

# Excavation at Lene Hara Cave establishes occupation in East Timor at least 30,000–35,000 years ago

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*Reinvestigations of the cave of Lene Hara in East Timor have yielded new dating evidence showing occupation from before 30,000 BP. These will further fuel the debates on early colonization of the region.*

*Key-words:* Indonesia, East Timor, Pleistocene, Middle Palaeolithic, Lene Hara

Timor, the largest of the Lesser Sunda Island chain lying between Java and New Guinea and Australia, has long been recognized as one of the most prospective locations for finding evidence of early settlement by *Homo sapiens* making the water crossing across Wallacea between the Pleistocene continents of Sunda and

Sahul. Birdsell (1977) proposed Timor as a likely stepping-stone island for migration into Sahul as it lay on two possible migration routes involving fairly short water crossings. The first (FIGURE 1, 2A) follows the Lesser Sunda chain of islands along to Timor and then continues on east to Tanimbar Island, with an eventual

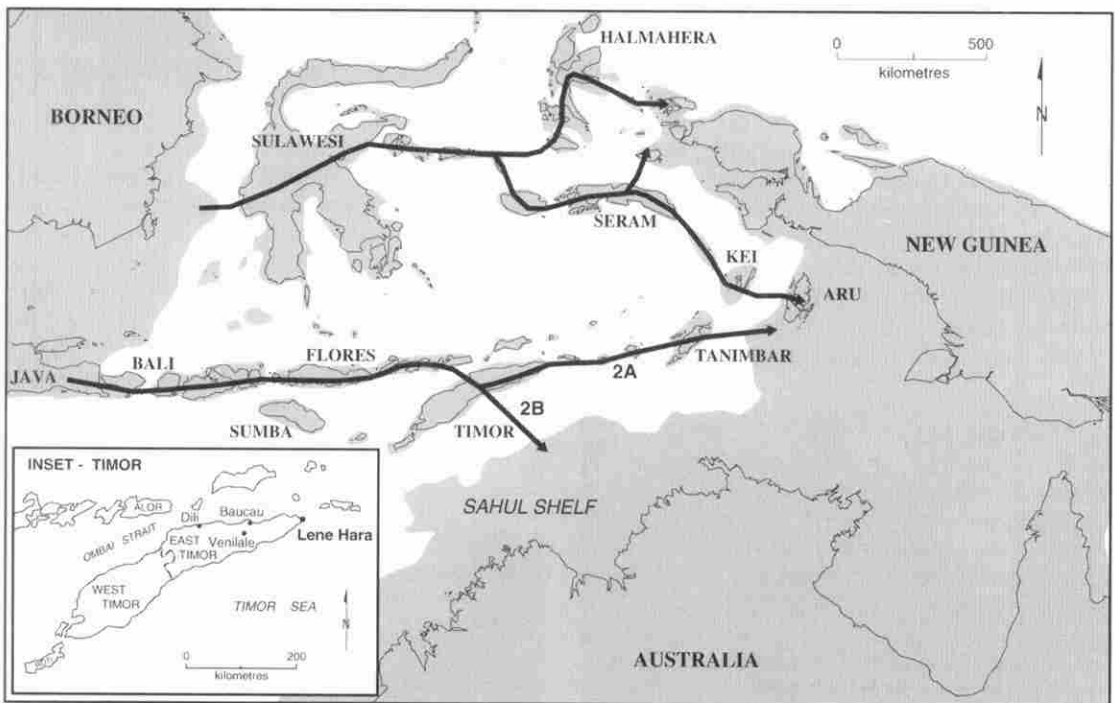


FIGURE 1. Sunda, Sahul and Wallacean islands with Birdsell's routes of colonization and inset of Timor showing location of Lene Hara Cave.

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FIGURE 2. *Lene Hara Cave.*

landfall near the Aru Islands on the expanded Sahul Shelf. The second (FIGURE 1, 2B) crosses from Timor to the shelf in the present Kimberley region of the northwest Australian coast.

