

## ARCHAEOLOGICAL RESEARCH IN THE MADAI-BATURONG REGION, SABAH

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This preliminary report describes in outline the results of archaeological excavations undertaken in the Madai and Baturong regions, inland from Kunak on Darvel Bay, Sabah, between 1980 and 1984. The excavations were undertaken by staff of the Sabah Museum in Kota Kinabalu, together with the author, who was supported by an Australian Research Grant. I wish to acknowledge the following persons and institutions whose assistance has been central to the success of the project; Curator David McCredie<sup>1</sup> and staff Peter Koon and Madeleine Piper of the Sabah Museum, Johann Gabnor and the Idahans of Madai, the Mostyn Palm Processing Company (now Borneo Abaca Ltd), the Earl of Cranbrook, Dr Philip Hughes, and the Radiocarbon and Thermoluminescence dating laboratories of the Australian National University. The full list of helpers runs well into double figures, both in Sabah and in Australia, and I hope I am doing no one a disservice by retaining the full list for the final report.

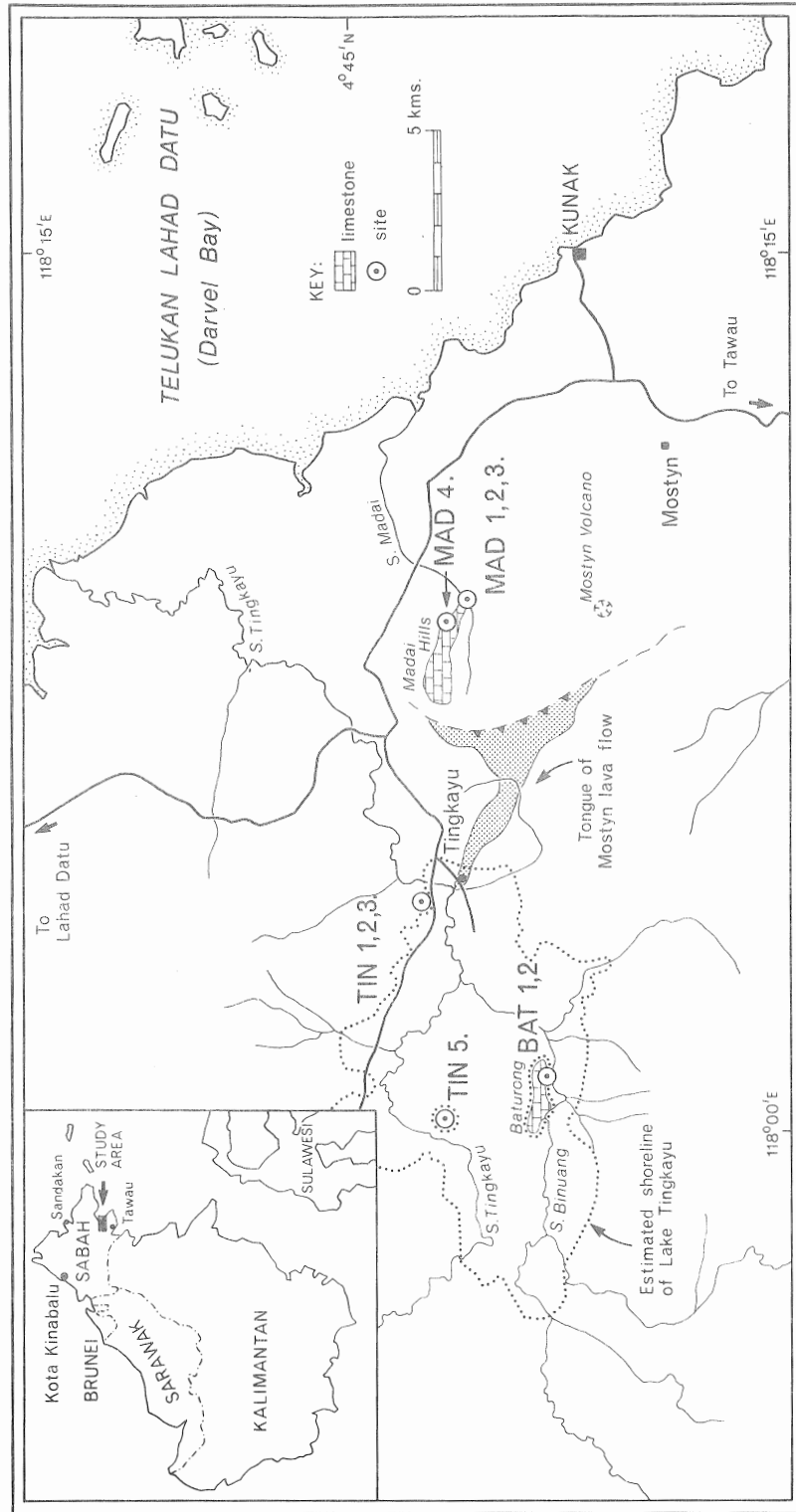
### THE REGION.

Figure 1 shows the study region, which is covered by the Mostyn and Sungei Tingkayu map sheets (1:50,000), and the Upper Segama and Darvel Bay geological map (1:125,000), both published by the Malaysian Directorate of National Mapping. Most of the archaeological sites are found in two Mesozoic limestone massifs, Madai and Baturong, both of which contain complex networks of solution tunnels which often emerge to the open air as dry habitable caves and rock-shelters. Baturong is in turn surrounded by a large area of water-laid deposits which are presumed to have been laid down in the bed of an ancient lake ("Lake Tingkayu").

The Madai massif today rises out of the surrounding Chert-Spillite sedimentary and volcanic formation of Cretaceous-Eocene age, while the belt of territory south of Madai, from Kunak inland through Mostyn, consists of Pleistocene olivine basalt lavas. One of these lava flows caused the blockage which gave rise to the Tingkayu lake sediments further inland, which are in turn surrounded by the extensive Kuamut sedimentary formation of Tertiary age. Archaeologically, the widespread sedimentary chert deposits of the region are of great importance since they provided the raw materials for stone tool manufacture.

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NOTE 1. David McCredie was tragically killed in a road accident in January 1984; without his enthusiastic support the project would never have commenced. The present Curator of the Sabah Museum, Anwar Sullivan, has continued this support, and some of the archaeological finds mentioned here are now on display in the magnificent new museum building in Kota Kinabalu.



A.N.U. 1982

Figure 1. Map of the Research Region.

