

**A PRELIMINARY REPORT ON NON-METRICAL
CHARACTERISTICS OF NEOLITHIC SKELETONS
FOUND AT BAN KAO, KANCHANABURI¹**

by

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The discovery of neolithic skeletons at Ban Kao by the Thai-Danish Prehistoric Expedition immediately struck me as a wonderful opportunity to attempt to throw some light on the problem of the origin of the Thai people; a question upon which there has been much conjecture and which remains unsettled.

Previous study concerning the origin of the Thai clearly evidences a fundamental disagreement over the types of people who inhabited this part of the world now called Thailand in early times. On the evidence of language, tales, Chinese annals and of culture, most students of Thai history seem to think that the present Thai territory was inhabited by a group of people called Mon-Khmer. They believe further that the Thai at this time lived in the southern part of China, and even earlier in the area between the Huangho and Yangtze rivers; that the Thai were driven by pressure from the Chinese to their present situation. Two studies, however, seem to contradict this idea. One is that of Professor Credner² who, noting that the Thai are rice-cultivating people who prefer a tropical climate and do not inhabit mountainous slope-lands, thought that the Thai must have lived originally in low-lands near the sea; the provinces of Kwangsi and Kwangtung in China, for example. The second dissenting study, by a student of Chinese history, Dr. Mote³, claims that there is no evi-

- 1) First presented at a Seminar in December 1964 on the question "Who are the Ancestors of the Thai" organized by the Faculty of Archaeology, Silpakorn University.
- 2) See Credner, W., *Cultural and Geographical Observations Made in the Tali (Yünnan) Region With Special Regard to the Nan-Chao Problem* (Translated from the German by Major Erik Seidenfaden), Bangkok, 1935.
- 3) See Mote, F.W., 'Problems of Thai Prehistory', *Social Science Review*, vol. 2, no. 2, 1964, pp. 100-09.

dence at present to indicate that the Thai ever lived in the northern or even in the middle part of China. And, in fact, in the Kingdom of Nan-Chao, which most people believe was developed by the Thai, they were but a minor group. The people who might be related to the ancestors of the present Thai lived in the provinces of Kwangsi and Kwangtung.

To date these differences have not been resolved. I would now venture to attempt this.

When we Thai began to take an interest in our own history, our neighbors, guided by the West, and already made much progress in the study of their histories and prehistories. Whenever we in Thailand made any find of importance it was compared with what had already been found in neighboring countries. Our studies were mainly concerned with surface finds: special structures, buildings and artifacts found inside them. We took very little interest in excavation. The skeletons discovered during the excavation at P'ong Tük⁴, for example, were ignored by students of Thai history. When the finds in Thailand corresponded to what was found in neighboring countries it was concluded that present Thai territory was occupied by similar peoples. From this it followed that the Thai must have been elsewhere, and no place was more suitable than the southern part of China where Thai-speaking people live today.⁵ Assuming, instead, that the present territory of Thailand was inhabited by ancestors of the present Thai we would account for that similarity in cultural elements with neighboring countries through natural diffusion. For example, the principal art styles in Thailand (the dates of which over-lap generously, to the confusion of those who take an interest in Thai history) are: Dvaravati, 6th-11th centuries A.D.; Srivijai, 8th-13th centuries; Lopburi, 11th-14th centuries; Chiengsaen 12th-16 centuries; Sukhothai, 13th-14th centuries; and U-Thong, 12th-15th centuries. Assuming that relations with neighboring countries caused these styles—Dvaravati, Srivijai, Lopburi, Chiengsaen, Sukhothai, U-Thong—to be introduced during the 6th-15th centuries, we

4) See Quaritch Wales, H.G., Further Excavation at P'ong-Tük (SIAM), *Indian Art & Letters*, vol. 10, 1936, pp. 42-8.

5) See Dodd, W.C., *The Thai Race*, Cedar Rapids, 1923.

would eliminate entirely the question of mass migration and the dispersal of those people supposed to have occupied this area previously.

To prove or make this idea acceptable, one has to find evidence that the Thai people or the ancestors of the present Thai lived in this area during prehistoric times. The evidence cannot depend on the study of history or what is called proto-history but must proceed from the study of prehistory. The kindness of the Thai-Danish Prehistoric Expedition members, and especially Mr. Per Sørensen who permitted me to work at the excavation, the Committee of the National Museum of Copenhagen who invited me to study the skeletons, and Professor J. Balslev Jørgensen of the Laboratory of Anthropology at the University of Copenhagen, who supervised technical aspects, have allowed such study. Though the work is not yet complete (comparison with Thai skeletons at the Department of Anatomy, Faculty of Medicine and Siriraj Hospital is, in fact, just beginning) and I can now give only a preliminary report based on 37 skeletons, the findings thus far encourage the belief that the Ban Kao neolithic skeletons will indeed yield evidence pertinent to the question of the origin of the Thai people.

The life span at Ban Kao was short: 26 skeletons are those of people of an estimated age of less than 30 years; only two of more than 40 years. Physical condition appears to have been rather inferior; many long bones are weakly developed with femurs curved forwards. Stature was nearly the same as that of the present Thai.

