

SKULL TREPHINING IN PREHISTORY

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Summary

We describe the characteristic of a prehistoric skeleton found, one metre under the surface, at Ban That, Udon Thani, Thailand, about 11 km from the Ban Chiang district. Judging from the artifacts nearby, the skeleton probably dates to the same metal age as the Ban Chiang era, which was famous for its painted pottery,

The skeleton is a male, probably of less than 25 years of age and shows two interesting deformities. Firstly, there is a hole (9×10 mm) on the left side of the skull, 40 mm above the upper border of the external auditory meatus. This hole did not show any abnormal pathology, suggesting that it did not arise from disease. However, there is a depression at the outer surface of the hole near the posterior border, which may have resulted from scraping by a sharp instrument. We thus believe that this hole is a trephined hole, the first example discovered in Thailand. The second deformity, found on the left hip joint, probably results from Perthes' disease, leading to total destruction of the head of the left femur and to decreases in all the diameters of the acetabulum. The two deformities were unconnected.

Trephining or trepanning, which involves the surgical removal of discs of bone from the cranial vault, is a procedure practised in modern surgery for the treatment of pathological processes found inside the skull. The operation is quite safe and routinely practised, with the skull healing by itself without leaving any defects. Trephining also appears to have been widely practised by neolithic man, despite the formidable nature of such a surgical operation. Several prehistoric trephined skulls have been discovered in Europe,¹⁻⁵ most commonly in France and less commonly in Austria, Poland, Russia, Germany and Spain. Outside Europe,⁶ examples of trephining have been found in the Pacific region, South America, North America, Africa and Asia.

Despite the widespread occurrence of prehistoric trephining, no examples have so far been discovered in Thailand, not even among the 49 neolithic skeletons recovered from Ban Koa, Kanchanaburi. In this paper, we describe the first example of prehistoric trephining to be discovered in Thailand.

The skeleton was given to the Museum of Prehistory for study by the Dept. of Archaeology, Silpakorn University and was discovered 90-100 cm below the surface at Ban That, Udon Thani, 11 km from the Ban Chiang district. Judging from the

TABLE I DIMENSIONS OF FEMORA AND ACETABULA FROM BAN THAT SKELETON

	Left side (mm)	Right side (mm)
<i>a. Femur:</i>		
Maximum length	394	410
Oblique length	384	404
Trochanteric length	365	381
Subtrochanteric diameter	67	75
Platymetric index	100	119
<i>b. Acetabulum</i>		
Height	43	48
Width	43	N.D.
		(due to the damages in this region)
Depth	10	20

artifacts and pottery present, the site dates to the same period as Ban Chiang, i.e., in the bronze or metal period. The skeleton is of a male and in good condition except for some black stains, probably caused by the condition of the soil. From the condition of the cranial suture and teeth, the age at death was probably no more than 25 years.

The anterior part of the skull shows some destructive erosion of bones and a defect in the region of the bridge of the nose causing uncertainties in positioning the nasal bones and destroying the anterior wall of the frontal air sinus (Fig. 1a). A large hole (27×34 mm in size) appears in the frontal bone. The bones of the occipital region are missing so that reconstruction of the entire skull was not possible. No measurements were made.

A circular hole (9×10 mm in size) appears in the left temporal region, near the upper border of the squamous part of the temporal bone and 40 mm above the upper border of the auditory meatus. Although this hole might have resulted from trephining, such interpretations should always be made with care. For example, the hole in the skull shown in Fig. 1b, discovered at Broken Hill, Rhodesia and dated in the early mesolithic age⁶ or in the early upper pleistocene age,⁷ is not believed to result from trephining but is thought to be due to the erosion of the bone by a metastatic abscess resulting from a diseased mastoid process.⁶ Although the hole in the Ban That skull is located in a similar region, no spicules of bony growth are detectable and no evidence for erosion from burial or disease was found, unlike in the Broken Hill skull. Furthermore, in the Ban That skull, there is a depressed area, notably on the posterior border, as if the bone had been scraped away by a sharp instrument. We thus believe that the skull studied is an authentic example of prehistoric trephining, the first discovered in Thailand.

