The Archaeology of Linaminan, Central Palawan:
A Preliminary Report on Excavations

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Abstract

Linaminan - 'The House of Linamin' - is a sacred Pala'wan site and prominent feature on the landscape within the Barangay of Isumbo, in the municipality of Sofronio Española, on the island of Palawan, Philippines. With views out to the Sulu Sea and across the surrounding rice-paddies, this metamorphic outcrop stands over sixty metres above sea level. Repeated and large-scale treasure-hunting in search of the mythical 'Yamashita Gold', has revealed an archaeological site of local and regional importance. As well as being the earliest ceramic tradeware-bearing terrestrial site in the Philippines, Linaminan has produced a remarkable array of polished stone adzes and iron implements, as well as a vast earthenware assemblage. Analysis of excavated material continues, but here we present a full report on excavations. The goal of this article, therefore, is to fully present the methods and results of excavation, with more interpretive and specialist papers to follow.

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Introduction

Palawan has a rich Metal Age heritage, with a number of sites having being excavated by Robert Fox (1970), supplemented by recent excavations at Ille Cave (Szabó *et al.* 2004; Szabó 2005). Imported trade goods are ubiquitous, and Palawan was clearly well integrated into regional networks. Early entrepôts and polities, however, are unknown, and trade goods are relatively evenly spread geographically. While Palawan apparently had close relations with overseas states, trade-goods did not simply supplant locally-produced items. Recent research has revealed a local tradition of imitating trade beads in shell using lapidary, rather than traditional neolithic shell-working techniques (Szabó 2005; Basilia *et al.* n.d.). This almost certainly represents technological transfer from elsewhere fused with a traditional raw material, and indicates the complexity of Palawan's relationships with its neighbours. Despite the rich and syncretic Metal Age heritage of Palawan, most attention has focused on the archaeology of the Palaeolithic and Neolithic periods, and the status and role of Palawan within Metal Age networks, and the effects upon the local culture, remain unclear.

In order to investigate the nature of the Metal Age transition in Palawan, and its impacts upon local, traditional neolithic culture, the authors conducted excavations at the newly-recorded site of Linaminan in central-eastern Palawan. Artefacts from treasure-hunting activities had made their way to the National Museum of the Philippines in Manila, and the richness of these collections, as well as the fact that they derived from an open as opposed to a burial site, provided clear impetus.

While the Linaminan excavations are part of a broader project investigating the nature of Metal Age society, culture and regional connectedness from a Palawan perspective, the following report is not an attempt at a synthesis. There have been very few full site reports published in the Philippines, or Island Southeast Asia generally, which is a recurrent source of frustration to those trying to understand regional patterning in the archaeological record. Thus the aim here is to present a comprehensive site report on the excavations at the Linaminan site, which took place over a three-week period in November 2006. Analysis of various components of the assemblage is ongoing, and further specialist papers will follow. It is hoped, though, that the publication of this report will provide a clear contextual basis for the discussion of finds.

Background to Excavations

Linaminan is located on the property of Mrs. Egleceria Cajolo in Barangay Isumbo, just south of Aboabo on the National Highway connecting Puerto Princessa

with Brooke's Point in southern Palawan. The location of Isumbo and the Linaminan Site is shown in Figure 1, with a plan of Isumbo showing the location of the site shown in Figure 2. A picture of the Linaminan outcrop is presented in Figure 3.

Isumbo is now characterised by a patchwork of wet-rice fields, however wet rice agriculture is a very recent introduction to the area. Mrs. Egleceria Cajolo, who came to Isumbo (from Iloilo) in the late 1950s, tells that the area was at that time forested. In the mid-1970s, the area was cleared using fire, with such clearance extending some distance up the sloping sediments surrounding the outcrop and over the surrounding hills (see Figure 4). With the use of the lowlands for wet-rice agriculture and the use of the low hills for the production of such crops as bananas, the forested outcrop of Linaminan stands in stark contrast. Many birds congregate in this area, along with occasional monitor lizards (*Varanus salvator*) and monkeys (*Macaca fascicularis*).

The Linaminan metamorphic outcrop is well-known to members of the nearby Pala'wan community. It occupies a sacred place in the cultural and physical landscape, and is associated with a number of beliefs and historical memories. These aspects of Linaminan are discussed below by Leo Batoon.

Ethnographic Accounts of the Linaminan Archaeological Site

Leo M. Batoon

Local informants do not know the very first appearance of *Linaminan* in the socio-geographic landscape, however, according to their ancestors, the *naliyanun* or sacred place has been there for many generations. Pala'wan call the place *Linaminan*, the house of a certain woman named Linamin, who is a deity or a supernatural being. The place is so enchanted that most Pala'wan are afraid of visiting or going near *Linaminan* because of the spirits or deities that inhabit the place which may cause them severe illness or even death. Even during the present time, people do not go there because of the possible dreadful outcome, but not the *baliyan*, a local priest or medium, who, with his companions, go there to conduct the *pagdiwata* rituals and healing processes.

Salap Bondi, residing in Sitio Bongalog, is a *baliyan* or a local priest or medium who occasionally visits *Linaminan* for healing rituals. Salap inherited the position of *baliyan* from his father. He says that in Pala'wan tradition only men can hold the title of a *baliyan*. *Linaminan* is a place where they can find *silumpat pagar*, which according to Salap is a curative flower. The flower is not easy to find, and

only those that possess special abilities can acquire one. He admitted that even he himself has still have not found one. The flower is scented and apart from being a medicinal plant, it can also be used as love potion.

In performing the *pagdiwata* ritual in *Linaminan*, Salap would bring food like chicken, and rice cake varieties such as *lutlut* and *pusu-pusu*, and offer it to the deities who have caused the illness. Such deities are believed to be evil ones that the Pala'wan call them *saitan* or *moron*. To further appease the spirits, *tabad* (a local rice wine) in a *siburan* (tradeware jar) is also offered. Pig is prohibited in the *pagdiwata* ritual. During the healing ritual, the *baliyan* would call the deity who had caused the illness and make a *sanggup* or promise while burning a *parina*, and then offer the food and drink. *Parina* is incense from sap of a local tree called *taguk*.

He is not allowed to talk to anybody he meets while on his way up to *Linaminan*. People would know a *baliyan* who would be performing the *pagdiwata* because he usually walks fast. He also wears a sash across the body and two pieces of *lugus* (head cloth) tied around his forehead. He would also have a *tukaw* or large knife around his waist. Salap said that he goes with at least two companions who also wear the same attire. *Baliyan* performs the *pagdiwata* ritual on top of *Linaminan* when the type of illness is severe; if it is just simple illness, they conduct the ritual at the foot of the rock formation.

There are several local stories specifically regarding *Linaminan*. According to one informant, there was a time that Isumbo had a large population but an epidemic of *labaw-tipdas* (lit: dreadful measles) almost wiped out the entire village. The informant added that most of the sick people were brought at the foot of *Linaminan* for healing purpose, however, most of them died and were buried there.

There was also a time that a big flood inundated Isumbo forcing people to shelter on elevated mounds such as *Linaminan*.

One informant also said that during the 1960's he saw people used *Linaminan* as a resting place after planting activities in the adjacent fields. They brought with them food in pottery vessels or wrapped in leaves.

The Linaminan outcrop has been thought by treasure-hunters to contain a cave housing the fabled 'Yamashita Gold'. In fact, unlike many other such geological features in Palawan, the outcrop is not composed of cave-riddled karst limestone, but of a low-grade meta-sedimentary rock. Rather than caves, there are large fissures where the rock has split, and the terrain around the base of the

outcrop suggests that rockfalls are major and occur with some frequency. Needless to say, Linaminan is an extremely unlikely resting place for Yamashita's treasure.

During the treasure-hunting activities, great volumes of sediment were displaced around the base of the outcrop, with the largest disturbance being a hole (labelled Treasure-Hunters' Pit 1) measuring some 12 metres in length by 3 metres across with a maximum depth of c. 4 metres. The large amount of archaeological materials uncovered were either kept by workers, or dumped in piles in various locations around the site.

Linaminan came to the attention of Dr. Eusebio Z. Dizon of the National Museum of the Philippines, when Mr. Remedio Villanueva (a proponent of the National Museum for underwater archaeology, and conductor of previous works at the Linaminan site) noted some stone adzes in Dr. Dizon's office and commented upon their likeness to a series recovered from Linaminan. This observation prompted the organisation of an exploratory trip to assess the site and its potential for archaeological research. The initial National Museum team was composed of Dr. Eusebio Dizon, Ms. Alexandra de Leon (Researcher I) and Mr. Darryl de Leon (Consultant Archaeologist, Frontier Sealand Research Foundation), and the reconnaissance took place from the 9-13th of January 2006. A number of surface artefacts were recovered from treasure-hunting spoil heaps, and further artefacts were passed on to the Museum by Mr. Villanueva. The results of this assessment, including a discussion of material culture recovered, are presented in Dizon and A. de Leon (2006). The recommendations outlined in this initial report suggested that the site - despite the damage - may still hold considerable archaeological potential and that further archaeological explorations and excavations should take place.

While it had been decided that the Linaminan site was a priority for further investigation by the National Museum, finances provided an obstacle to progress. In May 2006, Katherine Szabó, post-doctoral research fellow at the Australian National University, negotiated the availability of funds through the Australian Research Council. It was decided, between Dizon and Szabó, that a short excavation would take place in November 2006.

A number of questions arose from both the activities of the treasure-hunters themselves, as well as the material at the site uncovered by them. Firstly, given the extent of the damage to the site by the use of heavy earth-moving equipment and machinery such as jack-hammers, it was unknown how much in the way of intact deposits remained at Linaminan. Secondly, the mix of typical 'neolithic' artefacts such as polished stone adzes and obviously Metal Age material culture such as iron tools and fragments of ceramic tradewares, prompted questions as to whether the site was stratified, and if so, what time periods were represented. Furthermore, the presence of prestige goods together with an apparent absence

of human burials, led us to question the function(s) of the site. These initial questions led to the structuring of the excavation around four major objectives:

1. Understand the way in which archaeological deposits had built up around Linaminan,
2. Determine over what time-period(s) the site was in use,
3. Determine the ancient use(s) of the Linaminan site,
4. Locate intact archaeological deposits that may provide a fruitful zone for further excavation.

It was projected that the results of investigations into these questions would not only clarify aspects of the site history and chronology, but provide a useful basis for continuing work should this be required.

Methodological Approach

In order to effectively understand the relationship between the various components of an archaeological site, as well as its placement within the wider socio-geographic landscape, establishing site layouts and stratigraphy is of the utmost importance. Thus before beginning excavation, it was considered important to attempt to gain a clear idea of the underlying deposits. In the case of Linaminan, the presence of three large Treasure-Hunters' Pits gave us the chance to examine the nature, ordering, and composition of deposits prior to excavation. Treasure-Hunters' Pits were located on the south, east and northern sides of the rock outcrop. These were labelled, respectively: THP1, THP2 and THP3. Figure 5 shows the three THPs.

