BUKIT BUNUH, LENGGONG, MALAYSIA: A NEW EVIDENCE OF LATE PLEISTOCENE CULTURE IN MALAYSIA AND SOUTHEAST ASIA

Associate Prof. Dr. Mohd Mokhtar Saidin
The Centre for Archaeological Research Malaysia
University Sains Malaysia
11800 Penang, Malaysia
mmokh@usm.my

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Intorduction

A new Palaeolithic site- Bukit Bunuh- discovered in 2002 has thrown light on Malaysia's Palaeolithic, and findings from this site will have to be considered in the interpretation of other Palaeolithic sites in Southeast Asia. This is because Bukit Bunuh is an undisturbed lithic workshop- with reliable and confirmed date of 40,000 years old. Excavations revealed stone artifacts- anvils, cores, hammerstones, pebble tools (chopper, handaxe, etc) flake tools, debitages. The discovery of the Bukit Bunuh handaxes suggest 'similar technical and cognitive capabilities' on both sites of the Movius Line?. The Palaeolithic people in Bukit Bunuh use the materials of quartzite, quartz, chert, flint and impact breccia. Being an undisturbed site means that Bukit Bunuh can contribute to an understanding of Palaeolithic technology while also throwing light on the loose finds from Palaeolithic sites in Southeast Asia. Thus, this paper will focus on the new site discovered- Bukit Bunuh- and its contribution to lithic classification.

Palaeolithic Evidence in Lenggong Valley

Southeast Asia is already known in world Palaeolithic culture- such as open site of Irrawaddy in Myanmar, Kanchanaburi in Thailand, Cagayan in Philippine, Kota Tampan in Malaysia and Pacitan, Sangiran, Ngandung in Indonesia, which was established as a Paleolithic sites since early 1900's. Since that, some of these sites had been challenged- in terms of the artifacts, dating, *in situ* etc.

Since 1987, Malaysian archaeology has been active research in prehistory, conducted mainly by the Centre for Archaeological Research Malaysia (CARM) at Universiti Sains Malaysia, in cooperation with the Department of Museums and Antiquities. Our first site is Kota Tampan. The 1987 discovery and excavation of Kota Tampan which was found *in situ,* provided sufficient data to interpret it as a toolmaking workshop which revealed its lithic technology and classification, palaeoenviroment and dating- 74,000 years ago (Zuraina 2003).

The focus of research by CARM has been the Lenggong Valley in Perak, which began in 1987 with the discovery of Kota Tampan (Zuraina and Tjia 1988), and expanded to many other sites in the valley- Bukit Jawa (Zuraina 1997), Kampung Temelong (Mohd Mokhtar 1997a), Lawin (Mohd Mokhtar 1997b) and our new site Bukit Bunuh. These are all 5 open Palaeolithic sites that had been excavated. Beside these 5 sites, we also found another 11 open sites throughout the valley- Nenering, Bukit Sapi 1, Bukit Sapi 2, Kampung Luat 1, Kampung Luat 2, Kampung Luat 3, Bukit Suring, Batu Berdinding, Kampung Tawai, Kampung Air Bah, and Kampung Sumpitan (Mohd Mokhtar 2001).

This suggest that Lenggong Valley is one of the centre of Palaeolithic culture evolution in this region beside central Java (Table 1).

Table 1: Palaeolithic site in Lenggong Valley: The Dating

SITES	DATING
1. Bukit Jawa	Relatif dating ~ 200,000 years old
2. Kampung Temelong	Relatif dating ~ 200,000 years old
3. Lawin	Relatif dating ~ 200,000 years old
4. Kota Tampan	Fission Track 74,000 years old
5. Bukit Bunuh	OSL 40,000 years old

Our excavation of Bukit Jawa, Kampung Temelong, Lawin, Kota Tampan and Bukit Bunuh revealed that they share some basic characteristic- stratigraphy, site function, lithic technology, lithic classification and palaeoenviroment (Table 2). However, Bukit Bunuh showed 2 main different- the raw materials and the existing of handaxes.