In addition to this, there is evidence for a pathological process involving the bones forming the left hip joint, where there is a total destruction of the head of

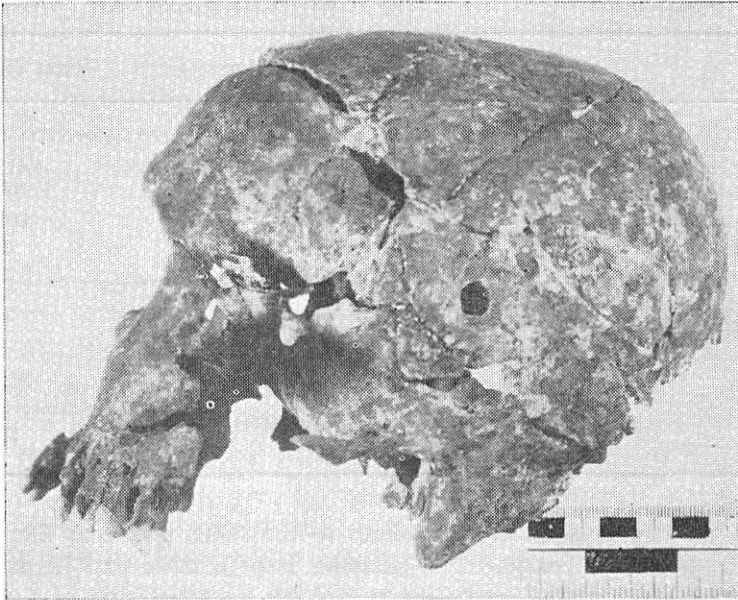
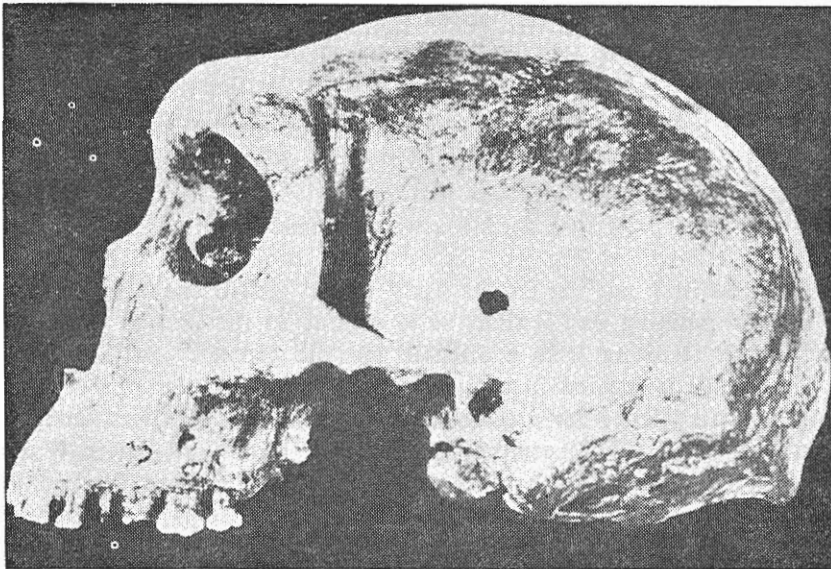


Fig. 1. a. Prehistoric skull from Ban That, Udon Thani showing a trephined hole



b. Prehistoric skull from Broken Hill, Rhodesia with hole on the left side
(from ref. 6)

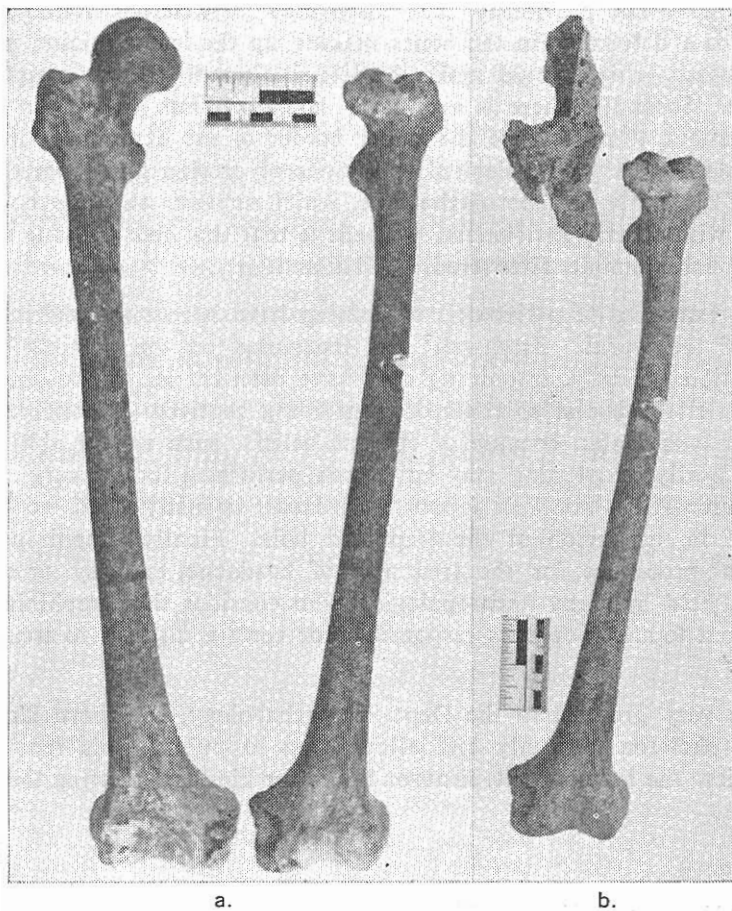


Fig. 2. a. Both femora of Ban That skeleton
b. Left innominate bone and femur of same skeleton

the femur, leaving only a small part of the neck (Fig. 2 a, b). This pathological process causes the femur on the left side to be shorter than that of the normal side (Table 1a). The diseased femoral head also causes the acetabulum of the left side to be smaller and shallower than that of the right side (Table 1b) or those of recent male Thais. These changes in bone structure suggest that this skeleton is the first prehistoric example of Perthes' disease to be reported in Thailand.

