

Archaeological Study at Ban Krabuang Nok

by Phasook Indrawooth,
Sinchai Krabuansang and Payao Narkwake

Lt is generally accepted that the Iron Age represents a major socio-economic and demographic breakthrough in the history of Thailand. In Northeastern and Central Thailand, especially in Northeastern Thailand, presence of iron artefacts, have been reported. Artefacts discovered still possess remains of slag and fragments of tuyere (clay nozzles which deliver the bellow blasts into the smelting furnace).

In the northeastern area, many of the sites revealing iron artefacts, together with evidences of inhumation, are moated sites. In fact, the practice of inhumation is considered to have been the indigenous way of disposing the dead in prehistoric period, prior to the introduction of Brahmanist and Buddhist influences.

But large quantities of artefacts, dating from the protohistoric and early historic periods, have been found in the region. Moreover the habit of surrounding settlements with moated enclosures resembles the practice of the historic communities, known as "Dvaravati". They flourished from the sixth to the tenth centuries A.D. in Central Thailand, under the

strong influence of the Brahmanist and Buddhist cultures.

It seems clear the transition that took place in Northeastern Thailand, from the late prehistoric period to the early historic period, is quite complex. Thus, many questions arise When did these complex societies start? How long did they survive? Was the socio-economic complexity in the region indigenous or introduced, or was it an externally stimulated development? Did the Iron Age represent the time of the emergence of states in the area involved?

To answer these and other questions, many works have been carried out by numerous scholars, both Thai and foreign. A report on the survey and study of archaeological sites in the lower Mun-Chi Basin provided much knowledge of such sites. The report was completed by Silpakorn University in 1982 (Vallibhotama 1984).

Regarding the date sequence of these sites, Higham and Parker have recognized the archaeological significance of one of the moated earthworks in the northeastern province of Roi Et. The area features

deeply stratified deposits and a dated sequence beginning c.500 B.C. and extending up to the period of the Khmer occupation of the region (C.A.D. 1,000) and beyond (Higham, Parker 1970; Higham 1977).

A recent research by Higham and his students has put forth the conclusion that the beginnings of some of the complex societies in Northeastern Thailand can be dated back to the late first millennium B.C. or earlier (Chantaratiyakarn 1983, Higham and Kijngam 1984). Such a conclusion is well supported by Charoenwongsa and Bayard in their preliminary report on the upper Chi, site of Non Chai (Charoenwongsa and Bayard 1985).

On the crucial question of whether or not the period of the moated settlements represents the time of the emergence of states in the area involved. This is still debatable (Kijngam, Higham and Viriyaromp 1980, Vallibhotama 1984, and Wilen 1982).

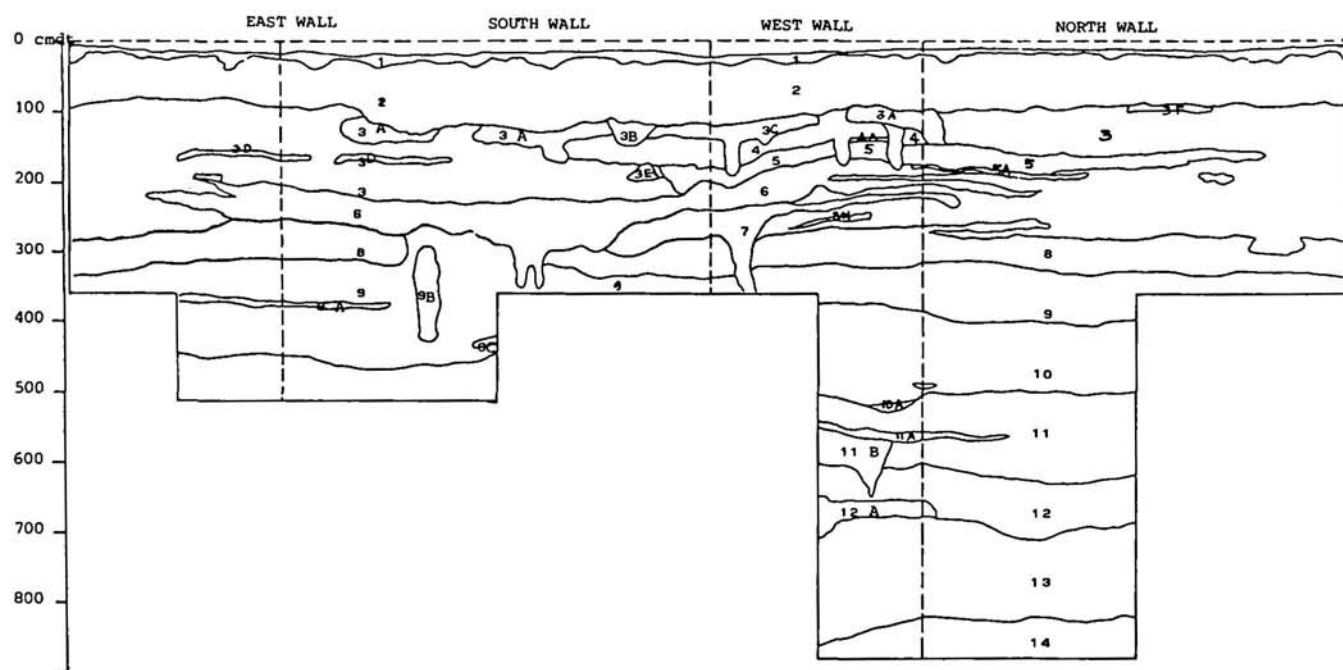
Besides the above mentioned works, many others have contributed much knowledge about such complex societies. These works have been carried out by both foreign and Thai scholars during the last two decades.

