RECENT RESEARCH AT GUA SIREH (SERIAN) AND LUBANG ANGIN (GUNUNG MULU NATIONAL PARK), SARAWAK

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This paper presents some of the main findings of archaeological excavation conducted in Sarawak in the caves of Gua Sireh in Serian District and Lubang Angin in the Gunung Mulu National Park. Excavations at both sites were undertaken by staff of the Sarawak Museum under the co-supervision of the two writers between July and August 1989.

GUA SIREH

Gua Sireh is a limestone cave located about 55 kilometres southeast of Kuching, in the Serian District of the Samarahan Division in western Sarawak (Figure 1). It is situated about 60 metres above the rice fields which flank the base of the limestone massif of Gunung Nambi. As will be seen, the fact that good rice-growing terrain occurs close to the site is of great interest in light of the finding there of ancient rice remains. The cave has two chambers which are referred to in this report as the main and small chambers (Figure 2).

Gua Sireh was first excavated by Tom Harrisson and Wilhelm G. Solheim II in 1959, but the materials recovered were never fully analysed or published (see Solheim 1983:38). All are still stored in the Sarawak Museum, together with those from two other unpublished test excavations carried out by Zuraina Majid in 1977 and by Edmund Kurui in 1980. There was therefore a need to conduct limited further excavation in order to provide an essential stratigraphic key with which to interpret the earlier findings[1].

The 1989 excavations in Gua Sireh were conducted in two phases: the first from 20 to 24 July and the second from 9 to 18 August 1989. Two small trenches were laid out. One, with a total area of 3.75 m^2, was laid out in one of the unexcavated strips between the still-open but much eroded Harrisson/Solheim trenches of 1959. Because no written records of this earlier excavation survived we were not able to decipher the original grid code and the 1989 trench was simply referred to as EFG8, based on a temporary grid of our own. Trench EFG8 was located in the middle of the main chamber. The second trench, designated 89A (1.5 x 1.5 m), was located closer to the cave mouth and outside the Harrisson/Solheim excavation area (Figure 2). Excavations were carried out in arbitrary

Indo-Pacific Prehistory Assn. Bulletin 10, 1991:386-405 (P. Bellwood ed., *Indo-Pacific Prehistory 1990,* Vol 1)
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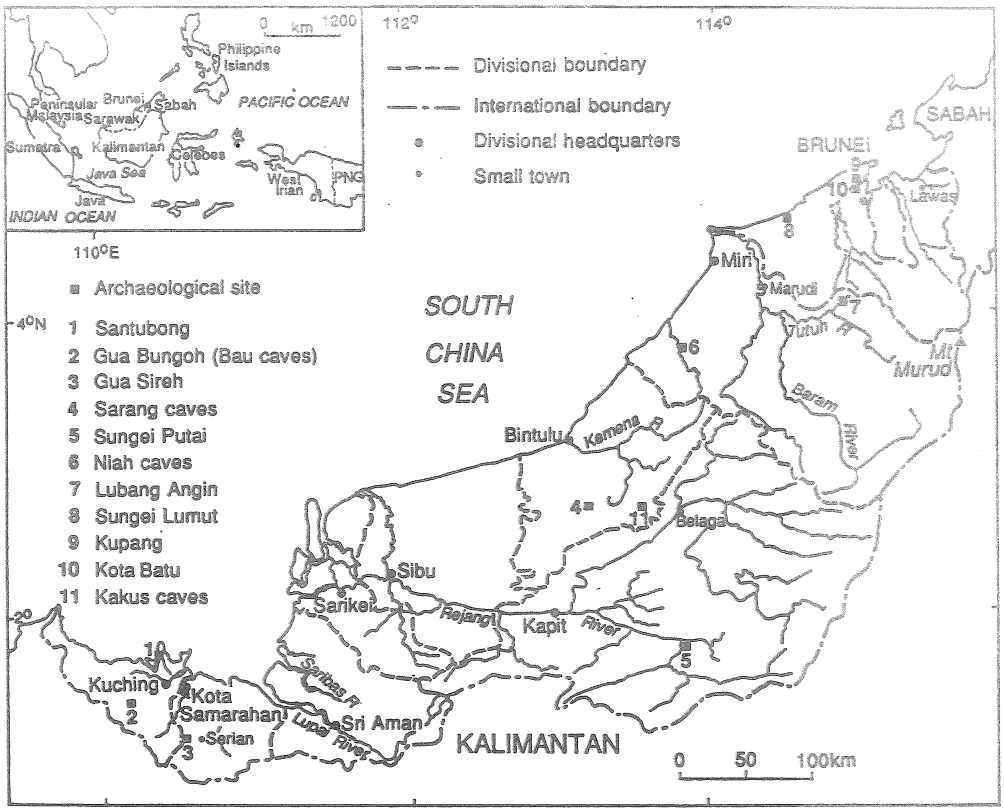


FIGURE 1: ARCHAEOLOGICAL SITES OF SARAWAK AND BRUNEI

levels of 5 cm as the natural layers were not easily visible during the actual process of excavation. The contents of postholes were removed whenever they were encountered. The layers were much easier to see in section, however, and are described below. A 2 mm mesh (mosquito netting) was used to sieve all the excavated materials, the deposits being fairly dry, especially in EFG8.

Stratigraphy of trenches EFG8 and 89A

Trenches E8, F8 and G8 (EFG 8) have a maximum of nine cultural layers through about 60 cm of deposit, some being lenses of limited extent (Figure 3; not all the lenses were represented in the illustrated section). The basic soil matrices of these layers are probably a mixture of guano and other sediments which have worked down from higher portions of the main cave passage to the south. Postholes were encountered in EFG8 cut from all layers from 2 down to 9. The functions of these postholes are hard to identify in the absence of coherent patterns. However, the quantity of human bone in this area of the cave (see below) suggests that they might have formed the supports for funerary biers,

perhaps for wooden coffins, although none exist in the cave today. Other possibilities include domestic sleeping platforms.

