

**THE ARCHAEOLOGY OF GUA TUPAK  
FROM 1,190 B.P. TO 170 B.P.  
IN BAU, SARAWAK**

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FROM 1,190 B.P. TO 170 B.P.  
IN BAU, SARAWAK**

**by**

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# **ARKEOLOGI GUA TUPAK**

## **DARI 1,190 B.P. HINGGA 170 B.P. DI BAU, SARAWAK**

### **ABSTRAK**

Pada bulan November dan Disember 2007, survei arkeologi telah dijalankan di gua batu kapur di sekitar kawasan Bau, Sarawak oleh penulis dan sekumpulan penyelidik dari Pusat Penyelidikan Arkeologi Global, Universiti Sains Malaysia, Pulau Pinang dengan kerjasama Jabatan Muzium Sarawak, Kuching. Tujuan survei ini dijalankan adalah untuk mencari tapak yang berpotensi untuk kajian peringkat sarjana penulis. Survei ini mendapati bahawa Gua Tupak berpotensi untuk kajian arkeologi dan ekskavasi telah dijalankan di tapak tersebut pada Februari dan Mac 2008. Ekskavasi di Gua Tupak telah menghasilkan pelbagai data arkeologi yang mampu memberi informasi tentang arkeologi Gua Tupak dan kawasan Bau. Data arkeologi ini terdiri daripada jumpaan artifak seperti sisa cengkerang, tulang haiwan, pecahan seramik dan artifak batu. Selain itu, sampel-sampel arang dan cengkerang turut dikumpul bagi tujuan pentarikhan radiokarbon. Profil tanah juga direkod dan sampel tanah dikumpul bagi tujuan analisis palinologi. Keputusan analisis artifak dan interpretasi ke atas data arkeologi yang diperolehi dari Gua Tupak telah menunjukkan bahawa tapak ini telah digunakan sebagai tapak penghunian sementara. Berdasarkan pentarikhan radiokarbon, stratigrafi dan jumpaan artifak, penghunian di tapak ini telah dibahagikan kepada dua fasa iaitu Fasa Awal ( $1,190 \pm 40$  B.P.) dan Fasa Akhir ( $270 \pm 50$  B.P. hingga  $170 \pm 40$  B.P.). Berdasarkan jumpaan-jumpaan arkeologi di Gua Tupak, tapak ini mungkin telah dihuni oleh kumpulan pemburu dan

memungut. Asemblaj arkeologi di kawasan utama Gua Tupak yang mewakili Fasa Akhir penghunian mungkin juga mewakili sisa-sisa aktiviti oleh kumpulan pemungut sarang burung. Aktiviti yang telah dijalankan oleh masyarakat di Gua Tupak mengkhusus kepada aktiviti sara hidup. Masyarakat di Gua Tupak telah menjalankan aktiviti memburu dan memungut serta mengeksploitasi pelbagai sumber seperti persekitaran hutan, sungai dan estuari. Hasil analisis artifak mendapati bahawa tiada perubahan yang ketara dalam cara hidup masyarakat Gua Tupak dari Fasa Awal hingga ke Fasa Akhir penghunian. Analisis sisa fauna menunjukkan bahawa secara amnya, jenis-jenis haiwan dan moluska yang sama telah diburu dan dipungut sebagai sumber makanan dari Fasa Awal hingga ke Fasa Akhir penghunian di Gua Tupak. Di samping itu, teknologi pembuatan tembikar dan alat batu juga tidak menunjukkan perbezaan yang ketara dari Fasa Awal hingga ke Fasa Akhir penghunian. Secara keseluruhannya, kajian ini telah menyumbang informasi yang berharga tentang kronologi, urutan kebudayaan, fungsi tapak serta aktiviti dan cara hidup masyarakat awal di Gua Tupak, Sarawak dan Malaysia amnya.

**THE ARCHAEOLOGY OF GUA TUPAK**  
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**ABSTRACT**

In November and December 2007, an archaeological survey was conducted by the author and a research team from the Centre for Global Archaeological Research, Universiti Sains Malaysia, Penang with the cooperation of the Sarawak Museum Department, Kuching in the limestone caves of the Bau area, southwest Sarawak in order to search for a site for the author's Master of Arts (MA) study. The result of the survey determined Gua Tupak to be a highly potential site and consequently, excavations were carried out at the site in February and March 2008. The excavations at Gua Tupak yielded valuable archaeological data that could aid in providing information on the prehistory of the site and the Bau area. The archaeological data include various types of artefacts such as shell remains, animal bones, ceramic sherds and stone artefacts. In addition, charcoal and shell samples were collected for radiocarbon dating, soil samples were collected for palynological analysis and soil profiles of the excavated trenches were recorded. Results of the analyses of artefacts and interpretations of the archaeological data recovered from Gua Tupak suggest that the site was used as a temporary habitation site or shelter with two main phases of occupation; the Early Phase with a radiocarbon date of around  $1,190 \pm 40$  B.P., and the Late Phase with radiocarbon dates ranging from  $270 \pm 50$  B.P. to  $170 \pm 40$  B.P. Based on the findings at Gua Tupak, the site was probably frequented by hunting and gathering groups. However, there is also a possibility that