The inhabitants of Ban Kao had short ovoid skulls, as is found in the present Thai (fig. 1), with medium and broad faces, broader than the present Thai (fig. 2). The Ban Kao skeletons show a broad and flat root of the nose; a good number of the present-day Thai skulls also show a broad and flat root of the nose (fig. 3). The skulls at Ban Kao have slight alveolar prognathism; a mild degree of alveolar prognathism can be seen in present-day Thai skulls, especially in female ones (fig. 4). The skulls at Ban Kao have a short, wide, deep palate; the same can be seen in present-day Thai skulls (fig. 5). The mandibles of the neolithic skulls⁶ appear to have been weakly

6) The report of my investigation of the mandibles of the neolithic skulls is being prepared by the Committee of the National Museum in Copenhagen.

developed, but the sides diverged at the symphysis menti so that the bicondylar and bigonial diameters were enlarged, which would make the mandible prominent in life; the same condition can be found in the skulls of present Thai (fig. 6). In the Ban Kao skulls the four front teeth of the lower jaw lie in a straight line, disrupting the smooth curve of the dental arch which bends at an angle in the region of the canines; this condition has been found in some skulls of present Thai (fig. 6). The shovel characteristic of the upper incisors of the neolithic skulls is not so pronounced as that found in other Mongoloids (following Dahlberg's classification it falls in the groups "a" or "b"); similarly this characteristic is not pronounced in present Thai skulls. The Ban Kao skulls have many caries in their teeth with masticating surfaces quite worn down; caries can be found in large numbers in present Thai skulls, but the masticating surface is different. Erosion of the labial surface of the crown in some teeth from the Ban Kao skulls, due perhaps to eating citrous fruits or using a hard brush made from the root of a tree, is not found in present-day Thai skulls.

Two artificial deformities of the teeth were found in the skeletons at Ban Kao. One was the extraction of the lateral incisors and canines of the upper jaw on both sides about the time of puberty (fig. 7). This is not found in present-day Thai skulls but one out of seven bronze age skulls found at Lopburi evidence such extraction (fig. 8). The extraction of teeth at puberty is still practiced by Australian aborigines. The other deformity noted was the filing of the labial surface of the upper incisors (fig. 9); this also cannot be observed in present-day Thai skulls, though some claim that the filing of teeth was practiced some 50 years ago in the southern part of the country. I have not found substantiating evidence of this, but two interesting reports from which I should like to quote speak of this custom. Dr. Mote notes that in Chapter Four of the Man Shu the customs of the Mang-man are described as follows: "The 'black-teeth' tribesmen use lacquer to paint the teeth; the 'gold teeth' tribesmen wrap thin sheets of gold around their teeth. When some matter arises that they must go out to meet people, they put on this gold as adornment, but they

take it off when they eat . . .”⁷ While giving no indication of the practice of filing, this indicates that that branch of the Thai race living on the southwestern border of the Nan-Chao Kingdom did something to their front teeth. A note by Dr. Wales reads as follows: “In the meantime the drawing made at the museum [Museum of the Royal College of Surgeons] which illustrates my article, shows the tooth-filing very clearly [fig. 10] One cannot fail to notice a strong resemblance in this respect to the filed teeth of the neolithic skulls recently found by the Thai-Danish Prehistoric Expedition higher up the same river Meklong. Perhaps the P’ong Tük skulls could be those of a similar people who by the early centuries of the Christian era had come into the possession of iron weapons”.⁸

Dr. Wales has expressed himself differently at different times on whether the skulls found at P’ong Tük belonged to ancestors of the Thai or not. In 1937 he held that: “All we can say is that, so far as the present evidence goes, it appears to point to the conclusion that Thai colonies were already established in the Meklong valley (and presumably the Menam valley also) in the early centuries of the Christian era: and thus it may be that the existing theories on Thai migration into Siam will have to be revised.”⁹ In a ‘correction’ published in 1964 Wales stated that he had learned that filing of the teeth is not a custom of the Thai and that the four Thai skulls in the Royal College of Surgeons collections showed no trace of tooth-filing. He wrote to Professor Cave who had examined and compared the P’ong Tük skulls in 1937 to ask whether any error could have been made. Professor Cave replied: “Whatever skulls I did use for comparison with your excavated specimens, must have shown filing of the teeth and must have had Siam as their locality although such specimens may have represented Malays hailing from Siam rather than genuine Thai people”. Consequently, Wales concluded: “In view of such frankness it is hardly necessary to emphasize that any supposition

7) Mote, *op. cit.*, p. 107.

8) Quaritch Wales, H.G., ‘Some Ancient Human Skeletons Excavated in Siam: A Correction’, *Man*, vol. 64, 1964, p. 121.

9) Quaritch Wales, H.G., ‘Some Ancient Human Skeletons Excavated in Siam’, *Man*, vol. 37, 1937, p. 90.

that the P'ong Tük skulls provide any evidence for early Thai occupation of central Siam must be finally abandoned."¹⁰

Though we cannot come to any definite conclusion concerning the relation of the P'ong Tük skeletons to the present Thai as no other racial characteristics have been studied, we have discovered that tooth-filing has been practiced in this country from neolithic times to early in the Christian era, and, assuming there is no doubt about the statement of Professor Cave, the custom was practiced somewhere in Thailand or Malaysia during this century.