Table 2: Palaeolithic site in Lenggong Valley: The Similar Characteristic

Characteristic	
1. Stratigraphy	Cultural layer is between the top layer (new alluvium deposits) and the granite soil
2. Site Function	Toolmaking Workshop
3. Lithic Technology	a. Direct Percussion- big hammerstone to core, core to anvil b. Indirect percussion- hammerstone to core/pebble/flake on anvil/thigh
4. Lithic Classification	Anvils, Core, Hammerstones, Pebble Tools, Flake Tools and debitages
5. Paleoenviroment	Lake

The Lithic Workshop

The presence of anvils, cores, hammerstones, pebble tools, flake tools and debitage, and their association with one another suggest a function related site. Boulders had very distinct battered marks on the top surface, suggesting that they were used as anvils. Around these anvils were found flakes and chips, further confirming the function of the boulders as anvils. The chunks were cores whose detached flakes were found within an approximate 0.25 m radius. Some of these flakes could be matched to their respective cores.

The cores and anvils, for instance, showed attributes that were repeatedly found in many pieces, suggesting that they were not natural occurrences but that they revealed the existence of a definite system of production.

Flakes were present in the thousands in the excavation and could not all have been broken and concentrated in the sand and gravel by natural processes. All of the flake edges are sharp, and would acquire a rounded edge if transported. Because the flake edges are sharp, the materials here have not been transported. Thus, the workshop site is *in situ.*

Other evidence, such as the spatial location and relationships between the different categories of artifacts, further attests to this being an undisturbed Palaeolithic workshop. The occurrence of rounded pebbles and boulders, together with angular and sharp edged fragments of the same rock material precludes the possibility of these pieces having been accumulated purely through natural (as opposed to man-made) processes.

The spatial arrangement of artifacts observed during the excavation (for instance, between anvils and flakes, flakes and cores), together with the positions of the anvils with battered marks on their top surfaces and the cores and flakes that could be conjoined, suggest that the artifacts are *in situ*, and the site is therefore undisturbed.

Lithic Classification

In the preliminary stage, artifacts were sorted out from non –artifacts. Artifacts bear marks of human manipulation through flaking, bashing, trimming or utilization. Non-artifacts were the unmodified or non-humanly modified, pebbles and cobbles that were part of the natural river sedimentation environment.

From a recurrence of certain forms and the association of these artifacts, certain major categories are visible. There are those artifacts that are the tools of production, namely anvil, core and hammerstone, those that are the products of manufacture, namely pebble and flake tools, and those that are the waste products of manufacturing, is the debitage.

The spatial arrangement of artifacts observed during the excavation (for instance, between anvils, cores, hammerstones and flakes) together with the position of anvils showing battered marks on their top surfaces, cores and flakes that could be conjoined, and sharp flakes and flaking surfaces of cores, not only suggest that the artifacts are *in situ*, but they also provide confirmation of our construction of the artifact types.

As would be logical of a lithic workshop, the largest proportion of artifacts were waste material or debitage. It was also evident that some artifacts were of dual purpose, for instance, a broken anvil could be utilized as a core. In such a case, characteristics of both artifacts would be visible on the boulder i.e. bashing marks as well as flake removal surfaces. Also, as can be expected of a workshop, there were unfinished pebble and flake tools, and the number of completed pieces were low, as upon completion a large proportion of them would have been taken away and used.

In constructing the classification of this assemblage, certain categories are distinct and straightforward. These are anvils, cores and hammerstones, the equipment for

production. The debitage is identified as the unutillised waste. There are in various sizes and shapes- chunks, flakes and chips.

Classifying the end product of manufacture, ie the tools produced for direct use or for the production of other tools, required more time and effort to test out at a satisfactory set of attributes for the types. A set of attributes is considered satisfactory when it reflects the cohesiveness of a group of artifacts as a type, and separates it distinctly from other types.

