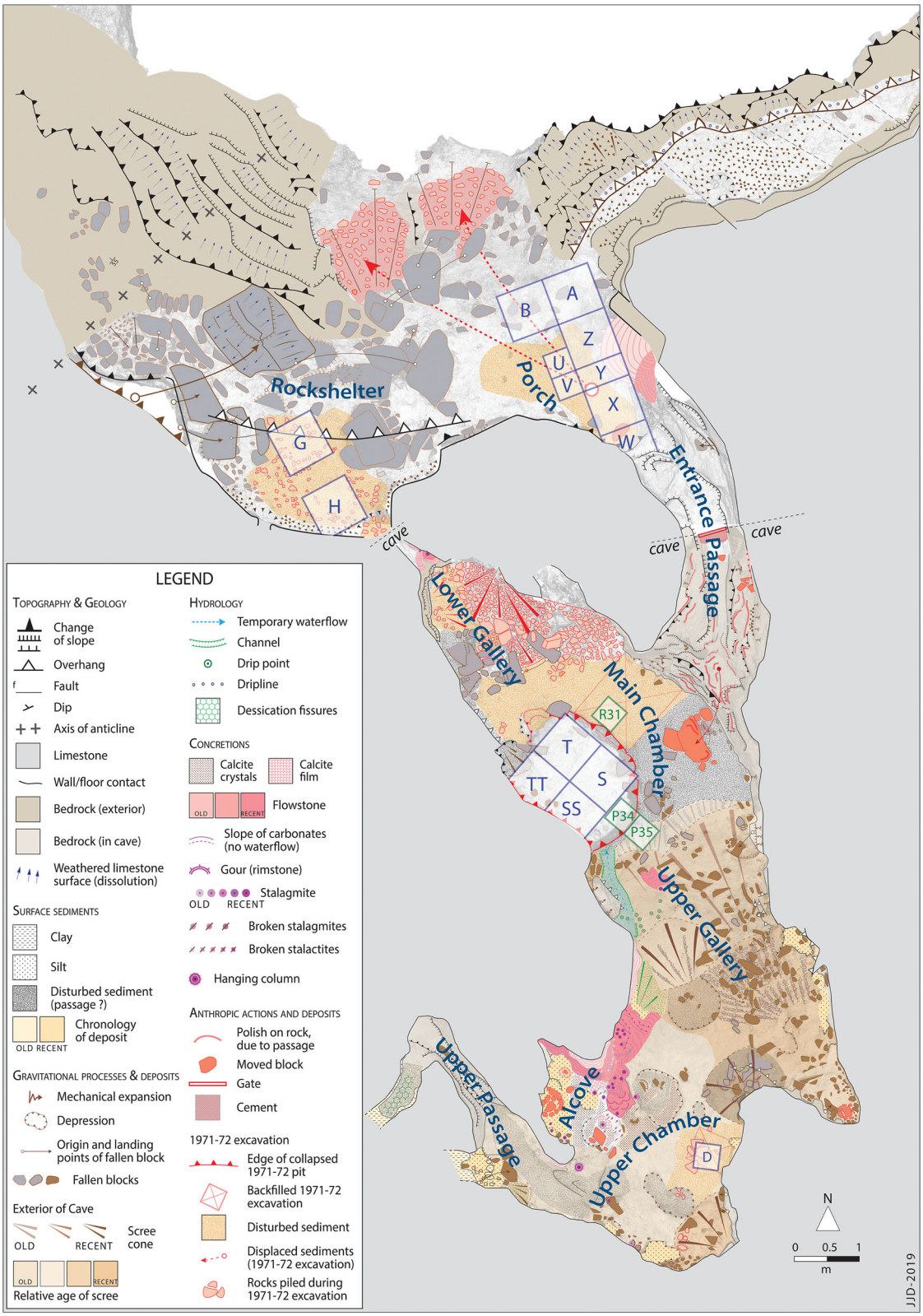

Figure 2. Cloggs Cave, showing locations of excavated areas (cartography by Jean-Jacques Delannoy; artwork by Jean-Jacques Delannoy and Bruno David).

overhang now referred to as the 'Rockshelter' (Figure 2; see Delannoy et al. 2020). They were dug to depths of 60–80 cm. Contiguous excavation Squares A, B, U, V, W, X, Y, and Z formed a trench in the Porch area, immediately north of the Entrance Passage to the cave's inner chambers. These excavations progressed to a depth of c. 1 m, uncovering extensive rockfall and cultural materials (Flood 1973:Tables 19.1 and 19.2). Inside the cave, within its expansive Main Chamber, a 2 × 2 m pit (Squares S, T, SS and TT) was positioned against the western wall. This excavation uncovered a c.

2.4 m-deep sequence containing cultural materials along with much older, non-artefactual layers with extinct megafauna remains from the basal c. 1 m of the northern c. 70 cm section of deposit. To the north of, and adjacent to, the main excavation inside the cave, a sequence of charred earth layers was exposed by the removal of the uppermost c. 20 cm of artefactually depauperate soft sediments. Finally, a 0.5 × 0.5 m area (Square D) was excavated in the cave's Upper Chamber. The excavations were conducted in 5–10 cm arbitrary spits, usually attempting to follow but sometimes cutting across the stratigraphy (e.g. see Flood 1973:Figures 41 and 42).

The antiquity of these internal and external zones was investigated through six conventional radiocarbon determinations, each obtained on comminuted charcoal combined from various parts of excavated squares. For the Main Chamber inside the cave, a radiocarbon age of 22,935–31,108 cal BP (22,980 ± 2000 BP, ANU-1220; all ^{14}C ages are calibrated against SHCal20 on Calib 8.20 and presented at 95% probability; Reimer et al. 2020; Stuiver and Reimer 1993) was acquired for the megafaunal deposits, and a minimum age of 19,323–23,282 cal BP (17,720 ± 840 BP, ANU-1044) for the deepest occurrence of stone artefacts. An age of 15,444–17,446 cal BP (13,690 ± 350 BP, ANU-1182) was acquired midway through the artefactual deposits, and 9,128–10,258 cal BP (8,720 ± 230 BP, ANU-1001) for layers of microstratified ash found in the upper c. 15–20 cm (see Flood 1974, 1980:260). Two radiocarbon ages were obtained from the Rockshelter and Porch outside the cave, each from about midway through the deposit: 743–1,054 cal BP (1,040 ± 65 BP, ANU-1181) for Square G (Spit 6 A), and 798–1,176 cal BP (1,110 ± 70 BP, ANU-1183) for Square W (Spit 5) (Flood 1973:Figures 39–40). What these age determinations signalled was that inside the cave, occupation was almost entirely Pleistocene in age, the upper cultural deposits terminating around 10,000 cal BP.

Flood used these determinations to anchor her discussions of human activities at Cloggs Cave in relation to Late Pleistocene to Holocene regional climate change. Flood (1973:286–287, 1980:268, 2007:52) suggested that people vacated the cave c. 10,000 years ago, shifting occupation to the Rockshelter and Porch outside as the climate 'ameliorated' (warmed) at the start of the Holocene. The artefacts and animal remains between these areas varied markedly (see Flood 1973:286). Outside the cave, the excavations uncovered 924 stone artefacts, in contrast to only 70 from inside. Furthermore, small quantities of mussel shell (*Velesunio ambiguus*) and animal bone were recovered outside the cave, whereas there was a total absence of shell inside the cave and, while there was an abundance of animal bone throughout the cave sequence, all, or almost all, were attributable to owl roosts and other natural deaths (Hope 1973:251; see also Flood 1980:275).

Flood (1973:267) argued that the excavations both inside and outside the cave contained evidence of a 'macrolithic' Pleistocene industry of patinated pebble tools and steep-edged scrapers, followed by a 'microlithic' Late Holocene industry. The perception of a two- (or three-) fold separation of stone artefact industries was common at the time, even expected (e.g. Bowler et al. 1970:52; Jones 1971; Lampert 1971). Flood (1973:270, 1974:175, 1980:259) found large core tools and scrapers in the deepest excavation levels both inside and outside the cave, and several geometric microliths and a single Bondi point in the uppermost levels outside the cave. However, these two distinct sets of artefact types occurred within the same levels of the highly disturbed entrance Porch excavations (Flood 1973:Figures 39–40), and, inside the cave, two microliths were also recovered from the upper levels (see Flood 1980:268; see below). The two Late Holocene radiocarbon ages acquired for the Rockshelter and Porch excavations were from mid-depths of the Square G and Square W sequences, and arguably put into doubt an assumed Pleistocene age for the undated macrolithic industries there.

In the cave sequence, Flood (1973:246–247, 1974:181–182, 2007:53) identified an unchanging faunal assemblage through time: 'The fauna throughout the deposit inside Cloggs Cave … was similar to that found by the first European settlers on the Buchan limestone'. The faunal evidence suggested a relatively stable climate in the immediate vicinity of the cave – an uncomfortable pairing with her conclusion that post-glacial warming enabled people to move from the cave to the open-air Rockshelter and Porch (Flood 1980:275). The mussel shell remains in the upper levels of the Rockshelter excavations were identified as evidence of seasonal occupation prior to the Holocene: 'The absence of shellfish exploitation in the Pleistocene period, if real, may reflect winter occupation of the site, since, even in the ethnographic present, Aborigines elsewhere considered the water of the slow-flowing rivers of the riverine plains too cold in winter to dive for shellfish' (Flood 1980:268). Flood's (1973:Table 3A) review of the local ethnographic literature, however, did not suggest that Aboriginal people dived for mussels.

Flood (1973:Appendices 1A–B, 2A–C, 3A) made extensive use of ethnographic sources in relation to Aboriginal burning practices, population size,

Figure 3. Excavation in progress in Square P35 XU11, among the SU2 ash layers surrounding the standing stone, Cloggs Cave, 3 February 2019. (A) Close-up of the excavation; the upper part of the standing stone can be seen in the lower right-hand side of the square. (B) Joe Crouch excavating Square P35 while standing in the 1971–1972 partly infilled (from wall collapses over the previous 48 years) pit, view into the cave from the end of the Entrance Passage (photos by Bruno David).

hunting tools, occupation patterns and the 'food quest'. A paucity of stone artefacts and food remains in the cave led her to interpret its occupation as a temporary hunting camp rather than a large-scale or longer-duration base camp. Her ethnographic lens was explicitly one of 'habitat and economy'. For example, in summarising the potential reasons why GunaiKurnai people might have travelled to the 'tablelands and mountains' in (and prior to) the early colonial period, Flood (1973:245) highlighted the 'hunting of possums, kangaroos or other marsupials, the procuration of stone for tool-making, and … moth-hunting'. Social or cosmological dimensions such as, for example, the imperative to maintain relationships with neighbouring peoples did not feature in her interpretations (for a critique, see Bowdler 1981). Seasonal migrations of Bogong moths were described as a 'magnet to draw [Aboriginal people living at or near Cloggs Cave] … to the mountains in summer'. Despite this, Flood (1980:268, 275) recognised that, as the climate warmed and the cave was apparently vacated, Aboriginal people may have come to view caves not as habitations but as burial sites and fearful locations (although there is no evidence of any kind that GunaiKurnai ever used caves as burial sites).