the more recent archaeological assemblage at the main cave area (the Late Phase) represent activity remains of birds' nest collectors. The main activity at Gua Tupak was focused on subsistence. The inhabitants of Gua Tupak conducted hunting and gathering activities in a variety of ecological habitats such as the forest, riverine and estuarine environments. Analyses of artefacts indicate that there was no major change in lifestyle from the Early Phase to the Late Phase. General similarities in the faunal assemblage indicate that similar animals and molluscs were hunted and gathered for food in the Early Phase and the Late Phase. In addition, similar earthenware and stone tool manufacturing technology also persisted from the Early Phase to the Late Phase. As a whole, this study has contributed valuable information to shed light on the chronology, cultural sequence, site function and activities of the early inhabitants of Gua Tupak and the Bau area, as well as Sarawak and Malaysia in general.

# **CHAPTER 1**

## **INTRODUCTION**

This chapter discusses previous archaeological work carried out in the Bau area. The issues and problems of the previous research will also be discussed as well as the aims and methodology of this research. In addition, a general description of the study area, including Gua Tupak and the Bau Caves Complex, will be provided. This chapter will also include a brief discussion on the climate, vegetation, fauna and populations of the Bau district, Sarawak.

### **PREVIOUS ARCHAEOLOGICAL RESEARCH IN BAU, SARAWAK**

Since the late 19<sup>th</sup> century, the caves in Bau, Sarawak have been visited by numerous researchers interested in the study of human evolution. Perhaps the first known archaeological dig in Bau was carried out in 1865 by a botanist called Odoardo Beccari, whom Price (1997:13) describes as “probably the first cave archaeologist”. Beccari dug in an unnamed cave near the village of Busso and in Lobang Angin.

In 1878, an extensive exploration of the caves in Borneo was carried out by a team of British researchers led by A. Hart Everett (Barker *et al.*, 2005; Basley, 1994; Everett *et al.*, 1880; Harrisson, 1958:551; Price, 1997). This palaeontological and anthropological research, supported by the Council of the Royal Society, the British Association and

private funds, was carried out in order to study the origin of humans, specifically to find the “missing link” between apes and humans. A total of 32 caves were visited including the caves of Niah in Miri and Bau nearby Kuching, Sarawak. Although the exploration of these caves produced findings such as pottery, stone implements, freshwater and marine shells, animal bones, beads and other ornaments, the results of the explorations revealed traces of people who had already reached an “advanced stage of civilisation” (Everett *et al.*, 1880:316). The research, therefore, did not fulfill the initial purpose of the exploration, which was to find the “missing link” between apes and humans. In Bau, Everett continued Beccari’s research in Busso in 1869 and in 1878-1879 for a period of nine months (Price, 1997:13). During the latter period, he also excavated Lobang Angin and Gua Tupak in Bau, Sarawak with the hopes of finding ape remains, albeit with disappointing outcomes.

Gua Bungoh in Bau was excavated in 1950 by Tom Harrisson and Michael Tweedie (the Curator of the Sarawak Museum and the Director of the Raffles Museum, Singapore at that time, respectively). The excavations at Gua Bungoh were carried out in two phases over a period of eleven days (12-22 April 1950) in an area, which Harrisson and Tweedie (1951:166) termed the “habitable floor”, measuring roughly 27 feet x 16 feet in dimension. The first phase of the excavation involved areas A, B, C, D and E, while the second phase involved areas F, G and H. In all of the areas, except for area D, excavations were conducted in layers of 6 inches. Area D was excavated in layers of 2 inches to give “a closer picture within the general framework” (Harrison and Tweedie, 1951:168). The excavation of Gua Bungoh yielded a variety of artefacts such as 19<sup>th</sup> century coins, porcelain and stoneware, metal implements, pottery, extraneous stones

and faunal remains such as riverine shells and bat bones (Harrisson and Tweedie, 1951:173-180). Based on the vertical distribution of artefacts in the soil layers, Harrisson and Tweedie (1951:180-183) proposed a sequence of three main cultural periods: the *Thiara* period, the *Pottery* period and the *Historic* period.

Another site in Bau that was explored by the Sarawak Museum in the 1950's is Gua Tupak, which was excavated in 1950 (Wilford, 1964:74). This excavation was presumably led by Tom Harrisson since he was the Curator of the Sarawak Museum during that time. The excavation produced findings such as earthenwares, stonewares, bones and ash, but other details of the excavation are not known since a report was never published.

