A PRELIMINARY NOTE ON THE EXCAVATION OF THE SAI-YOK ROCK-SHELTER

by

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During the years 1943 and 1944, the author was compelled to work on construction of the Moulmein-Bangkok Railway along the Kwae (river) Noi as a prisoner of war of the Japanese.

In March 1943, I had the good fortune of discovering six unifacially flaked pebble tools *in situ* in the upper layer of thick river laid gravels and boulders east of the hamlet of Ban Kao. This terrace is the highest, widest and most conspicuous of the Kwae Noi.

I was inclined to believe that this series of tools formed part of the Lower Palaeolithic Chopper Complex of South and East Asia, and although no palaeontological evidence was obtained, I assigned it to the pleistocene period.[1] In Burma, Punjab and North China, it was possible to demonstrate that similar tools belonged to the middle pleistocene,[2] and Mrs. Ann Sieveking went so far as to suggest, on geological grounds, that the Tampanian of Malaya was of first Interglacial or early second Glacial Age.[3]

However, it is as well to remember that plano-convex pebble tools go back to the dawn of time in South and East Asia, and should also realize that more or less similar tools of plano-convex section, dating from post-glacial times, are found widely spread in the Far East. I shall refer to this matter again when we come to discuss the pebble tool problem as a whole.

1. Heekeren, H.R. van 1948; Prehistoric Discoveries in Siam, 1943-1944. *Proceedings of the Prehistoric Society, 2, 24-32.*

2. Movius, Hallam L. Jr. 1948: The Lower Palaeolithic Cultures of Southern and Eastern Asia. *Trans. Amer. Phil. Soc.*, 38, 325-420.

3. Sieveking, Ann 1960: The Paleolithic Industry of Kota Tampan, Perak, Northwestern Malaya. *Asian Perspectives*, II, 2, 1958, 91-102.

More unifacially manufactured pebble tools, but of rather different shape, were found associated with some sub-fossil bones in a cave north of the hamlet of Wang Pho, and were classified by the author as post-glacial or mesolithic.

Subsequently, two polished square axes were picked up from the ground near the railway station at Ban Kao and finally a friend gave me a beautiful highly polished shouldered axe which was said to have been found near Nong Pladuk.

The most important specimens of this collection, seven in number, survived the war and are now on display at the Peabody Museum of the Harvard University in Cambridge, U.S.A.

In my paper mentioned in Footnote 1, I wrote: "I hope that this paper will inspire other archaeologists to investigate that country on a larger scale, better equipped and under more favourable circumstances". Many years have passed then and it was not until the year 1956, that a young Sheldon Travelling Fellow from Harvard, named Karl. G. Heider, stimulated by Prof. Hallam L. Movius, Jr., made fresh investigations in the same area. He made large collections of pebble tools, all surface finds, and subsequently, guided by an old local man, discovered in a gully west of Ban Kao near Hoi Maeng Rak, a great number of neolithic potsherds, fragments of stone bracelets, some polished square axes and parts of baked walls. Heider called the place Bang site. He was also the first to report upon a very promising burial ground from the Bronze Age at the sawmill site near Wang Pho.[4]

In the spring of 1960 when I had just returned from prehistoric field work in South America, I received to my great surprise and intense joy, an invitation from Denmark to participate in the Thai-Danish Prehistoric Expedition under the leadership of Dr. Eigil Nielsen, noted palaeontologist of the Universitets Mineralogisk-Geologiske Institut, Copenhagen. The third member

4. Heider, Karl G. 1957: New Archaeological Discoveries in Kanchanabury. *The Journal of the Siam Society*, XLV, 1,61-70.

_____1960: A Pebble-Tool Complex in Thailand, *Asian Perspectives*, II, 2, 1958. 63-67.

of the expedition was the young prehistorian Per Sørensen, and in Bangkok it was joined by the three Thai scientists, Nai Chin You-di, Mr. Arphorn and Mr. Tamnoen.

In the beginning of November 1960, we started our first trip along the Kwae Noi with an extension to the Three Pagodas Pass on the Burma frontier. From Kanchanabury also named Kanbury, situated at the junction of the Kwae Noi and Kwae Yai (or Mae Klong), we travelled by boat to the hamlet of Tacanon, which we reached after four days. From here we travelled on ten elephants to the Three Pagodas Pass and back to Tacanon again. In seven days a distance of two hundred kilometres was covered on elephants. We then went back slowly to Kanbury, making extensive reconnoitring trips on both sides of the river. Following this trip we went from Kanbury upstream the Kwae Yai, once again surface collecting and reconnoitring.