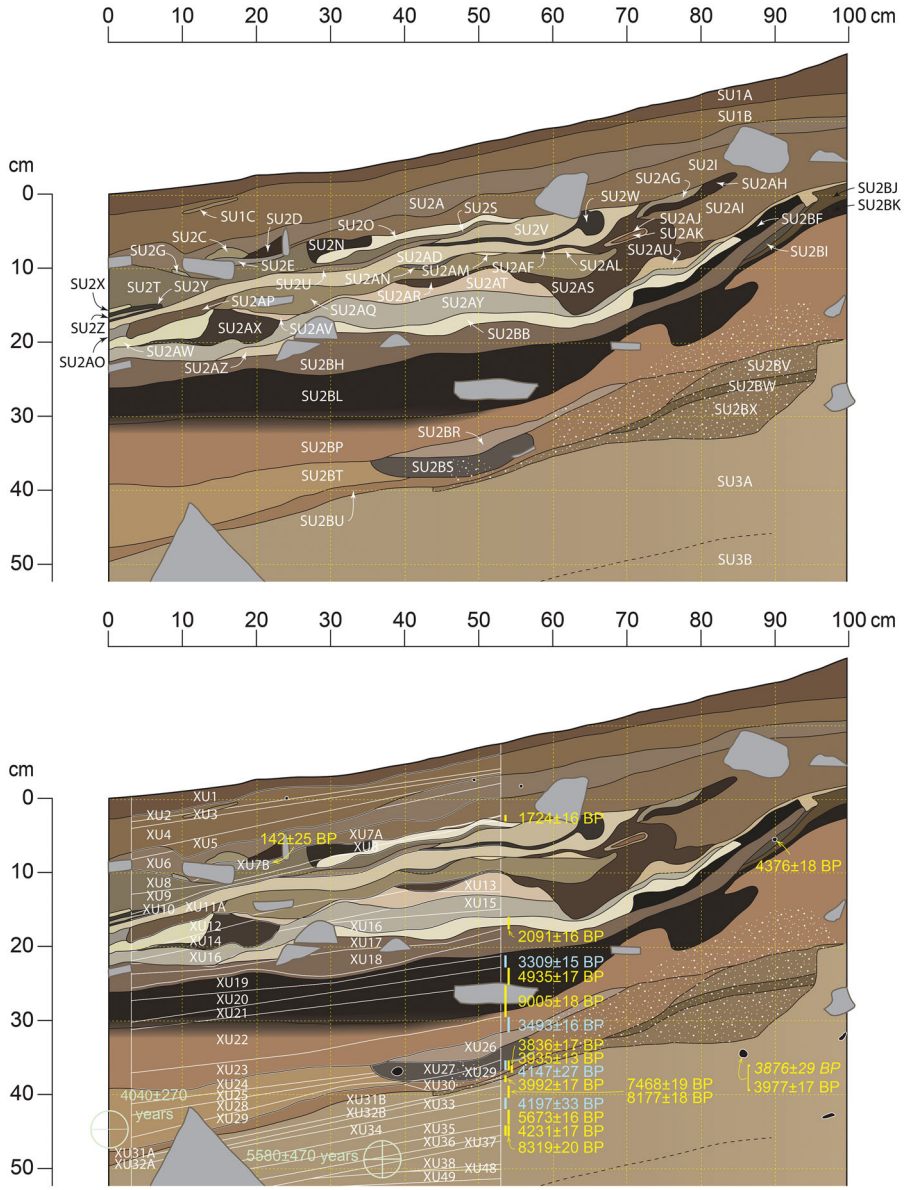

Figure 4. The hearth layers of the upper part of Square P35, Cloggs Cave, and radiocarbon and OSL ages obtained from the 2019 excavation. The ash layers begin with SU2AY–SU2BB. The 'BP' ages are uncalibrated AMS radiocarbon ages; the 'years' ages are single-grain OSL ages. The two circles with cross-hairs are the locations of single-grain OSL ages. Both the radiocarbon and OSL ages are shown with their 1σ uncertainty ranges. For legend, see Figure 6 (section drawings and artwork by Bruno David).

The 2019–2020 excavations

How, then, do the latest archaeological excavations at Cloggs Cave enable us to refine (or reconsider) these initial interpretations of the occupation and Early Holocene vacation of the cave? In 2017, the GunaiKurnai Land and Waters Aboriginal Corporation, representing the GunaiKurnai Traditional Owners of the cave, sent a delegation to Monash University with a request to initiate new partnership research in the Mitchell River National Park (see Roberts et al. 2020), Cloggs Cave, New Guinea II Cave and elsewhere in GunaiKurnai Country. Following a year-long period of first getting to know each other, and then assembling a research team, we returned to Cloggs Cave in late 2018 to assess the site's conservation, clean the variably collapsed exposed walls of the 1971–1972 pit, draft new section drawings, and prepare for new, small-scale excavations against the open pit's walls. The aims of the new excavations were to obtain detailed radiocarbon, optically stimulated luminescence (OSL) and uranium-series (U-series) ages for the sediment sequence, to better understand when the Old People were there; and to rethink what they did in the cave in light of new archaeological methods and a consideration of past and present GunaiKurnai knowledge. They were to tell anew the story of Cloggs Cave as revealed by GunaiKurnai knowledge and new investigative tools. Detailed, high resolution three-dimensional mapping of the cave using LiDAR was undertaken, (1) to enable

GunaiKurnai members who could not visit the cave to see its precise shape and features; (2) as a means of investigating the cave's configuration (including its palaeoentrance(s)); and (3) as a research tool to determine whether any part of the cave had been architecturally altered by the Old People in the past (for results, see David et al. in press a; Delannoy et al. 2020).

Three 50 × 50 cm squares were excavated in 2019–2020. Square P35 sampled the upper 125.7 cm only (buried large boulders inhibited deeper excavation) (Figure 3). Square P34 was situated against Square P35, and began where Square P35 had ended; it was positioned against the 'intact' (i.e. not collapsed) lower section of the southeast wall of the 1971–1972 pit, and proceeded down to 227.7 cm depth. Square R31 was positioned against the cleaned northeast wall of the 1971–1972 pit, and excavated from c. 20 cm depth down to the top of the megafauna layers (interface of stratigraphic unit (SU) 5 A and SU5B) 133 cm further below (i.e. down to c. 153 cm below the present cave floor). Here, the upper c. 20 cm of deposit had been removed by Flood in 1971–1972, the exposed underlying surface protected by plastic sheeting and covered by imported soft sediments. The upper layers of the cave were thus investigated from Squares P35 and R31, minus the missing upper c. 20 cm of Square R31.

The focus of our research was a dense sequence of ash ('hearth') layers that Flood had revealed across the entire 1971–1972 pit and that were exposed in the uppermost levels of all of the pit's walls. Those hearth layers represented the uppermost evidence of occupation of the cave, and apparently dated to c. 10,000 cal BP as determined by Flood's radiocarbon determinations (see above). Note that the missing uppermost c. 20 cm of sediment (SU1) that capped the dense ash layers (SU2) in Square R31 did not contain any evidence of burning such as hearths, consisting of artefactually depauperate (and possibly artefactually sterile) sandy loam.

The southeastern side of the 1971–1972 pit: Square P35

The sediment sequence in the adjoining but continuous Squares P34–P35 spanned 227.7 cm depth. Bedrock was not reached. The lower c. 170 cm of deposit consists of an infilled subsidence crater (SU3B–SU3G), on top of which a further c. 10–20 cm of redeposited sediment from upslope (SU3A) continued to fill what was once a shallow depression. Above the fully infilled subsidence crater of SU3 are then found a series of 76 finely stratified layers consisting mainly of ash from hearths (SU2). Together, these hearth layers measure c. 40 cm thick. The hearth layers are then capped by c. 10 cm of sandy loam (SU1) devoid of any demonstrably Aboriginal cultural materials (for details of the sediment sequence and its geomorphological interpretation, see Delannoy et al. 2020) (Figure 4).

One hundred and nine accelerator mass spectrometry (AMS) radiocarbon ages on individual pieces of charcoal (40 from Squares P34 and P35, 69 from Square R31), 10 single-grain optically stimulated luminescence (OSL) ages, and 13 uranium series (U-series) ages on buried, redeposited speleothems firmly date the formation of the subsidence crater and its immediate infilling (SU3B–SU3G) to c. 6,000 cal BP; the filling of its uppermost shallow depression (SU3A) to c. 6,000–4,400 cal BP; and the accumulation of the dense hearth layers (SU2) to c. 4,400–1,600 cal BP but with a most intensive phase (SU2I–SU2BH) between 2,000–1,600 cal BP. The only cultural evidence from the uppermost c. 10 cm of sediment are a late nineteenth or early twentieth century fireplace, broken bottle glass and spent matches (for detailed descriptions of the stratigraphy and dating, see David et al. in press b; Delannoy et al. 2020; Stephenson et al. in press) (Figure 5, Table 1).