Based on the Sarawak Museum records and also the excavation notes of Tom Harrisson, other cave sites in Bau, such as Gua Stulang, Gunong Krian and Lobang Angin (to name a few) have also been explored and studied. Although a number of archaeological sites in the Bau area have been reported, they were mostly discovered and dug by exploration parties. As a result, no systematic excavations were carried out and therefore, no accurate data and interpretations on the prehistory of Bau were obtained.

Apart from excavations, pottery from the Bau area has also been the subject of archaeological research. Studies on the Gua Bungoh pottery, obtained from the 1950 excavations by Harrisson and Tweedie (1951), were done by Solheim (1959, 1981), who found similarities between the Gua Bungoh pottery and other pottery obtained from archaeological sites in West Malaysia, Thailand, Indonesia, Philippines, Vietnam and

South China, as well as present day Iban pottery in Sarawak. Doherty *et al.* (1998, 2000), on the other hand, discovered the use of rice tempers in the manufacture of the pottery from several sites in Bau, such as Gua Tupak (or Tupap), Gunong Staat, Gua Chupak, Gua Raya and Bukit Sekunyit. The pottery samples examined by Doherty's team were all previously excavated materials stored in the Sarawak Museum archive.

## **STATEMENT OF PROBLEMS**

Although early archaeological explorations and excavations have been carried out in the Bau Caves Complex since the 1950's, a number of issues and questions regarding the prehistory of the Bau area remain unanswered.

Firstly, these issues and questions arose due to the unsystematic nature of the previous excavations and the recording of data. For instance, although the excavation of Gua Bungoh in 1950 has yielded data that are important to the prehistory of Borneo, the data and excavation report are incomplete. For example, although a map of the excavated area at Gua Bungoh was provided, it did not indicate the dimensions and boundaries of the trenches (Harrison and Tweedie, 1951:167). In addition, the excavated area was not gridded and therefore, it is assumed that the sizes of the trenches were not uniform. As a result, the excavation of Gua Bungoh appears to be unsystematic. The excavation of Gua Bungoh was also conducted with disregard over vertical control. In other words, the excavation was not conducted in uniform layers. For example, trenches A, B, C, F, G



and H at Gua Bungoh were all excavated in layers of 6 inches, while trench D was excavated in layers of 2 inches.

Secondly, the date for early human use of caves in the Bau area is unknown since no radiocarbon or chronometric dating of either Gua Tupak or Gua Bungoh was done. Even though some relative dating was attempted at Gua Bungoh by Harrison and Tweedie based on historical and comparative evidence, the estimates given were very broad and full of uncertainties. For example, the *Thiara* period was estimated to represent a habitation of “thousands rather than hundreds of years?” while the *Pottery* period dates back some hundreds of years ago (Harrison and Tweedie, 1951:180, 183).

Another issue and problem is the absence of stratigraphic record or soil profiles of the excavated trenches at either Gua Bungoh or Gua Tupak. As a result, the site formation processes and the nature of the deposition at the two sites are hard to determine. Also, without the soil profiles, any information regarding the cultural sequences at the two sites would be incomplete as the cultural layers would be unobservable. Furthermore, without any stratigraphic information, it would be difficult to determine the association between the layers and the artefacts found.

Additionally, in the case of the previous archaeological investigation at Gua Tupak, no report on the 1950 excavation was ever published, resulting in a lack of knowledge on the excavation methods employed and the findings. The previous research at caves in the Bau area was also not problem-oriented and consequently, important questions regarding

the prehistory of the Bau area were left unanswered. Some of the basic questions regarding Gua Tupak, the main subject of this study, that need to be answered include:

- 1) How old is the archaeological site of Gua Tupak?
- 2) How many periods of occupation are there at Gua Tupak?
- 3) What factors and processes influenced the deposition and formation of the site? What evidence of human agency can be seen at the site?
- 4) What activities were carried out by the inhabitants of Gua Tupak and what tools were used? What can all these tell us about the function of the site?
- 5) What affinities exist between Gua Tupak and other archaeological sites in Sarawak, as well as in Malaysia and the rest of Southeast Asia as a whole?

Lastly, in their report on the excavations of Gua Bungoh, Harrison and Tweedie (1951:185) highlighted the lack of comparative materials, as a consequence of their study being "...the first of its kind in Borneo", as a significant problem for their research at that time. As a result, the previous research lacked a comparative study that could establish the affinities between the prehistoric cave sites in the Bau area and other sites in Malaysia as well as in the Southeast Asian region.

