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Chronology of Fortified Settlements in East Timor

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ABSTRACT

This paper presents new data on the possible ages and functions of stone structures in the eastern regions of East Timor. Radiocarbon and thermoluminescence dates were obtained from samples from a number of these sites which suggest a late Holocene period construction and occupation. Results from small scale excavations at three sites suggest that these structures were fortified village sites. These social forces behind the building and use of these sites may be related to wider regional social and environmental factors over the last few thousand years.

Keywords fortified settlements, palaeoclimate, warfare, conflict, thermoluminescence dating, East Timor, Indo-Pacific

INTRODUCTION AND BACKGROUND

The remains of hundreds of large stone-walled structures occupy many seemingly strategic hilltops and cliff edges of the landscape of eastern East Timor. These structures, which local residents consider to be old village sites (*lata irinu* in the regional Fataluku language[1]), play an important role in contemporary cultural practice as sacred places, sites of clan histories, and other kinds of social memory. Little archaeological research has been done on these features, however, and questions about their age and past functions have not yet been seriously addressed. This paper reports on archaeological fieldwork and preliminary analysis of several of these structures located near the contemporary village of Tutuala (Figure 1) in the easternmost Lautem district of East Timor, undertaken by the author, students, and colleagues from the Australian National University, James Cook University, and the East Timor Ministry of Culture in 2003–2004. In this paper, I: 1) argue that these structures were

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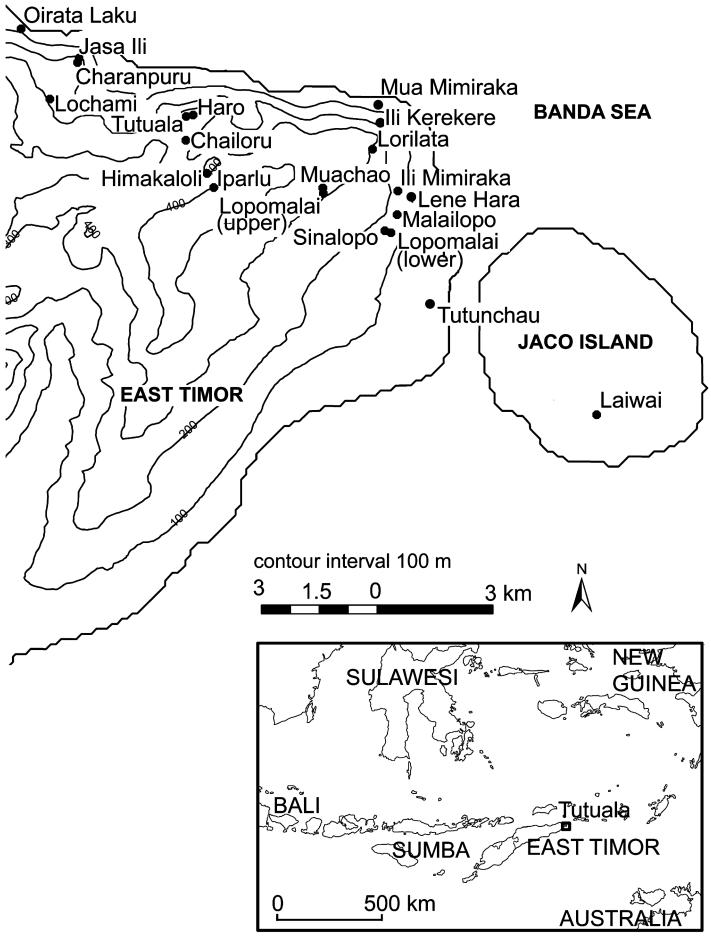

Figure 1. *Map of the Tutuala area, East Timor, showing sites discussed in the text.*

fortifications; 2) provide a preliminary age estimate for their occupation; 3) hypothesize why they appeared in East Timor in the late Holocene; and 4) suggest some chronological and functional similarities with other fortified settlements in the Indo-Pacific region.

