

A RECONSIDERATION OF THE CHRONOLOGY OF THE EARLY PALAEOLITHIC LANNATHAIAN CULTURE OF NORTH THAILAND

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ABSTRACT

Between 1972 and 1974 a number of Early Palaeolithic sites were discovered in the Lampang and Phrae intermontane basins in North Thailand. They have been reported and discussed on several occasions (Sørensen 1976, 1985). The chronological adjustment of the border between the Brunhes Normal and the Matuyama Reversed magnetocrons to 780/790,000 years ago affects the age of the North Thailand sites. In consequence, a re-discussion of their chronology is presented here, suggesting an Early Pleistocene time bracket of 1.2 to 0.8 mya for two of the Lampang sites, while the majority of the other sites in the Lampang and Phrae basins are probably dateable within a Mid-Pleistocene time bracket of c. 700,000 to 560,000 years.

Since the Early Palaeolithic sites in the Lampang and Phrae intermontane basins were first reported at the International Congress for Pre- and Protohistory in Nice in 1976 (Sørensen 1976), studies of these sites have been continued on and off, in the field by re-surveying some of the very few remaining sites.¹ These studies included a comprehensive geological re-investigation of the sites in 1978, a re-examination of the finds in the National Museum in Chiang Mai in 1987, and repeated field trips, especially to site P.2 in Phrae, the last conducted in 1994 in connection with the IPPA congress in Chiang Mai. Much of the new information resulting from this continued research has been presented at various congresses and conferences, but most of it remains unpublished.

However, with the chronological adjustment of the border between the Brunhes normal and the Matuyama reversed magnetochrons, now calculated to be from 730,000 to 780/790,000 years ago (Funnel 1995; Berger et al. 1995), likewise by extension the border between the Early and the

Mid-Pleistocene, the need to reconsider the chronology of the north Thailand Palaeolithic sites becomes obvious.

THE MAE THA SITES IN THE LAMPANG BASIN

The new time span for the boundary between the Early and Middle Pleistocene primarily affects the dating of the two Mae Tha sites MT.I/II and MT.VI, both in Amphoe Mae Tha, Changwat Lampang, as they are both earlier than this boundary. But the main problem still remains the same: how much earlier? Already in the first report on the geology and the relative and absolute chronology (Shouls n.d.) of all the sites, it was indicated that these sites could be very much earlier than the Brunhes-Matuyama boundary. The reason is that the reverse-geomagnetized lowest flow of the Lampang basalt, which surrounds the area of the MT.I/II site, rolls over the edge of tool-bearing Terrace I, the earliest terrace. Likewise, the reverse-geomagnetized flow also overlies the tool-bearing sediments at MT.VI, which could perhaps be pre-Jaramillo with the subsequent normal geomagnetized flows representing the Jaramillo Event, now dated to between 1.07 and 0.99 million years.

Furthermore, both at MT.I/II and at MT.VI it can be shown clearly that the down-cutting of Terrace I took place prior to the eruption of the basalt. At MT.I/II it can also be shown that the lateritization of the sediments with the tools predates the basalt. The MT.I/II site is actually somewhat older than MT.VI, as the latter shows no sign of lateritization of the deposits, but reveals a fresh, unweathered gravel conglomerate with the tools, probably because it was directly overlain by the volcanic ash and the basalt. It therefore may be assumed that there is no great chronological difference between the tool-bearing sediments and the deposition of the volcanic ash and basalt. Thus, the internal difference in age between the two sites unfortunately remains an unresolved problem.

All the attempts by the geologists associated with the project to get an absolute age for the basalt have been

unsuccessful. All K-Ar dates are less than 200,000 years, unrealistically low, probably due to loss of argon. The best result obtained was a fission track date of a sample from a flow known to be normal-geomagnetized. Unfortunately, only one track was found in the non-irradiated sample and the resulting date of 866,000 years (with an error range of 100%) cannot be considered significant (Barr *et al.* 1976).

Later on, Sasada *et al.* (1987) succeeded in dating two samples of the Lampang basalt by K-Ar to 0.8 ± 0.3 and 0.6 ± 0.2 mya. The authors seem to favour the 0.6 mya date as being the most reliable. However, in their paper they do not indicate whether the dated samples were normal- or reverse-geomagnetized. In any case, these dates seem to have little, if any, bearing in this context.