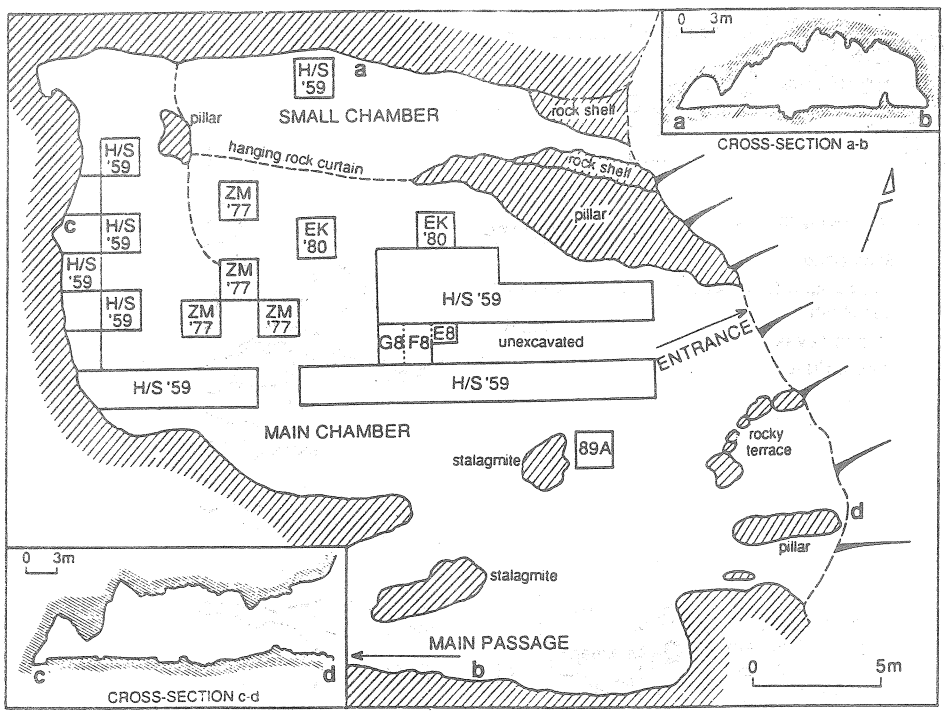


FIGURE 2: PLAN OF GUA SIREH

H/S = Harrisson and Solheim excavations; ZM = Zuraina Majid excavations; EK = Edmund Kurui excavations. E8, F8, G8 and 89A are the 1989 excavations

There are essentially six layers in trench 89A, as illustrated in Figure 4. Cultural deposits here extend down for about one metre; the trench is closer to the cave mouth than EFG 8 and has presumably been subjected to a greater inflow of fine sediment from the drip-line. The soil profile in 89A lacked the ash lenses and postholes which were so common in EFG 8.

Dating

Five conventional radiocarbon samples from trench EFG8 and one sample from trench 89A were submitted initially to the ANU Radiocarbon Laboratory. Two further micro-samples were then submitted to the Lawrence Livermore National Laboratory in California for AMS radiocarbon dating[2]. All these dates are listed in Table 1.

Commencing with trench EFG8, it will first be noted that samples ANU 7049 (charcoal) and ANU 7045 (freshwater shell, *Brotia* sp.) come from adjacent layers 4/6 and 7/8, yet differ by some 1300 years. This is in accordance with previous observations that

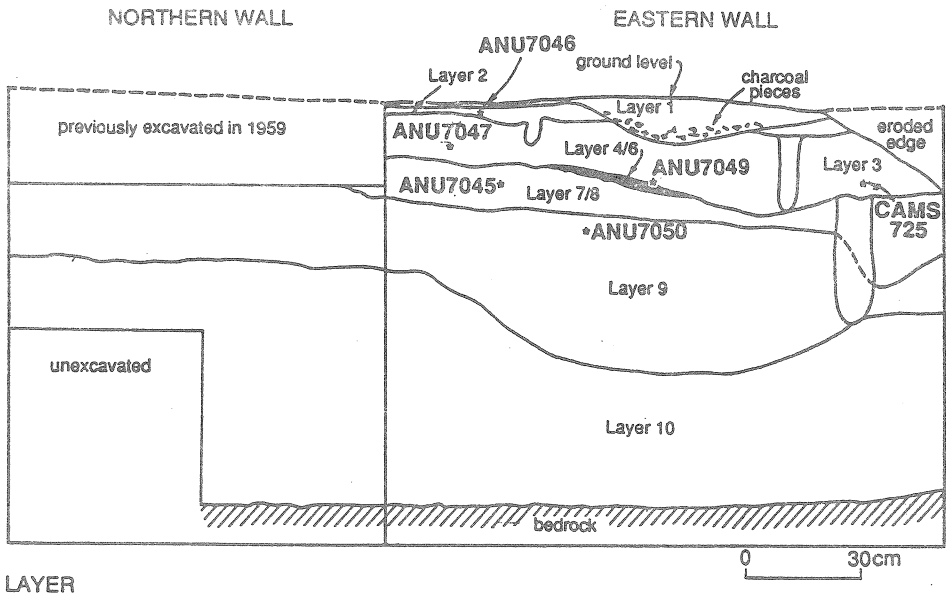
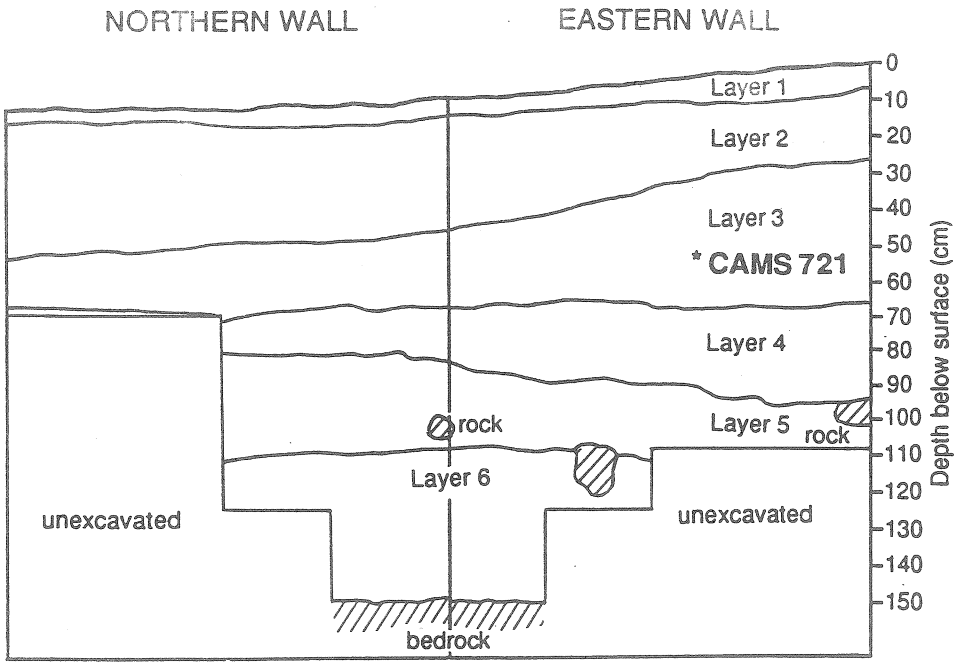


FIGURE 3: NORTHERN AND EASTERN SECTIONS OF GUA SIREH TRENCH E8

freshwater shell dates from limestone environments are always too old by varying amounts. Bellwood (1988:120) suggests 500 years too old for the Madai caves in Sabah, while Spriggs (1989:598) indicates that the errors in freshwater shell dates can be as much as 1500 years. In the case of Gua Sireh the magnitude of error is not clear since the charcoal sample is from a slightly higher stratigraphic layer (layer 4/6) than the freshwater shell one (layer 7/8), but an addition of at least 500 years to the real age of the shell must be considered likely.