Prior to its separation and subsequent independence from Indonesia in 1999, East Timor had seen relatively little attention from archaeologists. Primary work was done by Almeida and other Portuguese researchers in the 1950s and 60s (Almeida 1961; Almeida and Zbyszewski 1967; Correa 1964; Ormeling 1956), and Glover conducted dissertation research there in the late 1960s (Glover 1970, 1986). These researchers were primarily interested in Neolithic and earlier occupations. During the Indonesian administration of East Timor from 1975–1999, few non-Indonesians were allowed to work there and Indonesian archaeological research was confined to cultural resources surveys. Since 1999, intensive research has

begun again. Most work published to date has been conducted on an uplifted limestone plateau in the Lautem district, where dates of human occupation as early as 35,000 BP have been identified in solution cave sites such as Lene Hara (O'Connor et al. 2002; O'Connor 2003; O'Connor and Veth 2005). Some new attention has also been paid to the rich rock art sites of the Tutuala area first published by Almeida (Almeida 1967; O'Connor 2003).

Previous archaeological work has not focused on the stone structures common on the landscape of the region, but their importance to contemporary cultural practice has attracted the attention of cultural anthropologists (McWilliam 2001, 2002, 2003; Pannell 2004; Pannell and O'Connor 2005). These sites appear similar to "fortified" settlements found in Island Southeast Asia and Oceania, most of which date to ca. AD 1300–1700. If the East Timor structures date to the same period as others in the Pacific, archaeological data from the structures may be useful in developing explanatory frameworks for conflict and warfare in the wider Pacific region. The history of these locally important places is also of great interest to contemporary East Timorese.

SURVEY METHODS

We surveyed an area in the vicinity of the present village of Tutuala over several weeks in 2003 and 2004. Comprehensive full coverage survey was not possible in this densely forested and complexly "owned" region. We were guided to sites known by clan elders, hunters, birds nest gatherers, and others who were familiar with the landscape. Over one hundred cultural/ archaeological sites have been recorded in these survey walks to date. We recorded the locations and spatial forms of 17 stone structures in the Tutuala area, as well as several others in neighboring regions using GPS, rangefinder, and compass (Figure 1). Three stone structure sites have been subjected to preliminary subsurface testing, and radiocarbon and thermoluminescence dates have been obtained from these as well as other sites in the area (Table 1).

DESCRIPTION OF FORTIFICATIONS

The remains of fortified settlements vary somewhat in form, but generally they consist of dry-stacked limestone rock walls from 1.5 to 4.0 m high, and 1.0 to 3.0 m wide at their base, enclosing areas from about 500 to 3000 m^2. The sites are generally located on hilltops or cliff edges. In the latter case, walls tend not to extend along the cliff edge, suggesting that the steep drop-off served a defensive purpose. Stone features (e.g., platforms and lower walls) are found enclosed within these outer walls. Usually the exterior walls have an opening or doorway, and in some cases the entrance is walled for several meters to form a narrow twisting hallway (see Figure 2 for representative example). Most of the recorded structures are in secondary regrowth forest and are quite overgrown and difficult to visualize and photograph in their entirety. However, one structure (Haro, Figure 3) occurs adjacent to the currently occupied village of Tutuala and is relatively free of overgrowth. Many of these sites also contain sacred wood or stone markers (*sikua or saka* in Fataluku). These markers, along with stone platforms (*chalululuturu*, Fataluku for "ancestral grave"), are a focus of contemporary ritual practice, discussed in more detail below (see also McWilliam 1991, 2001, 2002, 2003; Pannell 2004; Pannell and O'Connor 2005).