On these trips an amazing amount of prehistoric material was obtained, covering the main phases of the prehistory of Thailand, but as might be expected all of it consisted of scattered single finds or at best unstratified unit collections, and this, of course, lowered its scientific value. The finds were made in caves, rock-shelters and open-air sites. The location of the majority of the caves was found with the aid of Thai informants and the Governor of Kanbury also rendered us all requested aid and co-operated most wholeheartedly with the enterprise. For the rest the success of the expedition depended a great deal upon the assistance of the Thai members who participated in the field work.

On the third trip, two sites were selected by us for more detailed study. Originally we apportioned a period of eight days only, for trial trenching at Bang site where Karl Heider had made his neolithic surface finds, as mentioned before. But as it happened, this site appeared to be a neolithic graveyard, containing well preserved human skeletons and funeral gifts consisting of complete pottery and selected polished stone square axes, only matched in importance by the Sieveking's excavation at Gua Cha, Kelantan in

Malaya.[5] We therefore decided to split the party; accordingly Per Sørensen and Arphorn stayed behind at Ban Kao to continue the excavation on a larger scale. Sørensen himself writes in a separate paper on this subject from firsthand knowledge. Nielsen, Chin You-di and the author left the site after eight days when already four skeletons with funeral gifts had been brought to light. We went upstream where we found two bamboo rafts with roofs waiting for us, and these served us as home for the next three weeks.

Here, south of the well-known waterfalls of Sai-Yok, there is a limestone ridge on the left bank, in easy reach of the river in which are two caves and a rock-shelter. The top of the floor of the last mentioned lies 28 metres above the low level of the river. Below the rock-shelter and connected by a steep talus slope we noted a high terrace of the ancestral river and a low terrace at 21 metres and at 7 metres respectively above the low floodmark of the present river.

Six workmen were recruited in the vicinity of Sai-Yok to carry out the digging. *Cave I*, with a refuse accumulation of only one metre in thickness, appeared to have been occupied by mesolithic, neolithic and bronze-age people, and subsequently by historical people. The latter occupation was indicated by the presence in the cave of wooden burial coffins containing urns with charred human bones and mortuary gifts like fine Sawankalok ware of varying shape, and bronze lime containers. Pottery, beads and a decorated bronze bell of the bronze age were found in the upper layers only. On the rockbottom of the cave we found two neolithic graves with human skeletons which were almost completely decayed. The funeral gifts were still present however, notably pots buried intact and many of them complete, a selection of polished square axes and one small shouldered axe. I have reserved these groups of objects for separate treatment. Cave II, having a thin layer of refuse, provided us with

5. Sieveking, G. de G. 1954 a : Excavations at Gua Cha, Kelantan. *Federated Museums Journal*, I/II, 75-138.

———— 1954 b : Gua Cha and the Malayan Stone Age. *Malaya Historical Journal*, 1, 2, 111-125.

some mesolithic pebble tools. Outside the caves was a fine half open *rock-shelter* under overhanging rock gables, where we made an excavation. It is with this excavation that this paper is mainly concerned. As the finds are still en route, it will be appreciated that this report is inevitably incomplete and that it must be considered as provisional only. Moreover, the excavation is still in a formative stage and further results are expected from future work. Yet certain conclusions may already be drawn and the information gathered from the excavation can be summarized as follows.

The surface was covered with scattered limstone rubbish in which we found 7 pebble tools and some potsherds. This situation was encountered before in many other caves. I have the feeling that for some reason or another, sedimentation in the caves came to a long time ago.

We carried out the excavation by taking off the soil in layers of 25 cms. carefully following the stratification. The rock-shelter appeared to be a refuse dump with deep accumulation of debris with a clearly defined stratigraphy. It has not yet been possible to establish its depth. At a level of 3.75 metres we came upon a disconformity; below this level was a lateristic red rubble with some boulders. In one place we went down to 4 metres without encountering the subsoil at that lowest level shell refuse and a stone artifact were still present. Whether traces of Early Man stratified below 4 metres will be found, there is yet no telling.

The Mesolithic Pebble Tool Industry; Post-glacial flaked pebble tools of quartzite with occasional bifacial trimming, form the bulk of the finds and 198 specimens were obtained from the digging. The majority were found concentrated in the upper 175 cms, but we came upon a second 'living floor' at a depth of approximately 3 metres below the surface.

Speaking in general terms the implements could be described as unifacially trimmed, flat-bottomed pebble tools, plano-convex in section and with a sharp cutting edge. On the entire ventral face

and on the less essential parts of the upper face, the matrix of the original pebble was left untouched. A few key types are: tools with a very high dorsal face and steep marginal trimming; flat, discoidal scrapers, carefully retouched about all edges; 'sumatraliths' oval in shape, and 'short axes' with straight chopped off posterial part, which perhaps are not a distinct type at all but only broken 'sumatraliths'.