Another characteristic which might prove significant is that in skeleton adult Lü II¹¹ (in addition to other features such as a broad, flat, root of the nose with a wide and deep palate) the bones of the skull were the thickest (11 mm) of the series; thicker even than that of the mesolithic skull discovered at Sai-Yok (figs. 11 and 12). The thick, coarse diploic tissues are very similar to those found in the skull of a young Thai girl who died of chronic anaemia (fig. 12). It has been found recently that one common cause of chronic anaemia in Thailand is abnormal haemoglobin E and thalassaemia. In a survey, again recent, the haemoglobin E trait was found in about 13 per cent of the total population; in some 42 per cent of the people in the northeastern part of the country.¹²

Formerly it was believed that this trait did not occur among the Chinese, but a recent survey by McFadzean and Todd disclosed haemoglobin E in four families and haemoglobin E/thalassaemia in two brothers from the southern part of Kwangtung.¹³ All claimed Chinese ancestry. This incidence, however, is by no means as great as that found in Thailand. (In fact, the characteristic might be used

10) Quaritch Wales, 'Some Ancient Human Skeletons Excavated in Siam: A Correction,' *op. cit.*, p. 121.

11) 'Lü' is the place of excavation, named in honour of Nai Lü, an old man in the village of Ban Kao, who led the expedition team to the site. Two skeletons were found at Lü II; that of an adult and a young child.

12) Wasi, P., personal communication, 1962.

13) See McFadzean, A. J.S. and Todd, D., 'The Distribution of Cooley's Anaemia in China', *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 58, 1964, pp. 490-99.

as a criterion for subdividing the Mongoloid major groups). If we could show that skeleton adult Lü II died of chronic anaemia and could relate this condition to thalassaemia E disease, we could come to the important conclusion that the disease has not appeared recently but existed among people who inhabited the present territory of Thailand more than 3000 years ago, and that, perhaps because of some selective advantage factor, the abnormal genes have persisted.

Though much study is necessary to any definite conclusion, what has been studied thus far seems to indicate that the present territory of Thailand was occupied by people who had some characteristics not very different from the present occupants. Solheim¹⁴ after examining these skeletons in Copenhagen came to the conclusion that there are numerous similarities between the neolithic population of Ban Kao and the present-day Thai; that is, there are no important differences between the two populations.

There are at present some misunderstandings about the way in which racial characteristics are inherited. Most people think that as a result of mixing over many generations characteristics would be so blended that there would be no characteristic pure to any race and there would be no possibility of telling one race from another. The idea is partly true, as some characteristics, such as height, weight and skin colour, are controlled multifactorially. But some characteristics still follow Mendel's law concerning 'the unit character segregate in hereditary transmission'. This law postulates a situation in which a certain characteristic, or a certain factor contributing towards the possession of a characteristic, appears in some of the offspring but is nearly or entirely lacking in others. Physical anthropologists are now studying those characteristics which yield percentage differences in various races.

We may not have presented here a convincing argument for the origins of the present Thai; indeed, such an hypothesis must await much research in various branches of study. But three years ago

14) See Solheim II, W.G., 'Thailand and Prehistory', *Silpakon*, vol. 8, 1964, pp. 42-77.

there appeared an article¹⁵ in which Kwang-Chih Chang abstracted works of J.K. Woo and included a picture of a Liu-chiang skull from Kwangsi. This skull has many characteristics common to both Ban Kao and recent Thai skulls (fig. 13). Kwang-Chih Chang wrote: "This new discovery of the Liu-chiang human fossils with such primitive Mongoloid feature in Kwangsi of South China, as well as the Tzu-yang skull uncovered in 1951 in the southwest Szechwan province, seems to indicate that South China might be a part of the birth place where the Mongoloid race originated and also to show that the Mongoloid group was in the process of formation and differentiation in the late Pleistocene".

15) Kwang-Chih Chang, 'New Evidence on Fossil Man in China', *Science*, vol. 136, no. 3518, 1962.

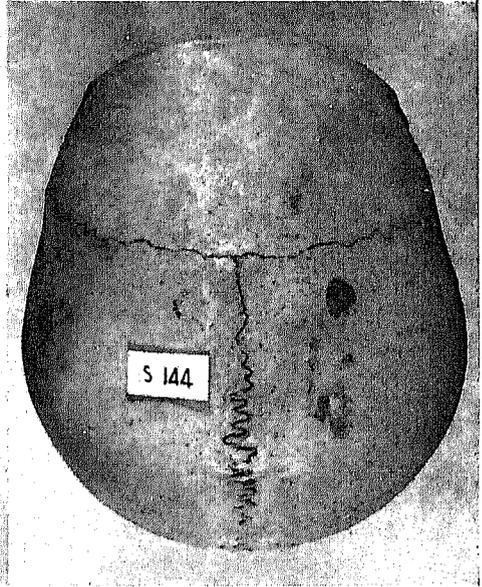


Fig. 1. An ovoid form is evidenced by both Ban Kao skulls (here, skeleton P) and modern Thai skulls (S 144).