Despite the need for freshwater shell date correction, this series of dates forms a very gratifying sequence with no signs of any undetected disturbance. This becomes particularly apparent when it is realised that the AMS radiocarbon date CAMS 725, on a rice grain in a potsherd from a depth of 20-25 cms in F8, is stratigraphically contemporary with samples ANU 7049 and 7045. The result, 3850±260 bp, is startlingly corroborative, and the cultural significance of this date will be discussed below. Meanwhile, absolute dates for the excavated layers in EFG8 can be given. Applying a negative correction of approximately 500 years to the shell dates, and referring to the locations of the Cl4 samples from G8 as shown in Figure 3, the upper part of layer 9 would have been under deposition by perhaps 5000 bp, and possibly a millennium or so earlier. The top of



LAYER

Layer 1 - light brownish grey ashy soil
Layer 2 - loose greyish brown humic soil
Layer 3 - as Layer 2
Layer 4 - dark brown soil with fine texture
Layer 5 - dark greyish brown soil
Layer 6 - dark greyish brown (sterile)

FIGURE 4: NORTHERN AND EASTERN SECTIONS OF GUA SIREH TRENCH 89A

layer 7 dates to about 4500-5000 bp and layer 4/6 to a more certain 4500 BP (calibrated). Layer 3 dates to about 3500 BP and layer 2 to a surprisingly young 825 BP. The upper layers have therefore accumulated quite slowly, about 20 cms in 4000 years. The cultural sequence, from apparent Neolithic to Early Metal Phase, contains nothing to contradict these dates. However, the lack of absolute horizontality, especially in G8, makes it a little difficult to relate the artefacts, recorded in 5 cm spits, with absolute precision to the radiocarbon dates.

Turning now to 89A, the oldest Gua Sireh radiocarbon date, of 21,630±80 bp (ANU 7049) on freshwater shell (*Brotia* sp.), was recovered from a depth of 95-100 cms in layer 5 (Figure 4). This date probably indicates the beginnings of human activity in the cave. Unfortunately, however, it lies beyond the range of calibration and is subject to the same factors of increased-age contamination as the dated shells from EFG8. It is only possible

to state that human occupation of the cave perhaps began close to a round figure of 20,000 years ago. This date, for a site so far inland (perhaps 500 kilometres at the last glacial maximum) is quite surprising, although its possible significance will not be discussed here (see Bellwood 1990).

Lab. No.	Radiocarbon age bp.	Calibrated date, one sigma range*	Material and provenance
ANU 7046	910±130	950(825)690	Charcoal, G8N layer 2
ANU 7047	3220±190	3686(3463)3259	Charcoal, G8N layer 3
CAMS 725	3850±260	4807(4283)3899	Rice grain in sherd, F8S, 20-25 cm
ANU 7049	3990±230	4835(4493)4096	Charcoal, G8N layer 4/6
ANU 7045	5290±80	-	Freshwater shell, *Brotia* sp. G8N layer 7/8
ANU 7050	5610±80	-	Freshwater shell, *Brotia* sp. G8N layer 9 (top)
CAMS 721	1480±260	1693(1354)1160	Rice husk in sherd, 89A, layer 3
ANU 7048	21630±80	-	Freshwater shell, *Brotia* sp. 89A, layer 5

*University of Washington Quaternary Isotope Lab. Radiocarbon Calibration Program 1987 Rev. 2.0.

TABLE 1: RADIOCARBON DATES FOR GUA SIREH

The AMS date CAMS 721 is on rice husk temper in pottery from the 50-55 cm level in 89A. This pottery is of Tanjong Kubor type (Bellwood and Omar 1980) in terms of decoration and the date of about 1350 BP seems perfectly reasonable for it. Given the depth of this sherd, however, it must be concluded that the upper layers of 89A have built up very quickly, especially when compared to EFG8. This may reflect closeness to the mounded drip line area at the front of the cave.

THE CULTURAL EVIDENCE FROM GUA SIREH

The vertical distributions of the major classes of archaeological evidence recovered during the 1989 excavations in Gua Sireh are shown in Figure 5.