In the following pages I will describe our main results, proceeding from the oldest sites to the youngest. To date, the Radiocarbon Laboratory at ANU has processed 31 dating samples, and the Thermoluminescence Laboratory has processed a further eight. Because some of these dates are still provisional I will only give date estimates in this paper, but it is important to note that all the radiocarbon results are consistent with stratigraphic considerations, and none of the major sites show signs of any great stratigraphic disturbance.

#### THE LAKE TINGKAYU SITES

On Figure 1 I have attempted to show approximate boundaries of the old Lake Tingkayu, as identified by soil and geological surveys and by fieldwork utilising levelled transects and contour information carried out in December 1981 with Philip Hughes. The lake, which may have covered up to 100 square kilometres, was formed when a lava tongue from the flank of Gunung Mostyn filled up an old course of the Tingkayu river, thus impounding the waters until they rose and overflowed through a low point a little to the north of the old course, just to the north of the Tingkayu plantation village on the map (for details see Paton 1963:13-16). The boundaries reflect a maximum lake extent based on the reconstructed altitude of the original overflow point, prior to outlet downcutting and eventual drainage.

The date of formation of the lake is probably indicated by a radiocarbon determination of  $28,300 \pm 750$  B.P. (ANU 3444A) from charcoal sealed beneath the end of the lava flow, which outcrops into the side of the exit gorge near Tingkayu village. In addition, very weathered water-laid sediments at the base of the Hagop Bilo shelter in the Baturong massif (see below) were apparently exposed to sub-aerial weathering as a result of the draining of the lake some considerable time before 17,000 years ago (John Magee, personal communication). These dates are highly significant because a number of open sites lie directly on the shoreline of the old lake, and on locational grounds they may be considered as contemporary with the lake-full stage, and thus between 28,000 and 17,000 years old (probably towards the older end of this range).

The major lake-edge sites, labelled TIN 1-3 on Figure 1, lie close together on a small promontory which juts into the old bed close to the lake outlet. Another site, TIN 5, lies on top of what must once have been a small island - today it is a hill amongst the oil palm plantations which occupy the western half of the old lake bed. TIN 1 has been mostly destroyed by the road bulldozing which led to initial discovery of the site, but TIN 2, excavated in 1980 and 1984, contained a manufacturing floor for the bifacial tools which characterize the Tingkayu industry. Unfortunately, the acid forest soil in which these sites lie has left no trace of bone, although it is hoped that charcoal fragments from the stone tool layer in TIN 2 can be dated in the near future.

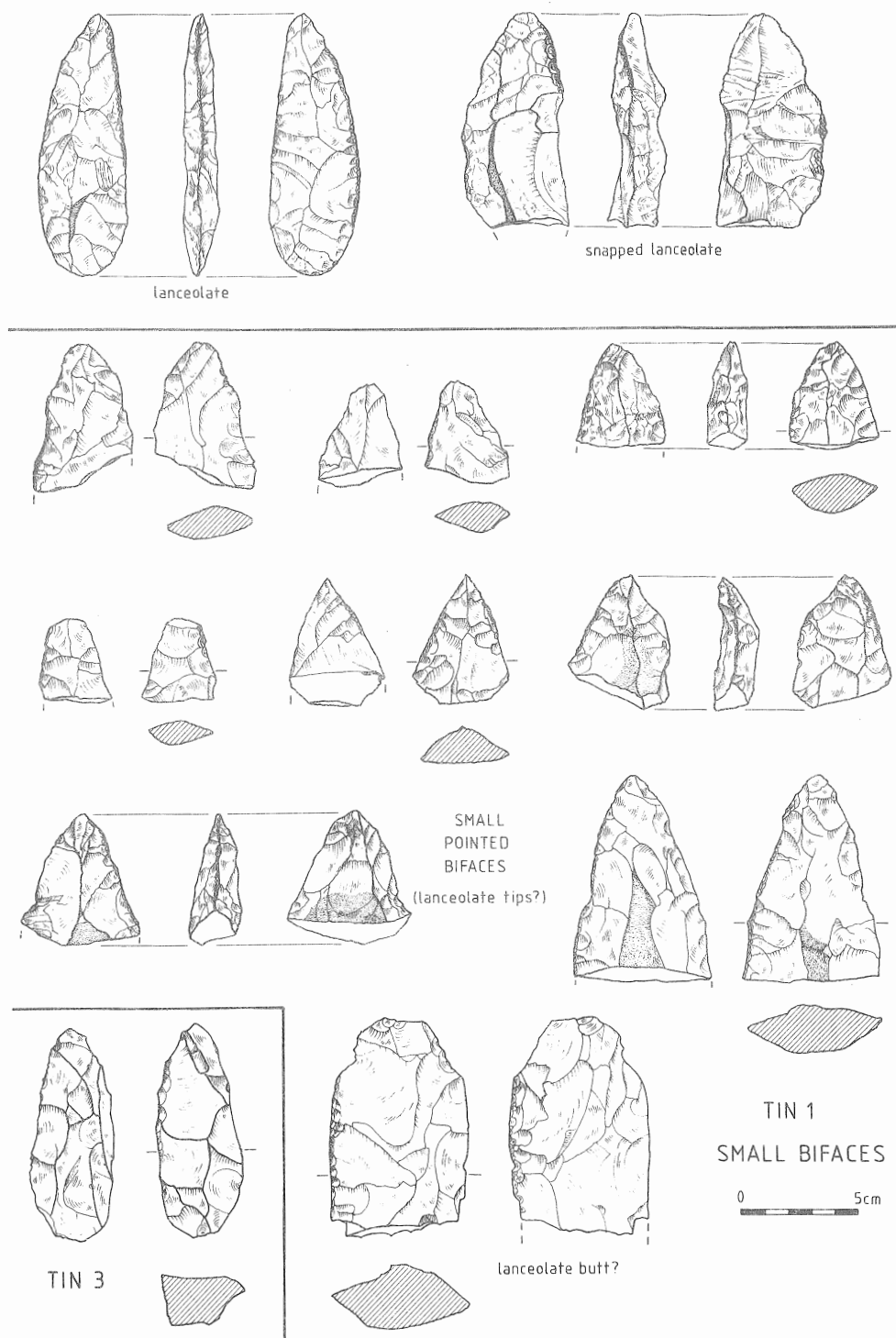


Figure 2. Lanceolates and Small Pointed Bifaces, Tingkayu Sites.