The northeast side of the pit: Square R31

Square R31 was excavated from c. 20 cm to 153 cm depth against the northeast wall of Flood's 1971–1972 pit. The entire deposit (excluding the top, missing SU1) was well stratified, consisting of 31 distinct SUs and sub-SUs. The base of the excavated deposit revealed radiocarbon ages going back to 43,412–46,763 cal BP (42,547 ± 920 BP, Wk-51144), consistent with an OSL age of 46,930 ± 4,150 years for a level of the 1971–1972 northeast wall slightly below and to the south of the base of Square R31, and a further OSL age of 51,830 ± 5,510 years further down again (see Delannoy et al. 2020). Sixty-nine radiocarbon ages from single pieces of charcoal, wood, bark, and possum scats revealed a long sediment sequence with excellent chronostratigraphic resolution (here we present all the uppermost radiocarbon ages (Table 1); the full sequence of radiocarbon and OSL ages will be presented elsewhere). While occupation begins in Pleistocene levels, the uppermost c. 15 cm of the excavation – the seven hearth layers of SU2 – date from c. 5,000 cal BP to c. 2,000 cal BP (4,433 ± 17 BP, Wk-50961 to 2,022 ± 21 BP, Wk-51363), and mostly c. 2,400–2,000 cal BP (2,380 ± 20 BP, Wk-51370 to 2,022 ± 21 BP, Wk-51363) (Figure 6, Table 1).

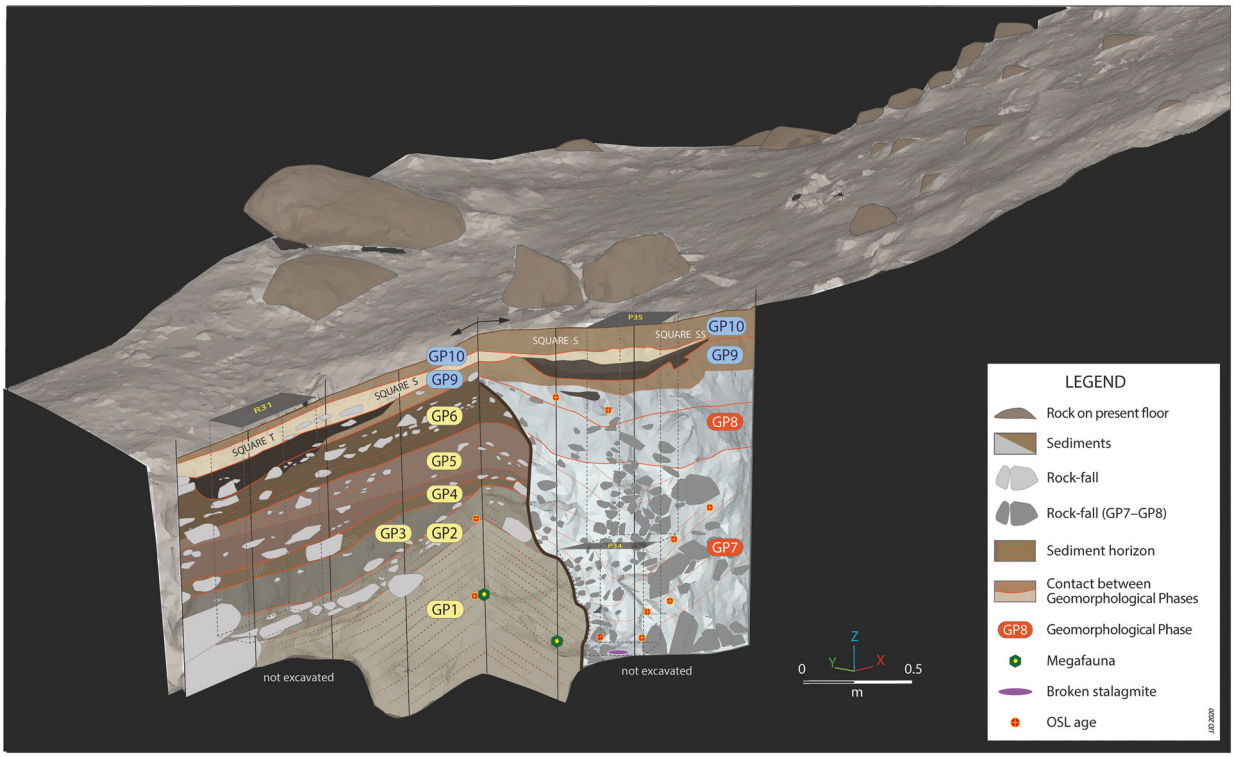

Figure 5. Geomorphological phases (GPs) of the Cloggs Cave deposit. The figure was drawn by superimposing Flood's 1971–1972 and David's 2019–2020 section drawings onto the accurately surveyed 3D model of the excavation pit. GP1 = SU5B; GP2 = SU5A; GP3-GP6 = SU4; GP7–GP8 = SU3; GP9 = SU2; GP10 = SU1 (for details, see Delannoy et al. 2020) (cartography and artwork by Jean-Jacques Delannoy; concept by Bruno David and Jean-Jacques Delannoy).

The SU2 dense hearth layers

It is clear from both the 1971–1972 and 2019–2020 excavations that the densest evidence of occupation in Cloggs Cave is archaeologically represented in Squares P35 and R31 by SU2, mostly dating to c. 2,400–1,600 cal BP. This is at odds with the original dating of SU2 from the 1971–1972 excavations, which had given a single conventional radiocarbon age of 9,128–10,258 cal BP (following today's calibrations) on comminuted charcoal (Flood 1974, 1980:260). The new dating, based on a sequence of 109 new AMS radiocarbon ages on individual fragments, and multiple single-grain OSL and U-series ages for the cave sequence (for the U-series ages, see Delannoy et al. 2020), conclusively show that Cloggs Cave continued to be used well into the Late Holocene. The question now remains as to how the cave was used at this time. We present each line of evidence (animal bones, stone artefacts, a standing stone, charcoal/hearths, mineral processing) separately, below, from which a combined interpretation is then made.

Animal bones

Well-preserved but somewhat fragmented bones are common throughout SU2. The fauna predominantly comprise non-volant small mammals, but also include the remains of bats, birds, lizards and frogs (for a species list, see David et al. in press b). Fires built over the bone-rich sediments have caused almost all the bones to be uniformly burnt black or grey, with a small number being calcined. Burning degrades collagen, making bone brittle and easily broken (e.g. Spennemann and Colley 1989), explaining the degree of fragmentation observed. Species with a maximum body mass of 225 g or less are represented by sub-adult to very old individuals (the latter referring to rodents whose teeth are so worn they only have a rim of enamel around the outer edge of the tooth and a single basin of dentine), but species with a maximum body mass of more than 225 g are uniformly represented by juveniles only. This suggests that the vast majority, or all, of the animal remains were brought into the cave by avian nocturnal predators, probably predominantly the masked owl (*Tyto novaehollandiae*). Apart from the high frequency of burning (see below for the cause), there is little to no evidence that people were in any way responsible for the accumulation of animal bones recovered from SU2 of Squares P35 and R31. This is entirely consistent with what Hope (1973) had found from the 1971–1972 excavations.

Flaked stone artefacts

Flood's 1971–1972 excavations across four 1 × 1 m squares inside the cave revealed a total of 70 stone artefacts (excluding four pebble manuports, see below). Only one of these (from Square S Spit 2 A) appears to have been found in her Unit II,

Table 1. AMS ^{14}C ages on single pieces from Cloggs Cave.

SU	XU	Excavation Square	Material Dated	Laboratory Code	$\delta^{13}C$ (‰)	^{14}C Age (BP)	%C
2E	7B	P35	*Eucalyptus* leaf	Wk-49638	n/a	142 ± 25	56.2
2 N-2O-2T	8	P35	charcoal	Wk-49639	−29.1 ± 0.2	1724 ± 16	55.7
2AZ-2BB-2BH	17	P35	charcoal	Wk-49641	−22.4 ± 0.2	2091 ± 16	72.5
2BL	20	P35	possum scat	Wk-50442	n/a	3309 ± 15	n/a
2BL-2BP	21	P35	charcoal	Wk-49645	n/a	4935 ± 17	63.4
2BL-2BP	22	P35	charcoal	Wk-49646	−24.6 ± 0.2	9005 ± 18	73.5
2BL-2BP	23	P35	possum scat	Wk-50443	−24.5 ± 0.6	3493 ± 16	n/a
2BP-2BT	24	P35	charcoal	Wk-49648	−26.7 ± 0.2	3836 ± 17	63.0
2BS-2BU	29	P35	charcoal	Wk-49502	−25.7 ± 0.3	3935 ± 13	78.1
2BT	28	P35	charcoal	Wk-49650	−25.0 ± 0.2	3992 ± 17	64.5
2BS-2BU	29	P35	possum scat	Wk-50444	n/a	4147 ± 27	n/a
2BI		SE wall*	charcoal	Wk-48865	n/a	4376 ± 18	38.6
2BX-3A		SE wall*	charcoal	S-ANU 60824	n/a	3876 ± 29	56
				Wk-48860	n/a	3977 ± 17	56.9
3A	33	P35	charcoal	Wk-49503	−27.5 ± 0.3	7468 ± 19	71.5
3A	33	P35	charcoal	Wk-49504	−25.3 ± 0.4	8177 ± 18	73.7
3A	34	P35	possum scat	Wk-50445	n/a	4197 ± 33	n/a
3A	35	P35	charcoal	Wk-49652	−24.3 ± 0.2	5673 ± 16	65.1
3A	36	P35	charcoal	Wk-49648	−22.6 ± 0.2	4231 ± 17	63.0
3A	46	P35	charcoal	Wk-49108	n/a	8319 ± 20	63.4
2A–2C	1	R31	charcoal	Wk-51363	−27.0 ± 0.7	2022 ± 21	54.5
2A-2C	1	R31	charcoal	Wk-51364	n/a	2142 ± 20	55.3
2A-2C	1	R31	charcoal	Wk-51365	−24.1 ± 0.7	2225 ± 20	67.2
2A-2C	2	R31	charcoal	Wk-51366	−23.4 ± 0.7	2155 ± 20	50.6
2A-2C	2	R31	charcoal	Wk-51367	−26.5 ± 0.7	2156 ± 21	55.8
2C-2D	3	R31	charcoal	Wk-51368	−24.9 ± 0.7	2132 ± 22	49.6
2C-2D	3	R31	charcoal	Wk-51370	−24.5 ± 0.7	2380 ± 20	62.7
2C-2D	3	R31	charcoal	Wk-51369	−25.8 ± 0.7	2763 ± 21	53.8
2F-2G interface	4	R31	possum scat	Wk-50961	n/a	4433 ± 17	n/a
2F-2G interface	4	R31	possum scat	Wk-50962	n/a	4115 ± 17	n/a
2G-4A interface	6	R31	possum scat	Wk-50963	n/a	7510 ± 20	n/a
2G-4A interface	6*	R31	charcoal	Wk-50276	−24.1 ± 0.5	8337 ± 28	46
4A-4C interface	7	R31	charcoal	Wk-50964	−24.1 ± 0.4	9539 ± 31	65
4C	8	R31	bark	Wk-50965	−22.4 ± 0.4	9717 ± 23	n/a
4C	8	R31	softwood plant fibre	Wk-50966	−24.7 ± 0.4	9598 ± 24	n/a
4C	8	R31	twig	Wk-50967	−20.9 ± 0.9	9689 ± 26	n/a
4C	9	R31	softwood	Wk-50968	−21.6 ± 0.9	9726 ± 21	n/a
4C-4D interface	9	R31	possum scat	Wk-50969	−19.4 ± 0.9	10,030 ± 24	n/a
4E	11	R31	wood	Wk-50278	−24.3 ± 0.1	10,361 ± 30	n/a
4E	11	R31	bark	Wk-50970	n/a	10,387 ± 26	n/a
4E-4F interface	12	R31	charcoal	Wk-50971	−23.0 ± 0.9	10,384 ± 34	66
4F-4G interface	16	R31	charcoal	Wk-51126	−23.5 ± 0.2	11,069 ± 35	75
4F-4G interface	15	R31	possum scat	Wk-51036	−27.6 ± 0.4	11,686 ± 29	n/a