## **AIMS OF THE STUDY**

This study attempts to address the issues and problems of the previous research in the Bau area. This could be established through systematic excavations and recording of

data in order to obtain reliable *in situ* data needed for an accurate and complete interpretation. The following are the main aims of this study:

- (i) To obtain chronometric dating for the archaeological remains at Gua Tupak.
- (ii) To record the stratigraphy of the deposits in the form of soil profiles so that the nature of the deposition and the site formation processes can be studied.
- (iii) To reconstruct the cultural sequence at Gua Tupak. Importantly, this will be the first archaeological site in the Bau area with a cultural sequence substantiated by chronometric dating.
- (iv) To determine the activities carried out by the inhabitants at Gua Tupak.
- (v) To establish the function of Gua Tupak based on activities carried out at the site.
- (vi) To conduct a comparative study between Gua Tupak and other sites in Malaysia, as well as in the Southeast Asian region in order to determine any affinities between Gua Tupak and other archaeological sites in the region.

## **METHODOLOGY**

The methodology used in this study involves the following:

- (i) **Archaeological Survey and Mapping**  
Archaeological surveys of limestone caves in the Bau area were done prior to the excavation in order to identify potential sites for archaeological research.

During the survey, the locations, dimensions and surface finds of every cave surveyed were recorded. Photographs of the cave floors, features and surface finds were also taken. At Gua Tupak, the whole site, including the cave features and the present excavation trenches, was mapped.

(ii) Archaeological Excavations

Excavations were conducted using standard excavation tools such as scrapers, trowels, ice picks and brushes in arbitrary levels or spits of 10 centimetres. The soil taken out during the excavations was sieved using 3 millimetre wire meshes to ensure that small pieces of artefacts were retrieved. At every spit, the positions of the artefacts were also recorded in three-dimensional measurements. All the artefacts recovered were sorted in labeled bags according to type and the spits or relative locations where they were found. During the excavations, notes detailing the excavation process and findings as well as other relevant information were taken. Still photographs and video recordings of the excavations and the artefacts *in situ* were also taken. Charcoal and shell samples were also taken for radiocarbon dating purposes, while soil samples were taken for palynological analysis. Following the excavations, the soil profiles of the excavated trenches were also recorded.

(iii) Analyses of Artefacts and Ecofacts

The excavations conducted at Gua Tupak yielded a variety of ecofacts and artefacts such as shell remains, animal bones, ceramic sherds, lithic artefacts

as well as charcoal and shell samples for radiocarbon analysis, and soil samples for palynological analysis. The analyses of artefacts and ecofacts from Gua Tupak include morphological analyses as well as statistical or quantitative analyses and scientific analyses. Unless otherwise specified, all of these analyses were conducted at the laboratory of the Centre for Global Archaeological Research, Universiti Sains Malaysia, Penang.

Morphological analyses are useful for classifying the artefacts as well as for determining the function of the artefacts and the manufacturing technology employed. Morphological analyses include the study of the form, size, weight, use wear and decorations of the artefacts. Statistical analyses involve the analyses of horizontal and vertical distributions of the artefacts in order to detect any temporal or spatial changes. On the other hand, scientific analyses include compositional analyses of earthenware sherds, palynological analysis of soil samples, zooarchaeological analysis of faunal remains and radiocarbon analysis of charcoal and shell samples. Compositional analyses of earthenware sherds (Thin-section petrographic analysis and X-Ray Diffraction analysis) are useful for classification as well as for determining the technology and sources of the raw materials used to manufacture the earthenwares at Gua Tupak. The X-Ray Diffraction (XRD) analysis of pottery sherds was conducted at the Universiti Sains Malaysia's School of Physics. Palynological analysis of soil samples, on the other hand, is useful for shedding light on the palaeoenvironment of the site and the ecological adaptation of the past inhabitants of Gua Tupak. Faunal remains such as shell

remains and animal bones were studied using reference collections available at the laboratory of the Centre for Global Archaeological Research, Universiti Sains Malaysia, Penang and the Sarawak Museum, Kuching as well as published sources in order to determine which species they belong to. This is done to determine the palaeoenvironment of Gua Tupak and to gain information on the ecological adaptation and subsistence activities of the cave inhabitants at Gua Tupak. Charcoal and shell dating samples collected during the excavations at Gua Tupak were sent to the Beta Analytical Radiocarbon Laboratory in Florida, USA for analysis.

(iv) Interpretation and Comparative Studies

The results of the analyses were examined in order to make interpretations on the nature of habitation and function of the site. These interpretations were primarily done based on the distribution and association of artefacts, the cultural sequence and radiocarbon dates. Furthermore, comparative studies were carried out with other similar and contemporaneous archaeological sites in Malaysia as well as Southeast Asia (Vietnam, Cambodia, Myanmar, Thailand, Indonesia and the Philippines) in order to find cultural affinities and to view the significance of Gua Tupak in the greater context of the Southeast Asian region.