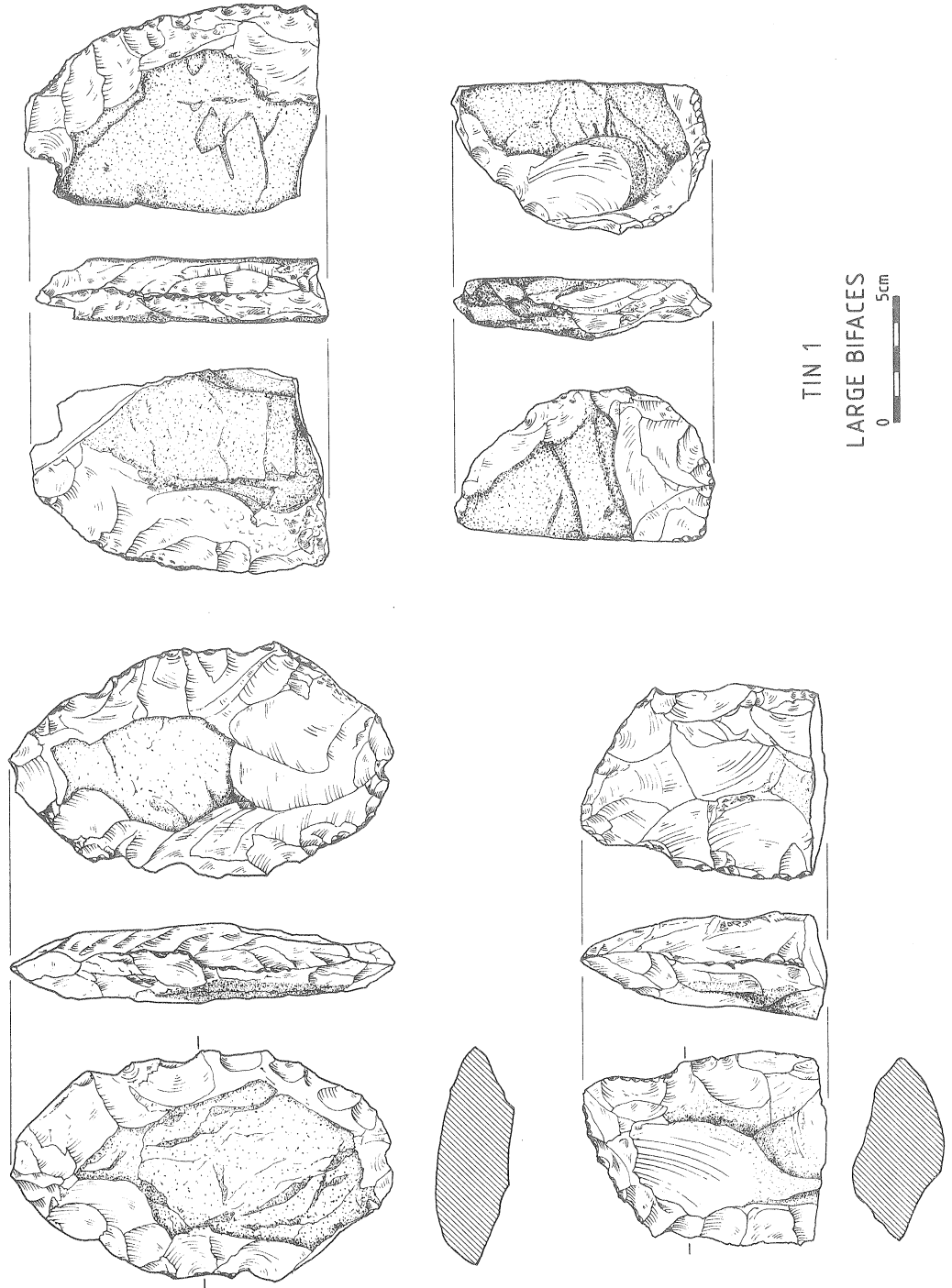


Figure 3. Large Tabular Bifaces from Tingkayu.

The Tingkayu stone industry (Figures 2,3) shows a unique level of skill for its time period in Southeast Asia, and the tools are mostly made on a locally quarried tabular grey chert (the precise source is not known, and may no longer exist, or it may be buried somewhere in the vicinity of the site), together with a few riverine pebbles of brown chert. The basic aspects of the industry are not exceptional, and comprise a range of large pebble tools, multi-platform and single-platform (horsehoof) cores, and utilised flakes. However, many of the tabular blanks were worked into large bifaces, and into smaller and quite remarkable lanceolate knives. Only one of the latter has been found complete (in TIN 1: Figure 2, top left), and it has very fine surface flaking, but broken segments and points with varying degrees of finish are common. In TIN 2 several broken lanceolates (one example being 17.5 cm long) and other bifaces have been excavated together with their manufacturing debris. The use-wear which occurs on a few of the lanceolates from TIN 1 suggests utilization of mainly the side edges, despite the overall pointed shapes. Hence, they could have served combined functions as projectile points and knives.

Precise extents of the individual Tingkayu sites are difficult to determine owing to the extent and depth of road bulldozing. The surviving areas of tool distribution in TIN 1 and 2 cover at least 100 square metres apiece, but the 120-metre long intermediate zone between the two sites has been incorporated into the modern road. Although there are no traces of any sites in this zone now, the prior existence of other working floors cannot be entirely ruled out. Indeed, TIN 3 may be simply an extension of TIN 2, from which it is separated by a 20-metre strip of deep bulldozing, and it is possible that these two sites once belonged to a single unit with a total area of possibly 800 square metres.

After the lake drained, the Tingkayu sites were apparently abandoned. It is unfortunate that they have yielded no direct economic evidence, and it can only be surmised that subsistence activities were focussed on the lake and its shores. The other enigma of these sites is that their characteristic bifacial tool morphology never appears again in the Sabah (or even the whole Southeast Asian) prehistoric record, as far as current evidence indicates. Future research may produce other industries of this type, but for the present the Tingkayu sites have introduced a totally unexpected level of lithic skill into the Southeast Asian archaeological scene.