Since the reason for this classification is to detect the internal order in the lithic assemblage (in order to interpret function and behaviour) and based on this, to construct a typology that can clearly communicate to others the internal pattern of the assemblage, it was decided that weight-mass was not as meaningful a criteria as form, i.e. pebble and flake. Thus, this classification distinguishes between pebble tools and flake tools. A tool type within each of the broad categories (i.e. pebble and flake) would be distinguished according to several morphological and technological attributes. This is therefore a classification that combines both technological and morphological criteria in its defination of types.

The lithic assemblage of Bukit Bunuh has been classified into cores, anvils, hammerstone, pebble tools, flake tools and debitage. With more than 20,000 of debitages, each of other categories have been further sub-divided into types (Table 3). The spatial relationship between and among these categories provide more confidence to the identification and classification of artifacts as suggested in this study.

Table 3: Classification of the Bukit Bunuh Assemblage

Category	Type	Quantity
1. Anvils		71 (9.5%)
2. Cores		87 (11.6%)
3. Hammerstones		159 (21.3%)
4. Pebble Tools	a. Choppers	*21 (25.3%)*
	b. Handaxes	***19 (22.9%)***
	c. Palaeoadzes	*12 (14.5%)*
	d. Notched Flat Pebble	*10 (12.0%)*
	e. Perimeter Flaked Pebble	*9 (10.8%)*
	f. Oval Unifacials	*7 (8.4%)*
	g. Miscellaneous	*5 (6.1%)* 83 (11.1%)
5. Flake Tools		347(46.5%)
		TOTAL: 747 (100%)

Handaxe

Handaxes had a very wide temporal and geographic distribution. The earliest examples were made in East Africa and date to about 1.4 million years ago (Schick and Toth, 1993). Wynn (1995) mentioned that to be a 'true' handaxe the artifact must derive

from Lower or Middle Palaeolithic contexts in Europe, Africa and Asia. After Africa, handaxes appeared in the Near East, Europe and Indian subcontinent. Stone knappers in Europe continued to manufacture them well into the Middle Palaeolithic, after 128,000 years ago.

Until recently, the handaxes distribution had been found almost exclusively in western Eurasia and Africa. This prompted the creation of a geographic boundary line between the east and west, known as the Movius Line. This line, named for a Harvard archaeologist who first described the east-west distinction, divided the two areas, labeling east Asia, which lack this handaxes technology, as cultural stagnant and western Eurasia and Africa as progressive.

The Bukit Bunuh handaxes are bifacially and unifacially trimmed pebble tools. It has sides converge toward a tip, which is usually rounded and some comes to a sharp point. Both lateral edges was modified. They are made from all type of material in Bukit Bunuh- quartz, quartzite, chert, flin and impact breccia. The largest is 2.7kg while the smallest is 1.1kg.

Conclusion

Did Bukit Bunuh handaxes destroy the Movius Line? Potts in Science Magazine 2000 reported that he founds handaxes in Bose basin, southern of China which was dated ~ 800,000 years ago. But an archaeologist Bar-Yosef said that the Bose findings are an exception, they don't destroy the Movius Line. With this new evidence from Bukit Bunuh suggest that Paleolithic people in Southeast Asia also produce handaxes.

Why make a handaxe? Based on Bukit Bunuh pebble tools classification (Figure 3) suggest that handaxe is an intentional product of prehistoric minds, in the sense that palaeolithic stone knappers set out to produce them as final products. Most Palaeolithic archaeologist see the handaxe as a general-purpose tool, who design was capable of performing many functions. This position is supported by experimental studies by Toth and microwear analyses (Keeley 1980). But Calvin (1993) suggest that they were projectiles.

Why in Bukit Bunuh at 40,000 years ago? If the dating is really associate with the handaxes, why homo sapiens in Bukit Bunuh using it, not at Bukit Jawa, Kampung Temelong, Lawin (~200,000 years ago)?

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