

# Pleistocene Timor: some corrections

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## Introduction

The Indonesian island Flores has been suggested to have been occupied by hominids up to 830 ka ago (Koenigswald and Ghosh 1973), by 730 ka (or 780 ka) ago (Sondaar et al. 1994), or before 800 ka ago (Morwood et al. 1999), and Middle Pleistocene jasperite quarrying has been reported from Roshi Danon in Roti (Bednarik 1998; Bednarik and Kuckenburg 1999). In the absence of such early finds from northern Wallacea it therefore stands to reason that, of Birdsell's (1957, 1977) three colonisation routes leading to Australia, the southernmost has the best prospects of being the correct version. It would have led from Java and Bali (Bali was connected to Java, and thus to the mainland, at times of low sea level) to Lombok. The most important biogeographical division in the world, the Wallace Line, runs through Lombok Strait. After this, a second sea crossing was necessary, at any sea level during the geological past, from Lombok to Sumbawa, and a third from there to Flores (assuming that some smaller islands such as Komodo were connected to the larger ones).

There can be no reasonable doubt that, by the end of the Lower Pleistocene, perhaps around 800 ka, a large hominid population was well established in Flores, coexisting with an endemic and impoverished fauna dominated by *Stegodontidae*. The contemporaneity of *Stegodon* and *Homo* has been established by Verhoeven in mid-1963 (Verhoeven 1968) and confirmed at the same sites by Maringer in 1968 (Maringer and Verhoeven 1970; cf. Bednarik 1995a, b), Sondaar et al. (1994) and Morwood et al. (1999).

In view of this strong case for the southern route to Australia, which presumably would have led from Flores to Alor, and then across Ombai Strait to Timor (Fig. 1), it is surprising that the Pleistocene archaeology of Timor has, until now, not attracted any sustained interest. Timor, presumably the last 'staging post' on the way to Australia, is obviously of great importance, not just for the flow of people to Australia, but also to more fundamental issues of hominid history. For instance, the Lower and Middle Pleistocene occupation evidence from Wallacea is of profound significance to the 'African Eve' hypothesis, as well as to questions of the technological, cognitive and cultural development of hominids (Bednarik 1997). Maritime navigation is arguably the most reliable source of information about maximal human capabilities at any given time in the past (Bednarik 1998). The principle behind this argument is similar to the one according to which it should be possible to estimate the shortest sea distance in the past by determining which large land mammals colonised the destination landmass. Elephants can swim 50 km and more of sea (Johnson 1980), hippos considerably less, deer perhaps 10 or 15 km, pigs less again (Bednarik and Kuckenburg 1999). Hence if all these animals were present in a region (as was the case in Sunda) and only elephants ever crossed (as is the case in Wallacea, where many islands were colonised by proboscideans), we can reasonably estimate the

shortest sea distance to be travelled. In the case of hominid seafaring, we can consider a given distance and purported conditions, and determine by replicative experiments the minimum technological conditions necessary to master such a crossing. This is likely to tell us a great deal more about technological capability than the typological 'study' of lithic assemblages, or any similar, often meaningless measure of 'progress'.

The Pleistocene information available from Timor is particularly fragmentary and incomplete, and it has not been effectively reviewed — a task to be attempted here. Glover and Glover (1970), in the most-cited work on Timorese stone tools, considered the issue on the basis of viewing just seventeen stone artefacts in a museum collection, surface finds from Flores and Timor, of which only ten were from Timor. Earlier, Verhoeven (1964) had located the first reported *Stegodon* remains in Timor, mentioning also the occurrence of surface stone tools in the vicinity of Atambua, but without suggesting that there was a connection between these finds. The brevity of his report is perhaps explained by its concluding sentence:

Unfortunately I had no time left to search for the fossil humans. Since I dutifully reported our finds to Djakarta, Bandung and Djogjakarta, others will soon continue the research [my translation].

The large-scale study of the type apparently envisaged by Verhoeven was never attempted. Apart from a descriptive palaeontological treatise produced some years later (Hooijer 1972), this find received little further attention, nor was any follow-up field work reported in the region until 1998. The only information available about the important sites to the east of Atambua is contained in the second half of Verhoeven's one-page 1964 paper. They amount to a few sentences and a summary of the sedimentary strata he recognised. Only sketchy details are available concerning the locations of the sites he examined, their geology or the possible antiquity of his finds.