The date for initial human colonization of Australia is now widely accepted at c. 55,000–65,000 years ago (Roberts *et al.* 1994; Thorne

*et al.* 1999). However, the Wallacean islands on potential migration routes between Sunda and Sahul have failed to produce dates approaching the antiquity of the earliest Australian sites (Bellwood *et al.* 1998; O'Connor *et al.* in press). These factors highlight the need for further archaeological investigations in Timor.

Despite promising results obtained in the mid 1960s in East Timor (Glover 1969; 1986), there has been no research possible there over the 25 years following the 1975 Indonesian inva-

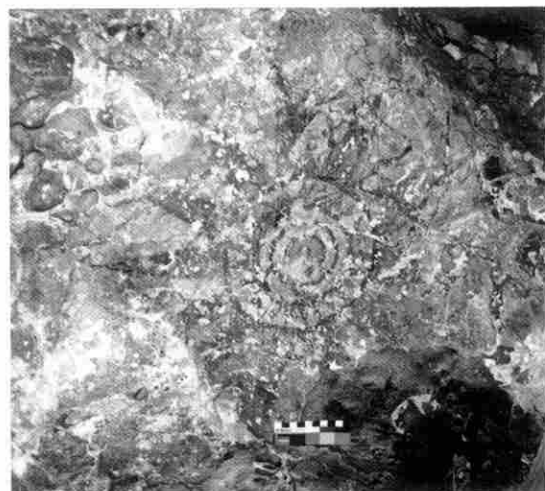


FIGURE 3. *Lene Hara paintings.*

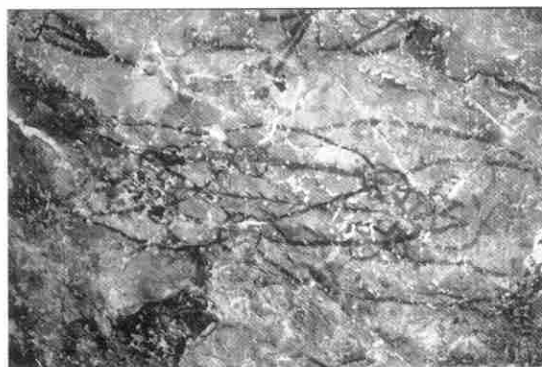


FIGURE 4. *Lene Hara paintings.*

sion. The current UN transitional presence and impending independence for East Timor have allowed archaeology to recommence.

Here we report some of the recent results of the East Timor Archaeological Project (ETAP), a survey and excavation project begun in June 2000 by the Australian National University and James Cook University, in consultation with the UN Administration and East Timorese leaders.

Prior to the commencement of ETAP the archaeology of East Timor (formerly Portuguese Timor) was known solely through the research of Portuguese anthropologists in the 1950s and 1960s and that of Ian Glover, conducted during 1966–7. The Portuguese carried out surface surveys, and in 1963 Antonio de Almeida excavated a cave, Lene Hara, on the eastern tip of Timor near Tutuala (Almeida & Zybszweski 1967: 57–8). Glover carried out an extensive test-pitting programme in the Baucau, Venilale, Laga and Baguia regions before completing major excavations at four caves in the first two regions (Glover 1969; 1986). Glover's primary goal was to investigate Timor as a possible source area for Pleistocene migration to Australia. However, his oldest site, Uai Bobo 2 near Venilale, dated only to 13,400±520 BP (ANU-238) and the other dated cave occupations were Holocene in age.

Almeida's excavation of Lene Hara comprised 2 trenches of 2x1 m and produced an 80-cm deep cultural assemblage with marine shells and stone artefacts to the base. His assessment was that the industry contained 'Mousterian' and 'Tayacian-like' implements and should be classified as Middle Palaeolithic through to Mesolithic (Almeida & Zybszweski 1967: 65). Unfortunately, the molluscan and other fauna were never described and the site was not dated. Almeida also recorded painted rock art at Lene Hara as well as in other sites in the Tutuala region (Almeida 1967). Glover noted that Almeida's illustrations of the stone artefacts he collected suggested little similarity with the 'distinctive tool types' found elsewhere in Timor in his own excavations (1969: 40).