*Collected from the wall of the cleaned exposed 1971–1972 pit (and plotted on the section drawing adjacent to the 2019–2020 excavation square) prior to commencement of the 2019–2020 excavation (i.e. this sample does not have an XU attribution). Note that the sub-divisions of SU2 (e.g. SU2A, SU2B etc.) in Squares P35 and R31 are independent of each other (these are thin, localised sub-layers or lenses that do not continue across the two squares).

corresponding to our dense SU2 hearth layers of c. 2,400–1,600 cal BP, although even this artefact may have come from slightly lower, in layers dating closer to c. 4,400 cal BP (see above), as on Flood's (1973:Figure 42) section drawing it is plotted at the interface with her underlying (and older) Unit III. Flood excavated the entire sequence of dense hearth layers in a single spit. She then accurately drew the configuration of the combined hearth layers on the section drawing and subsequently superimposed the location of the artefact onto it, so the exact provenance of this artefact appears to be best indicated by its position on the section drawing. In the cave, only two 'geometric microliths' were found in the undated but (based on our results) younger than c. 1,600 cal BP uppermost SU1 (devoid of hearths) above the ashy layers of SU2 (for distribution of stone artefacts, see Flood 1973:Chapter 19, Appendix XVIA).

Despite a 2.3 m-deep sediment sequence that spans some 6,000 years, Squares P34 and P35 only revealed a total of 15 flaked stone artefacts (a 16th artefact, a manuport, came from nearby, along the cleaned southeast wall of Flood's excavation pit). All came from the re-deposited fill of a subsidence crater dated to c. 6,000 cal BP (SU3B–SU3G) (for information on the infilled subsidence crater, see Delannoy et al. 2020).

In Square R31, 15 flaked stone artefacts weighing a total of 303.3 g and a manuport weighing 208.6 g were excavated. Again, none came from the dense hearth layers of SU2. The oldest definite stone artefact came from levels dated between 16,769–17,228 cal BP and 25,994–26,457 cal BP. The youngest stone artefact came from XU6, dated to 8,193–8,367 cal BP (7,510 ± 20 BP, Wk-50963) at the SU2G–SU4A interface (the results of ongoing technological, use-wear and residue analyses, and

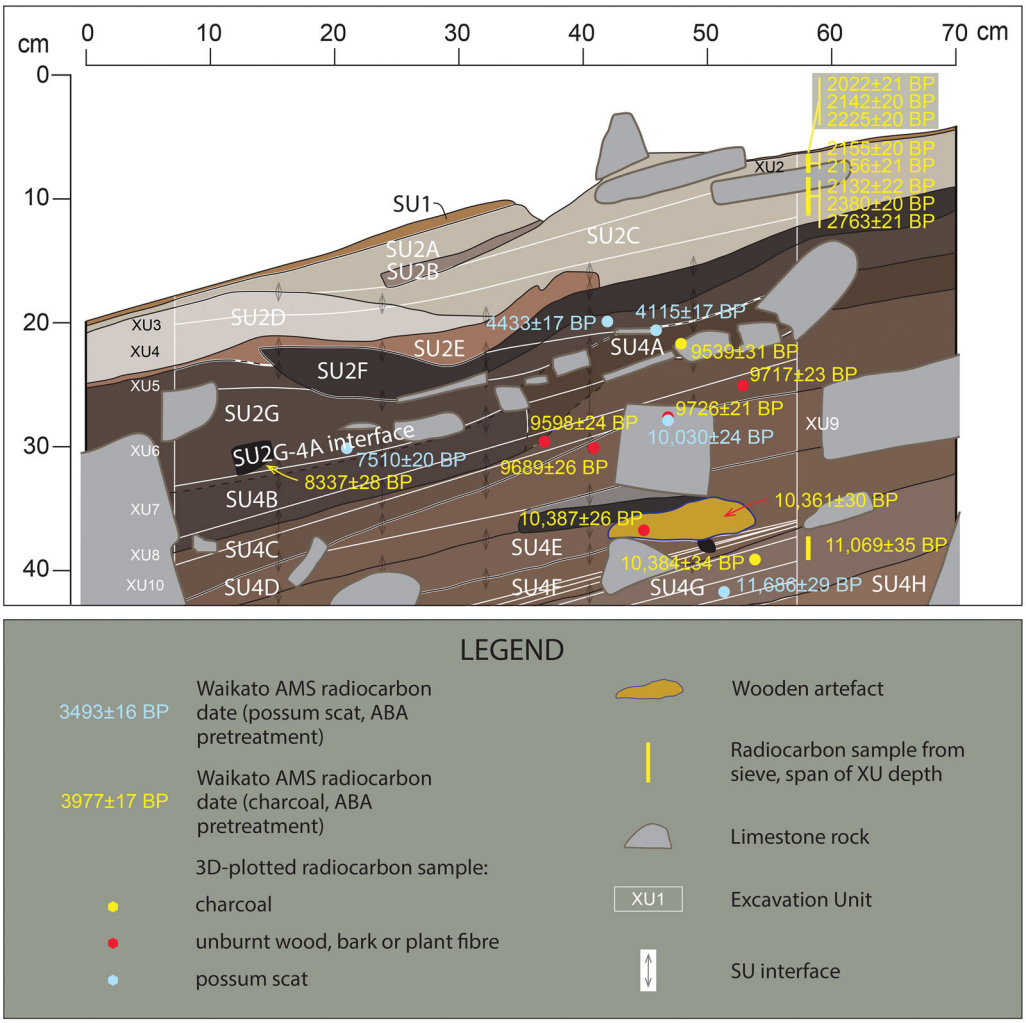

Figure 6. The upper part of the Square R31 southwest section dating to the Late Holocene, drawn from the northeast wall of the 1971–1972 pit prior to the 2020 excavation. The top 20 cm (not drawn) was removed in 1971–1972. The thin vertical black arrows indicate the zones of mixing (interfaces) between SUs (section drawing and artwork by Bruno David).

with this the chronostratigraphic distribution of the stone artefacts, will be reported elsewhere).

The question remains as to why there is not a single flaked stone artefact in the superimposed hearth layers of SU2 dating mainly from c. 2,400 to c. 1,600 cal BP, despite abundant evidence of the recurring presence of people in the cave at this time. We will return to this question below.

Pebble manuports

A small number of manuport pebbles were found through much of Flood's excavations down to Spit 19 of Square SS. Eight of these possessed what Flood (1973:272–273) considered to be 'clear' evidence of use. These were thought to have been 'burnishing pebbles', which she interpreted as evidence for the manufacture of possum skin rugs. A single bone awl, also interpreted for rug-making, was found in Square S, Spit 15 A (Flood 1973:Appendix XVIA:1). The 'burnishing pebbles' were found in the lower layers of the deposit, mostly in Spits 6 and 11 A in Squares S, and no pebbles of any sort were found in the dense hearth layers above Spit 3 A that we have now dated to the Late Holocene (Flood 1973:Appendix XVIA:1; 1980:269). No such pebbles were found in the 2019–2020 excavations.

Standing stone

A buried standing stone was revealed during the excavation of Square P35, its flat base lying 23.7 cm below surface (Figure 7). The standing stone is 28.1 cm tall, 12.2 cm wide, 7.4 cm thick, weighs 2,098 g, is burnt all around, and shows no signs of having been shaped by people. It was stood upright from near the base of the dense sequence of SU2 ash layers, immediately on top of (i.e. just post-dating) the lowermost whitish ash layer (the contiguous and at times merging SU2AY–SU2BB). First, a fire was lit on the flat but sloping floor (there is no evidence of a fire-scoop penetrating into the palaeofloor). That fire left a thin layer of whitish ash (SU2AY–SU2BB), but no charcoal, indicating either the burning of wood that turns to ash rather than

Figure 7. The Square P35 standing stone, excavation in progress. (A) Looking upslope. (B) Looking downslope from behind the stone. Note the scooped-out area (absence of white ash) at the base of the upslope side of the stone (photos by Bruno David).

producing embers (for this region, such as yellow box (*Eucalyptus melliodora*) or grey box (*E. bosistoana*)), or dried grass, bark, twigs or the like. The standing stone was then positioned upright on the whitish ash, with a 25 cm-wide span of the ash and underlying brown sandy loam (SU2BH) scooped from behind (the up-slope side of) the standing stone and re-stacked as a shallow mounded support around the base of the stone. That shallow sediment ring around the base of the stone ranged from 2 cm wide on the up-slope side of the standing stone, to 6 cm around its more precarious down-slope side. The sediment footing around the stone never exceeded c. 2 cm thick.

The standing stone was erected from the level of XU14 (as determined by the stratigraphic level of the base of the low mounded ring around it, and the level of the sediment scoop behind it), its base pushed down and thus intruding slightly deeper into XU17. A single piece of charcoal from XU17, 3 cm below the level from which the standing stone was built, was radiocarbon-dated to 1,932–2,084 cal BP (2,091 ± 16 BP, Wk-49641). A piece of charcoal from XU8, from between 9 cm (base of XU8) and 11 cm (top of XU8) above the level from which the standing stone was erected, gave an age of 1,535–1,692 cal BP (1,724 ± 16 BP, Wk-49639). The close proximity of the XU17 radiocarbon

determination to the construction level (XU14) signals that the standing stone is more likely to have been built c. 2,000 cal BP than c. 1,600 cal BP. The paucity of charcoal in the SU2 ash layers has not permitted further radiocarbon dating.