In order to clearly see the spatial relationship between the three THPs, and their relative position to the rock-face, a full site plan was drawn by National Museum artist Antonio Peñalosa (Figure 6). Spot elevations were also taken as part of the mapping process so that the relative heights of different areas of the site could be easily seen. These elevations are marked on the site plan, and all are related to the base-point of Temporary Bench Mark 1 (TBM1) or 'main datum point'.

From the outset of the excavations, it was borne in mind that there may have been habitation or utilisation of the top of the Linaminan outcrop itself. Thus, as part of the initial walking survey of the site, the group climbed to the top of the outcrop to investigate this possibility. While there had been some reports of earthenware sherds being recovered from this locale, it was immediately clear that this would not have been a suitable location for habitation. The top of the outcrop is long and narrow (c. 15 x 3-4 metres) with a very uneven boulder-strewn surface. It is also very exposed. The views, however, are tremendous, with a 360

degree vista out for kilometres, and a clear view of the coastline of the Sulu Sea. One such view is shown in Figure 7. While there is a very limited amount of archaeological material located on top of the Linaminan outcrop, there is no significant sediment build-up and gnarled vegetation permits little more than enjoying the view.

Also prior to excavation, a number of sacks of archaeological material discarded by the treasure-hunters, located near THP1, were opened and investigated. Decorated sherds, as well as fragments of tradewares, and recognisable parts of vessels such as rims, foot-rings, and carinations were retrieved, cleaned and accessioned. Labourers who had worked with the treasure-hunters agreed that all of these materials derived from the THP2 excavations on the eastern side of the outcrop.

In order to address the four stated objectives (above), further survey, mapping and excavation followed a set of pre-determined strategies. These were as follow:

Objective 1: Understand the way in which archaeological deposits had built up around the Linaminan outcrop

The huge open treasure-hunting pits allowed us to clearly see the pattern of the build-up of deposits around the Linaminan outcrop. Open pits were labelled, and stratigraphic profiles were drawn of each major wall. The sedimentary sequences of the various Treasure-Hunters' Pits were compared to assess rates of deposition and the nature of the sequence at different locations around the outcrop. Exposed cultural materials were removed, labelled and bagged after profile drawings. No Treasure-Hunters' Pits were located along the western side of the outcrop, so to investigate whether cultural materials were likewise present in this area, a 2 x 1 metre trench ('Area 4') was excavated by Ochoa and Piper. The results of this exploration are detailed in the 'Excavation' section.

Objective 2: Determine over what time-period(s) the site was in use

The stratigraphic sequence provides information as to the number and ordering of occupation/utilisation periods, and material culture can provide further important clues to the age of habitation. Absolute dating methods, of course, can give exact calendar ages. All of these dating methods have been employed for Linaminan. Information derived from the stratigraphic sequence is presented in the 'Stratigraphy' section, whereas discussions of the time-periods associated with material culture recovered from Linaminan will be discussed in the 'Material Culture' section. Two shell samples from THP2 excavations have been dated using

conventional radiocarbon techniques. The results are discussed in the 'Chronology' section.

Objective 3: Determine the ancient uses of the Linaminan site

Determining the ancient uses of a site requires a combination of scientific and social theory. The type of material culture represented within a site, or given occupation, gives important clues as to the sorts of activities that took place there in the past. Faunal remains (animal bones and shells) can provide information as to diet, and their presence can indicate whether the primary purpose of a site was for habitation (e.g. a living site) or whether it was reserved for, say, ritual purposes. Discussion as to the nature of the site is provided in 'Linaminan in Local and Regional Context'.

Objective 4: Locate intact archaeological deposits that may provide a fruitful zone for further excavation

If further excavation is considered desirable, it is important to have identified the best locations in which to proceed. A number of factors were considered important in assessing future potential, including the state of preservation of the remains, the amount of undisturbed archaeological deposits, the placement on the site plan relative to other areas and features, and logistical concerns. These issues, as they relate to Linaminan, will be discussed in detail in the section entitled 'Future and Further Research'.

Stratigraphy

As mentioned above, major exposed profiles present in each of the Treasure-Hunters' Pits were drawn prior to excavation. This was done for two major reasons; (1) so that the exposed stratigraphic sequences in different locales could be compared to one another, thereby providing insights into potential stratigraphic variation; and (2) so that excavation strategies could be tailored to be appropriate to the known stratigraphy. The results of stratigraphic analysis will be presented for each THP sequentially, followed by a consideration of the relationships between the various locales.

The strategy chosen for recording, and later excavating, the Linaminan deposits was the British 'context-based recording system'. The infrequency of its use in the Asia-Pacific region necessitates a brief explanation as to its goals and workings. Rather than following a 'spit-digging' approach, where sedimentary units of arbitrarily-defined thickness are removed sequentially, the context-based recording system aims to partition archaeological deposits based on (1) visible

stratigraphic differentiation and; (2) visible/textural differences relating to cultural features and deposition. Whenever a change is detected in the visible nature or composition of the deposits, the deposit/feature is assigned a specific context number, and recorded/excavated as a single 'unit'. Contexts are related to each other temporally and spatially through a 'Harris Matrix', whereby all contexts are linked together in a stylised stratigraphic flow-diagram.

Treasure-Hunters' Pit 1 (THP1)

As can be seen in Figure 6, THP1 is located on the southern side of the Linaminan outcrop. This THP is by far the largest, with dimensions of c. 3 metres across by 12 metres long by up to 4 metres deep (as measured from the current ground surface). The original ground surface is marked on the rock face as a white dotted line using spray-paint (refer to Figure 5), adding at least a further metre to the depth of the pit. The stratigraphic profiles of both the East and West walls of THP1 were drawn by Janine Ochoa, Timothy Vitales, Katherine Szabó, and Philip Piper. These two profiles are included here as Figure 8 (East Wall) and Figure 9 (West Wall). Figure 10 shows the process of profile-recording being undertaken by Vitales and Ochoa. The Harris Matrix for THP1 is presented in Figure 11, while a list of contexts is given in Table 1.

The sloping nature of both the modern and older ground surfaces is clearly visible in both walls, with the vast majority of rock fall aligning more or less horizontally with the ground surface at any given time. There is, however, a zone in both East and West profiles, which displays another pattern: large rocks lie perpendicular to the ancient ground surface rather than parallel to it (see Contexts (103), (113) and (114)). This zone also represents a disjuncture in the vertical positioning of the ceramic horizon, with ceramics to the north of these stones being at a considerably higher level than those to the south. With regards to the East Wall, it can be seen that (103) is in place before the build-up of cultural/ceramic horizon. The West Wall presents a different scenario, where is seems that the rock-slabs constituting (113) and (114) truncate the ceramic layer, and their vertical positions appear to fundamentally relate to the presence of the large boulder (116), which has altered their course of movement. If (113) and (114) can be regarded as later intrusions in the West Wall sequence, (118) can certainly not. It is the large boulder (118) that marks the ceramic layer disjuncture, with the cultural layer being higher on the north side and lower on the south. It is also worthy of note that the (118) boulder is opposite the East Wall vertical rock alignment (103).

What is clear is that during the deposition of the cultural pottery-bearing layers (101), (106), (112) and (117), there was a considerably higher ground surface

(100)	Layer	Treasure hunter spoil
(101)	Layer	Pottery layer in cobbly matrix
(102)	Layer	Pocket of friable soil
(103)	Feature	Vertical line of stones
(104)	Layer	Aceramic cobbly layer
(105)	Layer	Aceramic boulder layer
(106)	Layer	Pottery layer south of (103)
(107)	Layer	Topsoil, south of East Wall
(108)	Layer	Layer with occasional pottery directly above main pottery layer
(109)	Layer	Treasure hunter spoil
(110)	Layer	Topsoil
(111)	Layer	Clay with occasional pottery
(112)	Layer	Dense layer of pottery
(113)	Feature	Vertical line of boulders
(114)	Feature	Boulder standing diagonally
(115)	Layer	Aceramic cobbly layer
(116)	Layer	Layer boulder
(117)	Layer	Pottery layer north of (116) and (113)
(118)	Layer	Aceramic cobbly layer north end of North Wall

Table 1. List and description of contexts identified for Treasure-Hunters' Pit 1.

to the north of the rocks represented by (103) and (118), than south of them. Furthermore, while (118) is seemingly naturally deposited, the (103) vertical alignment of stones is anomalous and could well represent placement by ancient humans. Our interpretation, after much careful scrutiny, is that a stone wall or revetment was created by the ancient frequenters of Linaminan, at the beginning of the ceramic-bearing phase. This wall utilised both convenient naturally-placed boulders (e.g. (118)), and ones transported and placed by humans (e.g. (103)). Pottery, and occasional faunal remains, was then discarded on either side of the wall, but the wall-building and –buffering process meant that the cultural ground levels were somewhat different, on a north-south axis, from the beginning of human use.

This observation is important: few late Neolithic and Metal Age open sites have been excavated in the Philippines, and none so far in Palawan. The fact that

the weight of archaeological evidence derives from cave deposits naturally skews our understandings in particular ways. One of these is that features related to settlement, use and manipulation of the landscape are necessarily lacking. The Linaminan stone wall, in the vicinity of THP1, thus provides important clues as to these cultural issues.

Towards the extreme southern end of both the East and West Wall profiles, the presence of what appears to be ploughed agricultural soil was noted in section. The current wet-rice fields are today many metres distant, and lower, than the sediment around Linaminan. Local recollections (especially by the current landowner, Mrs. Egleceria Cajolo) of swidden clearance and gardening of the land in the 1970s around the fringes of Linaminan provide a likely explanation.

Before moving on, it should be pointed out that the different ceramic-bearing contexts are not different in character, and likely represent a single cultural layer. Their division into different contexts based on placement and intervening features, however, allows a more detailed understanding of the accretion of this layer.

Treasure-Hunters' Pit 2 (THP2)

Treasure-Hunters' Pit 2 (THP2), is located on the eastern side of the Linaminan outcrop (refer to Figure 5). The pit is considerably smaller than THP1, being c. 6 x 2 metres in size, and higher in elevation (12.67 metres from Datum 1 to Datum 2). The general THP2 area is composed of a sediment and rubble platform, which ascends sharply on the northern side, and descends sharply to the south and east. It was decided that the remaining platform area around the fringes of THP2 was a good prospect for excavation, having the added advantage of exposed stratigraphic profiles within THP2 itself. A plan of the THP2 area, including the dimensions of the pit and the grid-squares laid out for excavation, are shown in Figure 12. Two 2 x 1 metres squares were excavated in the vicinity of THP2; labelled S2W1 and N2E1. These are reported upon below, and further details of recognised stratigraphic contexts and their relationships will be presented within this latter discussion. The stratigraphy contained under the North Overhang, however, will be entirely presented here.