#### HAGOP BILO (BAT 1) (17,000 to 12,000 years ago)

During the lake period, the Baturong massif formed a towering limestone island, and the rock-shelters along the base of its southern cliff were all drowned. Hagop Bilo is one of these shelters, which today lies very close to the course of the Binuang river, and its basal and culturally-sterile lacustrine sediments are overlain, after

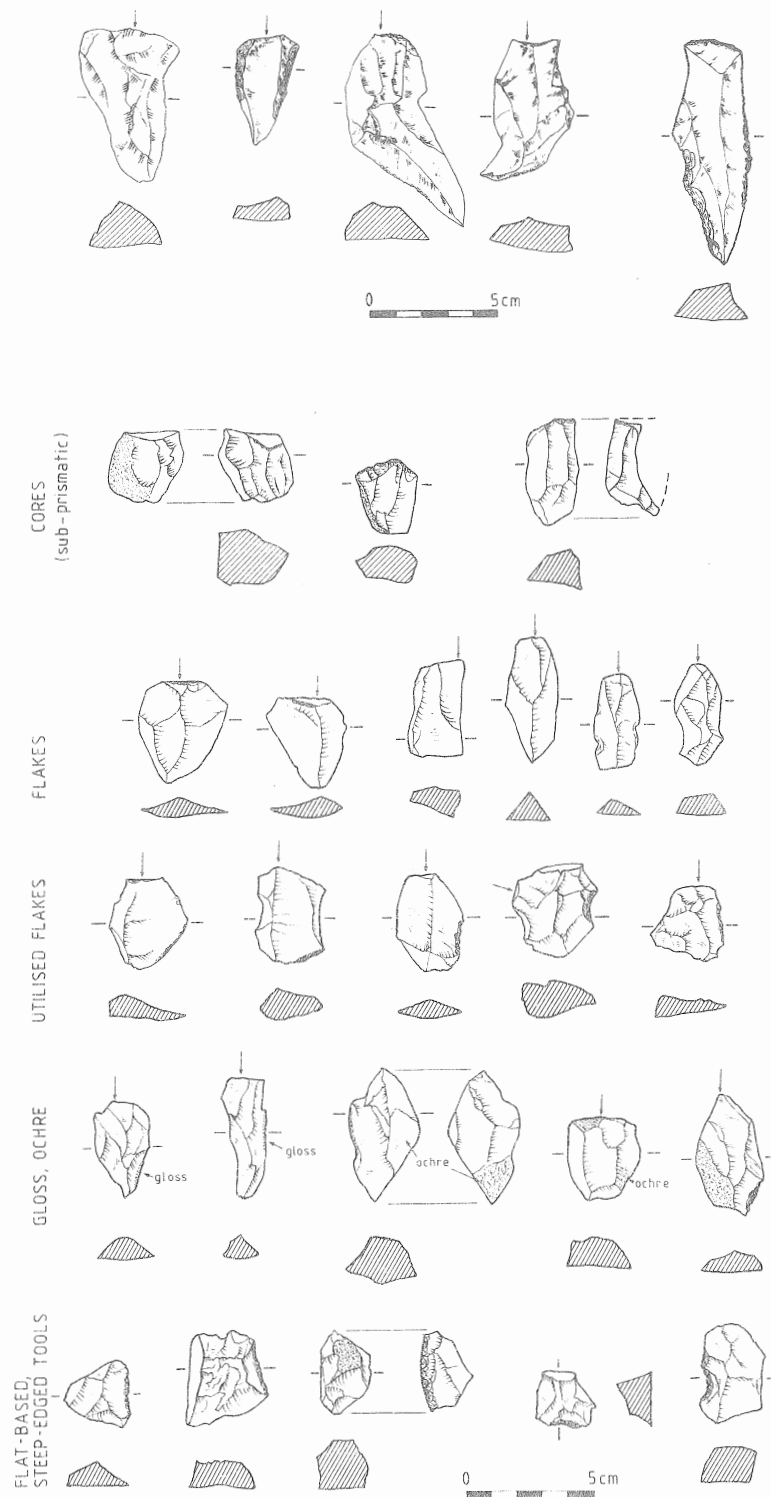


Figure 4. Hagop Bilo (17,000 - 12,000 B.P.): Selected Stone Tools. Those in the unlabelled top row are long blade-like tools.

a long break characterised by considerable weathering, by midden deposits in riverine alluvium dating between about 17,000 and 12,000 years ago. These midden layers contain mainly three species of riverine gastropods in the genera Balanocochlis, Sulcospira and Brotia, and marine shells are absent. The animal faunas, provisionally identified by the Earl of Cranbrook, include pig, sambhur, mouse deer, porcupine, monkey, rat, snake, tortoise, monitor lizard, birds, fish, and probably other small unidentified species. The stone tools of this period lack the bifaces, and comprise a fairly typical Indo-Malaysian pebble and flake industry with single- and multi-platform cores, utilised flakes, and flat-based and steep-edged domed scraper-like tools, all flaked from riverine pebbles of brown chert. Characteristics of some interest include a class of long blade-like knives (Figure 4 top), perhaps functional descendants of the Tingkayu lanceolates, and also the presence of an opal phytolith gloss on some tool working edges. The gloss is widely reported from other sites of this period and later in Southeast Asia, but was absent in the Tingkayu industry where open situations may not have been conducive to its survival, had it once existed. Another tool of interest from Hagop Bilu is a large bone spatula, similar to those from Niah and Gua Lawa, and pieces of scratched hematite were also recovered.

Soon after 12,000 years ago the Hagop Bilu shelter was in turn abandoned. The absence of marine shells in the deposits might suggest that its inhabitants were mainly inland dwellers, and with the shoreline perhaps 100 kilometres away at the beginning of occupation this interpretation is clearly sensible. However, by 10,000 years ago the coastal environment had undoubtedly moved significantly towards the Madai-Baturong region.

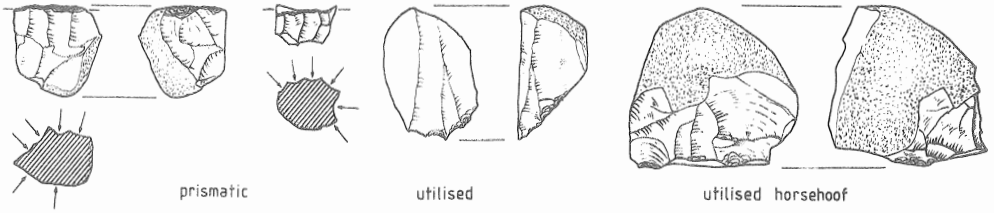
#### MADAI DURING THE EARLY HOLOCENE (11,000 to 7000 years ago).

The Madai massif is literally riddled with caves, as is Baturong. Most, of course, are dark, wet and partly filled with bird and bat guano. Some of these gloomy caverns were used for burial purposes after 2000 years ago, but the massif also has a set of caves at its eastern end, usually called 'the Madai caves', which provide excellent dwelling conditions where they meet the open air. The largest of these caves (Agop Atas, MAD 1) today contains a substantial Idahan village occupied seasonally for birds'-nesting activities. Above MAD 1 lies the smaller Agop Sarapad (MAD 2); both these caves were intensively inhabited by hunters during the early Holocene, between 11,000 and 7000 years ago (see Harrisson 1971:85-91 for earlier excavations in Agop Atas).