The standing stone was erected soon, probably immediately, after the burning of the hearth that created the basal whitish ash layer on which it was positioned. We know this because not enough time had elapsed for loamy sediments to be eroded down and redeposited from upslope between the time of the ash layer and the standing stone's construction. Subsequent to the construction of the standing stone, multiple fires were built around the stone, as evidenced by the many ash layers of SU2 surrounding it. The presence of a thin layer of brown sandy loam (SU2AR), redeposited from upslope on top of a series of ash layers approximately a third of the way up the standing stone's height, signals that all the hearths were not burnt in a single set of continuous firing events. Rather, people, or a person, came back to this location at least twice (and probably many more times), with enough time elapsed for the 1–2 cm-thick SU2AR layer of sandy loam to accumulate around the standing stone between the preceding and subsequent firing events. Nevertheless, the absence of redeposited sediment between most of the other ash layers indicates that they accumulated fairly rapidly, and possibly mainly during a single person's lifetime. More broadly, the radiocarbon age of 1,535–1,692 cal BP from XU8 shows that the sequence of ash layers has accumulated from fires built over a period of c. 434 years (taking the difference between the medians of the two calibrated ages from SU2), or 17–22 generations (using 25–20 year generation spacings) after the standing stone was first stood upright. By 1,535–1,692 cal BP when fires ceased to be burnt, only the top 13 cm (top of XU8) to 16 cm (base of XU8) of the standing stone would have penetrated above ground (for further details of the standing stone and its sedimentary context, see David et al. in press b).

Grindstone: Mineral processing

A small portable grindstone was found in Cloggs Cave, the only one found in the cave (Figure 8). Together with adhering sediments from the SU2 ash layers in which it originally lay, it had fallen from the edge of Square P35 during cleaning of the southeast wall of the 1971–1972 pit in 2019. The shape of the fallen sediment block that contained the grindstone, with its distinctive sequence of adhering microstratified ash layers, could be accurately repositioned to its originating location on the wall of the pit. The grindstone came from SU2, between the levels dated to 1,932–2,084 cal BP (XU17) and 1,535–1,692 cal BP (XU8) in Square P35. It is, therefore, contemporaneous with the standing stone that stood only c. 30–40 cm upslope from where the grindstone came.

The grindstone is 10.5 cm long × 8.3 cm wide × 2.2 cm thick and weighs 304 g. It is tabular in shape, unbroken since its last use (as determined by use-wear along its edges), with both surfaces ground. Unidirectional striations are abundant on both its very slightly concave surfaces. The grindstone's relatively flat faces and absence of deep grooves indicate that it is unlikely to have been used to grind stone axes. There is a lack of smooth, developed polish and total absence of starch grains and phytoliths in the areas examined for residues, signalling that the stone was not used to process siliceous plants. However, amorphous collagen, collagen fibres, collagen structures, partially woven collagen, possible bone-like fragments, Bogong moth wing segments, a Bogong moth hind leg, amorphous cellulose, and wood-like structures with bordered pits were found, many in various states of partial carbonisation (for details of the residues found and methods of extraction and identification, see Stephenson et al. in press). Concentrations of crystalline minerals were also found adhering to the edge of the grindstone, their position on the grindstone suggesting that it had been used to crush minerals with a crystalline structure (Figure 8). The specific nature of those crystals is currently under investigation and will be reported elsewhere (but see 'Discussion and conclusion', below).

Contemporary GunaiKurnai knowledge and ethnography

Until now, Cloggs Cave's archaeological deposits have been interpreted through a more or less conventional ecological reasoning that focuses on habitats and subsistence economies, a common interpretative framework in Australian archaeology and elsewhere in the world. Such interpretations view archaeological finds and occupational patterns as responses to environmental conditions, such as the cessation of cave occupation in the Early Holocene after the climate 'ameliorated' to permit outdoor living at the end of the Pleistocene (see above). There is, however, another way of understanding Cloggs Cave, which we explore here in relation to its Late Holocene occupation. This is through the incorporation of ethnography and current GunaiKurnai knowledge of GunaiKurnai culture, including how the Old People used caves in GunaiKurnai Country. What is at stake here are not

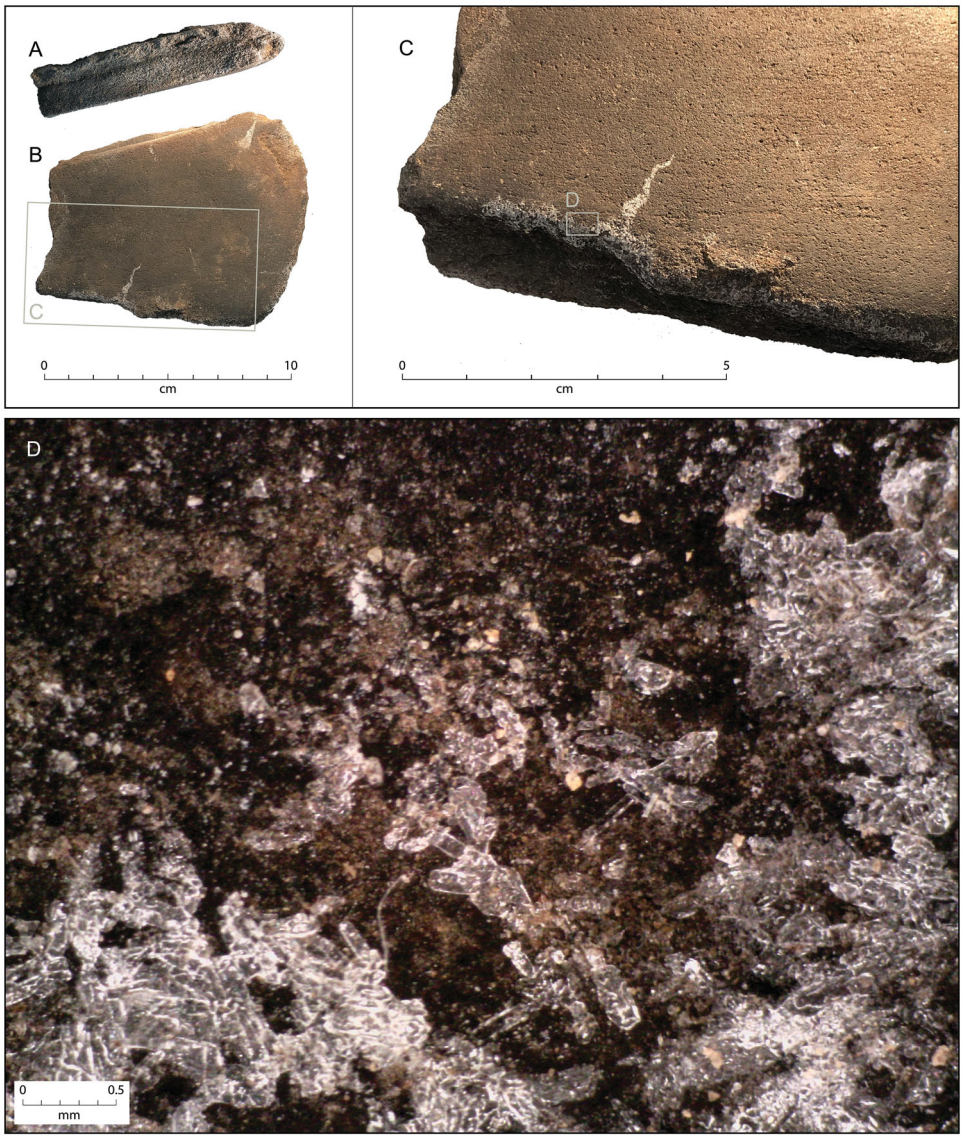

Figure 8. The Cloggs Cave grindstone. (A) Side view. (B) Plan view of ground surface. (C) Area along edge with adhering crystalline minerals. (D) Crystalline minerals on edge of grindstone (photos by Birgitta Stephenson and Richard Fullagar).

only environmental variables, but how the landscape is made meaningful through local world views, signalling that any given human action or social event cannot usually be reduced to adaptational thinking. This is fundamental for a proper understanding of Cloggs Cave, for the way people live in the landscape is always mediated by how the world is made meaningful through culture, and past GunaiKurnai culture is not unrelated to recent and present-day GunaiKurnai cultural perspectives.

We have elsewhere discussed how GunaiKurnai Traditional Owners of the early colonial period of the mid-1800s into more recent and present times considered caves, rocky fissures and pit drops as dangerous places (David et al. in press b). According to customary GunaiKurnai knowledge that continues to be communicated today, *nargun*, or '*ngrung a narguna*' – creatures made almost entirely of stone (*wallung*) except for their chests, arms and hands – inhabit caves and rocky fissures from which they prey on unwary passers-by, dragging them into their lairs (Howitt 1876:220). When Alfred W. Howitt, a geologist, was exploring the Mitchell River Valley with two Aboriginal companions, Turnmile and Bunjil Bottle, they visited a rockshelter (the 'Den of Nargun') in the Mitchell River Valley, 80 km to the west of Cloggs Cave (Howitt 1876). According to Howitt, 'The blacks said it [the Den of Nargun] must be the home of the "*Yabbung*", a mysterious creature which they believe haunts these mountains where they were living in caves and holes and preying upon the blacks when it can catch them. If you fire at it they say the bullet will turn round and wound you – or the spear thrown will turn back and pierce the thrower. The name of this cave is therefore "*Bunga*

Yabbunga" or the "Yabbung's Home"' (Howitt 1971:200).