Before starting excavation, an attempt was made to gain an understanding of the stratigraphic sequence. Stratigraphic drawings were made of three exposed profiles: the south wall of the Treasure-Hunters' Pit (adjoining grid-square S2W1), an exposed area below a tree root running diagonally through grid-square N2E1, and an exposed section under a large overhanging rock at the north end of the

Treasure-Hunters' Pit. The locations of these sections are marked on to Figure 12, and follow as Figures 13, 14 and 15 respectively.

The stratigraphic profile 'under the north overhang' is located within the Treasure-Hunters' Pit itself, under a large, overhanging rock at the northern end. This area of THP2 is shown in Figure 16. Five contexts were identified for the North Overhang deposits, and these are listed in Table 2. From a study of the stratigraphy, it was clear that there were at least two cultural strata: an upper layer rich in shell midden definitely associated with iron (207), and a lower earthenware pottery-bearing stratum of neolithic and/or Metal Age date (209). Closer analysis made it clear that the shell midden layer (207) was a lens contained within the lower portion of the upper topsoil stratum, so it was predicated that this would likely form a patchy lens above the main earthenware-bearing layer across the THP2 area. Figure 17 shows the stratigraphy under the North Overhang.

(206)	Layer	Natural topsoil: sterile
(207)	Layer	Dense shell midden associated with iron
(208)	Layer	Sterile soil
(209)	Layer	*In situ* earthenware-bearing layer
(210)	Layer	Cobbly aceramic layer

Table 2. List and description of contexts identified for the 'North Overhang' profile in Treasure-Hunters' Pit 2.

Treasure-Hunters' Pit 3 (THP3)

Treasure-Hunters' Pit 3 is located on the northern face of the Linaminan outcrop. It is a long, narrow trench that winds directly against the rock-face, and is c. 5 metres in length and 3 metres maximum depth. No excavation was undertaken in the vicinity of THP3, but the exposed south-facing section was cleaned and drawn, and contexts were described for the observed deposits. A single, earthenware-bearing layer was recorded, running along the length of the section, with an associated lead weight indicating a Metal Age chronology. The stratigraphic profile is presented in Figure 18 and the Harris Matrix, outlining the chronological relationships between identified contexts, is shown in Figure 19. The list and descriptions of contexts for THP3 is presented in Table 3.

One of the most notable features of the THP3 area is the rate of soil development above the earthenware-bearing layer. The thickness of this uppermost layer cautions us about making quick assumptions as regards the relationship between chronology and depth.

(300)	Layer	Sterile topsoil
(301)	Layer	*In situ* earthenware-bearing layer
(302)	Layer	Sterile cobbly layer
(303)	Layer	Sterile rubbly layer

Table 3. List and description of contexts identified for Treasure-Hunters' Pit 3.

Comparison of Exposed Stratigraphic Sequences

The examination of the stratigraphy from the various exposed locations at Linaminan reveals a rather consistent depositional picture. There is a single earthenware-bearing horizon visible at all THPs, and the only evidence of stratified cultural remains is afforded by the shell lens (207), situated above the earthenware layer, under the North Overhang of THP2. Underlying the earthenware-bearing layer in all profiles is either a cobble and clay or rubble and clay sterile layer, where the lithic inclusions derive from the outcrop itself. In most areas, the rubble and clay, with smaller inclusions, overlies the cobble and clay. This is potentially related to human traffic related to the later period of intense cultural activity.

The amount of fallen rock present above the cultural layer is a good indicator of the instability of the outcrop. Rock-falls are apparently large-scale and frequent. While the overlying soil has been removed by the treasure-hunters in the vicinities of THP1 and THP2, THP3 makes clear that thick, humic, soil layers have developed and accumulated at various points around the outcrop since the main period of its cultural use.

The recording of the exposed stratigraphy was partially done in order to inform excavation strategies. The comparatively more level surfaces in the THP2 area, as well as the fact that considerable cultural material was visible in the exposed profiles, prompted the excavation of two squares in this locale. Both of these test-pits had some degree of exposed stratigraphy, which could guide excavation.

Excavation

Excavation proceeded in two squares (2 x 2 metres) within the THP2 platform grid-matrix. These were S2W1, which borders the southern edge of the Treasure-Hunters' Pit, and N2E1, which marks the beginning of the ascent of deposits upslope in a northerly direction. The location of both of these squares is shown in Figure 12,

while the pre-excavation stratigraphic diagrams are shown in Figures 13 (S2W1) and 14 (N2E1).

Excavation of Square N2E1

Grid-square N2E1 was excavated by Janine Ochoa, Timothy Vitales, Donald Cajolo, and Philip Piper. The upper context (204) was composed of silty-clay with occasional reworked, eroded pieces of earthenware. A patch of badly deteriorated shell was noted during excavation of this context, and given the context number (212). Its extent was noted by Vitales and Ochoa and is shown in plan form in Figure 20. This shell lens is immediately above the cultural layer (205), and is possibly related to the shell lens (207) identified under the North Overhang. All recognised contexts for square N2E1 are described in Table 4.

(200)	Layer	Treasure-hunter spoil
(204)	Layer	Topsoil with reworked cultural material and shell patches
(205)	Layer	*In situ* earthenware-bearing layer
(212)	Lens	Shell lens; southern side of square
(213)	Lens	Sterile cobbly-clay layer

Table 4. List and description of contexts identified for square N2E1, Treasure-Hunters' Pit 2.

The sediment matrix of (204) is the same as the underlying, *in situ* earthenware-bearing (205), being a silty-clay, with numerous sharp angular fragments of deteriorated metamorphic rock derived from the Linaminan outcrop itself. The Munsell colour for both (204) and (205) is 7.5YR 3/3 dark brown. Fragments of earthenware pottery, iron and celadon tradewares were also recovered from (204).

A total of 1309 earthenware sherds were recovered from context (205), along with a small number of vertebrate and invertebrate faunal remains, five fragments of tradeware ceramics, and one piece of metal (iron). During excavation, earthenware pottery and other finds such as stone and metal artefacts were noted to have distinct distributions. Stone and metal artefacts were largely recovered from the area immediately surrounding the small slope of which the profile was drawn (Figure 14), while the earthenware fragments were situated under rocks and in the crevices between them. This spatial distribution is shown visually in Figure 21.

Excavation of N2E1 proceeded until (205) had been completely excavated and the underlying sterile rubbly-clay context (213) was fully exposed. The Harris Matrix for N2E1, showing the relationships between stratigraphic levels, is presented in Figure 22. The final depth to which N2E1 was excavated was not particularly deep (70 centimetres below TBM2), with the sterile (213) recognised through not only the absence of ceramics, but through an increasing number of cobbles and a grittiness in the clay matrix. Figures 23 and 24 show the stratigraphic profiles of the eastern and northern walls of N2E1 respectively, at the completion of excavation. Figure 25 is a photograph of the finished square.

Excavation of Square S2W1

Square S2W1 was not a full 2 x 2 metre in area, as it was aligned to face directly on to the treasure-hunter's pit itself. Excavation was undertaken by Ligaya Lacsina, Leo Batoon, and Katherine Szabó. Based on the profile diagram of the southern wall of THP2 (shown in Figure 13), and the previous ascription of some context numbers based on this drawing, it was clear that the uppermost deposits in square S2W1 represented the *in situ* earthenware-bearing layer (201). There was no treasure-hunter spoil (200) present on the top of S2W1. What was not clear from the profile drawn before excavation, was that the deposits thickened down-slope in a southerly direction. This meant the allocation of further contexts during the excavation, as well as some new contexts to define discrete, local deposits. The earthenware-bearing layer was visually partitioned by patchy inclusions of burnt and crushed shell, and during excavation it was unclear whether these differences represented several layers, or different depositional events over a cohesive and relatively short time period. The list of contexts for S2W1, THP2, is presented in Table 5.

(201)	Layer	*In situ* earthenware-bearing layer
(211)	Lens	Deteriorated crushed shell
(214)	Layer	Lower earthenware-bearing layer (ext. of (201))
(215)	Lens	Shell midden under northeastern rock
(216)	Layer	Earthenware-bearing layer under (215)
(202)	Layer	Rubbly clay: sterile
(203)	Layer	Cobbly clay: sterile

Table 5. List and description of contexts identified for square S2W1, Treasure-Hunters' Pit 2.

The main earthenware-bearing contexts, (201) and (214) produced a great density of earthenware sherds: 4589 for (201), 198 for (211), 1836 for (214) and 107 for (216). There were two distinct lenses of shell noted. The upper lens was composed of crushed and deteriorated shell, and formed a lens within (211), while the lower lens (215) was a discrete and largely intact sample recovered from beneath a large rock that lay over the northern edge of the grid-square. Neither of these shell lenses correlate stratigraphically with the lenses recorded under the North Overhang, or that noted for N2E1. Discussion of the shell recovered is presented in the 'Faunal Remains' section. The extents of (215) and (216) are shown in Figure 26.

Ceramic tradeware sherds occurred in very low levels throughout the cultural deposits, with the exception of (215) and (216). During excavation, it was reasoned that the lack of tradewares in (215) and (216) may have reflected an earlier date of deposition, or may have simply been a factor of sample size given the low quantity of tradewares recovered throughout the deposits. Iron was likewise recovered in all cultural contexts except (215) and (216), but again the low frequency made the reasons for this absence difficult to establish without an absolute chronology. Given this ambiguity, and the possible presence of an earlier cultural layer underlying clearly Metal Age deposits, one of the radiocarbon samples derived from context (215). Results of radiocarbon dating and further discussion of these are presented in the 'Chronology' section.

Botanical remains occurred infrequently, and the proximity of the cultural deposits to the modern ground surface, coupled with the prevalence of tree and shrub roots throughout most of the excavated matrix, mean that floral remains were treated with some chronological suspicion. Only one glass bead was recovered from the S2W1 deposits (discussed further in 'Material Culture' section) and no bronze. Bronze artefacts had been recovered by the treasure-hunters, apparently from the THP2 vicinity, and these are also described further in the 'Material Culture' section.

Contexts (201) and (214) are identical in terms of matrix and contain the same series of material culture. During excavation of the eastern half of the square, however, the intervening shell lens (211) prompted the separation of these two contexts. In the western half of the square, contexts (201) and (214) were excavated as the single context (201). While (201) and (214) apparently form temporally-distinct parts of the same deposit, and could legitimately be reintegrated as the single context (201), we have chosen to retain the context (214) for the eastern side of the square to provide additional chronological control. Excavation of S2W1 proceeded until the sterile, rubbly-clay layer (202) was exposed over the surface of the square. The Harris Matrix for S2W1 is presented as Figure 27, and the stratigraphic profiles of the completed southern and eastern walls are shown in Figures 28 and 29

respectively. Figure 30 shows the completed S2W1 grid-square relative to the treasure-hunters' pit.