The lithic material included two pebble tools worked on both faces and two ground axes or protoneoliths,[6] which were found in the upper layers; in the same layers, six potsherds were unearthed but after a depth of 75 cms, had been reached no further sherds occurred. The presence of the sherds and the protoneoliths suggest neolithic influence or contact.

The pebble tool complex of the lower deposit is entirely preceramic and all the tools are worked on one face only. During the excavation many large bivalve freshwater mussels were found in all layers, but a curious feature is the great rarity of mammal remains. It appears that the people whose tools were found in the debris, based their economy on a full exploitation of their favourable riverine and forest environment, by some kind of restricted wandering. The rivers there were well stocked with fish and shellfish, as they still are at present.

The most important pursuit was fishing and shellfish gathering; next in importance came hunting and collecting of wild food, whether animal or vegetable. Each band or family probably had its own territory and division of labour was based on sex. Women, it seems were mainly responsible for collecting shellfish and wild fruits and digging up esculent roots; men for hunting and fishing. The people frequented rock-shelters and caves, if found to be convenient and in easy reach of fresh water, but they also erected, temporary self made shelters in the open. In this connection it may safely be assumed that the accumulations of pebble tools together with factory waste which we found at several places in the open plain near Ban

6. Colani, Madeleine, 1932: Le Protonéolithe. *Praehistorica Asiae Orientalis* 93-95.

Kao and elsewhere, were actually remains of ancient hunting camps, now exposed by natural erosion.

Of course, as only the imperishable part of the original material culture has been retraced during excavation, the archaeological record, gives too simple an idea of the culture of the people. There is little doubt, that they also made extensive use of wood, bamboo and bark, but whether they had bows or spears or blowpipes is a matter of conjecture. I am inclined to believe that the pebble tools were mainly wood-working tools, and tools for chopping, cutting, scraping and other purposes.

The excavation had brought to light a burial of this ancient period which was unmistakably associated with mesolithic unifacially flaked pebble tools, without potsherds. It was a rather ill-preserved skeleton of a human adult, 150 cms. below the surface. It was placed almost parallel to the rear-wall on a bed of boulders; it was found lying on its back, face turned to the right, knees updrawn, right hand under the chin, left under-arm across the body. A heavy stone slab of quartzite was placed on the upper part of the body and the thoracic area has been subjected to downward pressure and was badly decomposed. The soil above the head and part of the body was stained with red ochre, a feature which has been connected with religious conceptions at the time. Red pigment (the colour of 'blood' and 'life') and its use in connection with burials are known throughout the Malay Peninsula and the Archipelago, but were unknown in Indo-China during mesolithic times.

Grave goods in the normal sense were not present, but a large mammal bone on the chest and many mussels, all with the hollow side up and placed on top of each other, are remains of food, meant to be taken along the journey after death, which suggests a belief in immortality.

What struck the observer at first glance; was the small stature of the skeleton, the remarkable thickness of the skull, which was 11-12 mms. in places, the fragility of the limb bones, and the small-

ness of the mandibular ramus and dentition. It is obviously a skeleton of *Homo sapiens*, albeit of a very primitive type. More will be said of this skeleton as soon as craniometric and comparative osteometric studies have been carried out by physical anthropologists.

One point however, seems already to be certain. The skeleton is physically distinct from the megalodontic Australo-Melanesians, who were supposed to be the originators of the mesolithic pebble culture.[7]

The overall picture, as based on the nature of the archaeological material of the Sai-Yok rock-shelter is without any doubt analogous with that of the Hoabinhian of Indo-China[8] and Malaya.[9] Or to be more precise the lower deposits contain, as mentioned before, a flexed burial connected with stone tools without exception worked on one face only and no potsherds, and should be ascribed to the Early Hoabinhian. In the upper layers however, apart from unifacially worked stone tools, were found some potsherds, two ground stone tools, two bifacial stone implements and these should be ascribed to the Middle/Late Hoabinhian. Previously a similar sequence was obtained at the Gua Kerbau and Gol Bait in Malaya by Van Stein Callenfels.[10]

The Hoabinhian and related cultures have a rather wide geographic range in the Far East. Regions where they occur most frequently are South China (more than hundred caves in the Sechwan and Kanshu provinces[11]), Indo-China (numerous caves

7. Stein Callenfels, P.V. van 1963: The Melanesoid Civilizations of Eastern Asia. *Bulletin Raffles Museum* Series, B, No. 1, 41-51.

8. Colani, Madeleine 1927: L'Age de la Pierre dans la Province de Hoabinh (Tonkin) *Mémoires Serv, Géolog. Indo-Chine*, 14.