Still, there are major gaps in our knowledge of past societies in Northeastern Thailand. Nobody has yet produced a detailed picture of the transition from the prehistoric to the early historic period in the region. And many questions still remain unanswered: i.e., how long the inhumation practice survived in the region, when the Brahmanist and Buddhist cultures were introduced into the region, etc.

In order to answer such questions, a lot of research work must be accomplished. The writers agree with Bayard and Charoenwongsa (1985) that more attention should be paid to

Area	Depth Level cm. dc.	Cultural Layers	Phases	Bone (gm)	Sherds (gm)	Shellfish (gm)	Iron slag	Iron fragments	Bronze fragments	Bronze artefacts	Group of sherds	Complete vessels	Bubbous-like objects	Plumets	Animal figurines	Clay pellets	Jar's spouts	Clay discs	Burnt Clay	Clay moulds	Charcoal	Ashes	Amulls	Whetstones	Beads	Glass fragments	Crucibles	Human Tooth	Bone artefacts	Perforated sherds	
326 m.	0-50	VI	III (900 A.D. - 1300 A.D.)	-	23130	940	✕				1						1	1													
	50-100	V		90	62150	-	✕					1	1	1					✕												
	100-150	IV		4349	60440	225			2	1			2		1		2			✕						1					
	150-200	III	II (200 A.D. - 900 A.D.)	4569	71780	7538		2	1	1	1	1		2		3	1		✕						5						
	200-250			4885	88145	15246	✕	2	-	2	2	1				4	6	1					1		2			1			
	250-300			1979	38290	4546		2	2	1						12	3								2						
	300-350			3400	49650	9854	✕	2	9	4	1					18			✕		✕		1	1	5		1		1		
350-400	1505	27440		2006			5							2	2			✕	2	✕				2				2			
400-450	II	2210		31780	5017		1	4	3							3				✕						2					
450-500		1910		56290	11545	✕		7								7				✕											
500-550		1850		41260	5350	✕		5																					1		
321.5 m.	550-600	I	I (300 B.C. - 200 A.D.)	453	2300	60	✕		1										✕		✕										
	600-650			2265	24010	5		1													✕										
	650-700			6390	30140	5710	✕																							2	
	700-750			3900	26027	16410																									
	750-800			2170	28140	26200											1														2
	800-850			393	1780	-																									
	850-900			-	260	-																									

Table I Results of the trench excavation at Ban Krabuung Nok.



Plan 1 Stratigraphy of the trench excavation at Ban Krabuung Nok.

archaeological importance of the site stimulated interest in the sampling of the ceramic sequence at Ban Krabuang Nok.