Area 4: Locale and Excavation

Given the presence of archaeological deposits along the south, east, and north faces of the Linaminan outcrop, it was decided that an exploratory excavation would be done on the western side to investigate the possibility of archaeology encircling the entire perimeter. The treasure-hunters had showed little interest in the western face, and deposits were largely intact. The area was assessed through a walking survey, but heavy vegetation, roots and leaf litter made archaeological remains difficult to detect. A spot was chosen on the southwest face that provided a relatively flat area clear of large trees (refer to Figure 6 for location). A 2 x 1 metre test square was set up, and excavated by Philip Piper, Janine Ochoa, and Amik Cajolo. The locale and grid-square, at the completion of excavations, is shown in Figure 31.

A total of ~50 centimetres of deposit was removed, and five contexts identified. While not totally sterile, cultural remains were sparse, and it is clear this area was not an important zone for past activities at Linaminan. Table 6 presents the list of contexts for Area 4. Figure 32 shows the finished north and west sections, and Figure 33 presents the Harris matrix. The cultural horizon (403) yielded only a small number of earthenware sherds (n = 54). These were mainly recovered from between large rocks, and their small, weathered condition would suggest that Area 4 was an area of occasional deposition, rather than a major activity zone.

(400)	Layer	Topsoil
(401)	Lens	Lens of red-orange mottled topsoil
(402)	Layer	Loam and cobbles; dark brown sediment
(403)	Layer	Ceramic horizon
(404)	Layer	Aceramic cobbly layer

Table 6. List and description of contexts identified for Area 4.

Material Culture

The major class of material culture recovered from excavations at Linaminan was undoubtedly earthenware pottery, with a range of vessel types and decorative forms within the sample. In addition to earthenware were artefacts of iron and stone, shell and glass beads, and ceramic tradewares. Supplementing

the excavated inventory of material culture, are those artefacts excavated by treasure-hunters. There are three such samples of these: material donated to the National Museum of the Philippines by Mr. Remedio Villanueva, surface/redeposited material collected by Dizon, A. de Leon and D. de Leon in January 2006, and surface/redeposited material collected as a part of the work presented here in November 2006. Much of the treasure-hunters' material—largely earthenware sherds, stone artefacts and tradeware sherds—were collected in sacks and dumped by an old concrete house platform near THP1. These were sorted through, and sampled.

The various classes of material culture will be dealt with here sequentially, with samples from excavation and the treasure-hunters' diggings being combined for the purposes of discussion. All the material retrieved from the treasure-hunters' sacks was consistently said to derive from the THP2 area, while the majority of the material donated to the National Museum is likewise said to have come from this area.

Earthenware Pottery

Given the small scale of excavations, the amount of earthenware pottery fragments recovered is extraordinary. Totals by area are presented in Table 7. While full analysis of the earthenware pottery is ongoing, preliminary on-site observations are presented here. Such observations include the range of vessel forms, decoration, and technological observations relating to tempering and firing of vessels. The fact that many sherds could be refitted, that edges did not show abrasion to any significant degree, and that many pieces were large, and that one small globular vessel was recovered whole, all point towards the fact that the earthenware assemblage was *in situ*.

Observations on Vessel Forms

A wide range of vessel forms are in evidence within the Linaminan assemblage, however some types are most notable by their virtual—if not complete—absence. Most conspicuously, this relates to burial jars. While some larger vessels are present, the earthenware assemblage is dominated by smaller vessels, and of particular note is the large number of, often ring-footed, bowls and small globular jars. Other vessels types include fragments of pottery ovens, a number of fragments from a cut-out pedestal vessel (such as the one recovered by Fox at Leta Leta in El Nido, northern Palawan; see Fox 1970: plate xvi), and lid/cover fragments. Rims are typically everted, however a number of direct rims (especially those from bowls and covers) is also present. It was noticed whilst

Location	Number of sherds	Sampling strategy
THP1	710	Sample from cleaned profile
THP2: N2E1	1483	All sherds from excavation
THP2: S2W1	6730	All sherds from excavation
Nth Overhang	21	Sample from cleaned profile
THP3	59	Sample from cleaned profile
Area 4	63	All sherds from excavation
TOTAL	**9066**	

Table 7. Quantification of earthenware sherds rcovered from the November 2006 season of survey and excavation. Figures calculated from National Museum accession records

cleaning pottery that a number of fragments recovered could be refitted. Although this process started on-site, it will continue in a more comprehensive fashion as analysis continues. This should add considerably more information regarding the sizes and shapes of vessels represented at Linaminan, as well as informing on site formation and taphonomic processes. A composite image showing a selection of vessel forms and features is shown in Figure 34.

Observations on Decoration

There are a wide range of decorative styles, surface modifications and finishes within the Linaminan earthenware pottery sample. While comprehensive discussions will follow from more in-depth analysis, some preliminary comments are offered here. The main decoration types seen on the *bodies* of vessels are carved paddle impression and bound paddle impression. Carved paddle decoration virtually always takes the form of 'checks' (see Figure 35). Bound paddle impression, which encompasses the category of 'cord-marking', is also seen on a number of sherds. In most cases, this is 'cord-marking', ranging from fine to coarse (see Figure 36). As with the Tabon pottery, basket– or mat-impression was not identified (see Fox 1970:81).

A very few body sherds have incised decoration. Frequently this consists of geometric, rectilinear or curvilinear designs infilled with further incision and stippling. The stippling effect is produced through punctation, using the end of stick or similar object. Such decoration is invariably seen on large, thick vessels, including two fragments of clay oven found amongst the treasure-hunters material pictured in Figure 34. A selection of incised sherds is shown in Figures 37 along with a sherd

that is incised and impressed, with the impressed component being a row of 'carabao (water buffalo) tracks' which are two-thirds-complete circles. Such impressions are found on a number of sherds deriving from different vessels within the Linaminan assemblage.

There is considerably more decoration of rims than the bodies of earthenware vessels at Linaminan. While rim-notching is by far the most common form of rim decoration, other modes of decoration include incised/impressed appliqué bands, impressed bands of 'carabao tracks', finger/tool impressions to create a scalloped design, incision, and punctate patterning. Investigation of correlations between vessel types and decorative presence and forms is ongoing. A selection of types of rim-notching are shown in Figure 38, while a selection of other rim decorations is shown in Figure 39.

A number of sherds were recorded as being slipped, with a number more being burnished. Given that Linaminan is an open site, there was some degree of chemical/taphonomic erosion of sherd surfaces, making burnishing, in particular, hard to positively identify. A high frequency of irregular vessel firing further meant that many sherds had oxidised outer surfaces that superficially appeared to be a slip. Slip colours recorded included mid-brown, red, pale orange and cream-buff.

Pottery Technology at Linaminan

Katherine Szabó and Timothy Vitales

Cursory observations were made while collecting, cleaning and sorting the earthenware sherds. Such observations relate to tempering, vessel construction, vessel firing, and pottery making tools. These are dealt with sequentially here.

Temper

Five main temper types were recognised while sorting. The descriptions of these are presented in Table 8. The vast majority of sherds were tempered with 'Type 1' gravel; including sub-angular black lithic fragments, rounded mid-brown pebbles, small baked balls of clay, and some calcareous and quartzite matter. Gravel samples taken from the dirt road outside the house of the landowner, Egleceria Cajolo, showed a close match in terms of constituents, suggesting local production. The major variation in tempers recorded as being 'Type 1' related to the size of the components. Fox (1970:77-78) noted a correlation between vessel size and temper-inclusion size for the Tabon pottery, where finer vessels had finer temper. The

Tabon pottery was noted as being dominantly calcareous-tempered (although recent data collected by Szabó suggests that this is not the case), and Fox suggested that beach sand was pounded and winnowed before inclusion in finer vessels. While there was variation in temper-constituent size in the Linaminan pottery, and larger vessels were noted to have generally coarser temper, many smaller vessels also had remarkably coarse temper.

1	Mixed gravel: brown pebbles, black angular rock, quartz, calcareous matter
2	Fine calcareous with quartz and charred organics
3	Calcareous with quartz
4	Very fine silt or grog
5	Red, cream and black fine gravel

Table 8. Temper types noted for excavated earthenware sherds.

Vessel construction

Preliminary observations suggest that the Linaminan pottery was slab– rather than coil– constructed, and shaped using the paddle-and-anvil technique. Anvil impressions on the interiors of larger sherds, as well as decorated paddle impressions on the outer surfaces testify to this. There is no evidence for the use of a slow wheel. With larger vessels, and those with everted rims, there is evidence to suggest that the neck and rim were added on after the construction of the main body. Breakage of vessels is rather consistently above the shoulder; often in a fairly clean line. Ring-feet were clearly manufactured separately, and attached to the vessel before firing. Many ring-feet have come away cleanly, and 'attachment scars' are commonly observed on the bases of bowls and small globular vessels. Some sherds have perforations which were made by piercing the wet clay before firing. Such perforations are presumably functional, and have been recorded by other scholars including Fox (e.g. 1970:89).

Vessel firing

Fox noted of the Tabon earthenware, that, despite the quality and finishing of many of the vessels, firing was often highly uneven. This was recognised, as is

usual, by the presence of unoxidised carbonaceous sherd cores in cross-section, and fire-clouding and uneven coloration on vessel exteriors. The same features were noticed, in general, for the Linaminan earthenware. These patterns suggest an uncontrolled firing environment; probably the stacking of vessels directly on/over a fire made on the ground. Greater unevenness in cross-section of bases and ring-feet as opposed to rims and necks, implies that many, if not most, vessels were fired on their rims.

Pottery-manufacturing tools

Given that the unusual and eclectic temper Type 1 matched locally abundant surface sediment, the possibility of local manufacture of the majority of the Linaminan earthenware prompted us to look for the presence of pottery manufacturing tools. We were aided in this by residents of the local Pala'wan village, who showed us examples of pottery anvils and burnishers. One such example is shown in Figure 40. Many stones similar to the anvil shown in Figure 40 were found amongst the treasure-hunters' material, while some such stones, as well as highly-polished cobbles, were recovered from excavation. A number of pieces of a soft grey-green sedimentary rock were also recovered from excavations in S2W1, and it is possible that these represent burnishers.

Stone Artefacts

Stone artefacts of various kinds were common within the Linaminan deposits, including abraded and polished stones and cobbles, polished stone adzes, and pieces of variously-coloured chert. At least some of the polished and abraded stones may relate to pottery production as outlined above. Other such stones, such as quartzite cobbles, are recognised by most local Isumbo inhabitants today as 'magic stones'. They are referred to as *mutia*, and according to one account, they were considered to be 'living' as when put in vinegar they 'run'. While quartzite stones are unlikely to do this, *mutiara* (Bahasa Melayu: pearl) certainly will, given the vigorous reaction between $CaCO_3$ and acid. The white roundness of the quartzite cobbles may be mentally or symbolically tied to the concept of the pearl. A group of these stones is shown in Figure 41.