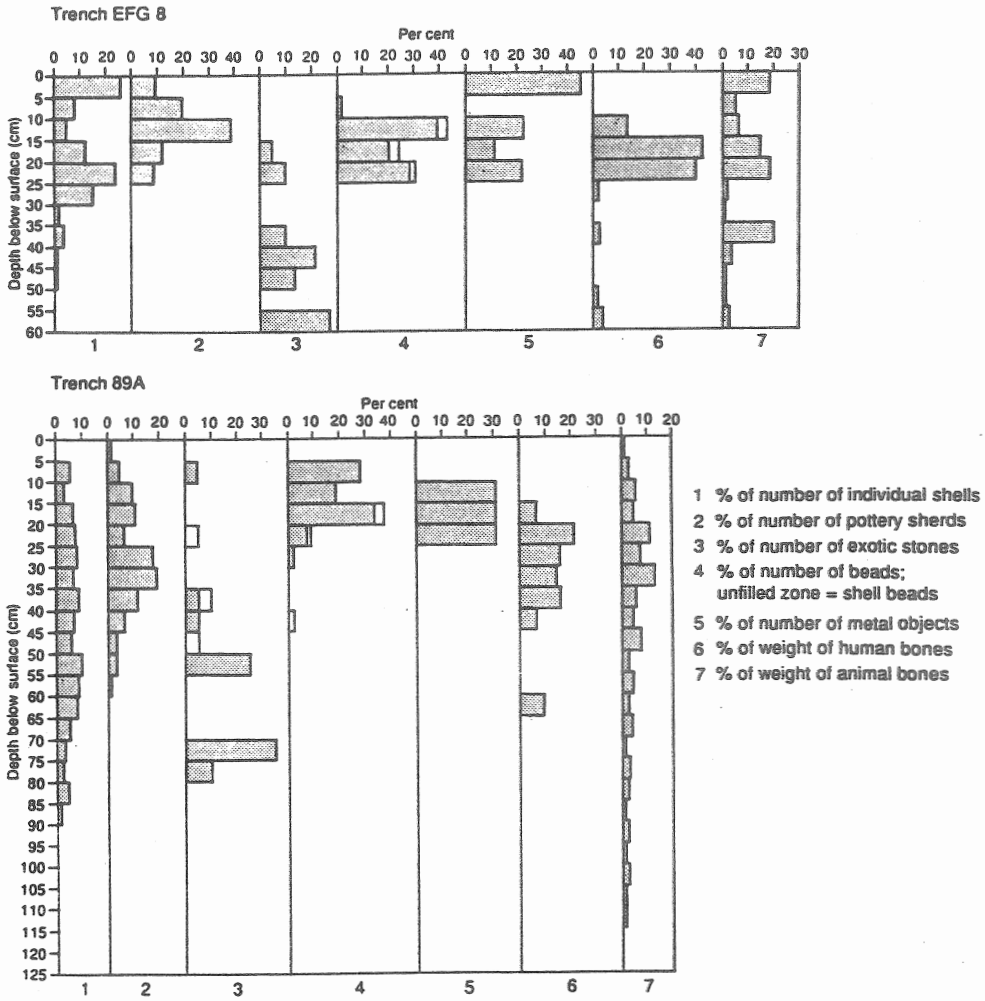


FIGURE 5: DISTRIBUTIONS OF CULTURAL MATERIALS BY DEPTH IN THE GUA SIREH EXCAVATION TRENCHES

(a) Food remains (including rice)

Freshwater shellfish appear to have formed a substantial part of the diet of the occupants of Gua Sireh. The three dominant freshwater genera in order of frequency are *Brotia*, *Neritina* and *Clea*, all of which can still be found in surrounding streams. *Brotia* accounts for more than 85% of freshwater shells and was found down to the base of the archaeological deposits. Its predominance in Gua Sireh probably reflects its greater availability rather than choice through taste.

Two phases of shellfish exploitation seem to have occurred in the site's history, as follows:

(i) The basal and presumably late Pleistocene layers in 89A, below 85 cms, have only small numbers of *Brotia* shells. The Pleistocene date ANU 7048 is on a sample of these shells; despite the absence of artefacts at this depth the shells must indicate some human use of the cave, even if ephemeral.

(ii) The main archaeological layers in both trenches, presumably dating to between 6000 and 1000 BP, have large numbers of all freshwater species (although with *Brotia* always dominant), together with a few estuarine shells of the genera *Anadara* (most common) and *Batissa* (rare). The estuarine shells clearly reflect the post-glacial sea level rise, and also the fact that the inhabitants of the site had access to the sea at least 60 kms away. In the top levels of both trenches, presumably since 1000 BP, there is a sharp decline in the numbers of *Neritina*. This is hard to explain, but it may reflect environmental changes caused by increased forest clearance and riverine silt loads.

Preliminary analysis of the animal bones recovered in Gua Sireh in 1989 reveals that a wide range of terrestrial and aquatic animals were hunted throughout the occupation. Pigs appear to have been the most commonly hunted animal, and other species include monkeys, barking deer, mouse deer and porcupines. Reptiles are represented by soft-shelled turtles and hard-shelled tortoises, monitor lizards and snakes. Remains of freshwater fish and crabs, which are to be found in the underground streams in the main interior cave passage (see Fig. 2), were also recovered.

A discovery of major importance at Gua Sireh is that of the rice-husk temper and even some whole carbonised grains in some of the pottery sherds[3] (Bellwood *et al.* 1992). As noted above, one of these sherds has been dated to c.4300 BP (CAMS 725) and the other to c.1350 BP (CAMS 721). The older sherd, which comes from the 20-25 cm level in trench EFG8, has whole-grain inclusions and carries faint traces of ribbed carved-paddle impression on its surface. This decoration is fairly non-diagnostic of age, and the piece would probably fit well within the "Neolithic" pottery of a site such as the Niah West Mouth. The younger sherd, on the other hand, has an elaborate pattern of carved paddle impressed diamonds on its surface identical to those on some sherds of similar date from Kupang in Brunei (Omar 1981: Fig. 8e). This style of pottery, termed Tanjong Kubor Ware by Bellwood and Omar (1980), was probably associated with late first millennium - early second millennium AD Malay expansion in the South China Sea hinterland. The AMS date fits the stylistic features very well.

The earlier date, of course, is one of the oldest for rice in Island Southeast Asia. Together with ANU 7049 and ANU 7045 it makes a presence of rice in Gua Sireh at circa 4300 BP a certainty. Whether the rice was grown locally or whether the pottery was brought in to the site we do not know. However, the pottery does not look exotic in terms of style or fabric and extensive ricefields exist in the alluvium just below the cave today. The closest other reliable dates for rice between 4000 and 3000 BP are those from Khok

Phanom Di in central Thailand (Higham 1989) and from Andarayan in northern Luzon (Snow *et al.* 1986). The Gua Sireh evidence is also of interest because it establishes a use of rice over a period of at least 3000 years in the general region of the site. The total number of excavated rice husk tempered sherds is not great - only 21 have been recognised so far in the 1989 sample - but they do occur in all pottery-bearing levels.

(b) Pottery

The main cultural material excavated at Gua Sireh in 1989 was pottery, of which 99.7% (4566 sherds) was local earthenware while only 0.3% (17 sherds) was Chinese of Late Ming (one piece only) and Qing date (identified by David Bulbeck). These imported sherds were found only in the top 15cms of trench 89A.

Most of the decoration on the local pottery is paddle impressed, using carved, basketry-wrapped or cord-wrapped paddles. Earlier reports (Solheim *et al.* 1959, 1961; Solheim 1983) mention that pottery with incised triangles, meanders, impressed circles, lime inlay and red-slipping was recovered from the site in 1959, but little of this can now be traced and the 1989 excavations yielded only two red-slipped sherds and only one with incised and stamped circle decoration. Of course, this circumstance may reflect the small size of the 1989 sample, and there is clearly a need for the 1959 materials to be sorted and analysed.

Basket-marked patterns are the most common type of decoration in the Gua Sireh assembage, accounting for 41% of all decorated sherds in EFG8 and a surprising 84% in 89A. They occur in similar proportions throughout all pottery-bearing levels. Solheim *et al.* (1961:236-237) mentioned that this type of Gua Sireh decoration, especially the heavy basket version, was paralleled in the West Mouth assemblage at Niah. Apart from basket-marking the other most common categories of carved-paddle impression at Gua Sireh are ribbed and checked, with herringbone patterns occurring quite commonly as well. Complex floral, curvilinear and diamond motifs (as on the younger dated rice tempered sherd discussed above) are concentrated in the higher levels of trench 89A, in accordance with their parallels in sites of the last millennium or thereabouts such as Tanjong Kubor (near Santubong; Solheim 1965:78) and Kupang in Brunei (Omar 1981). Undated Sarawak pottery assemblages with generalised Gua Sireh parallels also come from Gua Bungoh in Bau (Harrisson and Tweedie 1951) and possibly the Sarang caves (Harrisson and Reavis 1966:25) and the Ulu Kakus caves (Reavis 1966:271).

