

# THE KHMER KILNS OF BAN YA KHA

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## *Abstract*

A large group of partly disturbed Khmer kilns was discovered between 1993-95 near the village of Ban Ya Kha in Nakhon Ratchasima Province, northeastern Thailand. The sites have yielded more than 2,000 surface finds of Khmer earthenware and stoneware. They are classified according to form, decoration, glaze and colour. Attempts have been made to reconstruct vessels from the shards, and the chronology and range of Khmer ceramics is discussed. It is also possible that a prehistoric site is located near the kilns. Recommendation is made for controlled excavation at some of the Ban Ya Kha sites in order to resolve the many outstanding problems identified.

## Introduction

The identification of Khmer kiln sites in northeastern Thailand in the mid-1970s was a revelation, as no previous kilns had been positively identified in any part of the former Khmer Empire. The only potential site was Phnom (mountain) Kulen, some 40 km east of Angkor, reported by Etienne Aymonier (1901) who had visited the site in 1883. Abundant shards and mis-fired vessels found in the area led Aymonier to assume it was a kiln site but, so far, no kiln has been found and no excavation has been conducted. For now, Phnom Kulen can only be considered a provisional kiln site.

In the mid-1970s quantities of brown and green glazed wares appeared in the Bangkok antiques market. According to local art dealers, they were found by farmers in northeastern Thailand. Following this discovery, numerous surveys, surface collections and salvage excavations were carried out by the Fine Arts Department (Natthapatra 1990). By the 1980s at least 200 kiln mounds had been identified on the Khorat Plateau in the vicinity of Khmer temples. The greatest concentration of kilns is in the southeastern area of Buri Ram

Province at two main sites, Ban (village) Kruat and Ban Baranae. Both are close to an ancient road extending over 225 km across the Dangrek Mountains between Angkor and the Khmer outpost of Phimai. The road was probably one of the transport routes mentioned in inscriptions and ceramics may have been among the products thus transported. Subsequent excavations at Ban Baranae and radiocarbon dating of finds associated with ceramics place the kilns between the eleventh and twelfth centuries, which is consistent with the historical evidence (Khwanyuen 1985: 143).

One kiln area near the village of Ban Ya Kha in Nakhon Ratchasima Province, northeastern Thailand, has attracted little attention from archaeologists to date, yet it merits a more extensive examination because of its atypical location, surface finds and kiln structure. Ban Ya Kha lies 7 km southwest of *amphur* (district) Bua Yai by road, approximately on the 170 m contour. It is reached from the *amphur* on Highway 202 (Chaiyaphum-Sida), by passing through Ban Chan and Ban Don Khen Sanit (Figures 1 and 2).

The possibility that the site might be of archaeological significance came to light accidentally in 1992 when a green-glazed stoneware shard, clearly the remnant of a cover, was presented to the second author

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by a villager who had found it near his house. Subsequently numerous shards were found in the village. Most were unmistakably dark brown glazed Khmer stoneware, mainly fragments of jars and some bases of pedestal jars. Finds included thinly-potted unglazed pieces with incised patterns on the exterior. One fragment of a Chinese bowl was found; enquiries in the village revealed that when the primary school football field was being levelled by a bulldozer some years back, a cache of pots and artefacts was discovered, including what were said by villagers to be Buddha statues, but which the headman thought were images of Ganesha and Shiva. These were apparently sold. Some inhabitants in the village had unearthed sections of large Khmer jars within the house compounds; others found smaller fragments which were discarded as of no value. A few families had some pieces in good condition, including a large shallow basin, a storage jar and an elephant-shaped pot, all covered with a characteristic dark brown glaze as well as a green-glazed bottle with a tall narrow neck and a covered box (Figures 5-8).

Surface digging by the villagers produced other ceramics, of a similar type and date. One villager came across a cache of bones when digging in the garden, which was quickly disposed of for fear of spirits invading the house. The site of a village rubbish dump, between the *nong* (rain-fed water tank) and the *chonlapratarn* (reservoir) revealed several fragments of richly decorated Khmer jars. In one field close to the southwestern and higher end of the village a number of shards could still be found in 1994, and some metal objects had been unearthed, including what appeared to be a corroded and damaged presentation tray. It is worth noting that some art dealer's runners became aware of the site, and one elderly couple was 'robbed' at gun point of a large Khmer jar after being handed a 500 baht note. The pieces were clearly worth far more in the Bangkok antiques market.

Other artefacts of note found so far comprise two cut laterite blocks; one, almost

square, 68 x 72 cm and 23 cm thick, is now in the village school grounds (its source is not known for certain), and one is in the middle of a field which is sometimes flooded. It protrudes some 20 cm from the soil and an attempt to remove it was abandoned when the farmer found the block extended more than 2 m into the soil. The purpose of the blocks is not known.

