

## Chapter 8

# A model to account for temporal change

It is now necessary to consider sites with a wide geographic distribution in order to bring into focus evidence for cultural change at Ban Na Di. Sakon Nakhon Basin sites will be considered first, followed by the Khorat Basin, and finally data available from areas external to the plateau. Although many fabrics have been examined in thin-section, a detailed consideration of each is beyond the scope of the present work. Fabric descriptions will, therefore, be confined to general statements. Particular attention will be given to temper varieties. Further details will be provided only when essential to demonstrate specific points of interest. Intra- and inter-regional comparisons are necessary if temporal changes in technology are to be identified, because they may involve broadscale processes. As many sites as possible have been examined with the aim of constructing a basic temporal and areal framework. Site names are listed in Table B.1 (Appendix two). The prehistoric ceramics derive from 16 excavations and 32 surveyed sites which were surface collected. All of the excavated pottery has been analysed in thin-section. In 15 cases, surface collected pottery has been considered in hand specimen, the remainder were studied in thin-section. Thin-sections of pottery from 5 modern manufactories have also been examined for comparison.

### 8.1 Surface collected Sakon Nakhon Basin pottery

Sherds collected from 29 intensively surveyed Sakon Nakhon Basin sites, (Kijngam *et al.* 1980), have been analysed (fig. 8.1). A summary of fabrics and temper types is set out in Table B.3 (Appendix two).

The distribution of surface collected fabrics is summarized in Table 8.1 below. The data is based on an analysis of 78 sherds, 26 in thin-section.

TABLE 8.1: Sakon Nakhon Basin surface collected fabrics.

fabrics	sand ?	orth. grog	blebs	rice	vitrified
sherds	1	20	26	25	5
sites	1	18	24	25	5

The sampling strategy employed (Kijngam *et al.* 1980:81) involved collecting “at least

ware.” Thus the bias discussed in chapter 5 is probably inherent in the sample because stress was placed on certain specimens. In addition, the collection was further sampled by the writer for fabric variation. We can be reasonably confident, therefore, that a wide range of fabrics is represented.

## 8.2 Excavated Sakon Nakhon Basin fabrics

In addition to Ban Na Di, smaller excavations were carried out at Ban Muang Phruk and Non Kao Noi (Higham and Kijngam 1984).

### (a) Ban Muang Phruk

Each of the 93 rimforms, identified by Wichakana (1984b), has been examined in thin-section. The rimform fabric distributions, following Wichakana’s system, are summarized in Table B.4 (Appendix two). Radiocarbon determinations were not obtainable at Ban Muang Phruk because no securely provenanced charcoal was encountered. Based on rimform comparisons, however, the excavators have dated the initial occupation period to *c.* 100 B.C.. The petrographic data support this proposal. The Ban Muang Phruk fabric distributions are summarised in Table 8.2 below. Each rimform is illustrated in appendix two.

TABLE 8.2: The chronological distribution of Ban Muang Phruk fabrics.

level	orth.grog	blebs	rice	other	Phimai?	total
5	1	22	-	-	-	23
4	-	14	3	1	-	18
3	-	10	10	-	1	21
2	-	3	23	1	4	31

Notes: blebs ? are included in the blebs count. total: 93

### (b) Non Kao Noi

Again, no radiocarbon determinations are available. Forty nine sherds have been analysed in thin-section (Table 8.3).

## 8.3 Excavated Khorat Basin fabrics

### (i) Chi Valley sites

Pottery from excavations at four Chi Valley sites has been examined in thin-section. Two of these sites, Ban Chiang Hian and Non Chai, are large. They probably covered *c.*39ha and *c.*28ha respectively (Chantaratiyakarn 1984a), although the precise size of Non Chai is uncertain (Bayard *et al.* 1986). Ban Kho Noi and Non Noi are small, the latter covering only 100m x 70m (Kijngam *et al.* 1980:40).



### (a) Ban Chiang Hian

Based on radiocarbon results from Ban Chiang Hian and Ban Kho Noi, Chantaratiyakarn (1984:579), proposed the following chronology for Ban Chiang Hian: layer 11, *c.* 1300-900 B.C., layers 9-10, *c.* 900-600 B.C., layers 6-8, *c.* 600-1 B.C., layer 5, *c.* 1-500 A.D.. A total of 115 sherds, sampled by Chantaratiyakarn, have been examined in thin-section. Most are rimforms. Table 8.4 below, sets out their chronological distribution.

Two anvil fragments were recovered at Ban Chiang Hian, and this suggests pottery was produced on site. Some rimforms have a similar shape and surface decoration to Non Chai and Roi Et examples (Chantaratiyakarn 1984:592).

### (b) Ban Kho Noi and Non Noi

Both sites are located on a tributary of the Chi River less than 15 km from Ban Chiang Hian (fig. 8.2). Ban Kho Noi and Non Noi ceramics are considered by the excavators to be closely related to those of Ban Chiang Hian (Chantaratiyakarn 1984:583,601). Both excavations were small, exploratory test projects. Some rimsherd fabrics are petrographically consistent with samples from the Roi Et sites excavated by Higham (1977). Their source is uncertain. A Mun Valley derivation, however, is quite possible because they compare with a major Roi Et fabric group. A total of 36 sherds, mainly rims, have been thin-sectioned and examined optically. Tables B.5 and B.6 (Appendix two), set out chronological distributions of Ban Kho Noi and Non Noi fabrics respectively.