## **THE STUDY AREA**

This section describes the study area, which includes the excavated site of Gua Tupak and its surroundings in Bau. The surroundings of Gua Tupak discussed here include the topography, drainage and geology of the Bau area. The climate, vegetation, fauna and populations of the Bau area will also be discussed briefly.

### **Location**

Gua Tupak (lat. N. 1° 24' 20.5", long. E. 110° 11' 9.1", 56 meters above sea level), is one of the caves in the Gunung Jambusan limestone hill, in the Bau District of Kuching, Sarawak, about 35 km southwest of Kuching city (Plate 1.1). Gua Tupak is also known to the local villagers as Gua Tupap, while Gunung Jambusan has been variably called Gunong Batu in Rengga *et al.* (2004:23). Gua Tupak is situated about 5 kilometres from Bau Town, and is accessible through Jalan Merembeh, just off Jalan Jambusan, about 100 metres east of Kampung Skiat Baru. Presently, Gua Tupak is under the ownership of Kampung Skiat Baru and is protected because of the valuable birds' nests found in the cave. Permission from the Village Development and Security Committee (*Jawatankuasa Kemajuan dan Keselamatan Kampung*) of Kampung Skiat Baru had to be obtained and an access fee of RM 50 had to be paid before research work could be carried out in Gua Tupak. The main area of the cave is approximately 22 meters x 40 meters in size with a ceiling height of about 7 to 10 meters (Plate 1.2). Gua Tupak was previously excavated by the Sarawak Museum in 1950 (Wilford, 1964:74).



Plate 1.1. The location of Gua Tupak in the Gunung Jambusan limestone hill



Plate 1.2. A view of Gua Tupak taken from the main cave entrance



## **Topography and Drainage**

The topography of Bau is closely related to its geology. In the Bau area, four distinct land forms are recognised (Pimm, 1967:1-3; Wolfenden, 1965:1-2):

- (i) Rugged, precipitous hill formed from limestone, rising to heights of over 1,000 feet. The hills are cliff-bound and the massive nature of the limestone resembles tower karst. Caves are common in the limestone hills.
- (ii) Flat, low-lying areas formed by limestone flats and partly covered by alluvium. The limestone flats occur adjacent to the limestone hills.
- (iii) Low-lying undulating country up to 250 feet high formed by shale and sandstone.
- (iv) Steep-sided hills formed from stocks of porphyritic igneous rock. Deep, narrow and steep-sided gorges in the limestone hills are formed by weathering of porphyry dykes.

The Bau area is drained by the Sungai Sarawak Kanan and its tributaries. Underground streams are common in limestone areas, including Gunung Jambusan, where Sungai Siniawan enters the cave system from the west (Wilford, 1964:74; Wolfenden, 1965:2).

The shale and sandstone country is drained by small streams with few rock outcrops.

## **Geology**

The geology of caves in Bau, and the Bau area as a whole, has been extensively documented. Geological surveys and mapping of the Bau area were carried out by Pimm (1967), Wilford (1964) and Wolfenden (1965) of the Geological Survey, Borneo

Region. In more recent times, geological and mineral research in the Bau area was carried out by the Mineral and Geoscience Department Malaysia, Kuching (Rengga *et al.*, 2004). At the time of writing, another geological research, the Geological Heritage (*Warisan Geologi*) Project under the Ninth Malaysia Plan, is in progress in the Bau area, conducted by Dana Badang (pers. comm.) of the Mineral and Geoscience Department Malaysia, Kuching. In addition, investigations of mineral resources in the Bau area have also been conducted in the past by gold mining companies. Throughout the years, the geology of the Bau area has also been the subject of numerous university theses by Boniface (1979), Dorani (1978), Lau (1970), Lim (1980), Jamain (1982), Liliana (2005) and Ting (1991).

A number of different geological formations are observed in the Bau area and they have been studied by Pimm (1967:8-29) and Wolfenden (1965:8-32). The geological formations in the Bau area are described below.

(i) Bau Limestone Formation

The Bau Limestone Formation, of which the limestone hill of Gunung Jambusan (where Gua Tupak is located) is a part of, is a thick sequence of massive, pale grey, poorly to moderately fossiliferous pure limestone, with a little dark-grey argillaceous limestone. In one place along Poak Road, south of Jambusan, the formation is over 1,800 feet thick, while in the Krokong area, the formation is about 2,500 feet thick. However, the total thickness of the formation is unknown. The Bau Limestone Formation is of Upper Jurassic to Upper Cretaceous age (around 150 to 70 million years ago)

(Wolfenden, 1965:8). In some places, small nodules of dark-grey chert are present in the limestones. Calcareous algae, foraminifera and coelenterates of Upper Jurassic age are also found in the Bau Limestone Formation. The Bau Limestone Formation passes conformably up into the Pedawan Formation. Cliff-bound limestone hills, generally flanked by eroded limestone platform partly covered by alluvium characterise the Bau Limestone Formation. The Krian Member of the Bau Limestone Formation occurs at the base of the formation and comprises sandstone, some shale and argillaceous limestone.