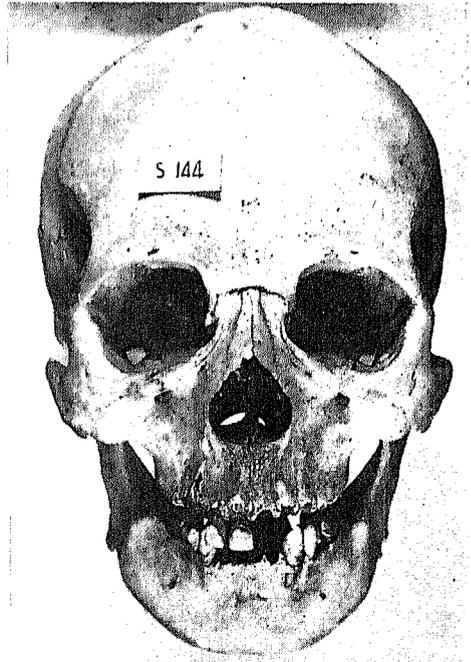


Fig. 2. Norma facialis of Ban Kao skull (skeleton M) and modern Thai skull (S 144) show medium and broad face.

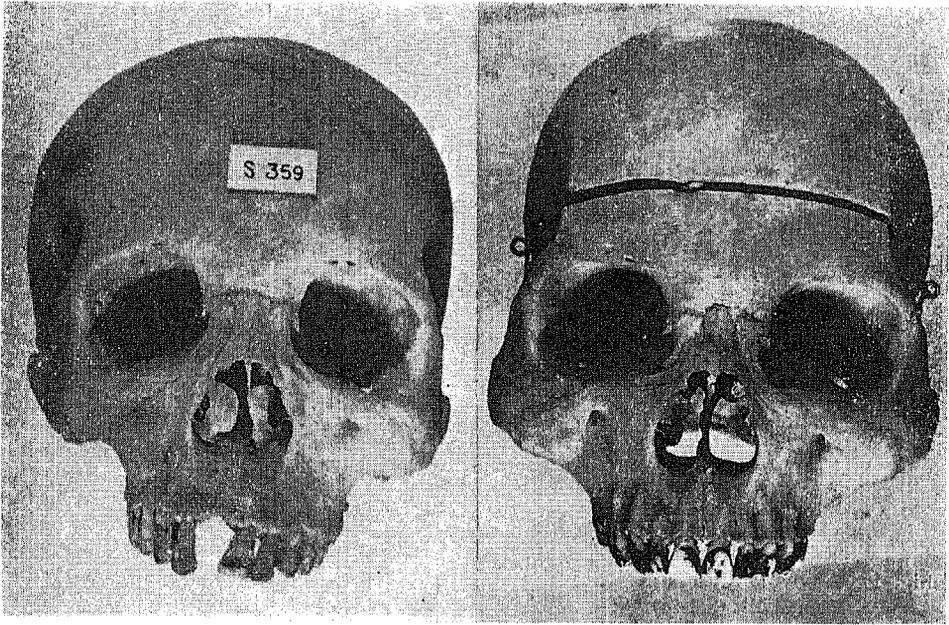


Fig. 3. Two modern Thai skulls showing broad and flat root of nose.

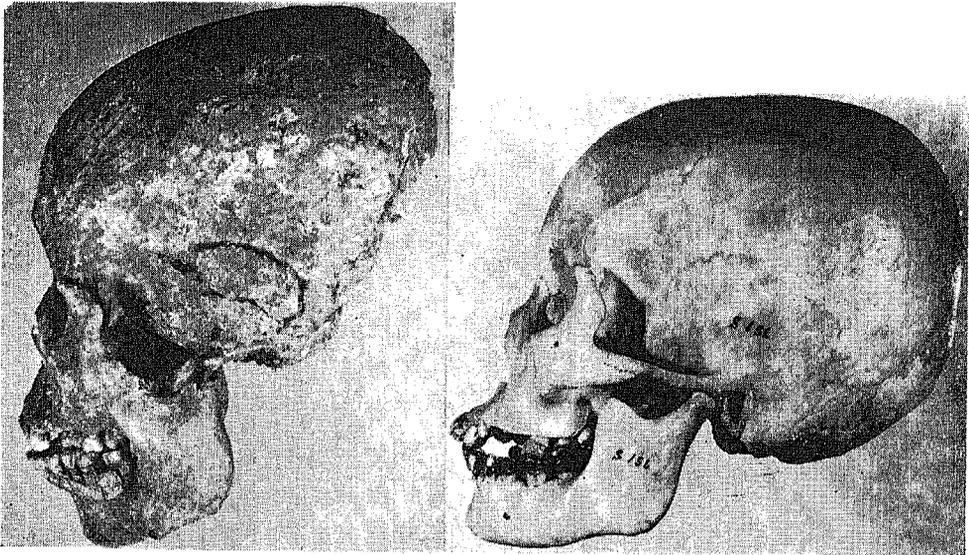


Fig. 4. Lateral view of Ban Kao skull (skeleton Lü II) and modern Thai skull (S 156). Both evidence alveolar prognathism; marked in the latter.