Several types of rim decoration can also be distinguished in the Gua Sireh assemblage. These include plain rounded lips which resemble those on the cooking vessels found at Tanjong Kubor (Solheim 1965), Kupang (Omar 1981) and Madai/Baturong in Sabah (Bellwood 1988). Some rims also have scalloped decoration similar to that reported at Niah (Solheim *et al.* 1959) and the Kakus Caves (Reavis 1966), while others have wavy lips. A common form of rim decoration is notching or incision, usually vertical or slanted on the outer edges.

The exact commencement date for pottery in Gua Sireh is uncertain, but an estimate of 5000 years ago would seem to be reasonable. The AMS-dated sherd (CAMS 725) was

found only 5 cms above the bottom of the main pottery-yielding deposit in EFG 8 (at 30 cms), although a few sherds, perhaps in some cases fallen down postholes, did occur to a depth of 55 cms in this trench.

(c) Beads

Most of the beads found in Gua Sireh in 1989 (a total of 222) came from the upper levels, above 30 cms in 89A and above 20 cms in EFG8. Some downward movement perhaps occurred in the latter trench since most glass beads surely postdate 2500 BP, although there is still a definite (if thin) stratigraphic separation between the oldest pottery (5000 BP?) and the oldest beads (see Figure 5).

Monochrome glass beads, usually of rounded cylindrical or spherical shapes, comprised about 81% of the total beads recovered. The most common colour is translucent blue, followed by yellow and green with a few black, dark red and white. These beads, which appear to have been manufactured mostly by drawing, range between 2.5 and 6mm in diameter but are mostly between 3 and 4mm.

The shell disc beads (12.5% of the bead total) range between 5 and 14mm in diameter. Most occur in the same layers as the glass beads, but one was found alone about 15 cms below the lowest level of glass beads in 89A; this may mean that shell beads have a greater antiquity than glass in the site, as would be inferred from their general occurrence in Neolithic Southeast Asian and Oceanic prehistory.

Five beads fashioned from fish vertebrae were found in an upper level of EFG8. Four carnelian beads were also found down to about 20 cms in EFG8. Unique beads in the site include two granulated gold beads and one possibly made of a green-glazed ceramic material. Eight gold beads (described as cloth studs) similar to the two from Gua Sireh were recovered from the 'Tantric Shrine' at Bongkissam in Santubong, dated to the 13th-14th centuries AD (Harrisson and O'Connor 1970). The gold beads from Bongkissam and Gua Sireh could have been manufactured in Sarawak since gold deposits do occur in the region. However, very similar gold beads were also found by Casal in a pottery sarcophagus dating from perhaps 2000 BP in a site near Pondicherry in India (Casal 1956: Plate XXXA), so importation from outside cannot be ruled out. In addition, similar gold beads are known from eastern Negros (Solheim 1964: Plate 25) and have been found very recently in a looted burial site at Bukit Silam in southeastern Sabah (Peter Koon, Sabah Museum, pers. comm.).

(d) Metal objects

Metal objects have basically the same stratigraphic distribution in the site as the glass beads, and possibly first appeared about 2000 years ago. Most are poorly preserved and both cupreous metals and iron occur throughout. Recognisable pieces include fragments of iron knife blades and sections of cupreous rings and bangles. A fine barbed cupreous fishhook was also found in the top 5 cms of EFG8. Like the beads, many metal objects might have been placed in EFG8 as grave goods.

(e) Stone Materials

The paucity of good stone material in most parts of Sarawak is reflected in the meagre collection of stone artefacts from Gua Sireh. Neolithic stone tools were apparently found during the 1959 excavations (B. Harrisson 1960) but these have not been located. No stone adzes were found in 1989. Most of the 1989 finds were non-diagnostic pieces of quartz or volcanic rock, some of the latter being heat-spalled and probably not a result of tool use or manufacture. However, the main point to note is that the pre-pottery levels of 89A, below 60 cms, did produce seven definite quartz flakes and one core fragment. Four chert flakes (three with silica gloss) and two pieces of ochre were also found in the pottery-bearing layers. The lower flakes clearly render pre-pottery occupation of the site a certainty, together with the shell date ANU 7048 which came from beneath the lowest stone tools. The highly ephemeral nature of the pre-pottery and pre-rice occupation in the site, however, merits emphasis.

(f) Human burials

Fragmentary human bones were recovered in large numbers in EFG8 between 10 and 25 cms in depth, thus with a similar stratigraphic focus to the glass beads and metal items. Very few pieces of human bone came from 89A, and the conclusion is fairly obvious that the central part of the cave, around trench EFG8, was used for funerary purposes at a time perhaps centred on the first millennium AD.

As the bones were badly fragmented and eroded precise identification was impossible. Furthermore, they were scattered and mixed with other materials in undefined patterns, thus suggesting that they might have fallen down on to the cave floor from now-destroyed biers. As noted above, the layers in EFG8 were cut by many postholes. No burial containers such as coffins or jars now exist in the site, and no evidence of inhumation burial in the cave floor was observed during excavation. Some of the dead were probably wrapped in bark cloth as traces of this material were noted, especially in F8.

Dental remains belonging to at least 16 individuals have been identified in the material excavated from EFG8 by Peter Dowling of the Prehistory and Anthropology Department at ANU. The population had a high incidence of shovel-shaped incisors (91% of maxillary central incisors), perhaps suggesting that those buried there had fairly close genetic connections.

(g) The charcoal drawings in Gua Sireh

A large number of charcoal drawings occur in Gua Sireh on the southwestern rear wall of the main cave, on the hanging limestone curtain, and on the walls of the small chamber. It is estimated that about 36 linear metres of cave wall have been decorated. The drawings occur mostly between 1 and 3 metres above the cave floor and they range between 10 cm and 1.5 m in height.