(ii) Pedawan Formation

The Pedawan Formation is a thick sequence of marine sedimentary rocks, predominantly shale and mudstone, with subordinate sandstone, rare conglomerate, argillaceous limestone, and radiolarite. The Pedawan Formation is of Upper Jurassic to Lower Cretaceous age (around 150 to 112 million years ago) and rests conformably on the Bau Limestone Formation (Wolfenden, 1965:26). In the Bau area, only the lower part of the Pedawan Formation is present and the total thickness is unknown.

(iii) Serian Volcanic Formation

The Serian Volcanic Formation occupies a small area in the northeast of the Krokong area and consists of a thick sequence of andesitic and basaltic lava, breccia, and tuff, with acid volcanic rocks towards the top. In the Krokong area, the Serian Volcanic Formation, which is of Upper Triassic age (around 228 to 203 million years ago), occurs “in a small triangular-shaped area of

undulating country between 100-200 feet high, flanked to the east and west by cliffs of limestone several hundred feet high” (Pimm, 1967: 8).

The caves of the Bau area “occur in the limestone hills lying in a generally narrow belt extending from the Kalimantan border, about 14 miles south-east of Bau to Bau...” (Wilford, 1964:47). Underground streams are very common in these caves and some of the larger mouths of these caves bear evidence of habitation by people in the past.

In terms of mineral resources, gold and antimony have been mined on a large-scale since 1823. Before the introduction of the cyanide process in 1899, the Bau area was estimated to have produced well over half of the total gold production (more than 1,230,000 ounces) and most of the 83,000 tons of antimony ore exported from Sarawak (Wolfenden, 1965:5). In subsequent years, however, the average annual gold production has dropped considerably.

### **Climate, Vegetation, Fauna and Populations**

The climate of the Bau area is typically that of an equatorial or tropical region. Like most of tropical Southeast Asia, it receives plenty of rainfall and sunshine all year round. The average annual rainfall is about 419 cm. The wettest months, when heavy rainstorms are common, occur during the North-East Monsoon, from October to March. Convectional rain, which normally falls in the afternoon, occurs during the South-West Monsoon season. During the rainy seasons, flooding is known to occur in the low-lying land around Bau (Wilford, 1955:17). Throughout the year, the temperatures of the area vary little with an average temperature of about 29.4 °C (85 °F).

A third of the Kuching-Lundu area, which encompasses the Bau area, is covered with tropical rainforest consisting of trees, mostly Dipterocarpaceae, up to 120 feet high. Some of the largest forests can be found in the Bungoh range where the sandy, infertile soils of the area and the steepness of slopes (in some parts), discourage the clearing of land for rice cultivation. Mangroves also occur extensively in the swampy areas near the mouths of the main rivers, particularly between the tributaries of Sungai Sarawak.

The fauna of the Bau area is not so abundant as in other parts of Sarawak as pigs, gibbons, deer and monkeys are heavily sought by the Dayak and Malay hunters in the primary jungles. Snakes, few of which are venomous, are also common. Bats and swallows are common in the caves around Bau.

The population of Bau District, according to Yearbook of Statistics Sarawak 2001, numbered 43,190 in the year 2000 (Chang, 2002:141). The majority of the population (29,215) consists of the Bidayuh. Traditionally, the Bidayuh are rice farmers, planting hill paddy by shifting cultivation and wet paddy in the swampy areas. Besides farming, they also collect birds' nests and guano from caves in the limestone hills around Bau. In fact, Bau was one of the earliest birds' nest production centres in Borneo, as early as Ming Dynasty times (14<sup>th</sup> -17th century A.D.) (Harrison and Jamuh, 1956:460). Little is known about the origin and the early history of the Bidayuh in Sarawak. However, they are believed to be one of the original people of Borneo and they were already living in Sarawak and in Bau prior to the arrival of James Brooke in 1839 (Drake-Brockman, 1959:30). According to one legend, the Bidayuh came to Sarawak from what is now Kalimantan, Indonesia about 20 generations before the Krakatoa eruption in 1883. This

means that the Bidayuh have been living in Sarawak for more than 600 years since the 1300s, based on one generation of 25 years (Chang, 2002:22). The Chinese also forms a large part of the population of Bau District (9,205). The Chinese originally came from Sambas, in what was then Dutch Borneo, early in the nineteenth century to work in the Bau gold mines. Beginning 1921, gold mining in the Bau area were carried out by Chinese-owned companies employing mostly Chinese workers. Other ethnic groups found in Bau district are the Malay (3,585) and the Iban (648).