BAN KRABUANG NOK

Ban Krabuang Nok or "Ceramic Village" (Maps 1, 2) is located in the Khorat Basin, between latitude 15° 16' 54" and longitude 103° 58' 06", in the district of Chum Phuang,

Nakhon Ratchasima Province. It is a high square mound, eight metres above the level of the surrounding rice fields (140 metres above sea level), covering an area of 64 acres (550 metres east-west by 450 metres north-south).

The village lies on a low plain (suitable for cultivation) between the old confluence of the Mun River (three kilometres to the south) and the

Sa Thaet watercourse (Map 1).

Ban Krabuang Nok, as seen from an aerial photograph taken in 1974 (Supajanya 1982), is surrounded by a moat of which only the northern and southwestern parts remain at present. Regarding water supply, about seven swamps and watercourses have been detected within two kilometres of Ban Krabuang Nok.




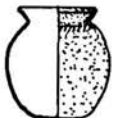
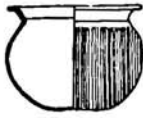


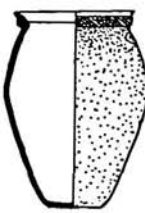

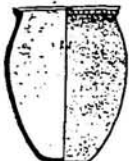



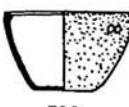
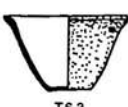






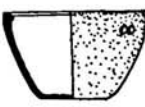
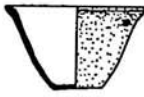





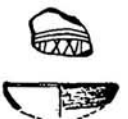

Cultural Layers	Characteristics	Different types of ceramics in the six cultural layers.					
VI	Porcelain, stoneware						
V	Brown glazed earthenware Spouted jar white ware	 T.6.6	 Spec.T.4	 Group II			
IV	Red slipped ware Vertical cord marking ware Plain ware	 T.6.5	 T.6.1	 T.5.1			
III	Applique ware Red slipped ware Spouted jar (cord-marked) Cord-marked/slipped ware	 T.7.2	 T.6.4	 T.7.1	 T.8.2	 T.7.1	
		 T.6.2	 T.6.3	 T.5.1	 T.8.3	 T.8.1	 T.6.1
II	Red Slipped ware Plain ware	 T.3.2	 T.5.2	 T.6.2	 T.6.3	 T.6.1	
I	Red slipped/polished ware Red on buff ware	 T.9.4	 T.9	 T.9.1	 T.9.3	 T.10	 T.10

Table II Different types of ceramics in the six cultural layers.

Nong Krabuang, the nearest water supply, is a very large swamp. Situated only 20 metres, south of the village, it supplies water to the inhabitants. At present, roads cut through the mound, exposing about three to four metres deep of stratified deposits from early occupations. Large quantities of potsherds, together with other artefacts have been discovered. Traces of an ancient iron smelting operation is evidenced by the scattering iron slag and tuyere fragments.

Having received financial support from the Research Center of Silpakorn University, the study team, composed of Indrawooth, Krabuansang and Narkwake, started working in January 1988. The area selected for excavation lies to the south of the mound and, approximately, in the middle level of the mound.

The study was done to provide a sampling of the maximum depth of deposits at the site. A trench of 3 × 6 metres was plotted and



Fig. 1 Bronze artefacts.

excavated. The excavation continued uninterrupted for three months until sterile soil was revealed in the trench, about 8.5 metres deep (Table 1).

RESULT OF THE TRENCH EXCAVATION

Six cultural layers or 14 natural layers were revealed in the trench excavation at Ban Krabuang Nok (see Plan 1). It is obvious that both bronze and iron were used throughout most of the history of the site. Besides



Fig. 2 Animal figurine.

metalwork, other artefacts made of stone, glass, bone and clay also appeared (Tables 1, 2 and Figs. 1-5).

RESULTS OF THE EXCAVATIONS OF THE FIVE TEST PITS

On the low slope of the southeastern part of the mound, five small test pits, 1.5 m. × 1.5 m. square, were excavated. Four pits revealed jar burials (Figs. 9, 10) but the other pit exposed a half-damaged kiln of cross-draught type, with two chimneys connected to each other. One of the chimneys is bigger than the other. Two complete earthenware vessels with a group of broken pots were discovered in the kiln (Figs. 6, 7, 8).