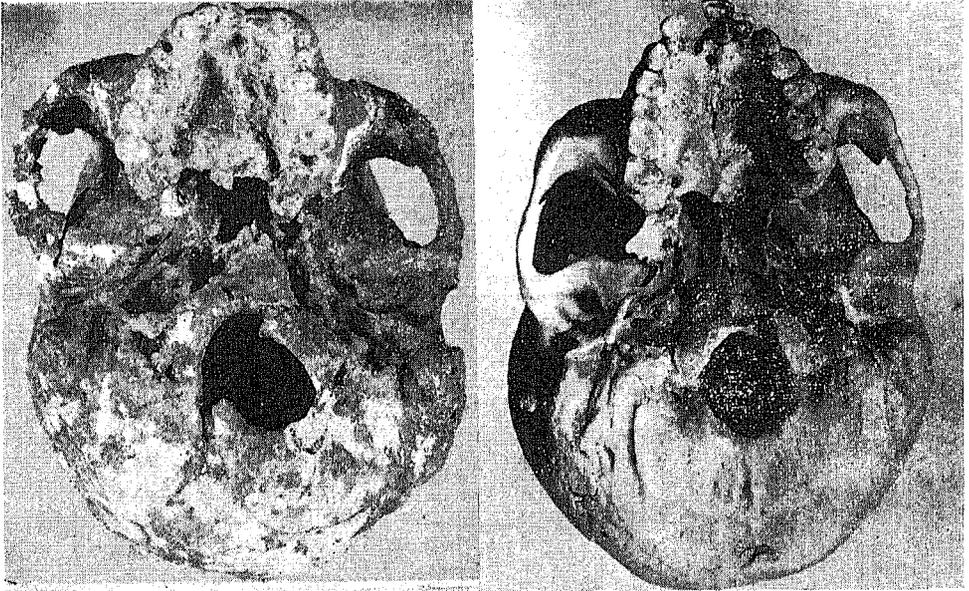
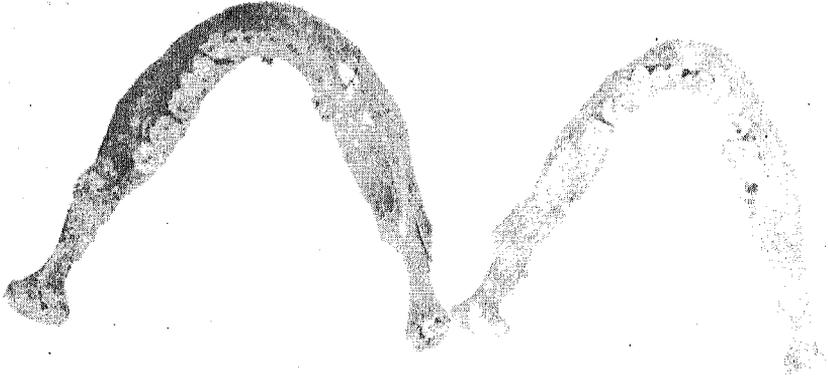
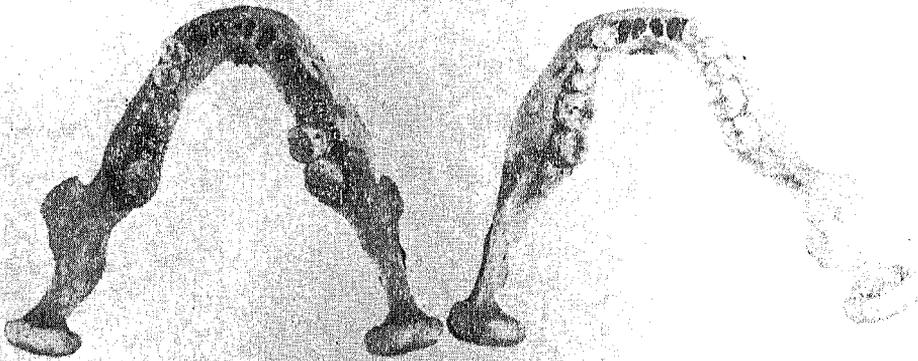


Fig. 5. Norma basalis of Ban Kao skull (skeleton P) and modern Thai skull (S 359). Both evidence wide and deep palate. Note slight backward bend to incisors in Ban Kao skull.



A



B

Fig. 6. Similar mandibles of Ban Kao skeletons (A; skeletons XIII, F) and recent Thai skeleton (B; skeleton S. 144, S. 10). Note divergence of sides from symphysis menti and angulation of dental arch.