## **SUMMARY**

Archaeological research in the Bau area began in 1950 when Gua Bungoh was excavated by Harrisson and Tweedie (1951). In the same year, another cave site in Bau called Gua Tupak was investigated by the Sarawak Museum, presumably also by Harrisson since he was the Curator of the Sarawak Museum at that time. Based on the Sarawak Museum records, other cave sites in Bau, such as Gua Stulang, Gunong Krian and Lobang Angin have also been explored. However, several shortcomings of the previous research due to the unsystematic nature of the excavations and the recording of data resulted in incomplete knowledge and understanding of the prehistory and the archaeology of the Bau area. For example, no chronometric dating was carried out at Gua Bungoh and Gua Tupak, and no stratigraphic information of both sites is available since, presumably, the soil profiles were not recorded. Therefore, the cultural layers at Gua Bungoh and Gua Tupak could not be observed. In the case of Gua Tupak, no report on the previous excavation was published, resulting in the lack of knowledge of the

methods employed and the results of the excavation. In addition, other early archaeological investigations in the Bau area were mainly carried out by exploration parties with no proper or systematic excavations.

Several questions remain unanswered as a result of the shortcomings of the previous research. These questions relate to the age of the sites, the cultural sequence, activities and ways of life of the prehistoric people in the Bau area, as well as the link between the sites in the Bau area and other archaeological sites in Sarawak, Malaysia and Southeast Asia. This study aims to address these questions by 1) obtaining radiocarbon dates for the archaeological remains at Gua Tupak, 2) recording the stratigraphy or soil profiles at Gua Tupak, 3) reconstructing the cultural sequence, 4) conducting a comparative study between Gua Tupak and other sites in Malaysia and Southeast Asia. In terms of methodology, this study includes archaeological survey and mapping, archaeological excavations, analyses of artefacts and ecofacts, and interpretation and comparative studies.

Gua Tupak, the site excavated in this study, is located in the Bau district, about 35 kilometres southwest of Kuching, Sarawak. The geology of the Bau area comprises three main formations; the Bau Limestone Formation, the Pedawan Formation and the Serian Volcanic Formation. Gua Tupak is located in the Bau Limestone Formation, as are most of the limestone caves in the Bau area. In terms of drainage, the major river systems are the Sungai Sarawak Kanan and its tributaries. Underground streams are also common in limestone areas, including Gunung Jambusan, the limestone hill where Gua Tupak is located. The climate of the Bau area is tropical with plenty of rainfall and sunshine

throughout the year. During the wettest months from October to March, floods are common in the low-lying lands around Bau. Tropical rainforests cover about a third of the Kuching-Lundu area, including Bau, while mangroves are found in the mouths of the main rivers, especially between the tributaries of Sungai Sarawak. The forest and mangrove areas are rich in faunal species such as pig, deer, monkey and snake. However, in the present, their numbers have dropped due to extensive hunting by the local population. Bats and swallows are also common in the caves around Bau. More than half of the population of the Bau area consists of the Bidayuh, whose traditional economic activities include farming and collecting birds' nests and guano from caves around the area. Besides the Bidayuh, other ethnicities present in Bau include the Chinese, the Iban and the Malay.



## **CHAPTER 2**

### **COMPARATIVE STUDIES**

This chapter reviews and surveys various archaeological sites from the Neolithic to the Bronze and Iron Age periods in Southeast Asia. The main purpose of the survey is to compare and to contrast the archaeological finds from various sites in Southeast Asia with those from Gua Tupak. By doing so, any affinities or cultural links that exist between Gua Tupak and other Neolithic and later archaeological sites in Southeast Asia can be determined. The archaeological sites surveyed in this chapter were chosen based on two criteria. Firstly, this chapter surveys archaeological sites which produced assemblages similar to those recovered from Gua Tupak. Secondly, archaeological sites which are more or less contemporaneous to Gua Tupak are also reviewed in this chapter. The sites reviewed in this chapter either meet any one of the criteria or both. For instance, Neolithic sites several thousand years older than Gua Tupak, which dates from around 1,190 B.P. to around 170 B.P. (See Chapter 3), are included in this survey on the basis of having similar archaeological assemblage. On the other hand, even though Gua Tupak did not yield any metal artefacts, Early Metal Age sites that are roughly contemporaneous with Gua Tupak are also included in the survey. With regards to the dates of the surveyed sites, they are presented here in the same way they were originally reported, regardless of whether a B.P., B.C., B.C.E., A.D. or C.E. date was used in the original references. The survey is divided and discussed according to the two main geographical regions of Southeast Asia; Mainland Southeast Asia and Island Southeast Asia.