Similar stories of caves were told about limestone formations at the Lake Tyers Mission (Bung Yarnda, now Lake Tyers Aboriginal Trust), 38 km south of Cloggs Cave, where even today Traditional Owners are reluctant to enter the caves. Here, *nargun* were also called 'hairy men', and were said to hunt small children. There were some differences in nineteenth century accounts about whether *nargun* were male or female (see Campbell and Vanderwal 1999:48–49; Smyth 1878:456–457). Phillip Pepper (1905–1985), an Aboriginal man who lived in the Gippsland region, reported a story that the people of Lake Tyers tell:

> What we liked maybe most of all was listening to the old people talk. Grandfather's stories were the best of all. We learnt how to talk the language and the old tribal stories, like when the old clever bloke of the tribe threw a handful of ashes at a tribesman and said, 'You turn into a *gama-gama*' – that's a black cockatoo. He showed us the white fungus from gum-trees they used to keep the fires going with.
>
> There was the story about the Hairy Man; it could be a man or a woman, but the Aborigines called it a man. Some called it *nargun*. It was a bad thing anyway. It was seven feet tall and went out at night to hunt the children and eat them. One night the Hairy Man come to the camp to get more children but it couldn't get in because of all the fires set around. While that *nargun* stamped around to get in to the children his feet got burnt. In the morning one of the Aborigines said when he saw the marks, 'What blackfella's track is this?' The people could see it wasn't one of their marks and they knew it was the Hairy One, so they followed the tracks around and they led to the top of Tooloo. Well some were frightened and didn't go any further and went back to the camp. Three of the tribesmen who kept going were Big Charlie, Big Joe and Short Harry – 'course that wasn't their names then, they had their tribal names – and they followed the Hairy Man to a cave. Now there were still other tribesmen with them three blokes and they started bangin' the *nargun* with their waddies, knockin' at it with the *nulla-nullas* and pokin' their spears into it. There was legs and arms flying everywhere, but they couldn't get the Hairy Man out of the hole. Short Harry, because 'e was the shortest, had to crawl into the cave after the *nargun*. He grabbed a foot but there were so many legs and feet dangling about he wasn't sure if it was the *nargun*'s, so he yelled out, 'What blackfella's foot is this?' One of the tribesmen said it was his, so Short Harry kept grabbin' until nobody answered, then they knew it was the Hairy One's leg. He hung on and the Aborigines cut the Hairy Man's ham-string with reed and bone knives. That's how they finished off the *nargun*. (Pepper 1980:57; see also Pepper and de Araugo 1985)

It is not clear whether every cave was home to a *nargun*. While most people did, and continue to, avoid caves, in the past some individuals used caves for special purposes. In GunaiKurnai Country, caves were the secret places where magic was performed and where ordinary individuals were transformed into 'magic men' or 'clever men' (*mulla-mullung*). Note, however, that while the ethnohistoric writings almost always write of *mulla-mullung* as males, Smyth (1878:474) writes that 'Women may become *Murla-mullungs* as well as men'. *Mulla-mullung* gained their knowledge and powers by being taught and 'shown the things which kill people, such as *Groggin* (quartz crystals), and *Bulk*' (Howitt 1904:408). A *mulla-mullung*-in-training was taught how to draw crystals (*kiin*) into the body, how to pull them out again, and how to use the stone to cure people of sickness. When *mulla-mullung* lose their crystals, they lose their powers (Howitt 1904:409–410). Smyth (1878:474) thus writes:

> A *Murla-mullung* is a doctor; a blackfellow becomes a *Murla-mullung* by being visited in the night by some departed relative – as a father, uncle, or brother. The vision shows him the causes of disease, such as *Toondung*, the inner bark of a variety of ironbark, which is supposed to get into the chest; *Bulk*, an egg-shaped quartz pebble; *Groggin*, quartz fragments, to which may be added *Bottle*, that is broken glass; *Murrawun*, the magical throwing-stick, made of ironbark wood.
>
> For these and other ailments various charms and their appropriate tunes are taught, and the sleeper on awakening is a *Murla-mullung*. He can now charm out the *Toondung* by singing the appropriate remedy over the patient …

In caves secret activities were carried out, magic was worked, spells were cast, and magic substances were obtained. In the 1880s, Tankli, the son of Bataluk the Lace-Lizard, gave an account to Howitt of how he became a *mulla-mullung*:

> When I was a big boy about getting whiskers I was at Alberton camped with my people. Bunjil-gworan was there and other old men. I had some dreams about my father, and I dreamed three times about the same thing. The first and the second time, he came with his brother and a lot of other old men, and dressed me up with lyre-bird's feathers round my head. The second time they were all rubbed over with *Naial* (red ochre), and had *Bridda-briddas* on ['a kind of kilt which the men wore in front and behind hanging from the cord which was wound round the waist as a belt']. The third time they tied a cord made of whale's sinews round my neck and waist, and swung me by it and carried me through the air over the sea at Corner Inlet, and set me down at Yiruk [Wilson's Promontory]. It was at the front of a big rock like the front of a house. I noticed that there was something like an opening

> in the rock. My father tied something over my eyes and led me inside. I knew this because I heard the rocks make a sound as of knocking behind me. Then he uncovered my eyes, and I found that I was in a place as bright as day, and all the old men were round about. My father showed me a lot of shining bright things, like glass, on the walls, and told me to take some. I took one and held it tight in my hand. (Howitt 1904:409–410; see also Howitt 1887:51)

Just as caves were, and continue to be, special places in GunaiKurnai cosmology, so too could certain classes of objects be special, such as Tankli's glassy stone, pebbles, crystals, and powders including ash. Such objects played special roles not just for curing the sick, but also for enhancing supernatural powers, and the practice of magic, both for good and more sinister purposes.

In GunaiKurnai Country, small egg-shaped stones, also called *bulk*, and (e.g. quartz) crystals were used on a daily basis as well as for special occasions and ceremonies (Smyth 1878:386–387). Small black stones (lydianite or fine-grained dolerite), or sometimes quartz, were used in initiation ceremonies by nearby groups. Such small, usually black pebbles were also commonly carried by GunaiKurnai in small bags made of possum skin (Fison and Howitt 1880:251; Howitt 1904:546). These stones often came into their ownership by magic. For instance, Howitt (in Smyth 1878:473) told the story of how a man acquired his *bulk* while camping on the Mitchell River:

> One blackfellow has told me that when he was camped on the Mitchell River, near Iguana Creek, a few years ago, assisting to gather wild cattle, two *Mrarts* appeared to him in the night as he slept. They were tall, and had long hands; they stood side by side at his fire, and were about to speak, when he awoke; then they were gone. But he saw on the spot where they stood a *Bulk* (one of the magical stones used by the Aborigines). He kept the *Bulk* as a potent charm.

Crystals and ground powders were used to cast spells and magic. Quartz could be ground into powder, and either the stone or the powder could be thrown at people as a spell, or to scare people. Tankli, the *mulla-mullung*, said that he could 'throw the *Kiin* like light in the evening at people, saying to it *Blappan* (go!)' (Howitt 1904:409–410). It was also understood that throwing quartz powder at someone, laying quartz fragments or charcoal in a person's footprints, or where a person had lain down, could cause serious illness: it could cause 'a person to be mutilated in a terrible manner' (Bulmer in Smyth 1878:477; Howitt 1904:366). Ordinary charcoal powder or ash spread on the ground was not only essential for tracking *nargun* through the footsteps they would leave for all to see, but it was also a medium for magic. Describing how in the nineteenth century men dressed in preparation for casting an evil spell against an enemy, Howitt (1904:376) wrote: 'Then they stripped themselves naked, rubbed themselves over with charcoal and grease, a common garb of magic'. He also noted in regard to *jeraeil* initiation ceremonies: 'the charcoal powder belongs to these ceremonies and to magic' (Howitt 1904:619).

In short, according to current GunaiKurnai knowledge and late nineteenth to mid twentieth century ethnography, caves are the residences of *nargun*, potentially dangerous beings, and places frequented by *mulla mullung*, magic or medicine men and women. Caves are not known to have ever been used for everyday living or camping, but were locations where *mulla mullung* undertook their special training, practised magic, and obtained magical objects. Cloggs Cave's Late Holocene archaeological deposits need to be understood in this GunaiKurnai cultural context.

Discussion and conclusion

We began this project to re-visit the archaeology of Cloggs Cave, expecting to refine specific details rather than to fundamentally re-think its chronology and how and why the cave was used in the first place. What we found challenges us not only to enquire in new ways about the GunaiKurnai past, but also how, as researchers, we have critically shaped the 'evidence' for what happened in the past through the mindsets we bring into the fold, pre-empting the result in the process. Hence Cloggs Cave has until now been understood by archaeologists as a cave occupied during the Pleistocene but then vacated as climatic conditions ameliorated at the end of the last Ice Age, enabling outdoor living in the adjacent Rockshelter and Porch instead. In this context, treating the cave's vacation as 'abandonment' would be a mistake. As Ian McNiven (2016:31) has noted, 'so-called occupation abandonment can equate with deep spiritual attachment to occupation sites'. Joe Watkins (2006:103–104) has made a similar point for other parts of the world, observing that Chaco Canyon, in the U.S.A., is often described by archaeologists as having been 'abandoned' c. 800 years ago, while in reality it has continued to be a meaningful part of Hopi, Zuni and Navajo life and of the 'social environment'. The implications of 'abandonment-thinking' for cultural understanding, Native Title, and by extension Cultural Heritage Management, is, as Peter Veth (2003) has argued, profound.

It is also the case that interpretations and explanations founded on principles of 'habitat and

economy' may have nothing to do with Cloggs Cave's past, such thinking being founded more in the economic schools of archaeology by which Australia's first generations of professionally trained archaeologists approached the site (be it from Cambridge, or from the U.S.A.; see above). While such hermeneutic entanglements are not new in archaeology, nor indeed in other branches of science, they are at Cloggs Cave exposed by GunaiKurnai voices in ways rarely seen as clearly in the archives of archaeological research. It is in this context that we particularly appreciate Christopher Chippindale's (2000:605, 609) notion of 'capta': 'the data are not data at all, for they are practically never *given* to us by the archaeological record. They are actually *capta*, things that we have ventured forth in search of and captured … It is what we choose to look at, what we seek to capture that comes first'. Here we have chosen to re-consider what was previously thought to be Cloggs Cave's Early Holocene vacation not just through the cave and its artefacts, but also through the preconceived ideas that have been brought to bear over some 50 years of research, and now through multiple cultural perspectives.