Similar limitations apply to all other Pleistocene research in Timor. The first mention of possibly Pleistocene artefacts appear to be the reports of a Portuguese researcher, Antonio de Almeida, who found Palaeolithic stone tools in East Timor (Almeida 1953; Almeida and Zbyszewski 1967). Although

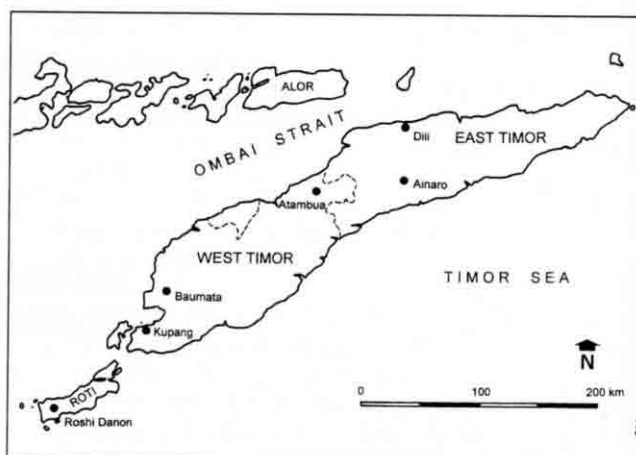


Figure 1 Map of Timor, with locations mentioned in the text

this work became so well known in Europe that Henri Breuil took an interest in it (because he realised that the tools were of Lower Palaeolithic typology), it was not followed up for half a century.

### Reviewing Verschuuren's work

Glover and Glover (1970) describe a few stone tools kept at Udana University in Kupang, collected by Jan Verschuuren near Atambua. They note that the artefacts were found on the surface, yet in the following sentence they attribute them to a Pleistocene deposit, the Ainaro gravels of East Timor. These gravels, they state, also contain two extinct forms of *Stegodon*, which suggests to them that the tools must be Pleistocene in age.

The Ainaro gravels are a feature of East Timor (Audley-Charles 1968), in a drainage basin that discharges south, into the Timor Sea, whereas Atambua is in West Timor, in a basin draining north, into Ombai Strait. There is no connection with Verschuuren's finds, and thus no geographical, geomorphological or palaeontological justification for Pleistocene attribution. Verschuuren's artefacts cannot be related even to the Weaiwe Formation within 20 km (Bednarik and Kuckenbun 1999), which has yielded all the *Stegodon* remains so far reported from Timor. Hence Glover and Glover's (1970) comments are seriously misleading. They have examined an inadequate number of unprovenanced finds (ten flakes from the entire island) and attributed them to the Pleistocene without any justification, and without examining any of the find sites.

Verschuuren had gathered a few hundred stone tools in the Atambua region, particularly to the south of that town. All were collected as surface finds from hill sides, washed out in small gullies, flood plains and in river gravel beds. They came from forty locations, generally within 10 km of Lalian (ca. 6 km south of Atambua), where Verschuuren was in charge of the Catholic priest seminary. In 1970, he tried unsuccessfully to have his description of this lithic material published in Europe. After his death Professor Johannes Maringer, who had worked with Verhoeven on Flores, revised Verschuuren's manuscript and eventually had a new version of it published, subsequent to his own death in 1981 (Maringer and Verschuuren 1981). Although Verschuuren lived near Lalian for nine years, nearly all the stone tools were collected within a few months, from October 1964 to January 1965. He was visited and consulted by Verhoeven in August 1964, who discovered the first *Stegodon* remains found on Timor late that same month. Therefore it seems reasonable to assume that

Verschuuren's brief burst of collecting activity was motivated by his contact with his colleague Verhoeven (who was the director of the Flores priest seminary).

Most of Verschuuren's stone tools remain in a small museum in the high school of Lalian, where I have examined about 250 specimens. I have also visited some of the sites where he has collected, and found others close to his base which he has not mentioned, such as Surik Lulik on the west bank of the Talau river, just 2 km south of Lalian. Initially, Verschuuren collected mainly along the rivers Terlan and Buik, and after showing his material to Verhoeven, both went to the hill Hedibesi on 15 August 1964, which is 5 or 6 km SSE of Lalian, forming part of a long ridge along the east bank of the Talau. I examined this prominent hill and found a surface scatter of artefacts about 40 m below its peak, above a saddle on its western flank. There is very little sediment present at the location and I tentatively regard the assemblage as being of the Late Pleistocene, on account of its Upper Palaeolithic typology (Fig. 2) and state of weathering (patina thickness averages 2.5 mm on dense cryptocrystalline silica; cf. Bednarik 1980). Alluvium occurs on the hill slopes up to about 475 m a.s.l., indicating the level of a previous floodplain significantly higher than the present landscape.

Verschuuren intensified his collecting endeavours after finding the surface scatter of lithics at Sukocuoma on 28 November 1964. The principal sites he visited next (according to my examination of his labelled lithics) were Busa Bula (3 and 30 December), Bausara (8 December), Welo Rolaran (12 and 13 December), Toribauk (13 December) and Halimea (31 December). He continued his search in January 1965, first at Derok Masin (6 January), then three days later returning to a major site, Turasmanu, which he had already collected from after finding Toribauk on 13 December 1964. He revisited Turasmanu on 9 January 1965, and then found some tool scatters at Lalian itself, on 20 January. Finally, he located three more sites and collected from them on 27 January 1965 (Oetfoh, Kalua and Ofemu).