Table 1. **Radiocarbon and thermoluminescence dates from Tutuala area sites.**

Site	Unit	Depth below surface (cm)	Sample Material	Lab Number	Method	13C/12C Ratio (o/oo)	Uncalibrated Age (BP)	Calibrated Date*	Notes
Tutuala	n/a	Surface	Earthenware	U1117	TL	n/a	135 ± 15	AD 1800–1830	No OSL signal
Lorilata	4	10–20	wood charcoal	Beta-184711	AMS	−26.2	240 ± 30	AD 1930–1950; AD 1640–1680; AD 1740–1800	
Lorilata	n/a	Surface	Earthenware	U1118	TL	n/a	371 ± 81	AD 1498–1660	No OSL signal
Lorilata	1	10–20	Earthenware	U1119	TL	n/a	131 ± 35	AD 1780–1855	
Lorilata	1	10–20	Earthenware	U1119	OSL	n/a	303 ± 40	AD 1607–1687	
Lopomalai (lower)	1	0–5	Earthenware	U1207	TL	n/a	259 ± 50	AD 1641–1741	Poor TL plateau
Lopomalai (lower)	1	0–5	Earthenware	U1207	OSL	n/a	40 ± 11	AD 1899–1921	
Lopomalai (lower)	1	0–5	Earthenware	U1208	TL	n/a	505 ± 122	AD 1323–1567	Poor TL plateau
Lopomalai (lower)	1	0–5	Earthenware	U1208	OSL	n/a	57 ± 11	AD 1882–1904	
Ili Mimiraka	1	30–40	marine shell (*lambis* sp)	Beta-197355	C14	+2.4	1430 ± 60	AD 400–660	
Ili Mimiraka	1	30–40	Earthenware	U1209	TL	n/a	485 ± 63	AD 1392–1508	
Ili Mimiraka	1	30-40	Earthenware	U1209	OSL	n/a	3885 ± 399	2330–1530 BC	
Ili Mimiraka	n/a	Surface	Earthenware	U1116	TL	n/a	420 ± 110	AD 1420–1640	
Ili Mimiraka	n/a	Surface	Earthenware	U1116	OSL	n/a	1010 ± 100	AD 840–1140	
Mua Mimiraka	n/a	Surface	Earthenware	U1211	TL	n/a	3634 ± 650	2334–1684 BC	Poor TL plateau
Mua Mimiraka	n/a	Surface	Earthenware	U1211	OSL	n/a	1374 ± 228	AD 348–576	
Tutunchau	1 C+D	Under wall to 30 cm	Wood charcoal	Beta-197356	AMS	−24.4	170 ± 30	AD 1660–1690; AD 1730–1810; AD 1920–1950	
Tutunchau	1 C+D	Under wall to 30 cm	Marine shell (*lambis* sp)	Beta-197357	AMS	+1.2	1650 ± 40	AD 210–400	
Tutunchau	1 C+D	Under wall to 30 cm	Earthenware	U1210	TL	n/a	532 ± 200	AD 1218–1618	No OSL signal
Ile Kerekere	n/a	Surface	Earthenware	U1115	TL	n/a	361 ± 39	AD 1550–1630	

*Calibration for radiocarbon dates to 2-sigma calculated using INTCAL 98 (Stuiver et al. 1998); local reservoir correction not available or applied.

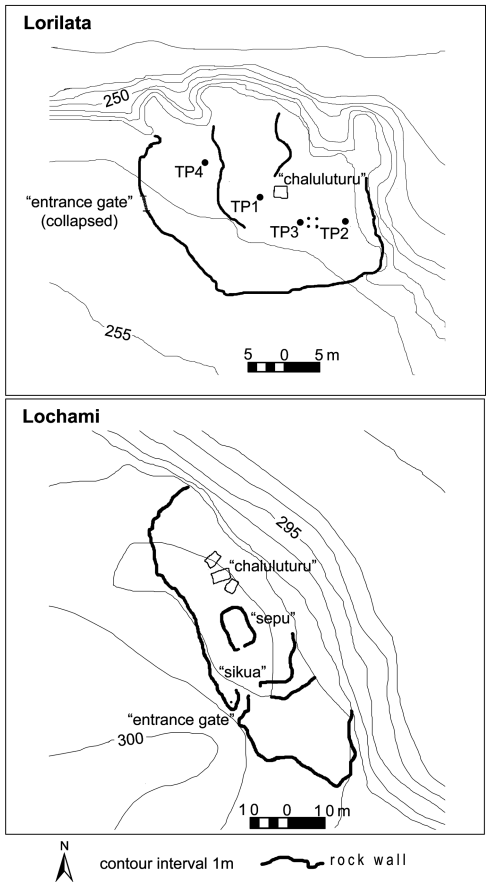

Figure 2. *Maps of the Lochami and Lorilata fortified sites.*

ARCHAEOLOGICAL TESTING

After identifying and recording fortified settlements in the Tutuala area, we tested three sites with the primary aim of determining when they were occupied and how they functioned. We faced numerous challenges in obtaining local permission to excavate. Most of the sites are sacred places, so local people were concerned that such activities would release spirits *(tei)* which live underground at certain sites, often as guardians of those sites. We were fortunate to work with a highly capable traditional "lord of the land" Rafael Quimaraes, who was able to perform rituals at sites in his clan territory and those of other closely allied clans, allowing our excavations to proceed.