SUMMARY OF RESULTS

The excavation at Ban Krabuang Nok revealed three phases of occupations. The first phase begins from the late prehistoric period or the Late Metal Age, which is comparable to the Late Period of Ban Chiang (C.300 B.C.–200 A.D.). The periods of occupation extend up to the historic time, as late as the 13th century A.D. or beyond. Through this long period, the inhabitants produced pottery, bronze artefacts and smelt iron for local consumption, and possibly for exporting to the adjoining territories as well.



Fig. 3 The middle vessel contains human ashes.

Phase I The Late Prehistoric Period or the Late Metal Age (300 B.C.–200 A.D.). This phase is characterised by the appearance of the iron slag, the iron implements and the bronze ornaments, comprising rings bracelets and bells. The prominent types of ceramics are the Red slipped polished ware (Group III Type 9) and the Red-on-buff ware (Group III Type 10).

Phase II The Proto-historic Period (200 A.D.–900 A.D.). Similar types of the iron implements and the

bronze ornaments of the first phase continued to exist. Moreover new types of bronze ornaments appeared. They were hairpins, earrings and pendants.

Regarding ceramics, the Applique ware (Group III Type 7), the Cord-marked/slipped ware (Group III Type 8) and the Red slipped ware (Group III Type 6) form the prominent types. The ceramics observed, Group III Type 6 and Type 7, usually have single or double knobs on their shoulders. Potters must have conducted the firing technique in the open hearth

kiln and in the cross draft or horizontal draft kiln. During this phase, the inhabitants practised jar burials too. (Figs. 9, 10 and Figs. 11, 12)

Phase III The Early Historic Period (900 A.D.–1300 A.D.). From the archaeological context, no evidence of iron implements or bronze ornaments were revealed. However, there were iron slag remains. As for the bronze technology, a new type of clay mould was used. It has a rectangular shape, with two or four faces for casting into different sizes of rings.

Brown glazed wares (Group II), products of local kilns located in Buriram Province during the ninth to the 13th centuries A.D., were found. Ceramics, Group III Spec. Type 4 or the white ware, were also prevalent in the archaeological context. Regarding disposal of the dead, jar burials were replaced by cremation burials.

From the foregoing, it can be concluded that in the first phase, there was a close relationship among the people living in the Khorat and the Sakon Nakhon Basins during the Late Metal Age.

The first phase at Ban Krabuang Nok is comparable to the Late Period of Ban Chiang and to the fifth and the sixth cultural layers at Ban Na Di in the Sakon Nakhon Basin. In the Khorat Basin, the first phase can be compared to the Early Period at Non Chai and to the second phase of Ban Chiang Hian, etc. (White 1982; Bayard, Charoenwongsa 1985; Chantaratiyakarn 1983).

In the second phase, the cultural development at Ban Krabuang Nok strongly related to the protohistoric settlements in the Mun-Chi Valleys, where jar-burial practices were prevalent. The main products of the local inhabitants were iron and ceramics. However, evidences of bronze products, in the form of