The prehistoric skeleton described in this paper shows two interesting phenomena, which have not previously been discovered in skeletons found in Thailand. Firstly, there is a deformity in the bones making up the left hip-joint, probably due to Perthes' disease, which would make the left side unable to bear weight as well as the right side. Secondly, there is a circular hole 9×10 mm in size on the left side of the skull, about 40 mm above the upper border of the external auditory meatus. From the absence of any pathological conditions or erosion and from the depressed appearance of the outer surface of the hole, which suggests that the bone had been scraped away with a sharp instrument, we believe that this hole was due to trephining and the first such example discovered in Thailand.

Several examples of prehistoric trephining have been discovered in Europe and other parts of the world. Brothwell⁵ has speculated on the possible purposes for such an operation. Firstly, trephining may have been carried out to obtain roundels for use as amulets, either after death or from living captives. Secondly, it may simply have been fashionable because of current beliefs, such as the ability to confer longevity.⁸ Thirdly, trephining may have been performed for the surgical treatment of skull fracture: this is not well supported because, in many cases, no injuries have been observed in the region of the trephined hole. Finally, trephining may have been a medical procedure for the treatment of headache, epilepsy or other illness. This theory is held by many anthropologists who consider that trephining may have been carried out to allow demons responsible for certain diseases to escape from the victim's head.⁴

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บทคัดย่อ

ได้รายงานโครงกระดูกสมัยก่อนประวัติศาสตร์ 1 โครงจากหมู่บ้านธาตุ จังหวัดอุดรธานี เป็นหมู่บ้านที่อยู่ห่างจากหมู่บ้านเชียงซึ่งประชาชนรู้จักกันดีเกี่ยวกับเครื่องปั้นดินเผาลายเขียนสีประมาณ 11 กิโลเมตร โครงกระดูกจากพื้นดินประมาณ 1 เมตร เป็นโครงกระดูกชาย อาศัยลักษณะของรอยต่อของกระดูกกะโหลกและฟันโครงมียายุไม่เกิน 25 ปี จากลักษณะเครื่องมือ เครื่องใช้และเครื่องปั้นดินเผาอยู่ในสมัยโลหะเช่นเดียวกับที่บ้านเชียง

โครงมีลักษณะผิดปกติ 2 แห่ง แห่งหนึ่งพบรูขนาด 9×10 มม. ที่ทางด้านซ้ายของกะโหลก อยู่ห่างขึ้นไปจากขอบบนของรูนอก 40 มม. ลักษณะของรูและตำแหน่งที่พบคล้ายคลึงกับรูในกะโหลกที่พบที่โรดิเชียอาศัยอยู่เมื่อประมาณ $100,000 \pm$ ปีมาแล้ว Wells (1966) ไม่เชื่อว่ารูที่พบในกะโหลกโรดิเชียเป็นรูที่ทำให้เกิดจากการเจาะที่เรียกว่า trephining แต่เป็นรูที่เกิดจากการผุพังของกะโหลกจากผีที่กระจายแผ่ขึ้นไปจากส่วนยื่นมาสตอยด์ (mastoid process) โครงจากบ้านธาตุไม่แสดงการเปลี่ยนแปลงทางพยาธิสภาพเช่นกะโหลกโรดิเชีย นอกจากนั้นยังพบว่าที่ด้านนอกของรูโดยเฉพาะทางขอบหลัง มีรอยฟาดลงไปคล้ายถูกขีดโดยเครื่องมือคม ทำให้ตัดสินใจเป็นรูที่เกิดจากการเจาะ - trephining และเป็นรายแรกของโครงกระดูกก่อนประวัติศาสตร์ที่รายงานจากประเทศไทย การผิดปกติแห่งที่ 2 คือพบโรคเรียกว่า Perthes' disease ที่ข้อต่อโพกข้างซ้าย มีการทำลายของส่วนหัวของกระดูกต้นขา (femur) ทำให้กระดูกเล็กกว่าข้างปกติและมีผลทำให้หลุมอเซตตابلุ่ม (acetabulum) ตื้นกว่าข้างปกติด้วย โรคที่พบที่ข้อต่อโพกไม่มี การสัมพันธ์กับรูเจาะที่กะโหลก.