Apart from the presentation tray already mentioned, other metal objects have acci-

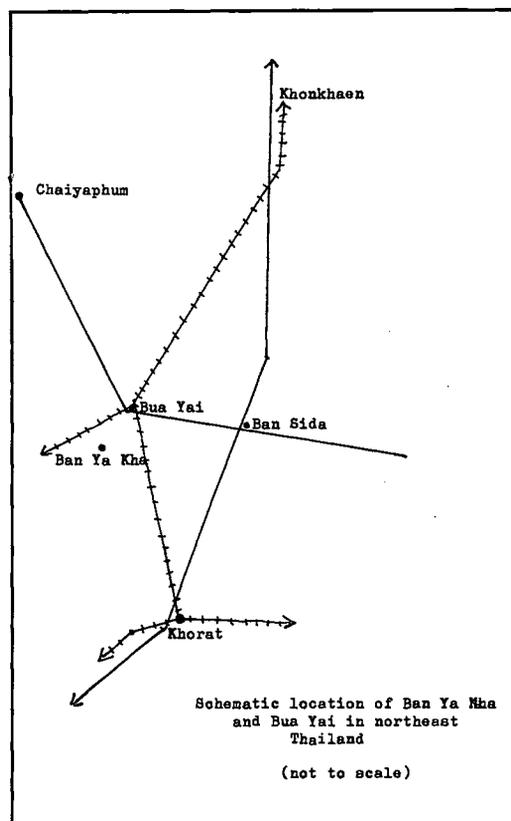


Figure 1. Sketch map locating Bua Yai.

identally been discovered in the village. These include a bronze Khmer palanquin support, and a set of plain hooped narrow bracelets, possibly of iron. These had been sold in Bangkok before it was possible to examine or photograph them.



Figure 2. The terrain at Ban Ya Kha.

### The village

The village of Ban Ya Kha today is a poor Lao-speaking, rice-farming community largely dependent on remittances from its youth working in Bangkok. Closer inspection reveals that the village is raised on a slight eminence above a uniformly flat land, and at the northern part of the reservoir there are three hillocks, one to the west of the water area, two to the east; on the easternmost of these a temple serving Bon Don Kheng was erected in 1992.

According to oral tradition, the present inhabitants of the area have mostly come to the locality only in the last hundred or so years. The oldest inhabitants speak of their fathers finding a jungle-covered land full of every kind of wildlife, especially tigers. They have no potting tradition and until the last few years, no realisation that the 'stones' they found in their gardens and occasionally in their fields were remains of Khmer structures.

### The kilns

It was when walking over the eminences to the northeast of the village that the second author first came across what turned out to be a string of kilns, most severely disturbed, on both sides of what can be called the Upper Huay Rahat leading from the outflow of the reservoir on the northern side of the eastern dyke, leading to Don Cheng. Those to the north side of the stream bed

provided a large number of glazed and unglazed shards. Ploughing the slope of the hillock in 1992 disturbed the surface sufficiently to reveal many fragments of wasters. On the western side of the central hillock, an area rich in cord-marked pottery was uncovered by persons digging for sand; at first sight these appear to be much earlier than the Khmer pottery.

For ease of identification these kilns could be grouped into:

Site 1. Here, twelve mounds on the northern side appear to comprise at least three identifiable kilns extending into the hillock now topped by a temple. The mid-stream area contains at least one kiln, possibly three more, and the much-disturbed southern side three, possibly six kiln sites. Enquiries among villagers indicate that columns (*sao*) used to exist at the point where the reservoir leads into a stream, and more were revealed when the concrete outflow was constructed about 1982; there is no trace of these now.

Several more possible kiln sites were then discovered above the water level of the reservoir, on a peninsula and islands to the west and south of the westernmost hillock. Although not as rich in shards as Site 1, the three kilns are nevertheless similar in structure. This kiln group is termed Site 2. The kiln most easily distinguished is almost round, approximately 15 m north to south and 14.5 m east to west.

Finally a much larger number of kiln sites, ten for certain and possibly more, was discovered at the northwest end of the reservoir which is called Site 3. These can only be visited in the dry season. One kiln is extremely large, some 60 by 39 m, but may also have been an earlier (burial?) site, judging from the huge quantity of cord-marked pottery found on its northwestern end. This has apparently been partially excavated, though by whom and for what purpose is not known.