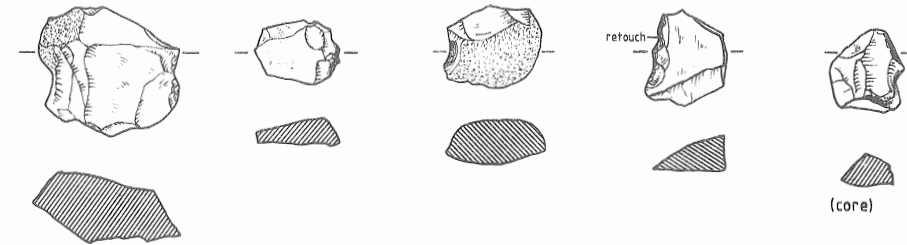
By 10,000 years ago the sea-level had risen considerably from its late glacial low-point, and coastal resources may have lain within an easy day's walk from the Madai caves. So people may have abandoned Hagop Bilu for Madai at this time. But there remains a problem, for the massive Madai caves, against expectations, show no sign of any



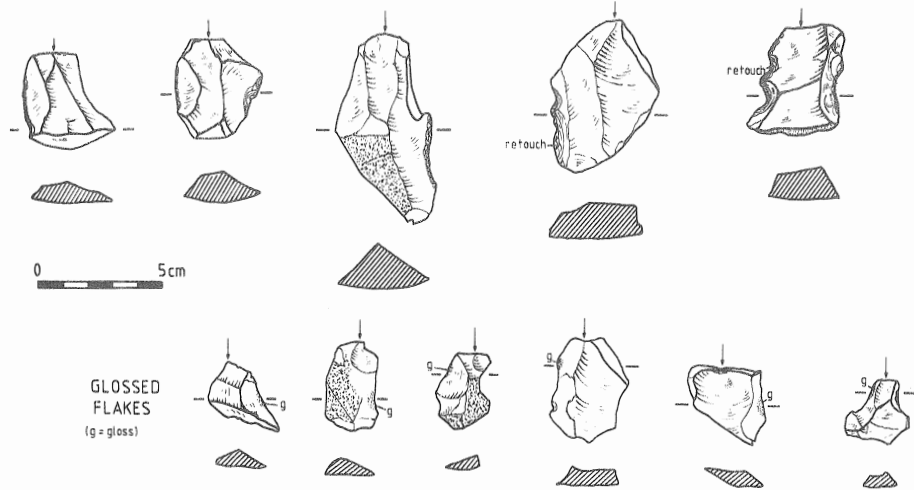
CORES



UTILISED CHUNKS



UTILISED FLAKES



HAMMERSTONES  
(volcanic pebbles)

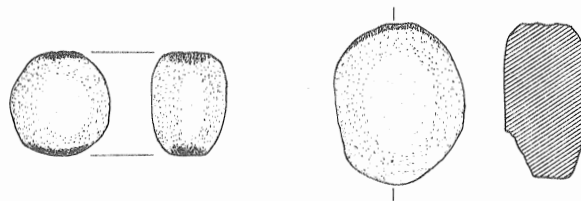


Figure 5. Agop Sarapad (11,000 - 7000 B.P.): Selected Stone Tools.

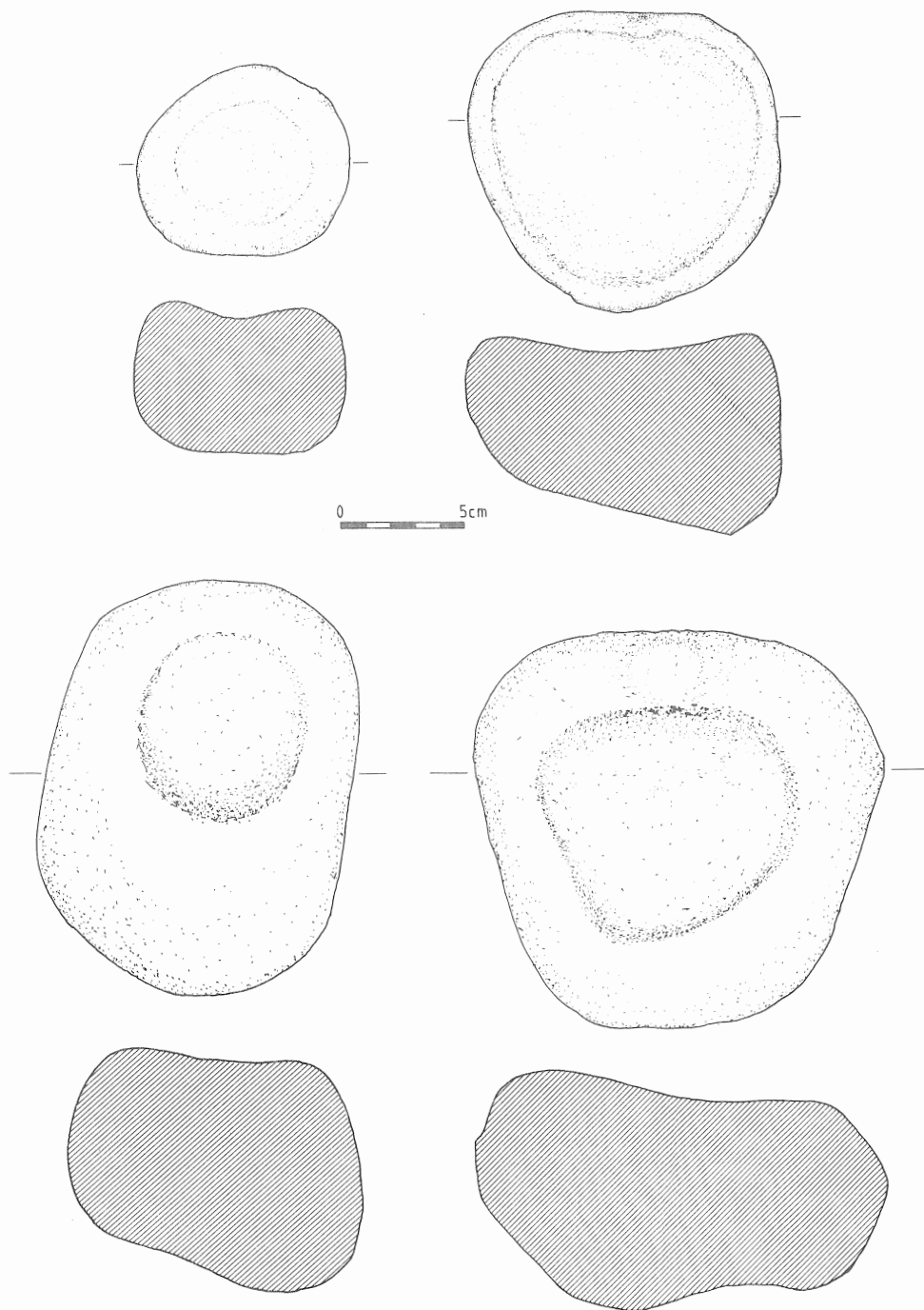


Figure 6. Agop Sarapad: Pitted Anvils or Mortars.