The geology of the eastern Lautem district presents a second major challenge to archaeological research. This recently uplifted limestone formation has many solution caves that contain deep anthropogenic deposits with time depths of over 35,000 years (O'Connor et al. 2002). Non-cave (open) sites, however, have thin, disturbed sediments, typically less than 40 cm deep on top of limestone bedrock. Thousands of years of swidden burning and farming in this steeply sloping region, as well as occupation activities themselves, have probably contributed to sediment disturbance and erosion. None of the fortified settlements tested in the Tutuala area had any visible stratigraphic integrity[2] and several consisted mainly of exposed bedrock with isolated pockets of sediment. This has had implications for dating occupation periods as I discuss below. We obtained dateable materials from three open sites which did not contain stone wall structures for comparative purposes (Mua Mimiraka, Tutunchau, and Ili Kerekere) which are summarized in Table 1. These were tested as part of an overall strategy to investigate landscape use in non-cave sites in the region and to help calibrate radiocarbon and thermoluminescence dates.

Once permission was granted to excavate a site, we used a 10-inch (25.4 cm) bucket auger to locate the deepest sediments. The most promising locations were excavated following natural stratigraphy divided by artificial 5- or 10-cm levels and dry screening sediments through 1/8-inch (3.2 mm) mesh. Deposits contained earthenware

Figure 3. *Exterior walls of the Haro site, 2004.*

pottery, faunal remains (animal bone and marine shell), and charcoal. Tree roots and insect burrows extended throughout the deposits to bedrock. Collections and samples were brought to the Burke Museum at the University of Washington on loan from the East Timor government for analysis.

SITE CHRONOLOGY

As mentioned previously, dating the occupation period of most of these sites was complicated by the lack of stratigraphic integrity. Our approach was to date a number of samples from the sites we excavated, assuming that this random approach would produce an approximate occupation date range. Optimistically, we hoped that actual occupation periods were relatively short (<100 years) and that the dates would be tightly clustered. Charcoal was suspect as a source for radiocarbon dating site occupation periods, as ongoing swidden burning has left deposits of charcoal mixed in the sediments not necessarily associated with actual occupation of the sites. Two charcoal samples were dated to compare with closely associated shell and pottery samples. An additional

complication for the dating of both faunal remains and pottery is that most of these sites are used as places of ongoing ritual activity, even though they may not have been occupied in living memory. These ritual activities include animal sacrifice and feasting, as well as periodic "repair" of stone features (Pannell 2004; Pannell and O'Connor 2004, 2005), which may have left faunal remains and pottery that post-date full-time occupation. Finally, we do not yet have a local marine reservoir correction for the Banda Sea region. Correction values (ΔR) for northwest Australia range between -15 and 90 and a regional average for west Australia and Java has been calculated at 67 (Bowman 1985; Southon et al. 2002), but upwelling patterns are likely to be different for the Banda Sea. Despite these uncertainties, we considered faunal remains and pottery to be more reliably associated with full-time occupation of the sites than charcoal.

Thermoluminescence (TL) dating of earthenware pottery recovered from these sites was seen as a potential solution to many of these dating challenges (Feathers 1997, 2003). Fragments of pottery (typically <2 cm diameter) were relatively abundant throughout the excavated sediment columns. TL dating of pottery has not been widely used in the Island Southeast Asia–Pacific region, primarily because its dominant coralline and/or volcanic geology produces pottery with little or no TL signal (Mortlock 1984; Prescott et al. 1982). However, improved methods and increased interest have recently produced some promising results from the region (e.g. Roberts et al. 2005). Initial testing of three sherds from the Tutuala sites at the University of Washington Thermoluminescence Laboratory produced good TL signals with well-defined plateaus, and the resulting dates were within the expected range (though these expectations were mostly conjecture). On that basis, we dated a total of 10 pottery samples (see Table 1). The lab attempted to measure both TL and optically stimulated luminescence (OSL) from each sample. Background radiation was measured in the lab from collected sediment matrix.

TL signals were sufficiently strong from all samples to make an age determination, although only six had a sufficiently strong OSL signal; in most cases there was wide disparity between the two values. Samples of pottery, shell, and charcoal from the Tutunchau site (which lacks a stone structure) were found in very close association under a feature, but produced widely varying dates. Dates from the Lorilata site showed tight chronological clustering that agreed well with expectations from ethnographic evidence, while those from Ili Mimiraka and Mua Mimiraka spanned over a 3,600-year period and seem more problematic.