In conclusion, we have the option of an early, pre-Jaramillo date at greater than 1.07 mya, and a later date of greater than 0.78/0.79 mya for the reverse-geomagnetized lowest basalt flows at Mae Tha. The latter may be the most realistic at the moment, but a pre-Jaramillo date cannot be ruled out. Either way, the MT.I/II and MT.VI sites are of Early Pleistocene age.

THE PHRAE SITES

The chronology of the Phrae sites is a much more complicated problem to deal with. They cannot be dated in absolute terms at the moment, because, unlike the sites in the Lampang basin, it has not been possible to relate them stratigraphically to the basalt flow closing the Phrae basin in Den Chai (Barr and MacDonald 1979). But it has been possible to establish a relative chronology for all the sites within the basin. Quoting from the geological report (Shouls in prep.):

There is little evidence for the thickness of the Quaternary deposits in the present basins (the Lampang and Phrae basins), but they both seem to be formed of an aggrading sequence up to a base level higher than at present, which is followed by an erosional sequence downwards currently continuing with the modern rivers to form incised meander belts within the basins.

Archaeologically, the location of the finds is in almost all cases similar to that of the finds in the Lampang basin, with the tools generally embedded in the lateritized sediments of the uppermost, and thus the earliest, of the river terraces. The exception is site P.2 (Phrae), locally known as Phrae Muang Pii, where a number of flaked pebble tools were found at the very bottom of the "badland" sediments during my first visit. According to experience from so many other sites, in which tools on the surface could usually be shown to originate from lateritized soils on closer investigation, it was also here thought that the tools might have been washed out from the lateritized small-pebble conglomerate capping

the site. During the second geological survey in 1978, the co-operating geologist Dr. Malcolm M. Shouls pointed to the possibility that the tools might have originated in a thin pebble conglomerate below the cemented silty argillaceous sediments. In 1982, however, tools/flaked pebbles were actually found *in situ* in the gravel conglomerate. Since then, finds have been made at P.2 during several later surveys of the site. These finds are not lateritized. They have obviously been insulated from this process by the overlying cemented sands, whereas lateritization, as mentioned above, has affected the gravels of the top sediments. This probably indicates that the finds from P.2 are somewhat older than the finds from the majority of the Phrae sites, which were embedded in the lateritized sediments of Terrace 1. An exception is site P-S.4, a small site with pebble tools which probably dates to the Late Palaeolithic or the Holocene.

Geologically, however, site P.2 is clearly a part of the same aggrading sequence of river and flood plain deposits as all the other Phrae sites, which are generally found at an elevation of 200 m above sea level, while the artefact horizon at P.2 lies at about 225 m. This suggests a somewhat greater age of the finds from P.2, a suggestion which is difficult to substantiate from the archaeological material. It does underline the fact that it has been possible to establish a certain relative chronology among the Phrae sites, but it does not give any further clues to an absolute age determination of these sites.

The only indication of a date may be found in connection with the pebble tool finds from Cambodia (Saurin 1966; Saurin and Carbonnel 1964), where two early periods of laterite formation separated by a sterile sand are reported in the northeast around Stung Treng, in the terraces formed by the Mekong river. Of these two laterite formations, the "latérite supérieure" contains tektites, K-Ar dated between 690,000 and 560,000 years, but fission track dated to $710,000 \pm 40,000$ years. The "latérite inférieure" contains pebble tools, which in many respects are similar to those of the Lannathian, except that a number are made on fossil wood like many from the Anyathian culture in Burma (Movius 1943). They apparently also differ in that the flake element is more frequent than in the Lannathian culture, but like the Lannathian and unlike the Anyathian, so-called chopping-tools are almost absent.² From this it may be cautiously concluded that the majority of the Lannathian sites in the Phrae intermontane basin, and probably a majority of the sites in the Lampang basin and the adjoining Mae Moh basin in Lampang,³ which are located over the basalt, are probably at least 560,000 years old and thus belong to the first half of the Mid-Pleistocene. This, considering the new dating of the Brunhes-Matuyama boundary, is now extended from about 780,000 to 140,000 years ago.