A remarkable series of stone adzes have been uncovered at the Linaminan site. Unfortunately, most of these derive from the treasure-hunters' material, however some examples were recovered during the excavation of THP2. Twenty-three adzes have thus far been recovered. Raw materials range from fine-grained

andesite to meta-sedimentary and coarse volcanic rock. Cross-sections are dominantly quadrangular or trapezoidal, although some forms, and in particular the gouges, have more complex morphologies. A number have tangs for hafting. All are small; generally under 12 centimetres in total length. As such, they are clearly not intended for tasks such as tree-felling, and are more likely associated with wood-working. The Linaminan adze assemblage is currently being studied in greater detail. Three excavated Linaminan adzes are shown in Figure 42.

Another formal stone artefact class present within the Linaminan assemblage is the barkcloth beater. Two examples have been recovered from the site, however, they derive from the treasure-hunters' material. Although unprovenanced, they are likely from THP2. The boxed text by Dr. Judith Cameron provides some more detail on these artefacts.

Barkcloth Beaters from Linaminan

Judith Cameron

Two barkcloth beaters were amongst the treasure-hunters' material recovered from the sacks near THP1. Both beaters were made from stone (Figure 43). Beater 1 (on the left) measures 141.72 millimetres in length, 48.94 millimetres in width, and 57.59 millimetres in thickness. Beater 2 (on the right) measures 88.80 millimetres in length, 42.12 millimetres in width, and 64.68 millimetres in thickness.

The two beaters from Linaminan are of two distinct types. Beater 1 is a handled beater, distinguished by six parallel, longitudinal grooves measuring 59.05 millimetres on one end of its upper surface. The un-grooved end of the beater forms the handle. Beater 2 is devoid of a handle and is distinguished by longitudinal grooves covering the entire upper surface with a deeper groove running along one face. Beaters of this type function differently with the deepest groove being designed to hold a handle usually made of rattan.

Archaeological Parallels

To date, no archaeological fragments of beaten bark cloth have been recovered from archaeological sites in the Philippines and evidence for barkcloth production is confined to stone barkcloth beaters. The earliest forms from stratified sequences date back to the Neolithic, about 3,000 B.P., while the latest date to this century. Stone beaters were still being used for producing barkcloth on Palawan Island in 1998. The earliest prehistoric examples are from Arku Cave, with other

Neolithic examples from the islands of Luzon, Cebu and Mindanao.

Beyer (1948:58-61) identified three different types of stone barkcloth beaters in the Philippine archaeological record: 'straight-backed', 'horned' and 'horned types lacking a handle'. Beyer also recognised differences in the grooved surfaces: fine grooves on a single surface, coarse grooves made with a saw on a single surface; beaters with fine grooved on one surface and coarse grooved on the other, and beaters with straight grooved, both angular and cross-hatched.

Beater 1 in the Linaminan assemblage conforms to Beyer's straight-backed type. Beaters of this type are less common that other types of beaters in the archaeological record, but have been found in Batangas as well as Rizal Province in Luzon. The earliest example was found in Arku Cave. Much earlier archaeological specimens have been found in Vietnam.

Beaters of the type represented by Beater 2 from Linaminan, which lacks a handle, have also been found on the islands of Luzon and Cebu. Elsewhere (Cameron 2006) I have shown that this type of beater has a different ancestry with firm archaeological parallels in Sulawesi and the Malay Peninsula.

A number of fragments of chert were recovered during the excavation of THP2. While initially appearing to be cores, further observation highlighted the absence of flake scars making the interpretation of a core unlikely. What was noted, however, was 'battering' of portions of the edges, as evidenced by numerous small fractures with step-terminations. An alternative explanation presented itself upon being shown traditional fire-strikers still used by some local Pala'wan. The kit consisted of an iron file and chert nodule packaged together in a bamboo container. The file was struck against the chert, generating a spark, which would start a wad of *kapok* fibres held in the hand smouldering. The use-wear noted on ethnographic chert fire-strikers closely matched most of the excavated pieces of chert. Figure 44 shows an ethnographic fire-starter kit, while Figure 45 shows one of the chert pieces excavated. Great detail on the chert fire-strikers from Linaminan is given by Vitales (2006 and on the next page).

Baked Clay Artefacts

In addition to the large volumes of earthenware, a number of other types of artefact were produced from fired/baked clay. Ordinarily, the putatively local temper Type 1 was mixed in during clay preparation. The most common formal artefact type recovered was a fishing sinker made to a clear prototype. Four such

Ethnography of Fire Making in Barangay Isumbo, Palawan and the Archaeology of Chert Usage

Timothy Vitales

The presence of artefactual chert in Philippine archaeological sites is a clear indication of its usage in this region in the past. The earliest evidence of its utilisation is found in Tabon Cave in Quezon, Palawan where chert artefacts date to around 47,000 years ago (Dizon 2003). Chert materials found in Philippine sites are mostly associated with the Palaeolithic, with some exceptions. An example of later usage is the chert flakes found in Guri Cave, also in Quezon, Palawan, where the use of chert continued into the Metal Age (Fox 1970, Peralta 1981, Teodosio 2005). There have already been studies regarding the manufacture and use of chert (e.g. Ronquillo 1981, Mijares 2002, Teodosio 2005) and most of the artefacts were interpreted as tools used for cutting, scraping, chopping, and whittling; if not as debitage or waste cores. This paper presents an ethnographic description of Pala'wan fire making in Barangay Isumbo, Sofronio Española, Central Palawan and how this observation might help in interpreting modified chert found in Linaminan site.

The Ethnography of Pala'wan Fire Making

Aside from the archaeological excavation of Linaminan, the team also conducted ethnographic research around the area; particularly among the local Pala'wan communities. They looked at material culture, folklore, burial traditions, patterns of trading, pottery making, and other aspects of Pala'wan culture, which might turn out to be helpful in our understanding of the site. Among those customs observed was the usage of strike-a-lights in making fire. The fire-making kit (Figure 46) is composed of three objects: a stone nodule (*batú santikán*), a steel fragment (*besí santikán*), and a tinder (*bárük*). All of these materials are placed in a bamboo container (*inlam santikán*) (Vitales 2006). The *batú santikán* is usually chert while the *besí santikán* is usually a file fragment (*kikír*). While the *barúk* is held near the edge of the *batú santikán* with the thumb, the *besí santikán* held on the other hand is struck down, creating sparks upon its contact (Figure 47). When the *barúk* catches the spark, it will ignite into a small ember and by gentle blowing the ember starts to flame up, thus starting a fire. Closer inspection of the *batú santikán* reveals the small and multiple battering marks concentrated on one edge with some traces of rusty residues on the marks. Sometimes a fragment of the *batú santikán* breaks off during the striking process. On the other hand, looking at the *besí santikán* reveals evidence

of wearing at the central edge on both sides, creating a 'waist-like' shape. It is usually this area that strikes the metal.

Ancient Santikán? Looking at Chert Fragments in the Linaminan Assemblage

Excavations at the Linaminan site have recovered various chert fragments, deriving from THP1 and THP2. Most of them had evidence of modification. One of the chert pieces recovered from S2W1 in THP2 has very distinct signs of modification (see Figure 45). This chert artefact was found in the earthenware-bearing layer, Context (201). At first it appeared to be a small core but closer inspection revealed very interesting features worth noting. One facet was ground to produce a very flat surface. No obvious flake scars were observed (Szabó *et al.* 2006), however most of the edges contain numerous small 'battering' marks concentrated in particular areas. The most parsimonious interpretation of this artefact is that it was used as a strike-a-light or *batú santikán*. The concentrations of battering marks indicate repeated striking of a hard object, but not for flaking or retouch. While it is apparent that it was being struck repeatedly by another hard object, it is possible that this action was to generate sparks. Other chert fragments do not show distinctive diagnostic traces indicating they are remains of strike-a-lights or the strike-a-lights themselves.

Discussion

Traditional usage of strike-a-lights in making fire is still being practised by several Philippine groups, especially among the indigenous groups in Palawan such as Tagbanwa (Fox 1982), Batak (Warren 1964), and Tau't Batu (Peralta 1983). They usually carry these tools during hunting activities. There are also accounts of using strike-a-lights in Samar (Scheans *et al.* 1972) and in Cagayan Valley in Northern Luzon (W. Ronquillo, pers. comm. 2006). Archaeologically, chert strike-a-lights have been recognised in some Philippine sites, aside from the example from Linaminan. In Catbalogan, Samar, several fragments of flint (another term for chert) were found with irregular retouch (Scheans *et al.* 1972). The authors interpreted them as probable strike-a-lights (*samtik*), which are still being used by the locals in that area. In Singnapan Basin in Quezon, Palawan, a chert fragment was found in an excavation of one of the caves that was probably used as a strike-a-light as well (Peralta 1983)

The identification of strike-a-lights in Philippine archaeological sites is very significant as it gives us a different perspective not only on how people in the past utilised stone materials such as chert, but also how we should look at chert materials found in the site. The use of ethnographic inference further enhances our

understanding regarding these materials. One example here is Glover and Ellen's (1975) fieldwork in Seram, Indonesia where they documented the fire-making among the Nualu using stone and steel strike-a-lights. They used this observation in identifying several chert flakes collected as possible strike-a-lights. Brumm (2006) also did an ethnographic study on fire-making in Soa Basin in Flores, Indonesia. The locals' reuse of stone flakes from a prehistoric site into strike-a-lights gave him an insight on the possible reuse of prehistoric lithic artefacts in the past and the taphonomic significance of these lithics found in local archaeological deposits. In fact, during their surface collection, one of the locals in the area, according to Brumm, definitely identified a bifacially reworked chert axe/adze collected in the area as an old strike-a-light. The chert piece from Linaminan was ground on one of its faces. Could this be also a case of an old artefact reused as strike-a-light?

Analysis of the modified chert fragment from the Linaminan Site can be further improved by microscopic examination, looking at residues of the material used in striking the stone. Pawlik conducted a microscopic analysis on a flint flake tool and haematite found in a site in Rhine Valley in Germany (Pawlik 2004) and the results suggested that it was used in producing fire. Residues were detected on the used edges of the flint artefact, which might have come from the material it came into contact with. Striations and grooves on the other hand were found on the hematite piece, apparently resulting from striking against a hard object. Element detection was done on the flint tool and hematite through energy-dispersive analysis of X-rays or EDAX. Traces of iron, a major component of hematite, were found on the flint while traces of silica, a component of flint, were found on the hematite. This is enough to prove that they came in contact with one another and that they might have belonged together as part of a fire-making toolkit.