A typical kiln mound at Ban Ya Kha is elliptical shape, raised some 20 cm or more at its lowest part above the surface of the land, and is surrounded by a denuded area

leaching salt. The kiln bulges to a slight eminence in its centre, a metre or more above the land, and has a tree or two growing on top. Entrances appear slightly indented on the southern side. No trace of a chimney on any site is visible. Each kiln is located very close to and slightly above the water level of the reservoir or stream. In all what appear to be 29 kilns have been identified around Ban Ya Kha, and others are said to exist at a greater distance from the village.

### **Scattered finds at Ban Ya Kha**

The centre of the school playing field continues to reveal shards, mostly of cord-marked pottery, as does the nearby temple, in which excavations for a new cremation structure in January 1993 produced a number of Khmer shards. This, referred to as Site 4, would appear to be another area worthy of closer investigation as well as the rubbish dump north of the two water tanks. Similarly, a field southwest of the village area, Site 5, seems likely to produce artefacts other than wasters such as found at Sites 1, 2 and 3.

### **The structure of Khmer kilns**

A few Khmer kilns found in other parts of the northeast (e.g. those in Buri Ram Province) have been complete enough to allow a study of the structure (Figure 3). So far the evidence shows that they were constructed with slabs of fired clay and that bricks were not used. Initially we believed that several kilns shared one chimney and that the kilns had adjoining walls but our current thinking is that the features may be superimposed and represent a series of kilns from different periods. These kilns are in three parts – a fire box, a chamber for the wares and a chimney – and were of the cross-draft type which gave sufficient draft to draw the gases downward and enable the flow of heat to be changed to obtain a more even temperature. These kilns are believed to date from the eleventh to thirteenth centu-

ries, but there is at Ban Ya Kha another type of kiln built with semi-cylindrical fired bricks, of which many examples can be found in the ground nearby the sites along with the shards. Most of these kilns are oriented north-south with the mouths facing south, except those to the south of the Upper Huay Rahat, which appear to face north.

### **Ceramics found at the kiln areas**

The data for this report were collected from January 1993 through May 1995. The sites around Ban Ya Kha have yielded more than 2,000 surface finds of Khmer earthenwares and stonewares to date. They have been classified into categories based on form, decoration and glaze colour, and attempts have been made to reconstruct vessels from the shards. Particular attention was given to rims and bases which are distinguishing features.

The forms and distribution of the material studied so far suggest that ceramics were produced at Ban Ya Kha as containers for daily use in the village and surrounding area and some, possibly, as ritual vessels. Typical containers include jars for storing water, pots for cooking and bowls for serving food. The absence of ceramic forms for eating is probably due to the custom of using leaves from tropical plants and trees, especially banana leaves, for dishes. The potters were most likely farmers and the potting probably took place during slack periods in the farming cycle, rather than full-time. The angularity of some forms, a strong horizontal element in the profile, ridges on the shoulder, a flaring mouth and a pedestal foot call to mind metal forms and it is possible that ceramic vessels were made in emulation of metal shapes (Rooney 1994). Animal-shaped pots with traces of calcified lime on the interior were undoubtedly used for betel chewing, widely practised in north-eastern Thailand. The large number of shards in the shape of a pedestal foot suggests that ceremonial jars with an ovoid body and a flaring mouth were produced.