The fact that the stone industry of Lene Hara was thought to be unique within the East Timor context and was claimed to be of a considerable antiquity on typological grounds, albeit undated radiometrically, led us to target it for excavation in 2000. Lene Hara is a large solution cave, positioned in a raised limestone ter-

race approximately 100 m above sea level and less than 1 km from the current coastline (FIGURE 2). Painted rock art occurs in panels on the roof just inside the cave entrance and around the main stalagmite formation in the central area of the cave (FIGURES 3 & 4). Motifs recorded are varied and initial impressions suggest differences in style to other rock-painting sites in the Tutuala region.

A 1x1-m test pit was positioned adjacent to Almeida's trench. Our testing confirmed the depth of deposit at 80 cm. Wet sieving of all cultural deposits through fine mesh (<2 mm) ensured good recovery of cultural material including lithic microdebitage.

The deposit was excavated in approximate 5-cm units, taking account of stratigraphic boundaries. The sequence comprised an upper darker sediment which was a mixture of silt and coarse to very coarse sand (7.5 YR 3/2–4/2) with more organics and overall less roof fall, and a lower level with a higher silt content and significantly more roof fall (7.5 YR 4/2–5/3) below 30 cm.

Most pottery occurred in the top 25 cm of the deposit along with stone artefacts, shell and a small quantity of bone. Two shell artefacts were recovered from units 7 and 10 at depths of approximately 24–28 cm and 36–40 cm from the surface respectively. Both are beads and are made on *Trochus* sp. and the whorl of a *Strombus* sp. They have been submitted for AMS dating to determine if they are *in situ* or intrusive from the upper layer. Stone artefacts and marine shell and small quantities of bone continued to bedrock at c. 84 cm. Species include fish, marine turtle, small murids, snakes, lizards and crabs. Bones of marine species were found to the base of the excavation. A single femur of a giant rat was found in unit 9. On the basis of its size it is probably *Coryphomys buehleri* (Aplin pers. comm.), the largest of the now-extinct giant murids identified by Glover (1986). A dog tooth was recovered from unit 5, associated with the lowest *in situ* pottery.

A total of 417 flaked stone artefacts were recovered from the excavation of Lene Hara. They occurred throughout the sequence, including within the upper pottery-bearing units. Almost all of the artefacts have been manufactured from a chert that ranges in colour from pale to dark red. The preliminary assessment of the Lene Hara artefacts indicates broad con-

tinuities through time with the near-exclusive use of a red chert that has been quarried from nodules or boulders with a chalky cortex. The small size of the flakes and cores throughout may indicate that the chert is not locally available. The assemblages can be described as a small flake-based industry, similar to that recently described from early industries from northern Australia, but lacking the ground axes and flakes from ground axes found in the earliest of these industries (O'Connor *et al.* 2000).

The shell is clearly midden material and not derived from the cave limestone. There seems little difference between the shell assemblage from any excavation level of the site, with rocky platform marine species such as *Strombus luhuanus*, *Trochus niloticus*, *Lambis lambis*, *Turbo* sp. and *Nerita* sp. dominating throughout. Our initial impression during excavation was that the site would post-date the attainment of current sea level at c. 6000 BP. The dates therefore caused some surprise (TABLE 1).