9. Tweedie, M.W.F. 1953 : The Stone Age in Malaya. *Journal Malayan Branch* RAS, 26, 3–90.

10. Stein Callenfels, P.V. van and I.H.N. Evans 1926. Report on Cave Excavations in Perak. *Oudheidkundig Verslag.*, 3/4.

————and H.D. Noone 1940: Report on an excavation in the rock-shelter Gol Bait near Sungai Siput (Perak). Proc. 3rd Congr. of The Preh. of the Far East, 119-125.

11. Chen Te-K'un, 1959: *Prehistoric China*, Vol. 1, 47-51.

and rock-shelters and some kitchen middens[12]), the Malay cave deposits[13] and perhaps Borneo[14]. This culture it seems has reached Kangaroo Island and South East Australia and Tasmania[15] but how it was transmitted, and in which direction, is still unknown. Its ultimate origin is more difficult to determine but it seems likely that the homeland of his culture is to be found in South China.

In Thailand it is found concentrated in the valleys of the Kwae Noi and Kwae Yai, and Sarasin reported to have found evidence of it in some caves in the north and the south of the country.[16] Something like 20 localities can be put on the map already, but there are certainly more.

We are still without an answer as to the exact date, but charcoal samples for time analysis were taken from most layers and are being tested by the radio-carbon method.

The pebble tool problem and future research: As has been emphasized before, pebble tools in the Far East are already known since Middle Pleistocene times and in North China, notably in Chou-kou-tien, they have been found in association with fossil remains of Pithecanthropus pekinensis.[17] On the other hand, pebble tools which have no fundamental technological differences with the former are also known from post-glacial times.

With the above remarks in mind, we have to realize, that too much emphasis cannot be placed on typology because typology itself is not an adequate guide to the relative age of the various types.

I am inclined to believe that the mesolithic culture represents a continuation of the Lower Palaeolithic, but an authority of Teilhard de Chardin's stature holds a divergent view and suggests that

12. Patte, E., L'Indochine préhistorique, *Revue Anthropologique*, 1936.

13. Tweedie, M.W.F. 1955 : *Prehistoric Malaya*, Background to Malaya series, no. 6.

14. Harrisson, T., 1947 : The great Niah Cave. A preliminary report on Bornean Prehistory. *Man*, vol. VII, 161-166.

15. Tindale, E.K. 1937 : Relationship of the extinct Kangaroo Island culture with cultures of Australia, Tasmania and Malay. *Records of the South Australian Museum*, 6, 116-119.

16. Sarasin, F. 1933 : Recherches préhistoriques au Siam. *L'Antropologie*, 54, 547-548.

17. Le Gros Clark, W.E. Pithecanthropus in Peking. *Antiquity* 19, 1-5.

the resemblance in type, is only superficial.[18] What stands, however, is that the Palaeolithic and Mesolithic both know unifacially worked pebble tools and that typology as a diagnostic should be used with caution and that the results must be treated with the utmost reserve.[19]

We have to realize that only stratigraphical, geological and palaeontological evidence of antiquity can help us with this problem. Therefore, further studies of this topic must be concentrated on ancient, fossil bearing gravels containing pebble tools. I am afraid that the gravels of the Kwae Noi are of little assistance as they are entirely devoid of fossils.

The author has supposed that the pebble tools he has found *in situ* in the gravels of a high terrace near Ban Kao, are palaeolithic. Important though this viewpoint may be, it has no undisputably clear foundation, and my argument might fail to convince, as we still do not know when these gravels were laid down by the ancestral river.

Another approach to the matter would be to carry out excavations in rock-shelters with deep refuse accumulations connected with high level river terraces, such as seem to exist in Sai-Yok.

Such excavation, admittedly, would be by way of experiment, but the possibility of further discovery is always latent in our work, and new prehistorical and palaeontological facts may well be brought to light, provided the excavations are carried well down into the lower strata.[20]

We hope that such further exploration will take place in the fall of the year 1961.

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18. Teilhard de Chardin, P. 1950 : Le Paléolithique du Siam. *L'Anthropologie*, 54;547-548.

19. In South and Middle Africa, prehistory begins with pebble tools and leads on to the development of the bifacial hand-axe.

In the East, however, it seems that archaic pebble tools persisted for long periods after they have given rise to more advanced types elsewhere.

20. Chan Te-K'un 1959 : *Prehistoric China*, Vol. I,47-51. In limestone caves in Kwangsi, South China, two types of layers have been distinguished. The upper deposits are of post-glacial age and contain mesolithic pebble tools and a sub-fossil fauna; in the deeper layers a Stegodon fauna was encountered with remains of *Gigantopithecus* and *Pithecanthropus*.