Other sources of evidence about the dates of occupation of these sites include the documentary record and social memory. The former has been unproductive for the Tutuala area, which appears to be among the last regions of East Timor occupied by the Portuguese colonial administration, only beginning in the 1920s (Forman 1977; Fox and Soares 2000; Gunn 1999). Oral traditions are more informative. Some of the sites recorded, such as Haro and Lochami, were occupied in living memory as late as the 1940s, and our informants often told stories of sequences of occupation for a series of sites (from oldest to most recent), if not absolute dates. For example, prior to population movements during the Indonesian occupation, the Tutuala clan is said to have lived first in Ili Kerekere, then Ili Mimiraka, Lorilata, Tutuala until the 1920s, Haro until the 1940s, and then Piti Leti (which has

no stone structures) after the 1940s (Pannell 2004). If one compares this sequence to the dates listed in Table 1, there is indeed some agreement, especially in the relative ages of Lorilata, Ili Mimiraka, and Ili Kerekere which were not occupied in living memory, but nonetheless are remembered in their "correct" sequence. This sequence, as well as those recorded for other clans, show a trend of clan movement from the coast to the interior, and from sea level to higher elevations. If these various sources of evidence are combined, there is equivocal support for placing the construction and occupation of the stone structure sites after AD 1000, which correlates with many of the "fortified" sites in the Pacific. However, this tentative chronology is subject to continued testing.

DISCUSSION

Several lines of evidence suggest that the structures found in East Timor had a defensive function. Defensive structures or fortifications are characterized by having long sight lines, built walls, and/or locations on bluffs, hills, or islands that restrict entry by outsiders (Arkush and Stanish 2005; Ladefoged and Pearson 2000; Lambert 2002; Maschner and Reedy-Maschner 1998). The combination of hilltop and/or cliff edge location with sweeping views of the coast, tall encircling stone walls, and entrance features suggest that the Tutuala area stone structures were defensive in nature. While some of these features in isolation may have served other purposes (walls might have served as animal pens, locations with long sight lines might have been an adaptive response to participation in trade), the fact that the Tutuala sites combine all of these features strongly suggests that they were built to protect against raids from outsiders.

Pottery and faunal assemblages recovered from test excavations in Lorilata and Ili Mimiraka are similar to those recovered from occupation sites in caves, such as the post-Neolithic layers at Lene Hara and in open sites such as Tutunchau. These include fragmented undecorated earthenware pottery, marine shell, and animal bone. Shell and bone from these sites are currently being analyzed, although the majority are too fragmented to be identified. However, the presence of food remains and utilitarian pottery in these assemblages suggest that these sites were domestic spaces with some long-term occupation, and not just military redoubts or short term refuges, although this is debatable and subject to further testing and analysis.

Internal features such as interior walls and stone platforms, were not investigated archaeologically because there was either inadequate sediments or traditional restrictions about disturbing sacred areas. Informants described the stone platforms as "graves" (*chaluluturu* in Fataluku), and indeed they resemble recently constructed graves in form and size, although graves are now made of concrete and ceramic tile. The lower interior walls were in some cases described by informants as defining ceremonial meeting spaces (*sepu* in Fataluku). At Lochami, the space defined by an interior wall had a particularly dense assemblage of pottery and shell on the surface, but this could be the result of post-occupation ceremonial use of the site. Further defining of site function will require more extensive excavation, preferably at a site with better stratigraphic integrity.

Oral traditions in Tutuala also support the view that these sites were fortified villages which were continuously

occupied (until the population moved to the next place). People in Tutuala and other parts of East Timor remember a time of *perang saudara* or *perang ratu* (Indonesian), literally "brotherly war" or "clan war", which predated Portuguese colonial administration. One Tutuala informant showed us a disarticulated human skull stored in a small cave which is remembered as dating from this time. Headhunting and slave raiding themes are also common in clan histories, echoing a long tradition of headhunting in Southeast Asia (Hoskins 1996). Additionally, many place names, clan names, and histories suggest migration from other places. These names (such as *Leti*, *Oirata, Malei,* and even *China*) can be traced to nearby and distant islands. Familial and economic ties were maintained with some of these places until quite recently (Josselin de Jong 1937).