It would now appear that what we have is a two-phase occupation. The majority of the deposit built up around 30–35,000 BP and appears to represent a transit camp between coast and inland resources. The distance to the sea at that time would not have been much different from today, given the steeply shelving marine topography, but access to the coast in this area may have varied considerably during the Pleistocene due to sea level changes. Changing coastal access may have removed the cave from communication routes after about 30,000 BP, occasioning its abandonment. There was no evidence for removal or truncation of the deposit in the area of the excavation, and it is possible that the site saw little or no occupation again until the

last few thousand years of pottery-using Neolithic occupation in East Timor, when the cave may have been used as a shelter convenient to local gardens. Reoccupation may have taken place directly on the top of the abandoned Pleistocene living surface, accounting for some mixing of the deposit around units 4 and 5, where a mid-late Holocene cultural and faunal assemblage is associated with very old dates on marine shell midden. Such mixing is a common feature in sites of the wider region (Spriggs 1999: 17–18).

While there is new evidence from western Flores in Wallacea for a culture-bearing pre-modern hominid population of *Homo erectus*, there is no evidence for continuity of occupation by hominids in this region (see Morwood *et al.* 1997; 1998; 1999; Schulz 2001). The premoderns apparently disappear from the record well before the region is colonized by modern humans. Paradoxically, there are still no archaeological sites in Wallacea with evidence for settlement by modern humans approaching the antiquity of the earliest Australian sites. It would seem that the reoccupation of the Wallacean region by modern humans occurred only in the last 35,000 years, and yet logically occupation of some islands must have occurred at least as early as the earliest Australian evidence prior to 55,000 BP. The answer to this conundrum must lie in sampling. Few Wallacean islands have been investigated archaeologically, the number of excavated sites on the islands which have been investigated is small, excavated samples from these sites are of small size, and our ability to date accurately the earliest excavated material using conventional radiocarbon dating is limited. Numbers

lab. code	date BP	depth below surface cm	excavation unit	$\delta C^{13}$	material
ANU-11400	1030±60	4–8	Unit 2	3.0±2.0	<i>Trochus niloticus</i>
ANU-11419	33,150±550	12–16	Unit 4 (A)	0.0±2.0*	<i>Lambis lambis</i>
ANU-11420	30,970±460	12–16	Unit 4 (B)	2.2±0.1*	<i>Strombus luhuanus</i>
ANU-11398	30,110±320	16–20	Unit 5	2.3±2.0	<i>Strombus luhuanus</i>
ANU-11399	32,440±400	36–40	Unit 10	1.9±2.0	<i>Strombus luhuanus</i>
ANU-11397	30,990±340	52–56	Unit 14 (A)	2.1±2.0	<i>Strombus luhuanus</i>
ANU-11418	34,650±630	52–56	Unit 14 (B)	2.9±0.1*	<i>Trochus</i> sp.
ANU-11401	30,950±360	68–75	Unit 18	1.9±2.0	<i>Strombus luhuanus</i>

\* = estimated.

TABLE 1. Radiocarbon determinations from Lene Hara Cave.

of Pleistocene excavated sites in Australia and well-dated sequences from them employing alternative dating methods (TL, OSL and U-series) outnumber those in Wallacea.

The pattern produced by current dating in Australia would suggest a direct southern route through Wallacea and on to the northwest Australian coast as the most likely route for initial colonization of Sahul. The earliest dates are in northern and southern Australia (Chappell 2000). However, a northern route through Kalimantan and the Philippines and/or Sulawesi into the northern Moluccas and thence along the north coast of New Guinea is also a possibility. Suggestively, the Huon Peninsula coral terrace find-spot of waisted axes on the northern New Guinea coast is the only site on the northern route dated by non-radiocarbon methods. A tephra associated with one of the axes gave a minimum TL age of 38,000 BP,

but the potassium contribution to the dose-rate is uncertain and the ages could be greater (Groube *et al.* 1986). A TIMS uranium series date gave a minimal age of 52,000 years for the underlying terrace formation (Chappell *et al.* 1996).

East Timor is now able to yield some of its archaeological secrets following the end of the Indonesian occupation. The results from Lene Hara suggest that it is an exciting archaeological prospect for future investigations. We are planning further fieldwork late in 2002.

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