The drawings comprise both figurative (85%) and non-figurative (15%) designs. The former consist mainly of anthropomorphic figures with triangular bodies, either filled or

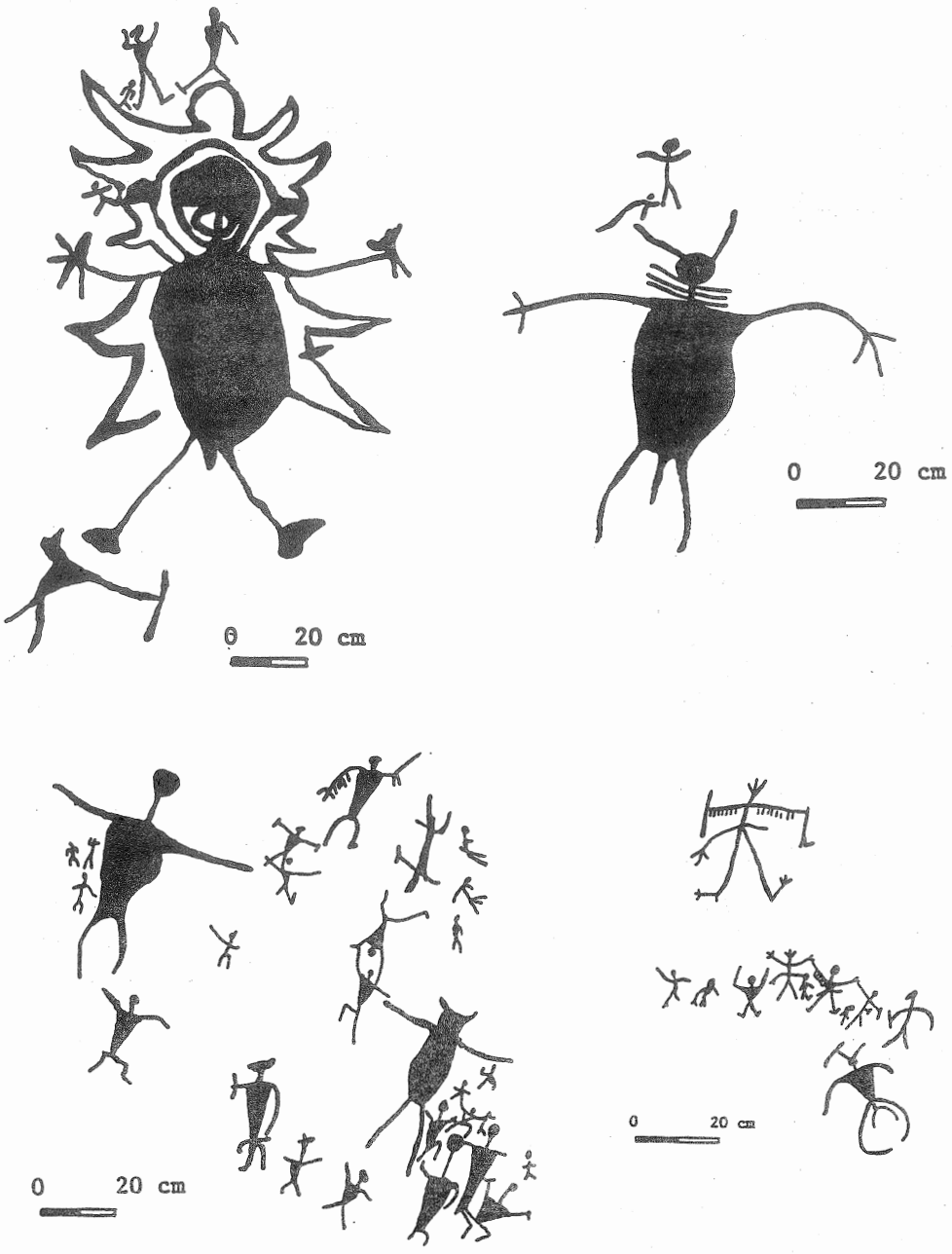


FIGURE 6: CHARCOAL DRAWINGS IN GUA SIREH

Top; large figures, possibly wearing cloaks or animal skins. Bottom left; wrestlers (?) and other human and animal figures. Bottom right; processing humans, some with headdresses and other adornments

unfilled. Some figures wear spiky head-dresses and hands are sometimes held outstretched or upraised. Some hands have digits. A few figures appear to be armed with objects such as shields, knives and spears. Some scenes show animals being hunted and perhaps butchered. The non-figurative motifs are rare and have no diagnostic features.

In general, many drawings seem to be depiciting familiar activities such as hunting, butchering and fishing. Other scenes include fighting, dancing and possibly processions or ritualistic ceremonies. In the latter, figures with head-dresses and adornments hanging from their arms might have been ceremonial leaders.

Two large figures (Figure 6), one about 1.5 m and the other 68 cms in height, perhaps represent deities or totemic symbols on account of their large sizes and bulbous body shapes. Solheim (1983:39) also regarded the larger of the two as a supernatural personage. It is also possible that the drawings might have had some funerary significance, given the quantity of human bone excavated from EFG8. Close correlations of artistic style and technique are only apparent with other Sarawak sites, and no definite resemblances can be posited with other rock art sites in Southeast Asia. The exact dating of the Gua Sireh art is not known but it is presumably at least 100 years old, and could of course be very much older. A more detailed description of this art is given by Datan (1990).

LUBANG ANGIN (WIND CAVE)

Lubang Angin, located above the left bank of the Melinau River, is one of the many limestone caves found in the Gunung Mulu National Park, which is situated about 90 kilometres inland from the South China Sea and about 160 kilometres northeast of Niah. The Mulu caves were explored speleologically by Wilford in 1950 (Wilford 1964) and by the Royal Geographical Society and Sarawak Government Joint Expedition in 1977-80. Prior to the 1989 work in Lubang Angin no previous archaeological excavation had been undertaken in the Mulu region.

The archaeological site itself is actually a smaller opening above the main Lubang Angin cave mouth. During the March 1989 excavation (by Edmund Kurui of the Sarawak Museum) three test trenches, each of 3 x 3 feet, were laid out and labelled LA1, LA2, and LA3 (Figure 7). Only LA1 and LA2 were excavated at this time, in arbitrary levels of 3 inches. During the July 1989 excavation most attention was devoted to the previously unexcavated trench LA2. Eventually, a total area of 3 x 9 feet (almost 1 x 3 metres) was fully excavated to beneath the cultural layer. Excavation was conducted in arbitrary levels of 5 cm until burial deposits were encountered, whereupon attempts were made to locate the contours of the burial pits. Owing to post-depositional soil processes, however, such burial pits remained quite invisible. As at Gua Sireh, all excavated materials were sieved through a 2 mm mesh.