This paper is centred on preliminary observations and analysis of the chert materials found at Linaminan, but further analysis is required to prove whether the assemblage indeed contains strike-a-lights. However recognition of strike-a-lights in archaeological sites, especially in the Philippines, is very important because it helps us to challenge our ideas of chert utilisation in the past. Modified chert should not always be treated as remains of tools for cutting, scraping, or chopping. Ethnographic inference plays a significant role in our understanding of chert utilisation since we know that these materials are still being used up to the present. Re-examination of the chert materials found in Philippine sites can be done to see how long we have been using these materials and what the significance of these objects were in the everyday life of people in the past. It is certain that there are several questions that can be asked of these artefacts, enabling us to understand more of our past societies.

sinkers were recovered; all from the southeast corner of S2W1. Oblate in shape, a longitudinal perforation was made by piercing the wet clay, and a single longitudinal groove runs down the outer surface connecting the ends of the perforation. One of these sinkers is shown in Figure 48.

A baked clay 'figurine' - possibly originally part of an earthenware vessel – was identified within the treasure-hunters assemblage. This has rows of punctuations (simple tool-end impression) that form an overall design rather than merely being infill stippling. This artefact is shown in Figure 49. A baked clay artefact also identified from within the treasure-hunters' collections stored at the National Museum of the Philippines, Manila, is paralleled by an identical ornament recovered by Fox from Duyong Cave (see Fox 1970: Figure 43c). Presumably the Duyong artefact was retrieved from the upper early Metal Age layers, although its stratigraphic associations are not detailed. The artefact is an oblate piece of fired clay, with a longitudinal perforation, as well as a longitudinal groove running along the upper surface. While Fox (1970:147) states it to be a 'pendant', other functions cannot be ruled out. The Linaminan version is show in Figure 50. Lastly, a single baked clay spindle whorl was also identified within the treasure-hunters assemblage. More detail on this artefact is presented by Dr. Judith Cameron in the dedicated boxed text.

Report on the Spindle Whorl from the Linaminan Site, Palawan

Judith Cameron

A single spindle whorl was recovered from within the treasure-hunters' collections now in the custodianship of the National Museum of the Philippines (see Figure 51). Spindle whorls are components of the hand spindle, a simple device used to spin fibres. The whorl was made from fired clay distinguished by its calcareous temper. Apart from three indentations around its perimeter, it is undecorated. Although pottery discs of this size and shape are commonly used as beads or decorative features on other artefacts in island Southeast Asia, the function of this particular disc was indicated by the presence of use-wear marks inside the central perforation. The worn surface on one side of the central perforation of the disc was resultant from the placement of a wooden or metal spindle inside the whorl during the spinning process.

The disc measured 5.27 centimetres in diameter which is well within the range of spindle whorls. It is of medium weight. No fragments of fibre were found

inside the central perforation. Its conical shape is diagnostic; it had a low Moment of Inertia which indicates that the whorl would have spun slowly with strong fibres. Conical whorls of this size and shape could have been used to spin hemp (*Cannabis sativa*) which is very different from Manila hemp from *Musa textilis*. Ramie (*Boehmeria nivea*) could also have been spun.

Beads in Shell, Glass and Carnelian

A small assemblage of beads was recovered from Linaminan, including one glass bead, one carnelian bead and five shell beads. The shell and glass beads were recovered from known contexts during excavation, while the carnelian bead is from the treasure-hunters' material. The glass bead is a dark blue, drawn, segmented bead that has split longitudinally. It is shown in Figure 52. The five shell beads were all recovered from square S2W1. They are all small, fully-ground disc beads similar to those recovered from Metal Age deposits at the site of Ille Cave in northern Palawan (see Szabó *et al.* 2004; Szabó 2005). One notable difference is that four of the five Linaminan shell beads have been drilled from both faces (i.e. countersunk) with the perforation meeting in the centre, with the drill-bit being obtuse and producing a distinct bevel. The Ille beads were perforated with fine, probably metal, drills with no bevel surrounding the perforation. One of the five Linaminan beads matches the Ille pattern of perforation. This technological difference may or may not be chronologically meaningful, but the drilling practices seen on the four Linaminan beads demonstrate some degree of continuity with neolithic approaches to shell bead perforation (for further information see Szabó 2005). Two shell beads from Linaminan are shown in Figure 52. The single carnelian bead is spherical, and apparently re-ground on at least one occasion.

Metal Artefacts: Iron and Bronze

As with the stone adze assemblage from Linaminan, most of the iron, and all of the bronze, artefacts were recovered by the treasure-hunters. The iron objects are in rather poor condition, being heavily oxidised (at least across visible portions) and fragile. The evidence from taphonomy alone, with many objects splitting in a laminate fashion, would suggest that the bulk of the iron is wrought rather than cast. The three bronze artefacts recovered are in marginally better condition.

There is a wide range of iron artefact types, nearly all of which can be categorised formally as tools. These include spear-points, knife blades and *bolo* (large multi-purpose knives) of varying morphologies, as well as an arrowhead

and a putative piece of slag from excavated contexts. Many of these pieces are paralleled by those excavated by Fox from Tadyaw cave (see Fox 1970: Figure 47). Figure 53 shows a selection of iron objects from Linaminan. As with many other classes of material culture at Linaminan, the iron artefacts continue to be analysed. There are three pieces of bronze: a socketed bronze axe which closely matches an example recovered by Fox (possibly from Uyaw Cave although this is unclear from the caption and text; see Fox 1970: Figure 39b), a slit-ring ornament, somewhat similar to a 'lingling-o' in morphology, and a nugget of degraded bronze. These artefacts are shown in Figure 54.

Ceramic Tradewares

A small number of sherds of stoneware and porcelain were recovered from excavations in the THP2 locale, with a number more being identified within the treasure-hunters' material. Thanks are extended to Mr. Fred Orogo of the National Museum, Manila, for preliminary comments on the tradeware sherds. There are no blue-and-white wares, and all vessels are provisionally dated to the Sung Dynasty (A.D. 960-1279) (but see following 'Chronology' section). Of the excavated material, all sherds bar one derive from small unrestricted vessels such as bowls and covers. Some stoneware jar fragments were found in the surface treasure-hunter accumulations near THP1, however no such fragments were recovered from excavated contexts. A bowl of Annamese manufacture has also been provisionally identified.

Stoneware and/or porcelain sherds were recovered from all excavated contexts except the lowest contexts in S2W1 ((215) and (216)). At all levels, however, tradeware sherds were scarce. Until the results of radiocarbon dating became available, it was unclear whether the absence of tradewares from (215) and (216) indicates the presence of an underlying deposit that significantly predates overlying levels, or whether it is simply a factor of sample size. This issue is likewise further discussed in the 'Chronology' section.

Four sherds of a very unusual type of tradeware were also recovered from Linaminan. One of these derived from the sacks of treasure-hunted material dumped near THP1, while three further fragments were excavated from THP2 (201). The initial reaction to these pieces was that they derived from further afield than the usual East/Southeast Asian tradewares, and further investigation has confirmed this. The sherds are light buff in colour, with quartzite and charred organic inclusions. What makes them so distinctive however, is the 'layer' of translucent teal-coloured glass present on both faces. This layer is up to 2 millimetres thick and cannot be considered a 'glaze' in any standard sense. While

one possible matching sherd has been sighted by Mrs. Cynthia Valdes within the Philippines (W. Ronquillo, pers. comm. 2007) parallels in Island Southeast Asian context would seem to be scarce. The literature would indicate, however, that similar sherds have, however, been recovered from south Kedah, Malay Peninsula, at the entrepôt of Sungai Mas.

Sungai Mas was an active trading port, with evidence of Chinese tradewares spanning the Tang (618-906 AD), Sung (960-1279 AD) and Yuan (1280-1368 AD) Dynasties, as well as Vietnamese and Middle Eastern trade ceramics (Miksic 1998:117). While there is still some debate, the trading port of *Kalah* identified in Arab records is commonly thought to be associated with Kedah – and specifically the Sungai Mas area – and this interpretation is strengthened by the recovered of Persian (Iraqi and Persian Gulf) ceramics and glassware, including the distinctive *sgraffiate*-ware of Persian production recovered from this site (Watson Andaya 1998:85). The four sherds recovered from Linaminan would likewise appear to be *sgraffiate*-ware, indicating that Persian trade items were making their way into the Philippines. It is likely that such exotic items represent 'down-the-line' trade rather than direct interaction with early Arab traders, due to the low volume of such material recovered from Philippine archaeological contexts. Ongoing analysis of both the fabric and glass of the putative *sgraffiate* sherds from Linaminan should shed further light on trading relationships and regional connections. One of the sherds is shown in Figure 55.

Faunal Remains

Relatively small assemblages of animal bone and molluscan shell were recovered from excavated contexts and cleaned profiles. Open sites in the tropics are generally unfavourable for the preservation of faunal material, and the soft and fragile nature of many of the faunal remains recovered indicates that Linaminan is no exception. Vertebrate faunal remains were analysed by Janine Ochoa and Philip Piper, and molluscan remains were analysed by Katherine Szabó. The results of these two discrete studies are presented below.

Analysis of the Linaminan Vertebrate Faunal Remains

Janine Ochoa and Philip Piper

In total, 187 bone fragments were recovered from the site of Linaminan through hand-collection and dry-sieving. Of these, about 36% of the remains were

unidentifiable and 17% were teeth. 97% of the entire faunal assemblage was collected from square S2W1, adjacent to the southwest edge of Treasure Hunter's Pit 2, within contexts associated with the ceramic horizon (contexts 201, 211, 214 and 216). Organic preservation on 'open sites' in tropical environment is notoriously poor and Linaminan is no exception. The assemblage consisted primarily of small decayed fragments of animal bone and loose teeth. In most cases, the bones had the soft, malleable texture that often resulted in specimens disintegrating on excavation. Cortical bone surfaces were often very flaky, cracked and exfoliating. The poor condition of the animal bone can be attributed to the 'open site' location of the Linaminan rock outcrop and the acidic nature of the clay/loam burial environment.

Of the 120 identifiable fragments, 40% (n=48) could be attributed to pig, with 31 specimens being teeth. Molar measurements (M1-3) were compared to biometric data from a reference collection of extant Palawan pigs in the National Museum. Three wild (*Sus ahoenobarbus*) and one domestic pig collected from Ransang, Palawan were measured. The data suggest that the molars of pigs from the Linaminan sample are generally slightly larger than those of the comparative specimens in all dimensions, with only the smallest molars in the archaeological assemblage falling within the range of *Sus ahoenobarbus* from Ransang (see Figures 56 and 57). This implies that either *Sus ahoenobarbus* is variable in size across its Palawan range, or that another variety of wild or domestic pig was being utilised at Linaminan during the Metal Age[1].