The lithic materials Verschuuren collected at these and other sites comprises none of the types Glover and Glover (1970) describe, and my examination of specimens held in Kupang suggests that the largest, least patinated and most colourful specimens had been selected for transport there. This indicates once again how unrepresentative museum collections usually are, and that from an archaeological point of view their 'analysis' can only lend itself to distortion. The collection had undergone three distinctive selection processes. The tools considered by Glover and Glover were first selected by taphonomic processes, then by the collecting activities of Verschuuren (who was selective in what he collected and what he left behind), and finally they were selected on the basis of a third set of entirely subjective criteria (related to what part of the collection was taken to the Kupang museum). This means that the collection should have been described, noting that the evidence has been subjected to metamorphological biases (Bednarik 1995c). To then read such a paper as a reliable description of 'Pleistocene flaked stone tools from Timor' (when no evidence was even provided that the collection is from the Pleistocene), as commentators have done since, does Timorese archaeology a disservice.

I have reviewed all of this material and conducted microwear studies and sedimentological analyses at selected sites, but I would not consider this work sufficiently comprehensive to publish my findings. Here I merely wish to correct the existing published record. Since Timor and Roti are



**Figure 2** Probably Late Pleistocene stone implements from Hedibesi, near Lalian, south of Atambua, West Timor.

the clear favourites for the source location of the first Australians (Bednarik and Kuckenbarg 1999) it seems essential to clarify the typological relationship of Timorese lithics with those of Australia. With one exception, all of Verschuuren's material seems to relate to a specific lithic tradition, which consisted largely of wood-working implements. Retouched concave working edges are common, and adzes are more prominent than any of the types the Glovers report. No shortage of raw material is evident in the way the stone is knapped. While it may be true that the assemblage is not identical to a specific lithic industry in Australia, many specimens are distinctly reminiscent of Australian tool types of the Pleistocene, and I regard this assemblage as belonging to the Late to Final Pleistocene until better evidence becomes available. However, the material from Halimea comprises two distinct components, easily distinguishable by both typology and patination. The younger matches that of the other sites, the older is typologically archaic, and its weathering state suggests an age several times that of the younger tools.

### Reviewing Verhoeven's work

Dr Theodor Verhoeven, an amateur archaeologist, was until recent years the most important archaeological scholar to have worked in Wallacea, and although he published no less than fifteen articles on his work, it has remained largely ignored in the English-language literature. His principal achievements were the discovery of Lower Palaeolithic tools on Flores, and the discovery of *Stegodon* and other fossil faunal remains on both Flores and Timor. I emphasise these points because of the disparaging comment made by Allen (1991: 252) about Verhoeven (I may well deal with the many inaccuracies in Allen's own paper in due course).

Verhoeven's work in Timor, however, was very brief, and the only published record we have of it is a one-page article published in the same year (Verhoeven 1964). It seems certain that he went to West Timor with the specific intention of determining whether *Stegodontidae* could have reached the

island. This is perhaps not fully apparent from the brief note, where he merely indicates his interest in the eroded landscape east of Atambua. It no doubt reminded him of the similar geomorphology (but different geology) of the Soa Basin, where seven years earlier he had found the first proboscidean remains in Wallacea (Verhoeven 1958). However, I have interviewed the foreman of his 40-men excavation team, Joseph Z. Andrada of Hale Ulun, who happened to be the sole survivor of that team (Fig. 3). From his detailed account and other sources it was easy to construct the history of this project.

On 19 August 1964, Verhoeven, in the company of Verschuuren and two other men, began to examine the hills east of Atambua. His strategy was to walk along natural exposures, and in a dry riverbed near Hale Ulun he found a single flake implement of what Verhoeven considered to be a Lower Palaeolithic type. There is only one major creek bed at Hale Ulun, which crosses the road just 100 m from Andrada's home. Upon checking the dry water course I found a few stone implements on the bank above it, eroding from a Late Pleistocene deposit.