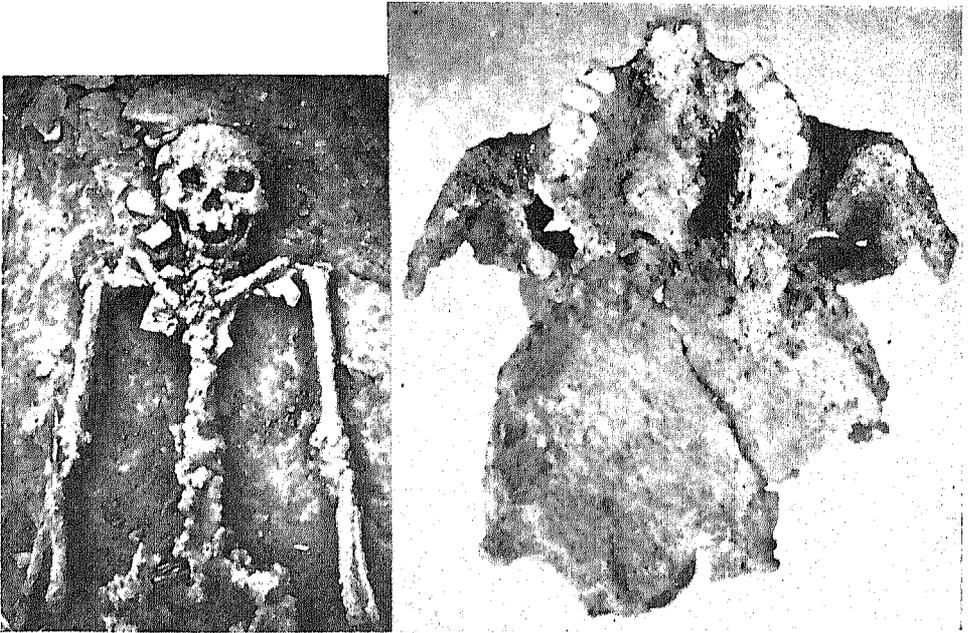


Fig. 7. Extraction of lateral incisors and canines in Ban Kao skeletons.

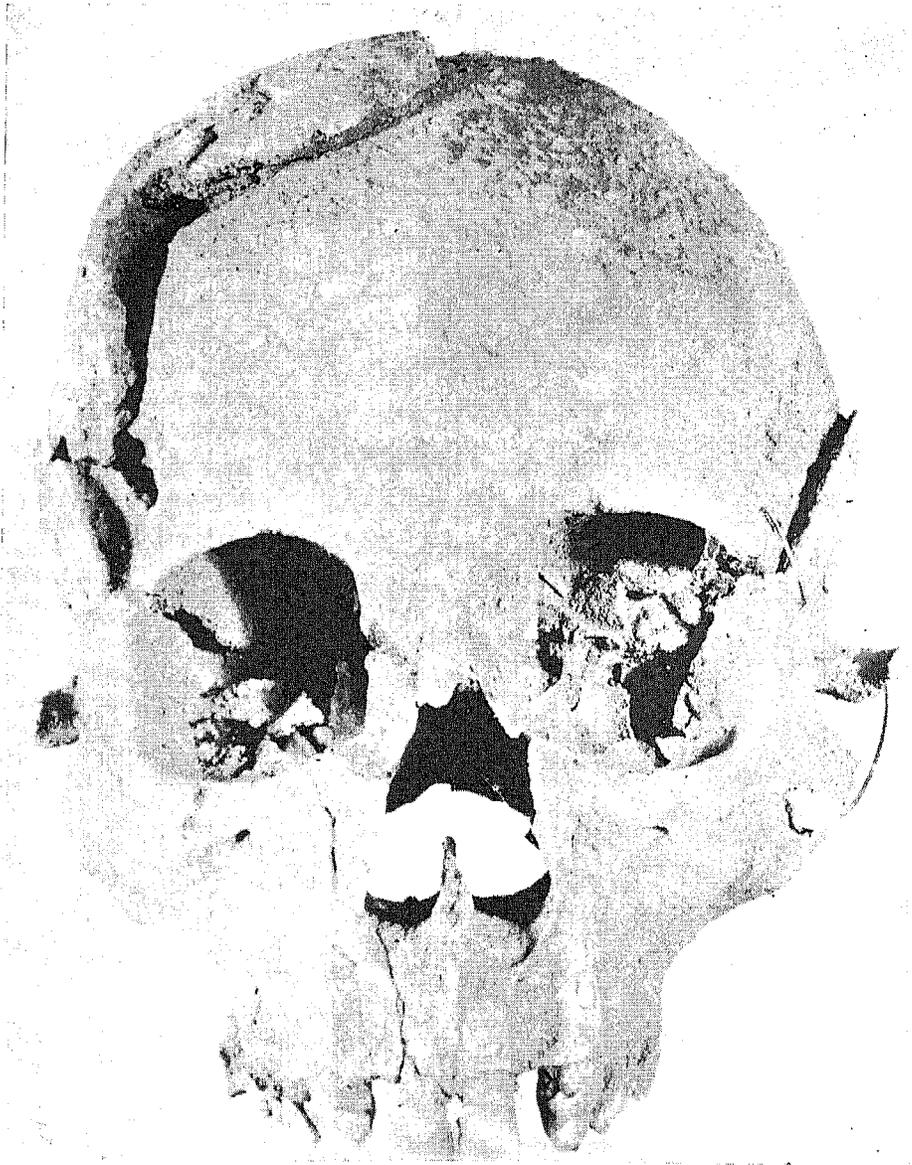


Fig. 8. Skull of bronze age (?) discovered at Lopburi showing extraction of both lateral incisors.



Fig. 9. Filed teeth in Ban Kao skull (skeleton IV).