Flood (1990:238) had searched for caves and rockshelters in the Southern Uplands, and found Cloggs Cave, 'in order to find remain[s] of the meals of the hunter-gatherers and bone tools as well as stone tools'. Following her excavations in the early 1970s, she was indeed able to interpret the site in light of these original aspirations:

> As it became warmer at the end of the last glaciation between 13,000 and 9,000 years ago, use of the cave increased. In the daytime the rockshelter was used, the north-facing ledges providing warm sitting places and a good vantage point out over the valley. At night fires were lit on the cave floor from *Eucalyptus* wood. The people gathered round, heating hearth stones and cooking food items gathered during the day such as possums, bandicoots, gliders, koalas and marsupial mice, rock and swamp wallabies and kangaroos. Men whittled with stone scrapers to make wooden spears and boomerangs, and rubbed hides with smooth river cobbles until they were pliable enough to be sewn together as cloaks. The possum or kangaroo skins were trimmed to size with sharp quartz flakes, holes were pierced with a bone awl, its tip ground and polished to needle-like sharpness, and sinews from the kangaroo's tail were chewed until supple enough to be used as thread. (Flood 1990:239)

The new dating clearly shows that Cloggs Cave was not vacated at the start of the Holocene, during a period of climate warming following the end of the Last Glacial Maximum. Rather, the Old People continued to use the cave well into the Late Holocene. But did they use it to process possum-skin rugs, and to camp in the relative warmth of the cave until the end of the last Ice Age, or was there something more, or other, to the use of the cave?

Across the original excavation pit, and now extending onto the new, much smaller excavated areas, a sequence of thin ash layers signals where the Old People built fires in the cave, especially between c. 2,400 and c. 1,600 cal BP. Yet, and despite an abundance of animal bones from 'natural' deaths, those ashy layers have not revealed a single bone likely to have come from human food refuse. The ashy layers are almost devoid of charcoal, especially towards the southeastern side of the excavation pit, indicating that soft materials such as bark, twigs, fungus or grass were probably burnt. Those fires were repeatedly built around a standing stone erected in the cave, and their ash was spread across the entire width of the cave. Ethnographic records from the early colonial era clearly demonstrate the importance of certain types of stone, quartz crystals and ground powders including charcoal and ash for the practice of GunaiKurnai magic (Howitt 1904:409–410, 619). As such, there is the very real possibility that the production of the ash was itself of key importance when it came to the use of the cave.

The paucity of stone artefacts deposited during this period leads us to further question what kinds of activities took place in the cave between c. 2,400 and c. 1,600 cal BP. While split quartz pebbles are a major artefact type in the earlier layers, the only stone artefact clearly coming from the ashy hearth layers is a small, portable grindstone with both animal residues and evidence of pounded or ground crystalline minerals. There is also additional evidence of the creation of crystalline powder inside the cave, a mere 8 m from the Square P35 excavation that contains the standing stone. In the area we refer to as the 'Alcove' (see Figure 2), stalactites were artificially broken, some as far back as 23,230 ± 300 years ago or more (as determined from uranium-series ages on 'soda straw' re-growths over the stumps of the broken stalactites; see Delannoy et al. (2020) for details, including of the U-series ages on the stalactites). Here, at ground level, speleothems appear to have been crushed to form a white, crystalline powder, extensive deposits of which remain on the floor of the Alcove near a secluded stone arrangement (Figure 9) (for details of the stone arrangement, crushed powder and broken stalactites, see Delannoy et al. 2020. Analysis of the crushed powder is in progress). We do not know when in the past the stone arrangement or surface deposits of crushed minerals date, but their presence in the cave furnishes further archaeological evidence of the cave as a special place where activities akin to those of the *mulla-mullung* of

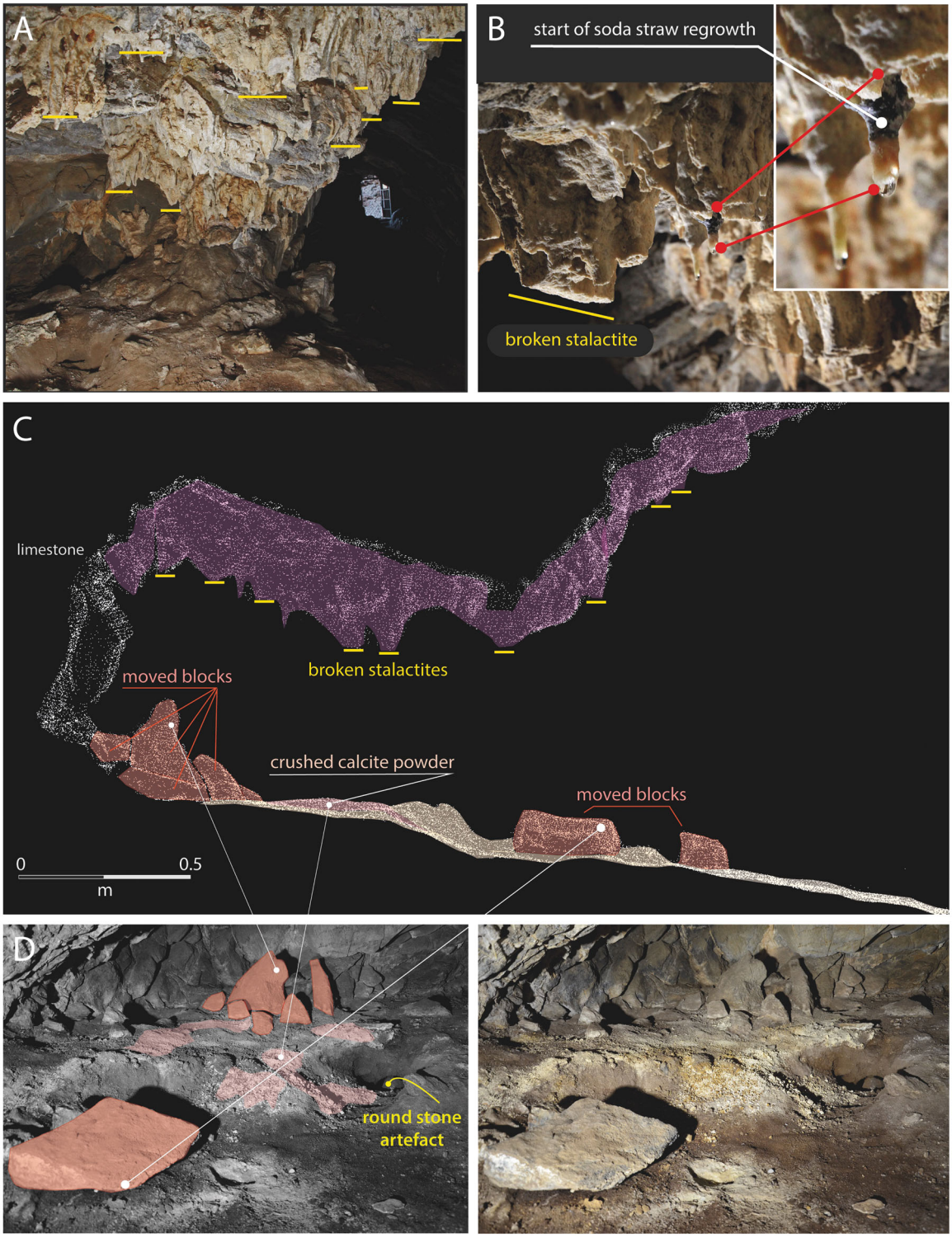

Figure 9. The Alcove. (A) Broken stalactite stumps on the Alcove's ceiling. (B) Close-up of broken stalactites with soda straw re-growths. (C) Cross-section through the Alcove (as visualised through the high-resolution LiDAR three-dimensional model). (D) Stone arrangement (background, tinted orange; all the blocks were moved into the Alcove from elsewhere in the cave), imported limestone block (foreground), and crushed calcite powder (cartography, photos and artwork by Jean-Jacques Delannoy).

nineteenth and early twentieth century ethnography and current GunaiKurnai cosmology occurred.

What these findings signal, individually and together, is that applying a 'habitat and economy' approach to the archaeology of places is not enough. Archaeological investigations may, and often do, reveal details of subsistence choices and their associated resource locations, but this does not, of itself, sufficiently address how or why people lived or otherwise did things the way they did in any given landscape or site. This is because activities are mediated by the cosmologies that shape a place's

meaningfulness, and, with this, what can and cannot happen there. In the spirit of Chippindale's capta, let us not lose sight of the fact that in doing archaeological research, the researcher(s) has already captured, through the approach by which they come to investigate, part of the story they will tell, even before the investigation has begun. The incorporation of nineteenth century ethnography and, in our case, present-day GunaiKurnai voices in the interpretation of the archaeological record thus offers two advantages. First, it brings into the interpretations, and with this into understandings of the archaeology, the descendants of those who created the archaeological record under investigation. Those viewpoints are usually richly nuanced with kin (descendant) cultural practices and perspectives. Second, it addresses the important ethical point that those whose culture is being investigated have a right to a voice in the public exposure of their own culture, especially in a context of unequal social (power) relations – as Ros Langford (1983), Ian McNiven (1998:47), Isabel McBryde (1985, 1992) and many others have pointed out, the power to write history is a power to construct notions of identity. It is with both these dimensions of research and interpretation in mind that a rethinking of the vacation, or, rather, the occupation, of Cloggs Cave merits a rethink.

Acknowledgements

We thank and acknowledge the late Phillip Pepper, the first Aboriginal person to write a book about their personal knowledge, recollections and experiences with local GunaiKurnai members in Gippsland. He listened to the local Elders and passed on the stories he was told to subsequent generations of GunaiKurnai, including many members of local communities today.

Thank you also to all the Monash University students from ATS3544 who participated in the Cloggs Cave excavations: Majidah Ayoob, Shayne Bates-Gilby, Jeremy Davies, Alice Jefimenko, Max Jesiolowski, Sophie Rankin, Julia Riley, Stephanie Sweet, and Abigail Wilson-Wheeler. Thanks also to Clara Law, Daniel Derouet, Madeleine Kelly for their participation in the excavations. Last but not least, we thank three reviewers and the editors for useful comments on an earlier draft.

Thank you to the GunaiKurnai Elders Council, the Monash Indigenous Studies Centre at Monash University, and EDYTEM at the Université Savoie Mont Blanc for research support, and Martin and Vicky Hanman of Buchan for assistance.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Centre of Excellence for Australian Biodiversity and Heritage, Australian Research Council (AU) [CE170100015].