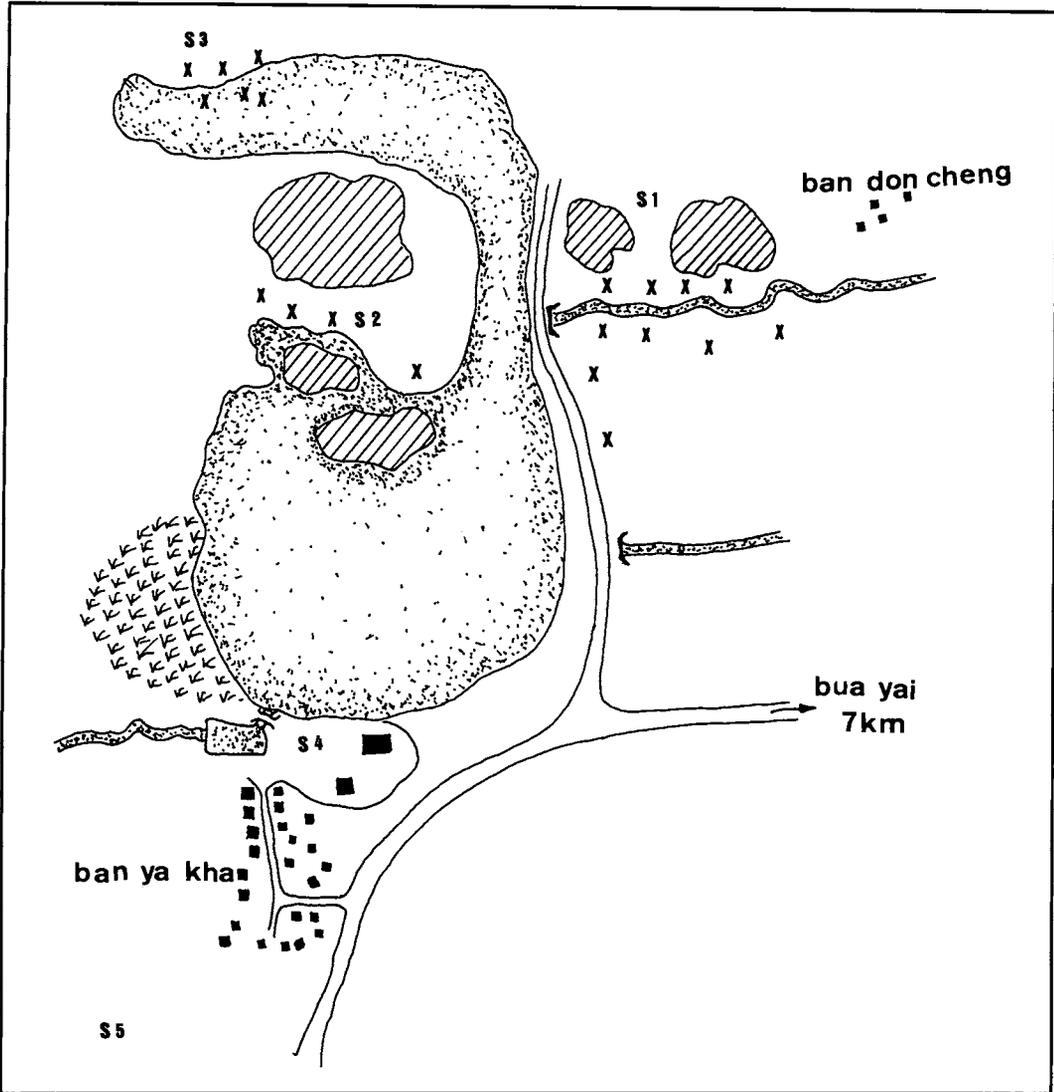


Figure 3. Plan of the kiln area at Ban Ya Kha (drawing by J. Dumarçay).

The finds indicate the extensive use of lids to cover jars and pots. A typical lid is shallow with carved rings on the top and a knob in the form of a lotus bud or a spire with diminishing tiers.

The types of ceramics found at Ban Ya Kha include all those known in the limited Khmer ceramic repertoire: stoneware with green and brown glazes, two-colour and slipped wares; and unglazed stoneware and earthenware. The proportion of the glaze colours roughly conforms to that found at

the Buri Ram kilns (Brown 1981: 43-4). The most numerous are brown glazed wares, followed by green; then come a few two-colour shards.

The large numbers of unglazed earthenware and stoneware found at Ban Ya Kha is surprising. In many cases the forms and incised motifs are identical to those found on glazed wares which suggests these were biscuit-fired, but for some reason never glazed. Only two other examples of Khmer

biscuit-firing are known from Thailand and it is unusual to find so many at one location.

### **The local ceramic technology**

The area around Ban Ya Kha is rich in the natural materials needed for ceramics—clay, water and wood for firing. The rice fields would have been an abundant source of clay. Khmer stoneware has a body rich in iron and sand that varies in colour, after firing, from cream to grey. The texture is dense and grainy. It was probably fired in an oxidising atmosphere at a kiln temperature of at least 1,200 degrees centigrade (Srisuchat 1989: 52). It is not uncommon to see iron particles that have broken through the surface. The nature of the raw materials is uneven and thus imperfections are inevitable. Medium and large vessels were coil-built. Coils of clay were gradually built up from a thick circular disk and luted together to form the walls of the vessel; then the coils were partially smoothed on the exterior to form a more homogeneous surface. Small wares, such as lime pots, were thrown on a potter's wheel. A scar on the base that looks like an enlarged thumb-print testifies to the use of a wheel. It occurred when a reed or cord was pulled tautly underneath the pot to sever it from the wheel. A visual comparison of the body with those found at other sites in Thailand suggests the Ban Ya Kha pots share a similar content and perhaps clay source, although scientific testing would be necessary to confirm this point.