human occupation before 11,000 years ago. The reasons for this are unclear, but perhaps the caves were not conveniently exposed to the open air until the end of the Pleistocene, and prior to this time they may have been at least partly buried as underground passages at the base of the great Madai cliff, which was mantled to a higher level than now by sediments of the Chert-Spilite formation. In other words, the present landscape outside the Madai caves may have been formed by the tremendous power of equatorial erosion within the last 10,000 years. It is true that there are unplumbed depths of bird and bat guano beneath the human deposits in the caves, but access to the system for these creatures may have been elsewhere; there are many high level openings.

The early Holocene human deposits in MAD 1 lie in a very acidic guano deposit, and, as at Tingkayu, only stone tools survive with some charcoal, all animal bones having totally dissolved. But the MAD 2 cave has much better conditions, for here the people deposited a large shell midden which has created and maintained its own alkaline environment; bone survives in quite good condition, although both caves are too damp for any uncharred plant organic matter to have survived. The MAD 2 midden thus tells the best story, and this has yielded thousands of stone tools of local river pebble chert, of an industry similar to that from Hagop Bilo but lacking the blade-like knives (Figure 5). Basically, this is an island Southeast Asian cave industry par excellence, with a heavy emphasis on pebble tools, large steep-edged tools, multi-platform and horsehoof (single-platform) cores, and utilised flakes, many of which have glossed edges. A number of large pitted anvils or grindstones occur (Figure 6), some coated with red ochre, and hammerstones are also common, either for stone tool making, or for food or ochre preparation on the anvils.

The food remains in the midden now include many shells of the estuarine mangrove bivalves Batissa and Anadara, and clearly the inhabitants were visiting the encroaching coast frequently. Most shells, however, are of the three same riverine gastropod species which were eaten at Hagop Bilo. The animals hunted were also similar, with the additions of larger creatures such as the orang utan, cattle, and two species of rhinoceros; these appear to have been absent at Hagop Bilo, but the small sample size and the provisionality of the identifications makes this uncertain. One important result of the faunal identifications carried out by the Earl of Cranbrook (in press) concerns the presence of both the Javan rhinoceros (Rhinoceros sondaicus) and the Sumatran species (Dicerorhinus sumatrensis) in the MAD 2 deposits. The former has not been previously reported from Borneo, and it apparently became extinct, at least in the Madai region, during the Holocene. Concerning bone tools, MAD 2 has produced only one point, and the scarcity of bone tools both here and at Hagop Bilo contrasts sharply with the situation at Niah in Sarawak. This may be a reflection of the much better stone resources available around Madai and Baturong, and we also have to allow for an unknown component of the tool kit in bamboo and hard woods.

After 7000 years ago the two Madai caves ceased to be frequented, and I am unable to see any clear explanation for this, except to suggest that the inhabitants may have moved to a coastal location, or perhaps camped elsewhere in an unexcavated part of the cave system. However, I have seen no other caves suitable for long-term habitation in the massif, and this may imply that the population moved away to settle elsewhere.

THE MADAI NEOLITHIC (ca 4000 to 2500 years ago).

After 7000 years ago the cave of MAD 2 was never again occupied, although jar burials were placed within it during the first millennium A.D. In MAD 1 a layer of guano and rockfall, sterile of traces of human occupation, was laid down over the earlier deposits, and then follows a thin and restricted band of human occupation dated to between 4000 and 2500 years ago from radiocarbon and thermoluminescence analyses. The only cultural remains in this layer consist of pottery, simple and thin-walled vessels, often with an unburnished red-slip or with surface paddle impressions (Figure 7) plus a few stone tools in the earlier Madai tradition.

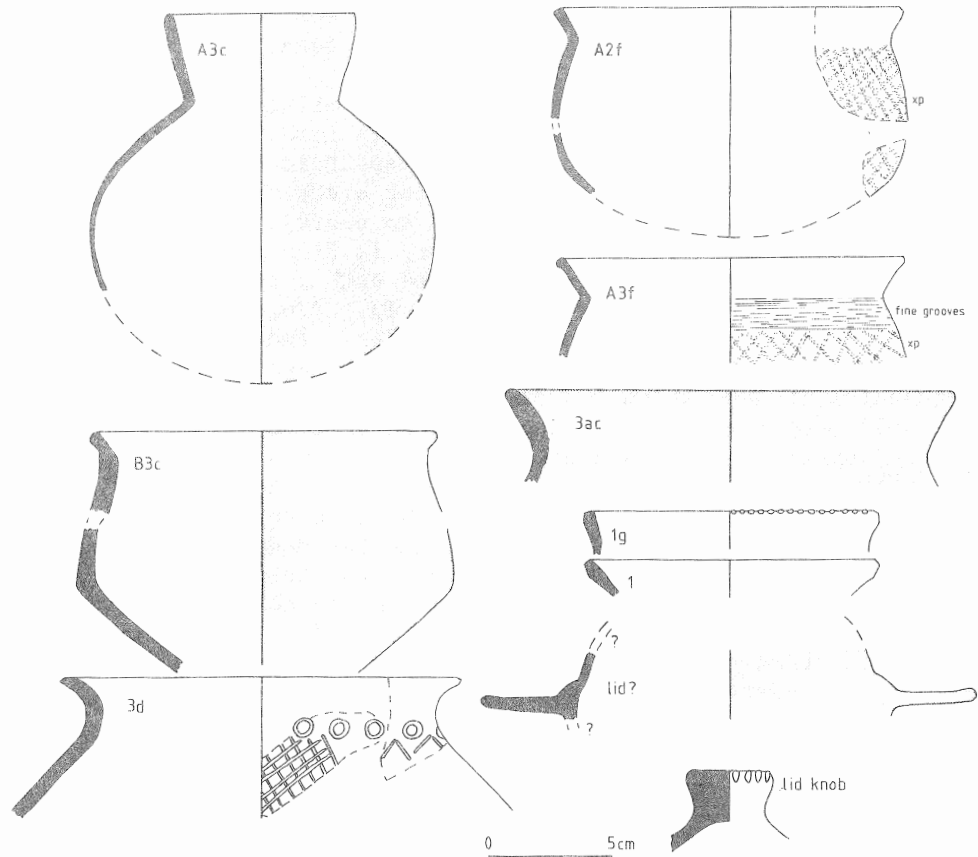


Figure 7. Neolithic Pottery from Agop Atas (MAD 1). Shading = Red Slip.