It is obvious, from the preceding presentation of data and discussion of the basins, that at the moment it is impossible to produce a coherent absolute chronology for the sites and the terraces on which they are found. However, in spite of this difficulty, a relative chronology seems to be well established, utilising the assumption that the lateritization was in the main penecontemporaneous with the terraces in the two basins. Hominid occupation of the sites in the Lampang and Phrae basins, located on floodplains or low terraces, is well demonstrated. I think it is possible to cautiously propose that site MT.I/II in the Lampang Basin belongs to the Early Pleistocene period and is somewhat older than the Brunhes-Matuyama boundary at 780,000-790,000 years, perhaps even predating the Jaramillo Event; and that site MT. VI in the Lampang Basin also belongs the Early Pleistocene period, but only just predates the Brunhes-Matuyama boundary or the Jaramillo Event.

The other sites in the Lampang Basin and the adjacent Mae Moh Basin have not been discussed here. The majority of them do not exist anymore, and mostly they are archaeologically insignificant in comparison with MT.I/II and MT.VI. They are obviously younger than these two as they are in geological contexts younger than the basalt, some related to Terrace 1, others embedded in sediments on Terrace 2. The former may belong to the middle or a later part of the Mid-Pleistocene period, the latter most likely belong to the Late Pleistocene or Holocene.

Concerning the sites in the Phrae Basin it may be concluded that they cannot be dated directly in absolute terms, and geologically only in relative terms. Site P.2 predates the other known sites in the basin, and both this and the majority of the other sites, embedded in the lateritized sediments of Terrace 1, belong to the Mid-Pleistocene period. The obvious exception is site P-S.4 which is located in sediments of Terrace 2. The finds from all these sites are morphologically rather homogenous, both in the basin itself and compared to the finds from MT.VI and the Lampang/Mae Moh Basin sites. They are assumed to belong to the early Middle Pleistocene.

In general, artefacts are made on well-rounded pebbles or cobbles of quartzite or fine-grained quartzitic sandstone. A flake element, whether as finished flake tools, as slightly worked or unworked flakes including primary flakes, and even as waste flakes or chips, is insignificant. In other words we are confronted with a genuine core tool assemblage with monofacially flaked tools.

In this paper I have refrained from comparing the Lannathaiian with other Southeast Asian assemblages, formerly claimed to belong to the so-called chopper-chopping tool complex of cultures. The Tampanian of Malaysia is now dated to about 34,000 years (perhaps 70,000

years) ago (Bellwood 1997:316), and the Pacitanian of Indonesia also seems to be Late Pleistocene (Bellwood 1997:64; Bartstra 1984; Bartstra and Basoeki 1989). The Anyathian in Burma has many similarities with the Lannathaiian, but the finds are exclusively surface and I agree with Karl Hutterer (1977:44) that their geological association with the Pleistocene river terraces appears to be uncertain. Besides, with only about 523 finds as the basis for the whole sequence from Early Anyathian 1-3 (the Early Anyathian 1 has only 23 artifacts from 3 localities), the statistical basis for the definition of this industry seems to be insufficient. In comparison, the number of tools from site MT.I/II amounts to over 250, and the number of excavated finds from P-S.3 to 1,860, to which can be added the 152 tools found *in situ* in the sediments before the excavation. There are also 525 surface finds, thus giving a total of 2537 finds from site P-S.3 alone.

NOTES

1. Of the originally over twenty tool-bearing sites where surface finds could be referred to a specific sediment horizon, only a handful still exist. The majority of the sites, including the earliest of all, the Mae Tha II site, have since been destroyed for road construction purposes. It should, however, be stressed that no efforts were spared then to make the responsible authorities aware of the need to have the most important of the sites protected under the existing law.
2. Thus, at site MT.I/II in Lampang, chopping-tools only account for 2% of the total number of finds. In the P-S.3 site in Phrae they only represent 0.75% of the excavated total of 1860 finds. But in the Early Anyathian 1-3 they make up 4.98% of the fossil wood implements, and 18.6% of the tools made on silicified tuff.
3. All the sites and the finds from the Lampang and Phrae intermontane basins will be described and discussed at greater length in the final publication of the finds. This author gave the name Lannathaiian culture (Sørensen 1985) to these finds, because all the sites were discovered within the area of the old Lanna Thai kingdoms, and so far no sites with a similar tool assemblage have been discovered outside the area notwithstanding extensive surveying.

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