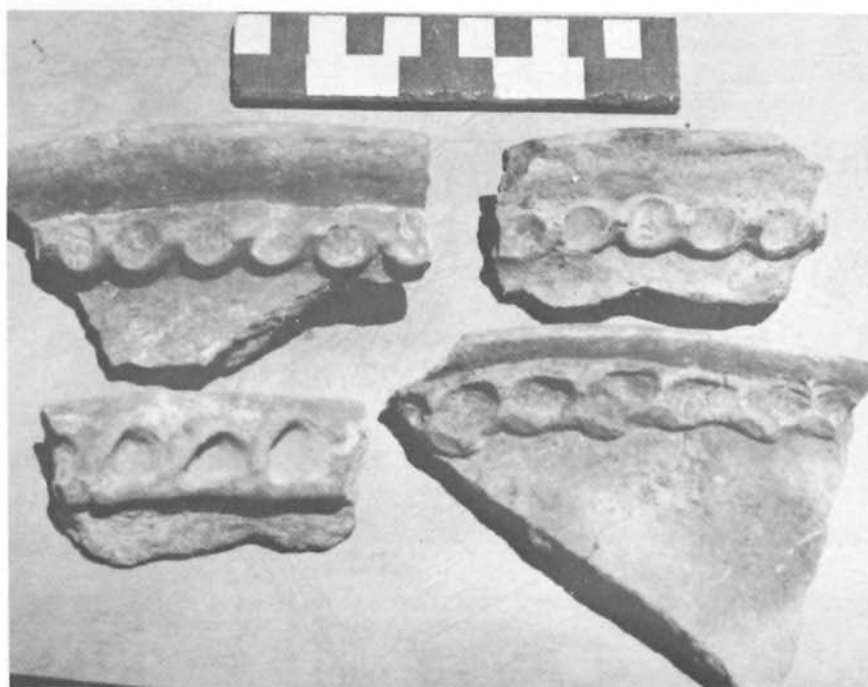


Fig. 4 Applique sherds with the finger mark motif.

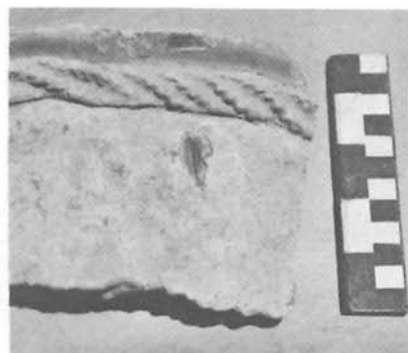


Fig. 5 Applique sherd with the cord motif.



Fig. 6 A bowl-on-stand left in the kiln.

beautiful ornaments such as earrings, pendants, and hairpins, were observed.

During this phase, the relationship between the inhabitants of the Mun-Chi Valleys and of the Chao Phya Valley should be recorded. So far, the bronze ornaments and the iron implements discovered at both valleys are quite similar.

Evidence of Indian contact also appeared in this phase. Indian type of ceramics, the spouted jar with short neck, popular in the Mun-Chi Valleys (not in the Chao Phya Valley) as well as at Oc Eo (South Vietnam), was discovered in this phase.

The prevalence of the spouted jar with the short neck indicates that the Indian culture was introduced to the Mun-Chi Valleys through the Mekong Valley, not through the Chao Phya Valley where this type of jar was not popular. (Malleret 1960; Van Lier 1988).

In the third phase, the inhabitants of Ban Krabuang Nok stopped producing bronze ornaments or iron implements. However, at Ban Krabuang Nok and at other sites, during the Early Historic Period, clay moulds for casting bronze into ingot form were in use in this phase.

Contacts with other settlements in the Mun-Chi Valleys still continued. Chinese porcelain from the Sung Dynasty, which was popular in the Chao Phya Valleys and in the Mun-Chi Valleys, was found in this phase. During this period, Theravada Buddhism might have been practised by the local inhabitants who performed cremation burials (Fig. 3).

The long period of occupation at Ban Krabuang Nok is a result of the suitable environment.

1. Site Location - The village of Ban Krabuang Nok is a low mound which lies on flood plains, suitable for cultivation. It is located between the old confluence of the Mun River, three



Fig. 7

Pictures (above and right) show a cross-draught type of earthen kiln with two chimneys connected to each other.



Fig. 8



Left: Fig. 9 Jars containing human bones found in test pit no. 3



Below: Fig. 10 Human skull found in jar no. 2, test pit no. 3

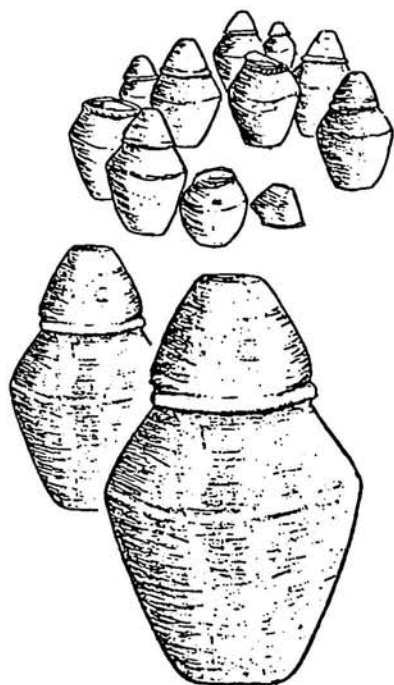


Fig. 11 A group of jar burials dug up from the jar burial site at Ban Krabuang Nok.