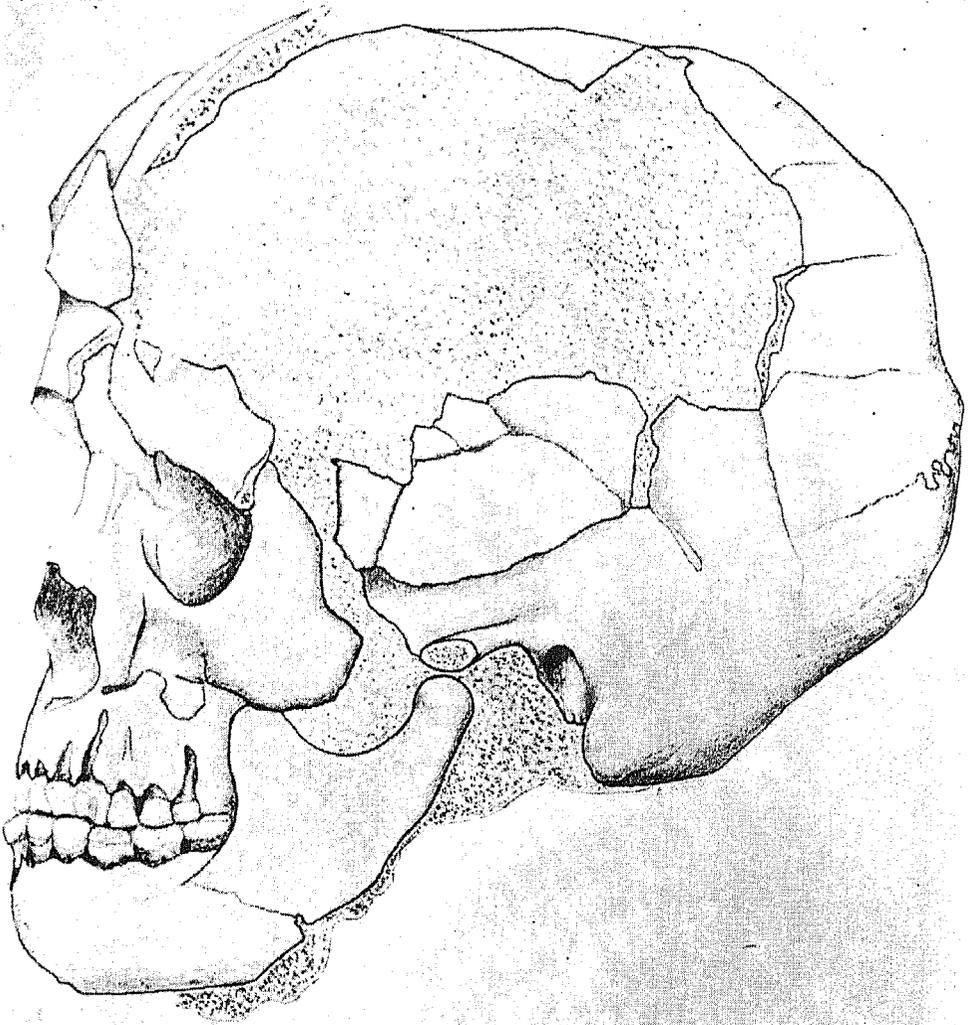


Fig. 10. Skull excavated from P'ong Tük (Siam) by Dr. H.G. Quaritch Wales evidencing tooth-filing (reproduced from *Man*, vol. 37, 1937).

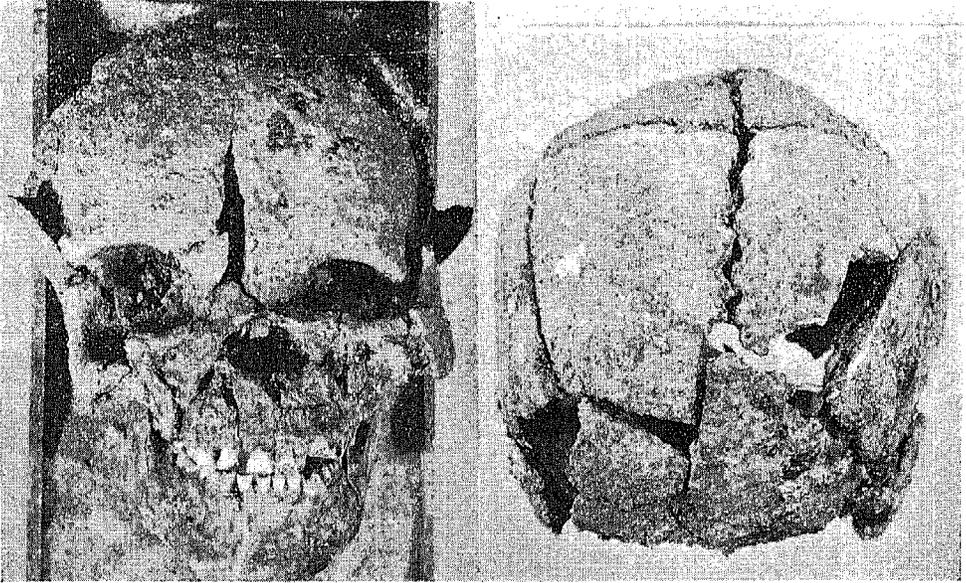


Fig. 11. Skull of skeleton Lü II. A piece was cut from the right parietal bone to show unusual thickness of the skull; compare with skulls shown in figure 12.