While documentary history about the Tutuala area does not pre-date the twentieth century, other parts of Timor were described by the first chroniclers as early as the sixteenth century as having a large number of small polities based in the interior mountains and perpetually at war with each other (Pigafetta 1969; Pires and Rodrigues 1944; Prapañca and Robson 1995; Ptak 1998; Reid 1985, 1988; Wallace 1986). This fragmented political landscape was a feature of other places in pre-colonial Island Southeast Asia as well (Junker 1999; Lape 2000a, 2000b). Early Timorese polities have generally not been considered "states", but rather small-scale chiefdoms articulated within larger scale systems of shifting alliances (Boxer 1947; Forman 1977, 1980; Fox 2000; Francillon 1980). Timorese polities were remarkably resistant to colonial domination. Portuguese control over the island was never complete, and until the twentieth century, was restricted to forts and trading posts; much of the post-1975 period Indonesian colonial control was similarly nominal in many parts of the country (Boxer 1969; Fox and Soares 2000). In the late nineteenth century, a re-energized Portuguese colonial administration began moving the indigenous population from isolated, fortified villages into settlements that could be more easily controlled and served by a new system of Portuguese forts, churches, and schools (Francillon 1980; Middlekoop 1963). By the middle of the twentieth century, most indigenous fortified villages had changed significantly from places of permanent or seasonal occupation to places of ceremonial or other activities; some were used as strategic military sites in the 25-year-long resistance by East Timorese to Indonesian annexation (Pannell and O'Connor 2004).

CONCLUSIONS

While additional work is clearly needed to securely place the East Timor stone structures in a chronological framework, the preliminary data presented here suggest that the earliest sites pre-date European colonial presence and may be chronologically and functionally related to similar structures found across the Indo-Pacific region. Prior to the late 1990s, most archaeologists explained the development of fortified settlements in the Pacific as the archaeological correlate for group conflict resulting from local or regional social forces such as population growth/resource scarcity or political evolution (Best 1984; Palmer 1969). Until quite recently, researchers have not considered or explained the striking temporal correlation between the many places across a very large region, including Island Southeast Asia and Oceania, which developed fortified settlements. In places with recorded

fortified settlements, the vast majority first appear between AD 1100–1700, regardless of the duration of human occupation. Fortified sites appear on the landscape at similar times from Eastern Indonesia to Eastern Polynesia, and from Okinawa to New Zealand (e.g., Field 2005, Ladefoged and Pearson 2000, Lape 2000a, Kirch 2000).

The temporal cluster of the appearance of fortified settlements across the tropical Pacific also coincides with the Little Climatic Optimum/Little Ice Age (LCO/LIA) transition and a sustained increase in El Niño/Southern Oscillation (ENSO) events unprecedented in the Holocene (e.g., Moseley 1997; Moy et al. 2002; Salinger et al. 1995). Intriguingly, these fortifications also appear primarily in areas that experience negative rainfall anomalies during ENSO events. Similar temporal correlations of evidence for conflict (trauma in human remains, fortified settlements) and climate change have recently been investigated by archaeologists in other regions such as California and the southwestern United States (Arnold et al. 1997; Bawden and Reycraft 2000; deMenocal 2001; Kennett and Kennett 2000; Moseley 1997).

An ecologically oriented exploration of late Holocene climate change in East Timor may be a productive line of inquiry towards explaining why people started building fortified settlements there. This inquiry, however, will require the collection and analysis of local proxy records for climate as well as data about the effects of climate change on human subsistence and economic activities, contextualized within a general anthropological understanding of the causes and expressions of conflict and warfare. These future projects also depend on a reliable chronology for the construction and occupation of fortified settlements in East Timor and the broader Pacific region, for which this paper represents a starting point. In many cases, innovative methods will be required to obtain secure and precise dates for the construction and occupation of these sites. Future work in East Timor will be oriented to further refining these chronologies.

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END NOTES

1. Fataluku is a non-Austronesian language spoken in the easternmost Lautem district of East Timor. Orthography used for site names in this paper may differ from previous publications that reflect an Indonesian language orthography ("ch" does not appear in Indonesian, for example).
2. A stone structure site in the village of Ira Ara on the northeast coast of East Timor with well-stratified deposits and human burials was

excavated by the author in July 2005. Results of this work will be published after analysis is completed.

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