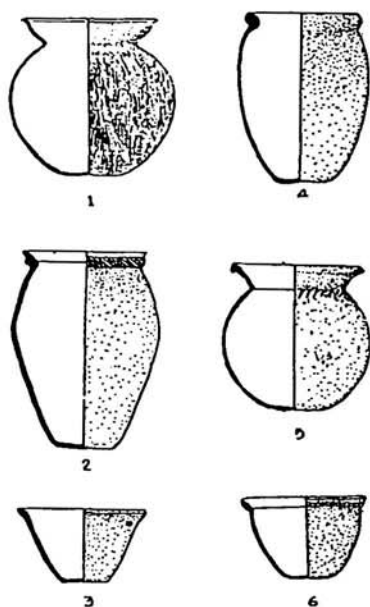


Fig. 12 Various types of jar burials (1,2,4,5) with their covers (3,6).

kilometres to the south, and a watercourse called Sa Thact, three kilometres to the north. It is also about five kilometres from the present junction of the Sa Thact watercourse and the Mun River.

The reason for this settlement on a mound is to keep away from the long period of flood in the rainy season. The two rivers nearby provide the local inhabitants with food (aquatic animals) and communication facility.

2. The Landscape, Its Flora and Fauna - The forest on the river's banks provides various kinds of woods : Shorea, genus Cassia, Dipterocarpaceae, genus Cassia, etc. It also has wild animals suitable for food, such as the pig (*Sus serofa*), the mouse deer (*Tragulus javanicus*), the barking deer (*Muntiacus muntjak*), the deer (*Carvus unicolor*), and the hog deer (*Carvus procinus*).

3. Communication - Land routes along the Mun River are

considered old main routes of communication for Phimai, Phuthaisong and Nakhon Ratchasima. These routes might have been used, since time immemorial, by traders who used to stop over and stay overnight at Ban Krabuang Nok. Nong Krabuang, a very large swamp, situated only 20 metres to its south, has supplied sufficient water for these traders as well as the local inhabitants of both the olden days and the present time.

Because they are quite narrow and not straight, river routes here might have been used only for short distance travelling. The frequent changes of these watercourses and river, caused by sandy soils, discourage people to use them as main routes.

4. Natural Resources - Iron and ceramics are the main products of the inhabitants, for local consumption and possibly for exporting to the adjoining territories.

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4.1 Iron Smelting Industry -

Remains of iron slags are piled up more than two metres high at Ban Krabuang Nok. It is obvious that Ban Krabuang Nok represents one of the earliest iron smelting sites in Chum Phuang District. However, the biggest site in the area is Non Udom, 15 kilometres from Ban Krabuang Nok.

Now then, the location of ore source should be considered. In the Early Historic Period, the location of an iron smelting industry was naturally restricted. The place chosen had to satisfy two important prerequisites of the industry, namely : 1) proximity of ore deposit, 2) availability the fuel.

Regarding fuel, Ban Krabuang Nok was surrounded by forests. It is obvious that transportation of either fuel or ores over long distances was beyond the reach of the early historic people. Therefore, early smelters might have used low grade iron ores available in the area. They are: 1) sedimentary iron deposits (nodular iron concretions) and 2) lateritic deposits (Bronson 1985).

In the Khorat Plateau, extensive beds of nodular iron concretions appear in most river deltas. The wide tracts of sedimentary soils are usually covered with laterite (Boonsanua 1986). Ban Krabuang Nok is located in the Korat Plateau and is near the Mun River. Therefore, local iron smelters could have used nodular iron concretions and laterite, available nearby.

4.2 Ceramic Industry - Burnt

clay, in the form of large platforms resulting from the firing process of the ceramic industry, appear throughout the mound at Ban Krabuang Nok. One platform, Test Pit No. 2, was discovered by the study team. Here potters may have also produced other types of ceramics from the cross draft kiln. Such a kiln was also excavated by the study team (Test Pit No. 1). ■

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