The osteological and cultural materials in Lubang Angin came from two original sources: sub-surface inhumation burials and on-surface grave goods. The latter often became broken in antiquity and fragments were incorporated in the fills of later graves, thus causing artefactual chaos in stratigraphical terms. Because of the absence of

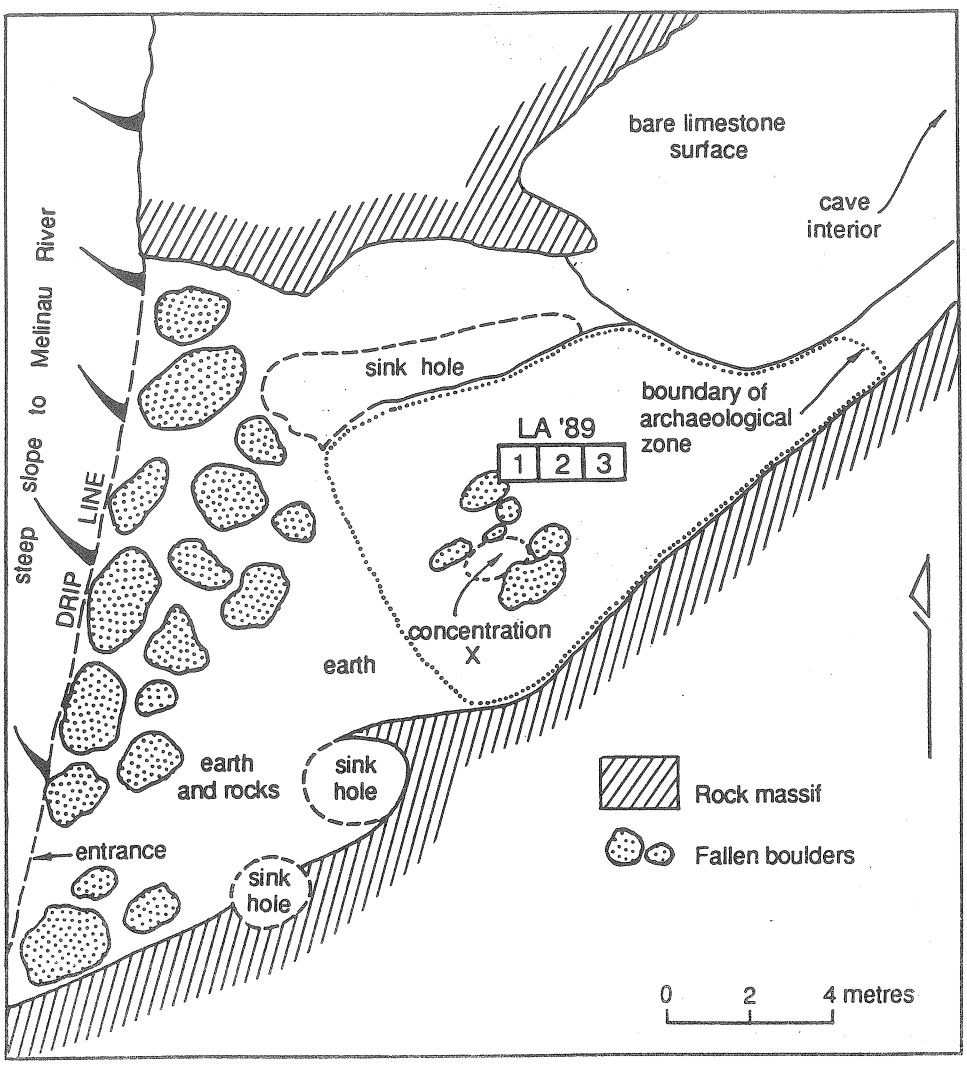


FIGURE 7: PLAN OF LUBANG ANGIN, SHOWING THE 1989 TRENCHES 1-3

stratigraphic layers and visible grave pits the artefacts could only be analysed as a single assemblage undifferentiated in time. Luckily, of course, the artefact assemblage is remarkably homogeneous and probably does represent only burial activity by a community of related persons over several centuries. The cave was never used for habitation purposes and no traces of hearths or even charcoal were found.

The pottery from Lubang Angin

Only local earthenware pottery was recovered from Lubang Angin. The excavated sherds probably represent a fairly small number of originally-complete vessels placed as grave goods on the floor of the cave above the inhumation burials. Four main classes of decorated vessel occur, the first being the "three-colour ware" which was first recorded from the Niah Caves (Harrisson 1958). The three colours are red (haematite?), black (charcoal?) and the natural colour of the pot surface, usually in the pale orange/brown/grey range. The Lubang Angin three-colour sherds have similar motifs to those from Niah, including some splendid angular meander or curvilinear patterns outlined by bands of two or three parallel incised lines filled with black pigment. Stamped circles, short incised dashes or punctate dots fill the interiors of the incised designs, which are also emphasised by red paint applied to the intervening unmodified surfaces. The three-colour ware vessels range in size from small to very large, the latter being massive carinated urns with rim diameters up to 30 cms.

The other three classes of vessel decoration, all fairly undistinguished after the ebullience of the three-colour ware, are simple incised with no painting (rare), carved-paddle impressed (rare), and cord-impressed (quite common). The paddle-impressed sherds have both parallel ribbed and checked patterns. Unlike Gua Sireh, there is no basket-marked decoration from Lubang Angin, and rims are never notched, always plain.

In addition to the above four decorative classes, most of which occur on restricted vessels of storage or cooking types, there are also some unusual earthenware appendages. These include two single spouts and two small modelled sambhur deer heads (Figure 8). The heads were doubtless affixed to the side of a pot or lid, perhaps as handles. The site also produced three double spouts (Figure 8), virtually identical to Harrisson's Type 1 double-spouted vessels from the Niah sites (Harrisson 1971). The occurrence of these vessels in Lubang Angin, some 160 kilometres northeast of the Niah Caves, is interesting because they had previously only been found in the Niah sites. It is also of interest to note that similar double-spouted vessels, approximately contemporary (c.2000 BP) with those from Sarawak (see below), have been found in the Admiralty Islands of Papua New Guinea, about 3800 kilometres to the east (Kennedy 1982:27). The Admiralty vessels, however, have finger-nail and shell impressions on their shoulders, necks and spouts whereas the Sarawak examples are entirely plain. The precise implications of these similarities remain uncertain.

Neutron activation (NAA) and X-ray diffraction analyses of some sherds of Niah and Lubang Angin pottery[4] indicate that the three-colour ware and double-spouted vessels were manufactured in more than one place. The results of these analyses are being prepared for publication elsewhere, but preliminary observations indicate that the Lubang Angin pottery was all made in one geological zone, perhaps within walking distance of a single potting village, although the results are not homogeneous enough to suggest one single clay source. The Niah fabrics are different from those of Lubang Angin on NAA readings and no trade of pottery between these two regions can be documented. The Niah pottery (West Mouth and Lubang Tulang) has at least two rather different

geological source regions. Some of the three-colour sherds from Lubang Angin contained aragonite, presumably from marine shell, thus indicating a coastal place of manufacture, perhaps near the lower Baram River.