## **MAINLAND SOUTHEAST ASIA**

The use of the term “Mainland Southeast Asia” in this chapter refers to the region covering Vietnam, Cambodia, Myanmar, Thailand and Peninsular Malaysia. Although Laos is also technically part of Mainland Southeast Asia, it is not included in this survey due the lack of knowledge about the archaeology of the nation. The following discusses the survey of Neolithic and Metal Age sites in Mainland Southeast Asia in the order of countries mentioned above.

### **Vietnam**

The Neolithic period in Vietnam is represented by various archaeological sites such as Cai Beo, Da But, Go Trung, Con Co Ngua, Quynh Van culture sites, Phung Nguyen, Con Chan Tien and An Son, with dates ranging from around 6,500 B.P. to 3,000 B.P. On the other hand, the Metal Age (Bronze Age and Iron Age) period in Vietnam is represented by sites in the Tay Nguyen region and Long Thanh, as well as by the Dong Dau, Go Mun, Dong Son and Sa Huynh Cultures, with dates ranging from around 3,500 B.P. to around 2,000 B.P. Archaeological findings at these sites are discussed as follows.

#### ***Cai Beo***

Excavations at Cai Beo in Hai Phong Province in 1972 and 1981 uncovered three distinct phases of occupation. The first phase at Cai Beo revealed stone tools of flaked and polished pebble tools similar to those of the so-called “Hoabinhian” tradition (Higham, 1996:82; Ngo The Pong, 1984/85:148). In addition, there was also an abundance of pottery. The Cai Beo pottery is generally handmade, low fired and

decorated with basket-marked patterns. The second and third phase at Cai Beo saw the introduction of polished and shouldered axes. The earlier phase at Cai Beo has produced a radiocarbon date of  $5,645 \pm 115$  B.P. (Ngo The Pong, 1984/85:148).

### ***Da But, Lower Ma Valley***

Archaeological research at Da But was first carried by Etienne Patte, who uncovered twelve burials in seated position with burial goods consisting of pottery vessels, shell jewellery, stone axes and red ochre (Higham, 1996:82). More recent findings were described by Bui Vinh (1991), who reported the discovery of an occupation layer dated around 4,500 to 3,700 B.C. with associated findings of coarse and basket-impressed pottery, animal bones, polished stone adzes and evidence of a hearth. According to Ha Van Tan (1984/85:135) and Ngo The Pong (1984/85:149), Da But pottery is typically handmade using the paddle-and-anvil technique and fired at low temperatures. In addition, all the vessels are round-bottomed pots and bowls with straight or slightly flaring rims without ring feet.

### ***Con Co Ngua, Lower Ma Valley***

Excavations at Con Co Ngua have uncovered seated burials interred in cylindrical pits (Nguyen Viet, 2005:89-90). Other findings at Con Co Ngua include ground, polished and flaked stone artefacts, bone implements, mat-impressed pottery sherds, marine, riverine and estuarine remains of fish, oyster and mussel as well as bones of pig, deer and buffalo. The Con Co Ngua assemblage is attributed to the Da But tradition of the Vietnam Neolithic period and is dated between  $3,020 \pm 100$  B.P. and  $2,740 \pm 1,050$  B.P. (Bower *et al.*, 2006:81).

### ***Go Trung, Lower Ma Valley***

Excavations in 1977 at Go Trung uncovered a typical Da But cultural assemblage dated around 3,000 B.C. (Higham, 1996:83; Nguyen Viet, 2005:89). Artefacts found at Go Trung include handmade and low fired pottery consisting of round-bottomed pots and bowls with straight or slightly flaring rims, similar to those found at Da But and Con Co Ngua (Ha Van Tan, 1984/85:135). Similarities were also observed with regards to the pottery decoration type made using basket-wrapped paddles. Net sinkers were also found at Go Trung, which according to Ngo The Pong (1984/85:149), indicate progress in the exploitation of sea resources.

### ***Quynh Van Sites***

Besides Da But, Quynh Van is also another prehistoric cultural complex in Vietnam (Ha Van Tan, 1984/85:136). The Quynh Van culture is named after the area in the lower reaches of Ca River, about 100 kilometres south of Go Trung, where its typical assemblages have been found. Quynh Van stone tools are differentiated from those found at Da But and Go Trung by having ungrounded edges and unpolished surfaces (Ha Van Tan, 1984/85:136; Higham, 1996:83; Ngo The Pong, 1984/85:149). In addition, Quynh Van pottery is made by the coiling method and decorated with comb-impressions unlike those found at Da But sites, which are usually made by the paddle-and-anvil technique and decorated with basket-impressions. The Quynh Van Culture was radiocarbon dated to around 2,700 B.C. (Higham, 1996:83).