ORCID

Bruno David http://orcid.org/0000-0002-8567-6135
Jean-Jacques Delannoy http://orcid.org/0000-0002-2815-4920
Matthew McDowell http://orcid.org/0000-0001-8009-4171
Chris Urwin http://orcid.org/0000-0002-3868-9574
Jerome Mialanes http://orcid.org/0000-0002-6790-7542
Fiona Petchey http://orcid.org/0000-0002-3308-9983
Rachel Wood http://orcid.org/0000-0002-1694-3295
Lynette Russell http://orcid.org/0000-0002-8978-9823
Lee J. Arnold http://orcid.org/0000-0002-6519-7831
Richard Fullagar http://orcid.org/0000-0003-1047-1466
Jeremy Ash http://orcid.org/0000-0003-0306-6307
Vanessa N. L. Wong http://orcid.org/0000-0001-9490-3187
Helen Green http://orcid.org/0000-0002-7842-6007

References

Binford, L.R. 1972 *An Archaeological Perspective*. New York: Seminar Press.

Binford, S.R. and L.R. Binford (eds) 1968 *New Perspectives in Archaeology*. Chicago: Aldine.

Birdsell, J.B. 1953 Some environmental and cultural factors influencing the structuring of Australian Aboriginal populations. *The American Naturalist* 87(834):171–207.

Birdsell, J.B. 1957 Some population problems involving Pleistocene man. *Cold Spring Harbor Symposia on Quantitative Biology* 22(0):47–69.

Bowdler, S. 1981 Hunters in the highlands: Aboriginal adaptations in the eastern Australian uplands. *Archaeology in Oceania* 16(2):99–111.

Bowler, J.M., R. Jones, H. Allen and A.G. Thorne 1970 Pleistocene human remains from Australia: A living site and human cremation from Lake Mungo, western New South Wales. *World Archaeology* 2(1):39–60.

Campbell, A.H, and R. Vanderwal 1999 *John Bulmer's Recollections of Victorian Aboriginal Life, 1855-1908. Occasional Papers, Anthropology and History 3*. Melbourne: Museum Victoria.

Chippindale, C. 2000 Capta and data: On the true nature of archaeological information. *American Antiquity* 65(4):605–612.

Clarke, G. 1952 *Prehistoric Europe: The Economic Basis*. London: Methuen.

David, B., J.-J. Delannoy, C. Urwin, J. Fresløv, R. Mullett and GunaiKurnai Land and Waters Aboriginal Corporation in press a Engaging and designing place: Furnishings and the architecture of archaeological sites in Aboriginal Australia. In I.J. McNiven and B. David (eds), *The Oxford Handbook of the Archaeology of Indigenous Australia and New Guinea*. Oxford: Oxford University Press.

David, B., J. Fresløv, R. Mullett, J.-J. Delannoy, F. Petchey, GunaiKurnai Land and Waters Aboriginal Corporation, J. Mialanes, L. Russell, R. Wood, L.J. Arnold, M. McDowell, J. Berthet, R. Fullagar, V.N.L.

Wong, H. Green, C. Urwin, L. Metz, J. Crouch and J. Ash. in press b Paradigm shifts and ontological turns at Cloggs Cave, GunaiKurnai Country, Australia. In O. Moro Abadía and M. Porr (eds), *Ontologies of Rock Art: Images, Relational Approaches and Indigenous Knowledge*. London: Routledge.

Delannoy, J.-J., B. David, J. Fresløv, R. Mullett, GunaiKurnai Land and Waters Aboriginal Corporation, H. Green, J. Berthet, F. Petchey, L.J. Arnold, R. Wood, M. McDowell, J. Crouch, J. Mialanes, J. Ash and V.N.L. Wong 2020 Geomorphological context and formation history of Cloggs Cave: What was the cave like when people inhabited it? *Journal of Archaeological Science: Reports* 33:102461.

Fison, L, and A.W. Howitt 1880 *Kamileroi and Kurnai: Group Marriage and Relationship, and Marriage by Elopement Drawn Chiefly from the Usage of the Australian Aborigines; Also the Kurnai Tribe; Their Customs in Peace and War*. Melbourne: George Robertson.

Flood, J. 1973 The Moth Hunters: Investigations Towards a Prehistory of the South-Eastern Highlands of Australia. Unpublished PhD thesis, Department of Prehistory, The Australian National University, Canberra.

Flood, J. 1974 Pleistocene man at Cloggs Cave: His tool kit and environment. *Mankind* 9(3):175–188.

Flood, J. 1980 *The Moth Hunters: Aboriginal Prehistory of the Australian Alps*. Canberra: Australian Institute of Aboriginal Studies.

Flood, J. 1990 *The Riches of Ancient Australia: A Journey into Prehistory*. St Lucia: University of Queensland Press.

Flood, J. 2007 Late survival of megafauna in Gippsland: Dated faunal sequences from Cloggs and other Buchan caves. In M.L. Cupper and S.J. Gallagher (eds), *Climate Change or Human Impact? Australia's Megafaunal Extinction. Selwyn Symposium of the GSA Victoria Division, September 2007, Geological Society of Australia Extended Abstracts 79*, pp.51–54. Sydney: Geological Society of Australia.

Higgs, E.S. (ed.) 1972 *Papers in Economic Prehistory*. Cambridge: Cambridge University Press.

Hope, J.H. 1973 Appendix XIV: Analysis of bone from Cloggs Cave, Buchan, N.E. Victoria. In J. Flood, The Moth Hunters: Investigations Towards a Prehistory of the South-Eastern Highlands of Australia. Unpublished PhD thesis, Department of Prehistory, The Australian National University, Canberra.

Howitt, A.W. 1876 Notes on the Devonian rocks of north Gippsland. *Progress Reports of the Geological Survey of Victoria* 3:181–249.

Howitt, A.W. 1887 On Australian medicine men; Or, doctors and wizards of some Australian tribes. *The Journal of the Anthropological Institute of Great Britain and Ireland* 16:23–59.

Howitt, A.W. 1904 *The Native Tribes of South-East Australia*. London: Macmillan and Co. Limited.

Howitt, M. 1971 *Come Wind, Come Weather: A Biography of Alfred Howitt*. Carlton: Melbourne University Press.

Jones, R.M. 1971 Rocky Cape and the Problem of the Tasmanians. Unpublished PhD thesis, Department of Anthropology, Sydney University, Sydney.

Jones, R.M. 1968 The geographical background to the arrival of man in Australia and Tasmania. *Archaeology and Physical Anthropology in Oceania* 3(3):186–215.

Lampert, R.J. 1971 *Burrill Lake and Currarong. Terra Australis 1*. Canberra: Department of Prehistory, Research School of Pacific Studies, The Australian National University.

Langford, R.F. 1983 Our heritage – your playground. *Australian Archaeology* 16(1):1–6.

Lawrence, R. 1969 *Aboriginal Habitat and Economy. Occasional Paper 6*. Canberra: The Australian National University.

McBryde, I. (ed.) 1985 *Who Owns the Past? Papers from the Annual Symposium of the Australian Academy of the Humanities*. Melbourne: Oxford University Press.

McBryde, I. 1992 The past as symbol of identity. *Antiquity* 66(250):260–266.

McNiven, I.J. 1998 Shipwreck saga as archaeological text: Re-constructing Fraser Island's Aboriginal past. In. I.J. McNiven, L. Russell and K. Schaffer (eds), *Constructions of Colonialism: Perspectives on Eliza Fraser's Shipwreck*, pp.37–50. London: Leicester University Press.

McNiven, I.J. 2016 Theoretical challenges of Indigenous archaeology: Setting an agenda. *American Antiquity* 81(1):27–41.

Murray, T., and J.P. White 1981 Cambridge in the bush? *World Archaeology* 13(2):255–263.

Pepper, P. 1980 *You Are What You Make Yourself to Be: The Story of a Victorian Aboriginal Family 1842–1980*. Melbourne: Hyland House.

Pepper, P. and T. De Araugo 1985 *What Did Happen to the Aborigines of Victoria: The Kurnai of Gippsland*. Melbourne: Hyland House.

Reimer, P.J., W.E.N. Austin, E. Bard, A. Bayliss, P.G. Blackwell, C. Bronk Ramsey, M. Butzin, H. Cheng, R.L. Edwards, M. Friedrich, P.M. Grootes, T.P. Guilderson, I. Hajdas, T.J. Heaton, A.G. Hogg, K.A. Hughen, B. Kromer, S.W. Manning, R. Muscheler, J.G. Palmer, C. Pearson, J. van der Plicht, R.W. Reimer, D.A. Richards, E.M. Scott, J.R. Southon, C.S.M. Turney, L. Wacker, F. Adolphi, U. Büntgen, M. Capano, S. M. Fahrni, A. Fogtmann-Schulz, R. Friedrich, P. Köhler, S. Kudsk, F. Miyake, J. Olsen, F. Reinig, M. Sakamoto, A. Sookdeo and S. Talamo 2020 The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* 62(4):725–757.

Roberts, G.L., R. Mullett, B. David, J. Fresløv, GunaiKurnai Land and Waters Aboriginal Corporation, J. Mialanes, F. Petchey, M. McDowell, V.N.L. Wong, K. Szabó, D. Stoessel, K. Krusic-Golub and L. Russell 2020 Community research in a public place: Wangangarra 1 rockshelter, Mitchell River National Park, East Gippsland (Australia). *Australian Archaeology* 86(2): 176–197.

Smyth, R.B. 1878 *The Aborigines of Victoria, with Notes Relating to the Habits of the Natives of Other Parts of Australia and Tasmania*. Melbourne: John Ferres, Government Printer.

Spennemann, D.H. and S.M. Colley 1989 Fire in a pit: The effects of burning on faunal remains. *Archaeozoologia* 3(1–2):51–64.

Stephenson, B., B. David, J. Fresløv, L.J. Arnold, GunaiKurnai Land and Waters Aboriginal Corporation J.-J. Delannoy, F. Petchey, C. Urwin, V.N.L. Wong, R. Fullagar, H. Green, J. Mialanes, M. McDowell, R. Wood, R. and J. Hellstrom in press 2000 year-old Bogong moth (*Agrotis infusa*) Aboriginal food remains, Australia. *Scientific Reports*.

Stuiver, M. and P.J. Reimer 1993 Extended ^{14}C data base and revised CALIB 3.0 ^{14}C age calibration program. *Radiocarbon* 35(1):215–230.

Thomas, N. 1981 Social theory, ecology and epistemology: Theoretical issues in Australian prehistory. *Mankind* 13(2):165–177.

Veth, P. 2003 Abandonment' or maintenance of Country? A critical examination of mobility patterns and implications for Native Title. *Land, Rights, Laws. Issues of Native Title* 2(22):1–8.

Watkins, J. 2006 Communicating archaeology: Words to the wise. *Journal of Social Archaeology* 6(1):100–118.