Interestingly, apart from a single lower left M1 from (201) and further fragments of a possible lower M1 in (214), all the pig teeth (29 specimens) recovered from the site were part of the maxillary dentition. It is fairly unusual to recover disproportionate numbers of upper and lower teeth, unless there has been some conscious or unconscious process of anthropic selection. In the case of Linaminan, perhaps pig crania were utilised for some specific purpose that did not require the mandibles or *vice versa*. The absence of the mandible would also imply that removal of this element occurred prior to transportation and deposition of the crania at the site. Several ethnolinguistic groups in northern and central Philippines have been documented to practice a ritual called *pagdiwata* (e.g. de Vera 1990). A variant of

[1]The wild pigs of Palawan were originally ascribed as a subspecies of the widespread *Sus barbatus* (Groves 1981; Oliver 1995) . However, a recent phylogenetic review of South-east Asian pigs by Lucchini *et al.* (2005) now designates the Palawan pigs as a separate species, *S. ahoenobarbus*, based on genetic and craniometric data. The Palawan pigs were said to be significantly smaller for all 16 cranial traits that the authors measured.

this ritual involves collecting and offering pig mandibles to appease and express gratitude to 'spirits' in nature. De Vera (1990) also conducted a study on animal assemblages from several sites in Bohol, which was composed wholly of pig and deer mandibles.

Fish comprise the next most abundant taxon (n = 15). Only two specimens have been identified so far, the lower pharyngeal plate of a Labrid and one Elasmobranch (shark or ray) vertebra, which has been utilised as a bead (see Figure 58). The natural hole through the center of the vertebral body demonstrates slight wear, and the edges of the vertebra have been ground flat. However, one extremely large fish centrum (length, 19.04 millimetres and diametre 22.35 millimetres) was also recovered, suggesting that deep sea pelagic fishing was being practised.

Other taxa represented are the macaque (*Macaca fascicularis*), monitor lizard (*Varanus* sp.) and binturong (*Arctictis binturong*). The complete axis of a relatively large-sized dog (*Canis familiaris*) (maximum length 53.11 millimetres, medio-lateral width across the condyles 26.28 millimetres) was also recovered from context (201). Dogs of similar antiquity to the Linaminan specimen have been reported from two sites in the Visayas (Mudar 1997). The remains of dogs are however rare in the Philippines – currently the only other archaeological record of dog has come from the late Neolithic/Metal Age horizons of Ille Cave, near El Nido, northern Palawan (Ochoa 2005).

Invertebrate Remains from Linaminan

Katherine Szabó

As mentioned throughout this report, there were a number of shell-bearing lenses scattered throughout the stratigraphy; particularly in the THP2 area. The uppermost shell-bearing horizon (207) overlies the earthenware horizon (209) under the north overhang in THP2. The shell lens in N2E1 may be contemporaneous with this. Two shell-bearing lenses in S2W1 were both contained within the earthenware bearing contexts (201), (214) and (216), with shell-bearing context (211) being stratigraphically higher than (215). In sum, this means there are at least three, discrete, depositional events through time involving shell.

The Linaminan shell is in poor condition; doubtless owing to the exposure of the site to the elements and the clayey matrix. Shell was soft and delicate upon recovery, but regained some integrity after air-drying in the shade. The shell sample recovered from Linaminan was not large, with only 295 fragments across all contexts. The total numbers of fragments per context is shown in Table 9.

Context	Locale	NISP
(201)	S2W1, THP2	3
(211)	S2W1, THP2	37
(214)	S2W1, THP2	12
(215)	S2W1, THP2	53
(204)	N2E1, THP2	83
(205)	N2E1, THP2	25
(212)	N2E1, THP2	3
(207)	North Overhang, THP2	78
(400)	Area 4	1

Table 9. Total numbers of fragments (NISP) of molluscan remains recovered from the various contexts at Linaminan.

Despite the clear chronological differences in deposition, there are no indications of changes in either local aquatic environments or human predation activities. Species collected derive from a series of adjoining biotopes, from freshwater, to brackish zones, to mangrove and estuarine areas. The most common species are the common oyster (*Saccostrea cucullata*), the windowpane or 'capiz' shell (*Placuna placenta*), the cockle *Gafrarium tumidum*, the ark shell *Anadara antiquata*, the freshwater gastropod *Melanoides tuberculata*, the estuarine bivalve *Marcia hiantina*, and the freshwater clam *Batissa violacea*. The freshwater apple snail *Pila ampullacea* is present in some numbers in the waterways surrounding Linaminan today, but is completely absent from the archaeological record. The presence of this stagnant-water gastropod is strongly tied to the practice of wet-rice agriculture (Szabó in prep.), and thus its absence is testimony to the lack of wet-rice cultivation in the area until very recently.

Chronology

Immediately following the excavations, we thought the date of main date of site usage to be somewhere around the 12th-13th century A.D. or slightly earlier. This date was based on the tradewares present, along with the association of iron and glass. In addition, there are no terrestrial sites in the Philippines having *in situ* tradewares dating earlier than the Sung Dynasty, so a date falling in line with the Tang or Five Dynasties periods was considered unlikely. There have, however, clearly been multiple phases of use, with a more recent phase represented by the upper shell lens (207) identified under the northern rock overhang of THP2. There was also a possible earlier phase of usage; ephemerally evidenced by the shell (215) and earthenware (216) excavated from under the large rock in S2W1. These contexts did not contain metal, glass or tradeware ceramics, though, as mentioned previously, this could have been an artefact of sample size – especially given the rarity of the these objects in the deposits throughout.

Two samples were been selected for radiocarbon dating so that issues of chronology could be adequately addressed. The presence of decayed tree roots and plant matter throughout all levels of excavation prompted caution about the use of botanical remains (i.e. charcoal) for radiocarbon dating. Shell was considered to be a more suitable dating material, due to its clearly stratified nature within the deposits. Shell has not been favoured as a dating material within Philippine archaeology, although the reasons for this are ambiguous. While shell, as any material, can produce problematic results, careful sample selection and the use of a laboratory with experience in dating shell, means that results can be as reliable as those from charcoal.

To ensure that the most appropriate species were chosen for dating, Katherine Szabó communicated with Dr. Fiona Petchey at the Waikato University Radiocarbon Dating Laboratory – a laboratory conducting ongoing research into the suitability of various shell species for dating. Dr. Petchey recommended that estuarine bivalves such as *Anadara antiquata, Gafrarium tumidum, Saccostrea cucullata* and *Placuna placenta* for sampling. Samples and results are listed in Table 10.

The results were somewhat surprising, dating the main period of usage of Linaminan to around the late 9th – early 10th century. The sample dating the context 'under the rock' (215) in S2W1, not containing any iron, glass or tradewares, were found to date to this same period thereby ruling out the argument for an underlying Neolithic stratum. The dates tell us that the main period of deposition happened over a rather short span of time (perhaps about 100 years), although the stratigraphy does let us into finer-grained temporal understandings.

Locale	Context	Species	Lab. code	Date b.p.	Calibrated Date (1 sigma/2 sigma) B.P.	Calibrated Date (1 sigma/2 sigma) A.D.
S2W1	(211)	*Saccostrea cucullata*	Wk20437	1568±38	1240-1050 1300-940	710-900 650-1010
S2W1	(215)	*Anadara antiquata*	Wk20438	1438±50	1120-900 1220-790	830-1050 730-1160

Table 10. Radiocarbon determinations for Linaminan. Calibrations are using OxCal version 3.10 with a delta-r value of -14±78.

Linaminan in Local and Regional Context

Linaminan is a prominent, and to the Pala'wan sacred, space on the landscape. It is geographically distinctive, and the views from the top commanding. The material culture amassed by treasure-hunters and the recent archaeological excavations present an interesting pattern which suggests the ritual function of the Linaminan outcrop, noted ethnographically, may have considerable ancestry. Archaeologically, a number of 'types' of site are encountered for later phases of Philippine prehistory: burial sites, habitation sites, and ritual sites. Burial sites are characterised, naturally, by burials. For Metal Age sites in Palawan, these are typically jar burials, where the bones of the deceased are placed within large earthenware jars, although sites such as Leta-Leta Cave (see Fox 1970 and Szabó 2005) and Ille Cave (see Szabó *et al.* 2004) demonstrate that other burial modes, including primary interment and secondary 'bundle' interments were also practised. Habitation sites are distinguished by the debris of day-to-day life, including food remains, evidence of fires for cooking (in the form of charcoal, hearths, fire-cracked rock, burning on the bottom of pottery vessels), structures evidenced by features such as post-holes, and evidence for (and by-products of) the production of artefacts of various types. Ritual sites, are, by their very nature variable. It is generally easier to consider, and rule out, the possibility of burial and domestic interpretations before investigating the possibility of a ritual space.

In the case of Linaminan, the archaeological remains did not fit at all comfortably with a 'burial site' interpretation. Large pottery vessels are scarce, and the very small amount of human bone noted for the site is highly weathered and fragmented. Further investigations of treasure-hunters' reports of burials revealed that full skeletons were not recovered, and no crania have been found by them. There may very well be burials around the Linaminan outcrop, but it does not appear to be a 'burial site'. Ethnographic Pala'wan burial traditions are discussed by Leo Batoon in boxed text format. While there are small amounts of animal bone

and molluscan shell, and there appear to be depositional 'events' involving shell, midden is not in any way a significant component of the archaeological deposits. Furthermore, the patterning in the pig remains noted by Ochoa and Piper, where skulls (and not mandibles) dominate the record, suggests that the presence of faunal remains cannot be unquestioningly attributed to simple eating practices.

While reconstruction of the earthenware pottery vessels has yet to be pursued in earnest, it is clear that the Linaminan vessels are, on the whole, rather small, with a high proportion of bowls. Many (if not most) bowls, as well as some small globular jars, have ring-feet attached. Fragments of stoneware and porcelain are from small vessels; again mainly bowls. Decoration is diverse and apparently more common than levels noted by Fox for 'Developed Metal Age' sites of the Quezon area (such as Tadyaw Cave and Rito Fabian Cave)(see Fox 1970), and there is virtually no evidence of burning on the bottoms of vessels. In short, it is currently difficult to ascribe the Linaminan earthenware assemblage simply to domestic activities.

Ethnographic Pala'wan Burial Traditions

Leo M. Batoon

Pala'wan bury their dead within 24 hours of death; however, burial takes place immediately when one dies of a contagious disease. They are buried just below or around the vicinity of the house. There are also cases of burial of the dead in the fields or forest area. The house of the deceased is abandoned after burial. An indication of death being the cause of abandonment of a house is the removal and/or dismantlement of the walls. They bury with the dead his/her personal belongings such as clothing, *siburan* (wine jars), tradeware ceramics, *bolo*, *budyak* (spear), *banbandil* (gong), and other personal effects. Food and water in containers are also interred in the belief that these will be used in the journey to the afterlife. The body is wrapped with a plain white cloth or blanket and buried 1 to 1.5 meters below the ground. The body is placed on a compartment of the grave and is covered with a slab of wood.