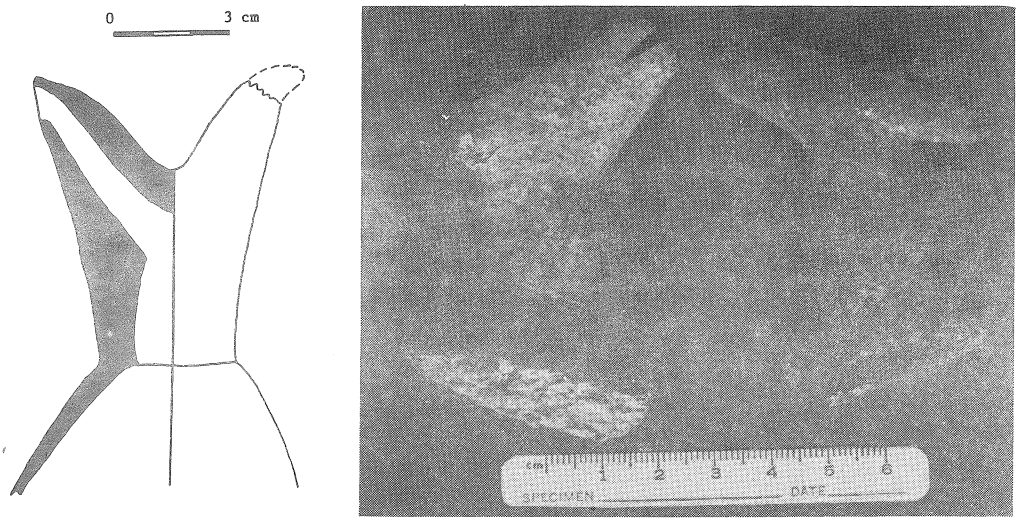


FIGURE 8: A DOUBLE SPOUT AND TWO DEER HEAD APPENDAGES FROM LUBANG ANGIN

The human burials in Lubang Angin

During the July 1989 excavation at least seven poorly-preserved individual primary burials were found, buried at depths between 20 and 70 cms below the cave floor. They resemble many of the burials excavated in the Niah Caves (Harrisson 1967) in the manner of placement. Three burials were definitely extended, one was flexed and one was possibly secondary. The others were uncertain owing to severe disturbance by successive grave digging in the same area. Several burials were placed on or wrapped in bark cloth, clear traces of which often remained beneath and alongside the bones. Most of the extended burials had their heads placed towards the cave interior, as at Niah, although one had its head pointing towards the cave mouth.

No complete grave goods were found with any of these burials, hence the assumption that the goods were originally placed on the cave surface, an assumption supported by the fact that sherds of several separate vessels were scattered widely over the surface of the site and right through the stratigraphic profile. However, some of the small grave goods such as beads might have been buried directly adjacent to the dead. It is worthy of mention that 46 glass and shell beads were found in Lubang Angin, of types identical to those from Gua Sireh. Two fragments of an iron knife were also found.

Dating

Four radiocarbon samples, one conventional and three AMS, were dated from Lubang Angin (see footnote 2 for credits). They are listed in Table 2. The *Batissa* marine shell dated as ANU 7044 (one of two found in the site) came from a depth of 40 cms in LA3; it was not associated with a definite burial but it obviously belongs to the assemblage as a whole. If one removes the recommended oceanic reservoir correction for Australia (450±35 years; no exact correction is available for the Sarawak region) as recommended by the ANU Radiocarbon Laboratory, this date becomes 2570±106 bp. The AMS dates, all on human bone from the burials, are slightly younger, but not significantly so. ANU 7044 actually overlaps with CAMS 729 at the two sigma range, and an overall span of time

Lab. No.	Radiocarbon age bp	Calibrated date, one sigma range*	Material and provenance
ANU 7044	3020±100**	-	Marine *Batissa* shell, LA3, 40 cm
CAMS 727	1650±90	1693(1545)1420	Human bone
CAMS 728	1960±90	2041(1922)1826 (1905) (1899)	Human bone
CAMS 729	2200±120	2349(2302)2049 (2255) (2185)	Human bone

* University of Washington Quaternary Isotope Lab. Radiocarbon Calibration Program 1987 Rev. 2.0.

** After removal of Oceanic reservior correction (see text) this date becomes 2570±106 bp.

TABLE 2: RADIOCARBON DATES FOR LUBANG ANGIN

for burial activity at Lubang Angin, together with the associated three-colour ware and double-spouted vessels, falls between about 1000 BC and AD 500, presumably with glass beads and metal appearing in the later phases. This range is in accord with dates for these types of pottery from the Niah Caves, despite problems with ascertaining the precise contexts of much of the Niah material (Bellwood 1985:256-7).

SUMMARY OF RESULTS

Gua Sireh proved to be an important site which has yielded evidence of pre-pottery habitation by foragers as early as 20,000 years ago. The site would have been about 500

kilometres inland at that time, during the glacial maximum, a certain indication that some inland parts of the rain forest of Borneo were at least exploited then. However, glacial maximum environmental information for this part of lowland Southeast Asia is still wanting, particularly concerning the extent and species composition of the forest cover.

After about 5000 years ago the human picture at Gua Sireh began to change, perhaps owing to the colonisation of riverine and coastal parts of Borneo by Austronesian-speaking agriculturalists. The new arrivals, whoever they were, clearly introduced pottery and rice cultivation to the region. They also maintained coastal contacts, as evidenced by the presence of marine shellfish in the site. By 2000 years ago the cave was being used for burial purposes and the users had access to both glass beads (imported?) and cupreous and iron tools and ornaments. The Chinese ceramics in the site are few and rather late when compared to the materials recovered from coastal Sarawak sites.

The excavations in Lubang Angin unearthed three-colour ware, double-spouted vessels, glass beads, marine shells and an iron knife, all belonging to a burial assemblage with very precise parallels in the Niah sites. These assemblages, both at Lubang Angin and in the Niah sites, can be dated overall to between about 1000 BC and AD 500. Presumably the component artefacts will reveal some stylistic change over time if they are ever found in clearly stratified deposits, but such are unlikely to survive in burial caves of the Niah and Lubang Angin type.

In retrospect, the discoveries at both Gua Sireh and Lubang Angin exceeded prior expectations. Further research in both areas is clearly warranted, and the analysis of the earlier excavated finds from Gua Sireh will probably produce even more surprises.

FOOTNOTES

1 Ipoi Datan's MA thesis (Datan 1990) describes the 1989 research; the results of the earlier excavations still have to be reconstructed.

2 We wish to thank John Head of the ANU Radiocarbon Laboratory for dating the conventional samples, and Richard Gillespie of the Department of Biogeography and Geomorphology at ANU for preparing the AMS samples and arranging for their dating at the Livermore laboratory in California.

3 We are grateful to Gill Thompson of the Prehistory Department at ANU for help with identifying these rice remains.

4 The neutron activation analyses were carried out by Bruce Chappell and Roy Doyle of the Geology Department at ANU, using the facilities of the Australian Nuclear Science and Technology Organisation at Lucas Heights. The X-ray diffraction was carried out by Chris Fodoulis and Tony Eggleton, also of the Geology Department at ANU.

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