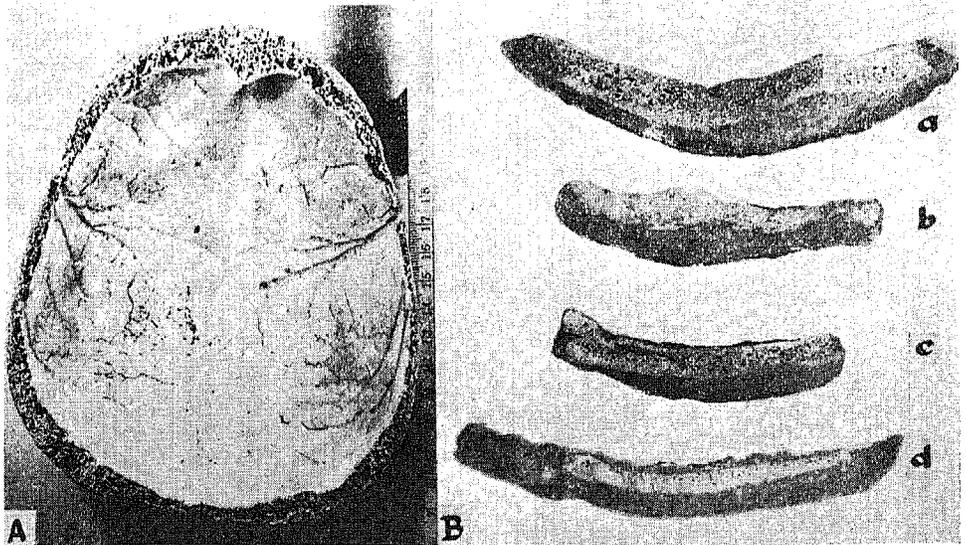


Fig. 12. A) Skull of modern Thai showing thickened bone due to chronic anemia (nature?). B) Thickness of skulls: a) Adult Lü II, b) Sai Yok, mesolithic man, c) skeleton IV, d) skeleton 2.

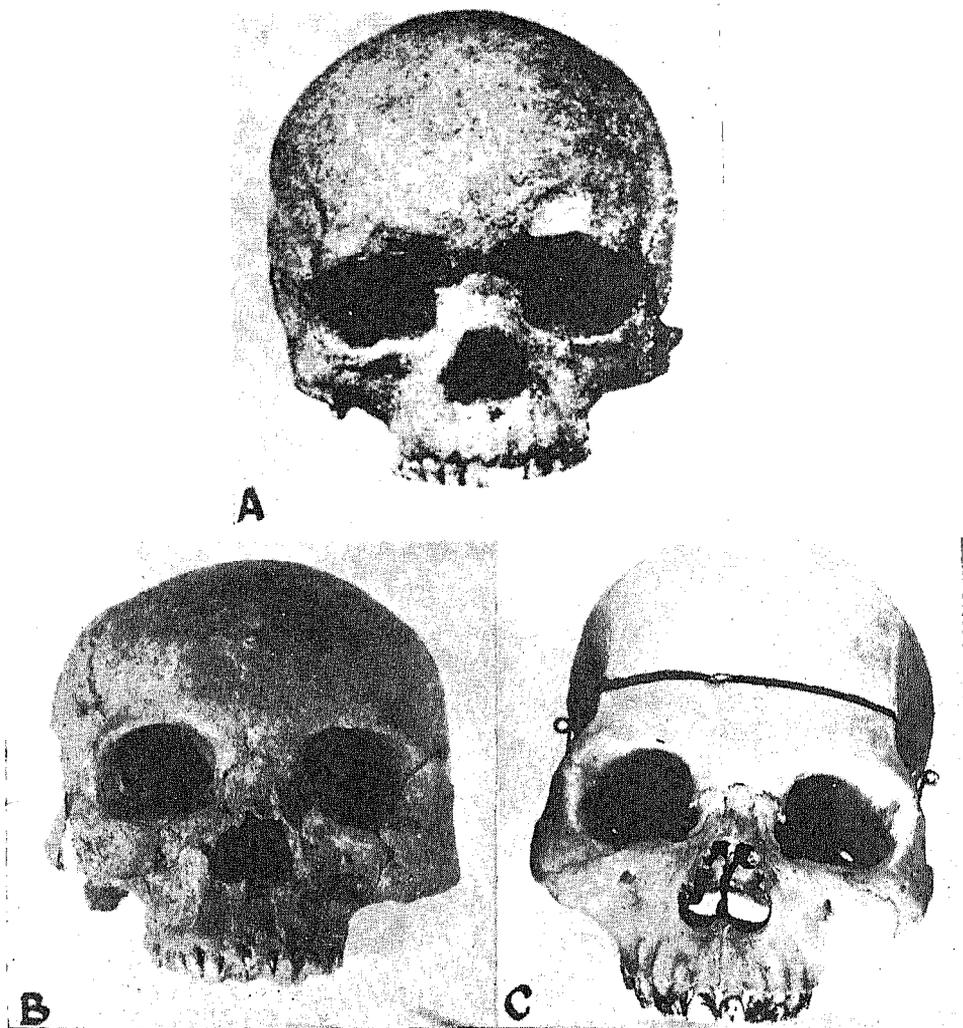


Fig. 13. A) Liu-chiang skull from Kwangsi; B) Ban Kao neolithic skull (skeleton IV); C) modern Thai skull (S. 100).