When buried, the head is oriented to the east when the cause of death is natural one like illness or of old age, and towards the north when the cause of the death is murder. If a woman dies while giving birth, the body is laid sideways. A seven-day period, *kapuspusan* or wake, is observed after the death of a member of the family, and during this time family members cannot undertake work or any

productive activities. The end of the wake is celebrated by serving food and drinks to relatives and visitors.

The lack of evidence for domestic or burial activities leads us to consider the possibility that Linaminan was, predominantly, a ritual space. While further excavation and analysis is required before this is mooted as a firm interpretation, there are a number of—what we would consider to be— key signatures. Firstly, there is the evidence from the pig remains, as discussed by Ochoa and Piper (boxed 'Vertebrate Remains' text). Secondly, there is a paucity of items of personal adornment. Only a single glass bead was recovered, as opposed to the large samples yielded by burial sites such as the upper layers of Ille Cave in northern Palawan (see Szabó *et al.* 2004). Thirdly, earthenware and tradeware vessels are neither cooking nor burial vessels. Instead, they are of small-medium restricted and unrestricted forms. Even 'utilitarian' vessels, such as the highly-embellished clay oven fragments, do not suggest a strictly utilitarian function. Fourthly, the presence of technological items, such as the baked clay net sinkers, need not imply a domestic/routine space. Material analysed from the large T'ang Dynasty (A.D. 618-906) burial site in Sarawak, Kain Hitam, suggests that fishing nets with attached sinkers, were used to adorn coffins (Szabó and Yang, in prep.). Put succinctly, there are a number of features of the Linaminan assemblage which imply it is a unique type of site for the central Palawan region.

Sites ascribed to a time-period synchronous with the Sung Dynasty of China are not uncommon in the Philippines, and Linaminan is chronologically placed at the beginning of the burgeoning of regional trade and the growth of centralised polities (see Junker 1999 for discussion and some interpretations; but see also Peterson 2005). The lack of the growth of such polities in Palawan, however, is somewhat intriguing. While this is not the venue for such a discussion, it can be noted that sites in Palawan have early trade links with the mainland of Asia, as evidenced by sites excavated by Fox (see Fox 1970) as well as Linaminan and Ille Cave. For some reason, however, such early connections do not appear to prompt the development of centralised economic and/or political locales.

Within a central Palawan context, Fox (1970:173-175) notes the presence of a number of sites that may be roughly contemporaneous with Linaminan, however few of these sites were excavated in any serious fashion by him. One that was, was the jar burial site of Bubulungun I Cave, Lipuun Point, where early Sung tradewares were recovered along with earthenware vessels. Interestingly, many of the tradewares recovered from Bubulungun I were small saucers/plates and bowls,

matching closely the vessel types recovered from Linaminan (Szabó personal observation, Quezon Branch of the National Museum of the Philippines).

There are presently no other open sites identified for, or excavated in, Palawan. The identification of archaeological deposits at Linaminan, therefore, presents a special opportunity to investigate the use of space and landscape. If Linaminan is a ritual site, an investigation of its relationship to habitation and burial sites in the local area will allow us insights into proto-historic Palawan (and perhaps Pala'wan) culture and lifeways we have thus far not had the opportunity to explore. In an effort to begin in this endeavour, Ligaya Lacsina conducted verbal and physical surveys to probe the question of the place of Linaminan in the local archaeological landscape. The results of her study are presented here.

Possible Archaeological Sites in the Vicinity of Linaminan

Ligaya S. P. Lacsina

Ethnographic research and a walking survey were conducted in Barangay Isumbo, Sofronio Española, Palawan in order to learn of possible archaeological sites in the area, especially in the near vicinity of the Linaminan archaeological site. The discovery of other archaeological sites in the area would greatly complement the data already gathered from the excavations at the Linaminan site. An archaeological kit containing specimens such as a stone adze, earthenware and tradeware sherds, and a shell bead, all collected from the Linaminan site, was used as an aid to show to those being interviewed. Residents from the area were asked if they were familiar with such archaeological items, and if these have been seen near their homes or when ploughing their fields. The presence of artifacts in an area would indicate the possible existence of an archaeological site that may be investigated in the future. Many of those interviewed were seniors who have lived in the area for many years, among them, members of the native group *Pala'wan*, who have lived there all their lives. They were also queried regarding their memories of the area's landscape and how it may have changed over the years.

Information on the presence of archaeological materials in the vicinity directly surrounding the Linaminan site was scanty. Hernani Asuncion reported that sherds are only infrequently seen when ploughing his field in Dumaduay, at the base of rolling hills just north of the Linaminan site. Egleceria Cajolo's brother, Rodolfo Bulawan, recalls ploughing from the earth small numbers of earthenware sherds after first settling in Isumbo in 1957 from Iloilo with his family. As time went on, he

said even fewer pieces would be found, until there would be none at all to be seen. Others who were asked replied that they have never seen sherds here.

The majority of the people interviewed that have seen earthenware and tradeware sherds in their fields are from Pinaupawan, found 2-3 kilometres west of Isumbo. Many of those that live in Pinaupawan are Pala'wan. Mensiran Tinggalan, a Pala'wan elder from Pinaupawan, brought samples of earthenware sherds he had recently dug up about 20 centimetres deep while planting a banana tree. He calls the area that he lives in *Banwa Banug* (Eagle's house). Another Pala'wan, 55-year-old Jagko Bongalong reported that in the 1980's he had a collection of stone adzes, called *nipa't duldog* (lightning's tooth) which were sold to him. Unfortunately, he had to sell these some years back. He was told that these were collected at the bases of coconut trees after they had been struck by lightning.

A walking survey was done to search for likely habitation sites by looking for surface finds and topographical characteristics that would be advantageous for settlers. This was conducted within the Cajolo property, starting from the area immediately surrounding the Linaminan site, moving east to the hill next to the site, and southeast to the rice paddies. The area is generally thickly covered by vegetation. Open areas were examined and selected places were shovel tested to about 15 centimetres deep. No surface artefacts were found during the survey.

The results of the interviews and survey point to Pinaupawan as the most promising location for finding archaeological sites possibly used contemporaneously with Linaminan. However, it may still be possible to find sites in the area just adjacent to Linaminan despite the lack of success of finding surface evidence. According to Bulawan, Isumbo was hilly and forested when he and his family migrated here in the late 1950s and not yet leveled for rice planting; rice paddies had only been developed around 1975. The agricultural activities in the area may have concealed any material culture that may have been left there. Test pits and augering around the area may confirm the presence of more archaeological, specifically habitation, sites here.

Further and Future Research

Intensive analysis of aspects of the material culture thus far excavated from Linaminan, from both the treasure-hunted material in the custodianship of the National Museum of the Philippines, and the material from recent excavations reported here, will ensue over the next year. The analytical tasks are itemised below:

- Preliminary chemical and microscopic analysis of a selection of iron and bronze artefacts in order to discuss technological aspects of production and putative source (see boxed text of Pala'wan metal trading and use below). The glass bead will also be chemically characterised and placed within the wider context of glass production and trade.
- Contextual analysis of the polished stone adze assemblage within the wider regional Asia-Pacific literature.
- Petrographic analysis of type specimen earthenware sherds in order to scientifically define temper types present within the Linaminan assemblage. This will give further insights into the putative local production of pottery, as well as the mobility of earthenware vessels between and with cultural communities. Ethnographic information as to local pottery production and clay sources circa two generations ago is presented in the following boxed text.
- Material excavated from a number of sites excavated in the Quezon area by Robert Fox will be analysed to generate a more integrated view of central Palawan later prehistory. Sites already being studied by Szabó include material from the late Neolithic (Ngip'et Duldug), through to the Developed Metal Age (Rito-Fabian Cave).

An expanse of intact archaeological deposits was defined by Szabó and Piper at the close of excavations. The wealth of *in situ* material recovered from S2W1, as well as stratigraphy indicating fine-grained multiple depositional events through time, and a thickening of deposits towards the south wall of grid-square S2W1, indicated that *in situ* deposits continued in a southerly direction down-slope from the southern extent of THP2 excavations. A rock overhang southeast of S2W1, down-slope, was investigated, and intact stratigraphy including a shell midden lens and earthenware ceramics was isolated. This zone was called Area 5. Area 5, as well as the area immediately to the south of grid-squares S2W1 and S2E1, are considered the most ideal locations for further archaeological excavation.

Ethnographic Information on the Local Production of Earthenware and the Trade in Metal Objects

Leo Batoon

Most informants say that there were once pottery makers in Isumbo. Potters were mostly women and utilised the paddle-and-anvil technique. The source

of clay would come from Sitio Tagbabanga, Barangay Ipilan of Quezon town approximately 5- to 7-kilometre walk north of Isumbo. Mensiran Tinggalan recalled from her aunt that other source of clay was in *Pinaupawan* at the foot hills of Mt. Dumaduay. They make pots for personal use and the most common of which is the *kulun* or *palayuk* type for cooking. Rodolfo Bulawan stated that a Spanish structure (could be a fort or a church) was once erected at the Separaccion Point., Sitio Palupalo, Barangay Burirao of Quezon town. This was the place where people would get bricks to construct their own kiln.

Metal objects such as *tukaw* or bolos, *budyak* or hunting spears, harvesting knives and other implements were not locally manufactured in Isumbo. They were traded by the Muslims who would come from Indonesia and Malaysia.

Community Involvement and Outreach at Isumbo

The Barangay of Isumbo is one of the poorest in Palawan with unemployment rates being high and the level of education being low. The regular presence of treasure-hunters in the township, therefore, not only brought in a welcome source of income (or at least the promise of this), but presented a very particular approach to 'digging holes looking for things in the ground'. One of our major tasks therefore, apart from the excavation of the Linaminan site, was to involve the community and explain (and demonstrate) the difference between treasure-hunting and archaeology. A particular course of action was charted, beginning with a presentation to the Barangay Council, in which the team introduced themselves, explained the concepts of archaeology and culture heritage as well as the role of the National Museum of the Philippines, outlined the research agenda, and made a commitment to present the results of the research in a readily digestible form. The latter included (1) a copy of the post-excavation report; (2) a copy of Robert Fox's seminal *The Tabon Caves* monograph; and (3) a poster designed specifically for the community conveying the results of excavation.

These three items were handed over to members of the community and Council in April 2007 by Szabó and Vitales. Ms. Nida Radam of the Quezon Branch of the National Museum of the Philippines was also present. Copies of the poster and report have also been lodged with the Quezon Museum, and Quezon Branch of the Palawan Council for Sustainable Development (PCSD), and additional copies of the poster have been deposited with the National Museum of the Philippines (Manila) and Archaeological Studies Program, University of the Philippines (Manila). The poster text is in both English and Filipino, and outlines in clear language the

goals of archaeology as a discipline, the results of excavation at Linaminan, and culture-heritage protocols in a Philippine context. Further funding will hopefully see an extension of this community engagement programme, including involvement of the local elementary and high schools.

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