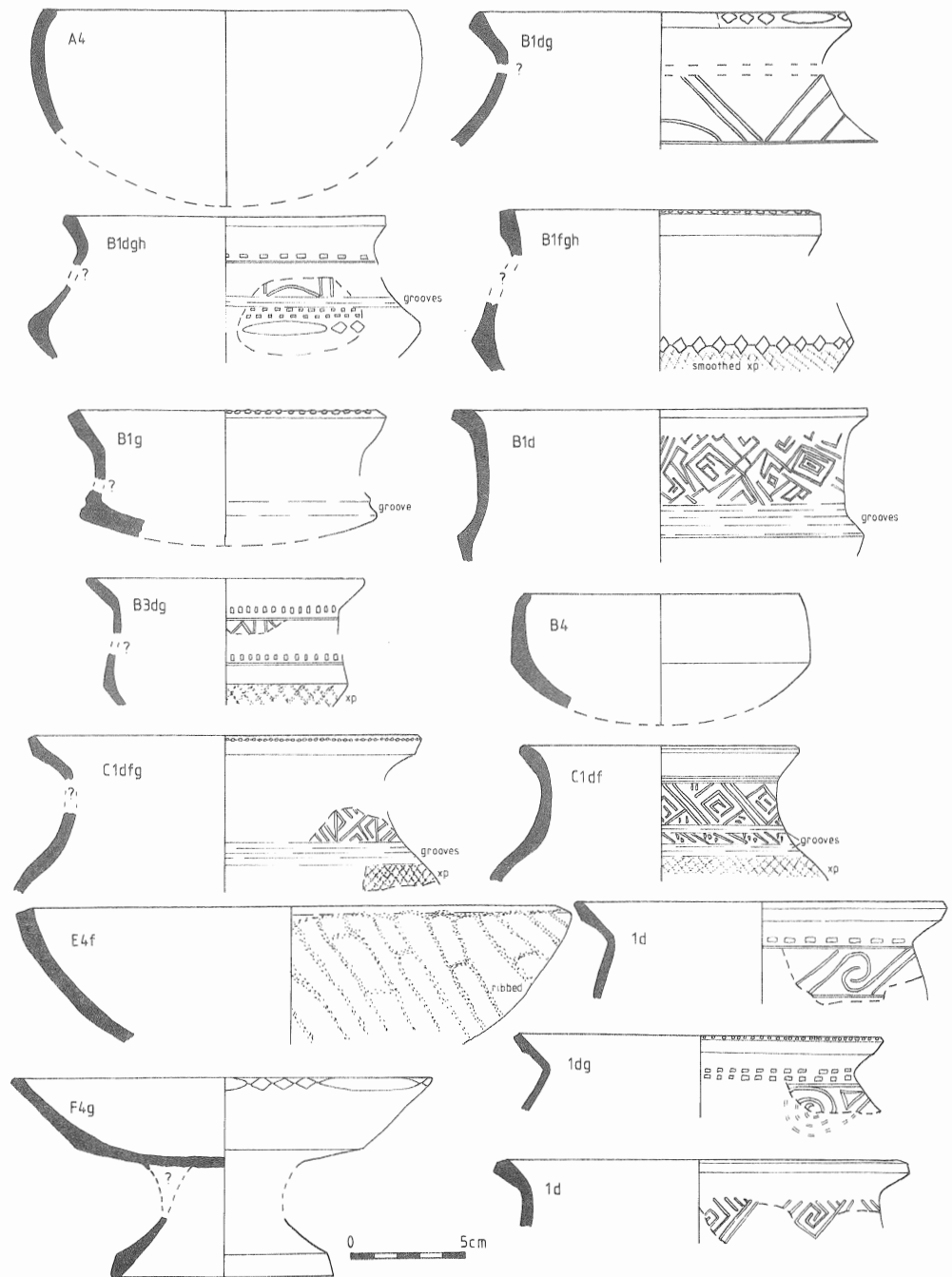
Red-slipped pottery of this type has been found in other sites in the Philippines and eastern Indonesia (e.g. at Leang Tuwo Mane'e in the Talaud Islands; Bellwood 1976), and there is a considerable quantity of linguistic and other circumstantial evidence to suggest that it was made by Austronesian-speaking peoples ancestral to the present native peoples of Borneo. It may be presumed that these groups practised horticulture, but the Madai sequence unfortunately has produced no clear traces of this so far, and a quantity of charcoal floated from the cave soils does not appear to contain traces of cultigens. The evidence from this period at Madai is unfortunately rather sparse, and a fuller picture may have to come from other sites.

#### MADAI-BATURONG IN THE EARLY METAL PERIOD, A.D. 1 to 1000.

For this period there is a wealth of remains from several sites, all well-placed in a sequence by radiocarbon dates, and further ordered by pottery typology. The period was one of great activity and contact around the shores of the Sulu and Celebes Seas, and it undoubtedly involved some indirect trade and contact with the small Indianized states which arose from the early first millennium A.D. onwards in Malaya, Sumatra, Java, and possibly southern Borneo. The main deposits of this phase are best listed in turn.

MAD 1 has the best dated series of material, and during the first millennium A.D. the cave was intensively inhabited, after a short period of abandonment following the Neolithic layers. Several of the layers contain postholes, perhaps for sleeping platforms (the modern houses in the cave are also raised on posts). Artefacts now go through a phase of florescence; the pottery is finely made, and has many complex bowl and flask forms decorated with a burnished red-slip or with intricate incised patterns (Figure 8). "Three-colour-ware" of the Niah type also appears in small quantities. Paddle impression, both cross-carved and corded, occurs throughout, and there are trends in frequencies of decoration and rim cross-section through the layers which should enable a fairly refined picture of typological change to be drawn. Copper/bronze fragments and a forged iron tanged spearhead (technically a low carbon steel according to Dr Colin Brewer of Queensland University) also occur, although it is not certain that these objects were manufactured locally, and the Madai caves have produced no evidence of local metalworking. Facetted carnelian beads of undoubted Indian inspiration have also been found; perhaps some of these were made in Southeast Asia rather than India proper, and one unfinished facetted calcite bead does suggest that some local manufacture was carried out.