When Verhoeven's search was continued seven days later, a fragment of a *Stegodon* molar was found just 300 m from Andrada's house. According to a second version of the events (Paul Y. Sondaar, pers. comm. 1998) he visited the local primary school and showed the students a *Stegodon* molar he had brought with him from Flores, promising the first to bring such a tooth a horse as reward (horses are greatly valued in rural Timor). Just over three hours later a boy brought a molar, together with some carapace segments of a giant tortoise, and promptly received a horse. Perhaps it was this event that led Verhoeven to search in the Weaiwe valley, east of Hale Ulun, where with Andrada and another local man he began to find fossil bone fragments. Andrada was then requested to assemble a team of labourers, and he returned with forty men within two hours. At a site now designated Weaiwe 1, a natural subsidence that had exposed the geological strata, Verhoeven began a large excavation. On 31 August he excavated the first *Stegodon* molar. According to Andrada, he became so elated that he danced exuberantly on the site, to the bewilderment of the work crew. This anecdote seems to confirm that, in recognising the age of the deposits, he had quite deliberately set out to repeat his earlier success in Flores. Like his compatriot, Eugene Dubois, who worked much earlier and in a different part of Indonesia, Verhoeven was evidently a shrewd observer of Pleistocene geology and of relative preservation conditions, and his very determined campaign was most certainly sophisticated, well targeted and carefully planned. From my own experience of following in his very footsteps I learnt to admire his judgment: like Dubois he was looking for a very small needle in a very large haystack, and the only reason why he found it was because his search methods were sound and systematic.

Verhoeven continued the dig at Weaiwe for three days, locating the remains of several species. He then also searched a locality he called Fulan Monu, about 2 km from the first excavation. No stone tools were reported by him from either site.

In reality Verhoeven was not the first to find such fossil remains in the region, they had been found, collected and curated for centuries at least. My ethnographic research indicates that the Pleistocene fossils are well known by the local people, who keep them as magic objects, alongside quartz crystals. These objects are handed down from generation to generation. They were used in healing ceremonies and



**Figure 3** Joseph Z. Andrada, December 1998. Verhoeven's principal helper in 1964, who acted as foreman of the large excavation team Verhoeven employed to recover *Stegodon* remains in situ near Kota Foun, West Timor.



divination, in rain making, and during recent centuries to protect warriors from bullets. The indigenes are reluctant to talk about such magic, assuming that it would be frowned upon by Westerners, but once reassured that the interviewer 'approved' of these practices, it becomes evident that they are still widely in use. In fact Atambua is a region well renowned for its continuing expertise in matters of magic.

Villagers brought the segments of the carapace of an extinct giant tortoise for me to examine, and various aspects of non-Christian beliefs were related during many interviews. Some of the ancient stories are of relevance here. According to such a story passed down 'by the old people', elephants once roamed on Timor in the distant past, they were tamed by the people and used for transport. I also observed that some villagers were quite familiar with the morphology of elephant molars, they knew what they were, how the lamellae develop and are expelled, and the role of the chewing plane. The most logical explanation of this knowledge seems to be that *Stegodon* remains had been correctly interpreted in the past as being of proboscideans, and the myths relate an ethnoscientific explanation of their presence. In his field work Verhoeven made good use of the position he held as a high-ranking religious luminary, therefore I am inclined to think that he was not informed of the ritual use of fossil remains. However, this is not at all certain, because the anecdote involving the gift horse could indicate that he was aware of the existence of fossil remains in the possession of villagers.

Some of the location names in Verhoeven's brief report are incorrectly used. He states that the area where he first excavated is called Fatukleos, which is in fact the name of a flattish hill about 1 km WNW. The site is located just to the north of Kota Foun, a village he fails to mention ('New Village'). Fulan Monu is the name of the nearest village to the north, and the correct name of the second site where he excavated is Odak, which lies in the village borough of Fulan Monu.

## Discussion

It is clear from the above that no credible evidence has so far been presented for a Pleistocene human presence in Timor (cf. Glover 1971). There is circumstantial evidence that very early industries may be present, particularly the archaic typology of the stone tools reported by de Almeida from East Timor and the dichotomy of the Halimeia collection. Such evidence comes also from other sites. I have observed stone implements of pre-Upper Palaeolithic typology near Kupang, and in one of the many rockshelters at Baumata I recovered a particularly interesting specimen (Fig. 4). Among an industry of clearly Holocene jasper flakes one specimen was made from a very much earlier tool that had become heavily patinated. The white patination zone suggests that the tool was initially a Pleistocene flake retouched for wood working,



**Figure 4** Re-used Pleistocene stone tool from Baumata rockshelter, West Timor.

and much more recently fractured and reused by a rather less competent stone knapper.

The most recent developments on the subject of a Pleistocene human presence on Timor are the results of my work at six sites near Atambua. Besides recording *Stegodon* remains at three of them, I located one in situ stone tool in the fossiliferous Weaiwe Formation, a calcareous conglomerate of the Middle Pleistocene. This was found together with a *Stegodon* molar at the site Motaoan. Another site, To'os, yielded a fragment of a large marine mollusc shell, impact fractured and then heavily burnt. This demonstrates anthropic transport, and the presence of a fire-using, seafaring hominid on Timor. This evidence, however, is not considered here, but will be presented in the course of publications which are in preparation.

In summary, it appears the island has been occupied by humans during at least two phases of the Pleistocene: during a late stage of that period, and at a very much earlier time. Currently available information is much too incomplete and sporadic to comment on the possible continuity of such occupation.

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