Decoration was mainly incised, probably using a bamboo stylus. Motifs are mainly geometrical and consist of swirls, curves, diamonds, circles, waves, rectangles, etc. (Figures 9-10). Horizontal bands on the shoulder dividing the design into registers are typical. Some shards reveal a motif with fuzzy edges that looks as though it were incised hesitantly, suggesting a somewhat blunt instrument was used or perhaps the vessel had dried too long before decorating, causing the tool to stick in the clay.

A slip, or thin layer of liquid clay, was applied to some of the shards. It fired a

purplish colour and was probably used either to mask the imperfections in the clay or to improve the body for glazing. The colour and texture of Khmer glazes vary considerably. Crazeing, or fine-line cracks that spread through the surface of the glaze, and flaking are the most common defects. In many cases the glaze trickles over the body forming thick strands, indicating a poor match between the body and the glaze.

### **Dating the ceramics**

The finds from Ban Ya Kha support the need for a complete reassessment of the dating of all Khmer ceramics, especially those from northeastern Thailand. Previously a glaze type was assigned a date based on an art style established by architectural work at Angkor (Brown 1988: 50-1). The finds in Thailand, however, indicate that all glazes were made during the period of ceramic production, that is at least in the eleventh and twelfth centuries, and perhaps longer. The original chronology based on art historical periods was proposed by Bernard Groslier and derived from archaeological work he directed at Angkor in the 1950s and 1960s. The purpose of his excavations was not ceramic-oriented, but rather to determine the layout of the structures of the former Royal Palace. When quantities of ceramics were surprisingly found in association with dated temples as well as in a burial site near the royal bath of Srah Srang, Groslier (1981) astutely recorded his findings and analysed the material. He subsequently constructed a provisional chronology for Khmer ceramics.

However, neither Groslier's chronology, nor that established on the basis of kiln excavations in northeast Thailand is really adequate. The material collected in Thailand lacks enough samples in a stratigraphic context from a broad range of sites to yield conclusive results. The ultimate goal is to record and analyse samples in sufficient quantities to determine the source of the raw materials, the site of manufacture and the regional distribution of the finished product.



Figure 4 Khmer kiln in northeastern Thailand excavated by FAD.



Figure 7. Village find: brown-glazed basin.



Figure 5. Village find: brown-glazed storage jar.



Figure 8. Village find: green-glazed jar with a tubular neck.



Figure 6. Village find: brown-glazed jar with a broad shoulder.



Figure 9. Brown-glazed shards with incised wave motif.



Figure 10. Shard with incised loop motif.



Figure 11. Unglazed rim shard



Figure 12. Comparative jar from an other site.

### Conclusions and analysis

The sites at Ban Ya Kha raise a number of questions. They are much further north than all previously known Khmer kiln sites, though are still within the area of the former Khmer Empire, as the nearby temples of Ban Sida and Pran Ku in Chaiyaphum tes-

tify. The village of Ban Ya Kha would appear to be an ancient one and presumably contained a community of potters. There are so many kiln sites that production must have been considerable, but may have lasted for a relatively short period of time, from about the eleventh to thirteenth centuries.

The fact that the present kiln sites are all slightly above the water level of the reservoir and the stream seems to indicate that water levels have changed little over time, in spite of the raising of dykes and the building of an outflow in recent years; consequently the reservoir would appear to be ancient, though its present extremely irregular shape in no way resembles a Khmer *baray*. The 'columns' formerly located at the point of outflow might have constituted part of an early dam. If this were so, then the community must have been relatively prosperous and settled, and production sufficient to justify important earthworks. The laterite blocks are puzzling; they might possibly once have formed part of temple altar bases similar to those excavated in south Kedah.

Another enigma relating to the site is the presence of what appear to be three artificial hillocks in otherwise flat land. The largest and highest, the westernmost, reveals no traces of ancient habitation, though a structure involving columns and a stone base appears to have been erected, and subsequently abandoned. Perhaps this hillock was an early burial mound but only controlled excavation can determine this. The central hillock, with its cord-marked pottery on the western side, appears, with greater certainty, to have been a burial site, and is undoubtedly worth excavation. The presence of the new temple on the easternmost hillock now is likely to preclude extensive excavation there.

The semi-cylindrical fired bricks found at Ban Ya Kha are difficult to place in time and function. They appear to belong to part of a kiln structure, yet no brick kilns for firing Khmer wares have been found anywhere. They may represent a different type of Khmer kiln but this requires confirma-

tion. The bricks may also belong to a later kiln sequence superimposed on top of the earlier, slab constructed clay kilns. A less-likely possibility is that the bricks are part of a religious structure associated with a habitation site. These tantalising prospects await further study.

**Note:** All illustrations have been supplied by Dawn F. Rooney, except where indicated.

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