Basically, this MAD 1 assemblage has much in common with that excavated in the cave of Leang Buidane in the Talaud Islands of northern Indonesia (Bellwood 1976, 1981), and some of the bowl and flask forms and the decorative styles and rim cross-sections are identical between the two sites. Much of the MAD 1 material is also paralleled in the jar burial sites in the Tabon region of Palawan, and



**Figure 8.** Pottery of the Early Metal Period (First Millennium A.D.) from Agop Atas (selection only, and not all types shown).

the well-dated Madai sequence may enable a better chronology to be developed for the whole region during the first millennium A.D.

Elsewhere in the Madai-Baturong region, jar burial assemblages which overlap in time with the habitation assemblages from MAD 1 come from Hagop Bilo (Figure 9) and Agop Sarapad, and also from the remote burial cave of Pusu Samang Tas (MAD 4) excavated in 1966 by Barbara Harrisson (1971:94-5). The Pusu Samang Tas jar burial pottery can be cross-dated with the MAD 1 sequence to the later first millennium A.D. The Tapadong cave jar burial assemblage from the Tapadong massif on the Segama river, inland from Lahad Datu and excavated by Barbara Harrisson (1971:78-81), also perhaps belongs to the late first millennium A.D. since some of the pottery is identical to that from Pusu Samang Tas. Furthermore, the Tapadong site produced 11 finely polished stone adzes with trapezoidal cross-section, plus a socketed copper or bronze axe and a terracotta casting mould for an object of cuprous metal. This latter find clearly proves the existence of some local metalworking in eastern Sabah.

After about A.D. 1000 habitation ceased in MAD 1, and the other jar burial caves mentioned appear no longer to have been used. In MAD 1 it appears that a new burial form known from many other Sabah caves was practised, namely burial in large log coffins, one of which has been radiocarbon dated to about 900 years ago. Between A.D. 1000 and about 1600 it seems that most habitation took place outside the caves, and the many log coffins and carvings of the Madai-Baturong caves may belong to this period (one of the Hagop Bilo wooden human carvings, described by Harrisson (1971:105-110), has also been radiocarbon dated to about 900 B.P.).

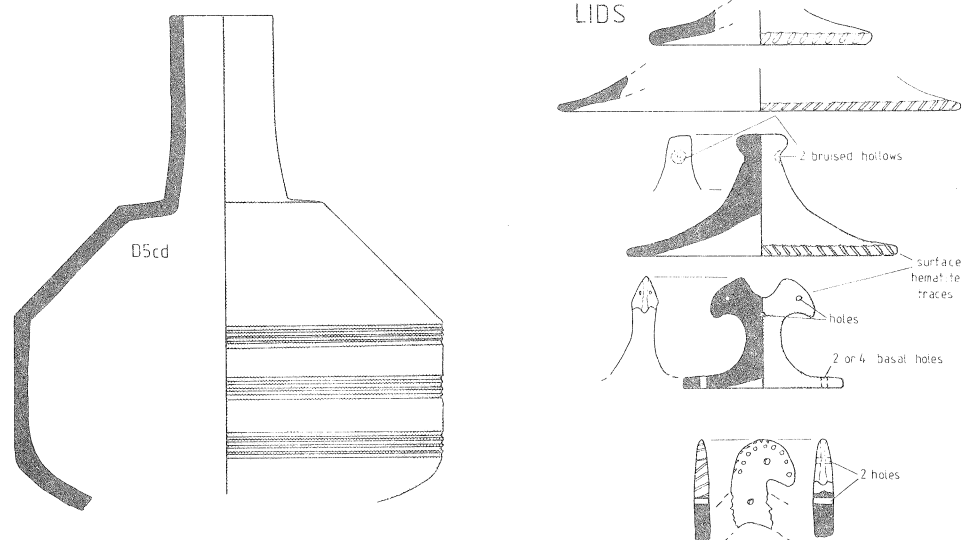


Figure 9. Pottery from Hagop Bilo (First Millennium A.D.).

MADAI OF THE RECENT PREHISTORIC AND ETHNOGRAPHIC PHASES - late sixteenth century to the present.

After the period of the log coffin burials, the Madai caves were again used for habitation, especially the main cave of MAD 1 where the main part of the Idahan seasonal village is today, plus the low cave (Agop Alag, MAD 3) through which the Madai stream now emerges after flowing through the limestone. In MAD 1 the upper levels which belong to this phase are sharply differentiated from the underlying levels of the first millennium A.D., and they contain much organic material such as wood. The Chinese, Thai and Vietnamese imported ceramics represented in these layers date from the late sixteenth century onwards according to John Guy of the Victoria and Albert Museum, and they are found with local wares which strongly resemble the ethnographic Samal and Bajau wares of Semporna and Sulu; Idahan informants also say that they have purchased their pots from these groups for a long time.

Therefore, perhaps by A.D. 1600 or soon after, new occupation began in the caves which can perhaps be attributed to the ancestors of the present Idahans. One reason for re-inhabiting the caves would doubtless be the increasing Chinese demand for the nests of cave swiftlets, which today are still collected from cave roofs and walls in many parts of Southeast Asia. The main period of Chinese demand for birds' nests appears to have started during the late Ming dynasty around the end of the sixteenth century, although Borneo caves may first have been exploited much later than this, perhaps from the late eighteenth century at Niah according to the Earl of Cranbrook (Medway 1963).

Indeed, although some of the imported MAD 1 ceramics may date back to the late sixteenth century, it is very possible that the older pieces were of heirloom status, and that the actual commencement of the birds'-nesters' village which is so striking a part of the cave landscape today dates from a more recent time, perhaps during the eighteenth and nineteenth centuries. Unfortunately, archaeology cannot be very precise about this, and the only radiocarbon date from these upper levels is reported by the laboratory as 'modern'.

CONCLUSIONS

The greatest significance of the Madai-Baturong sites, during the present stage of rather limited knowledge about Borneo prehistory, is that they provide a refined chronological perspective and definition of the archaeological cultures which have existed in eastern Sabah in the past. The results are not restricted simply to artefacts, but there is also a quantity of important environmental and economic evidence. Since the results from the other major site-complexes of the region, such as the Niah and Tabon caves, have never been completely published, the 30,000 year sequence from Madai-Baturong may eventually stand as a central 'key' for the whole area.



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