### (c) Non Chai

This large site occupies a nodal position in the Upper Chi Valley from which access to the Sakon Nakhon Basin was direct and easy (fig. 8.2 and 4.4). It was occupied from *c.* 400 B.C. to *c.* 200 A.D. (Bayard *et al.* 1986), and thus spans the period of transition from level 7 through to level 5 at Ban Na Di. Detailed assessments of temper and surface finish, under Bayard's direction, were carried out by Rutnin (1979). Examples of each surface finish class, identified by Rutnin, have been thin-sectioned. The fabric distributions are set out in Table 8.5 below.

The frequency percentages given in Table 8.5 were determined by Rutnin, and are expressed as proportions of the entire sample. It should be noted that outcrops of the Khorat Group, which also help form the Phu Phan Range, lie a few km to the west. The two grog-tempered fabrics with biotite have an overall similarity to clay 3 in the Sakon Nakhon Basin. Their mineral associations and hand specimen appearance, however, clearly set them apart from any Sakon Nakhon Basin pottery examined. The Non Chai bleb-tempered fabric groups are different from Sakon Nakhon Basin fabrics both in thin-section and hand specimen. A preliminary fabric assessment has been previously published (Vincent 1984b).

Most of the fabrics are bleb-tempered. They are from red painted or slipped sherds which were concentrated in layer 3. It is important to note that Rutnin's temper class "clay, sand and chaff" equates with this bleb temper. It comprises 88.4% of the rimsherds and 82.3% of the body sherds she examined under a low- power binocular microscope (Rutnin 1979:93). Non Chai provides important positive evidence to the temporal model set out below. We will return to it later. Each of the following sites is shown in figure 8.2.



## (ii) Mun Valley (lower)

Type sherds identified by the excavator from Don Taphan and Non Dua have been analysed. This material can be related to the third excavated Roi Et site, Bo Phan Khan. Each of these sites is located on tributaries of the Mun River. The excavators proposed the following chronology, based on radiocarbon dates and ceramic styles: phase 1, *c.* 500 - 1 B.C., phase 2, *c.* 1 B.C. - 700 A.D., and phase 3, *c.* 700 - 1000 A.D., (Higham 1977).

Higham (1977), who used similar temper and surface finish categories to Bayard and Rutnin, noted that rice-tempered wares dominate at each site. These include a particularly distinctive sgraffito ware, dubbed “Roi Et” by Higham, after the province in which it was first recognised. Sand-tempered pottery became prominent late in the sequence. A thin white ware is also late. At Non Dua a “clay” temper is associated with the early levels (Higham 1977). A selected range of wares representing the above sequence has been examined in thin-section. On the basis of hand specimen evidence, Higham noted that rice temper was early, “clay” rare, and sand was late in the sequence. Their chronological distributions are set out in Table 8.6 below.

None of the Roi Et fabrics is petrographically comparable to those from Sakon Nakhon sites.

### “Roi Et” ware

Each of the twenty sherds examined was composed of a fabric consistent with a sedimentary terrain. A notable feature is the numerous to abundant presence of fresh water sponge spicules. All the specimens were tempered with rice husk.

When still plastic, the exterior surfaces of “Roi Et” ware appear to have received a three stage sgraffito treatment. First they were cord-marked, and then a red (10R/4/4 to /6) slip or paint was applied. Finally, a series of horizontal parallel lines were carefully incised into the soft surface with a square-ended instrument. The lines are less than 1 mm deep, about 10 mm wide and 30 mm apart. Where incised, the vessel walls are oxidised a bright pinkish white (7.5YR/8/2). The smooth internal surfaces were also coated with a slip or paint. These vary from partly oxidised to reduced.

## (iii) Mun Valley (upper)

Seven sherds from four sites in the Phimai region have been examined in thin-section. Six are considered by the excavator as “typical Phimai tradition chaff-tempered”, and the other similar to Roi Et “white ware” (Welch pers. comm.). Each of the former sherds is tempered with rice husk. Without a detailed investigation of local clays, they are geologically non-specific. The latter sherd is quartzose with an abundance of fresh water sponge spicules and a silty matrix. This ware is very similar in hand specimen to the grog-tempered “thin white” Don Taphan ware discussed above. Petrographically, however, it is different.

The excavator (Welch 1985), basing his conclusions on ceramics, proposed the following chronology: Tamyae phase *c.* 1000 - 600 B.C., Prasat phase *c.* 600 - 200 B.C., Classic Phimai phase *c.* 200 B.C. - 300 A.D., Late Phimai *c.* 300 - 600 A.D., Sema *c.* 600 - 950 A.D. Late historic periods have been omitted. According to Welch (1985:229-238), the above dates are tentative. The chronological distribution of sherds, their provenances (Welch pers comm.), and fabrics are summarised in Table 8.7 below.



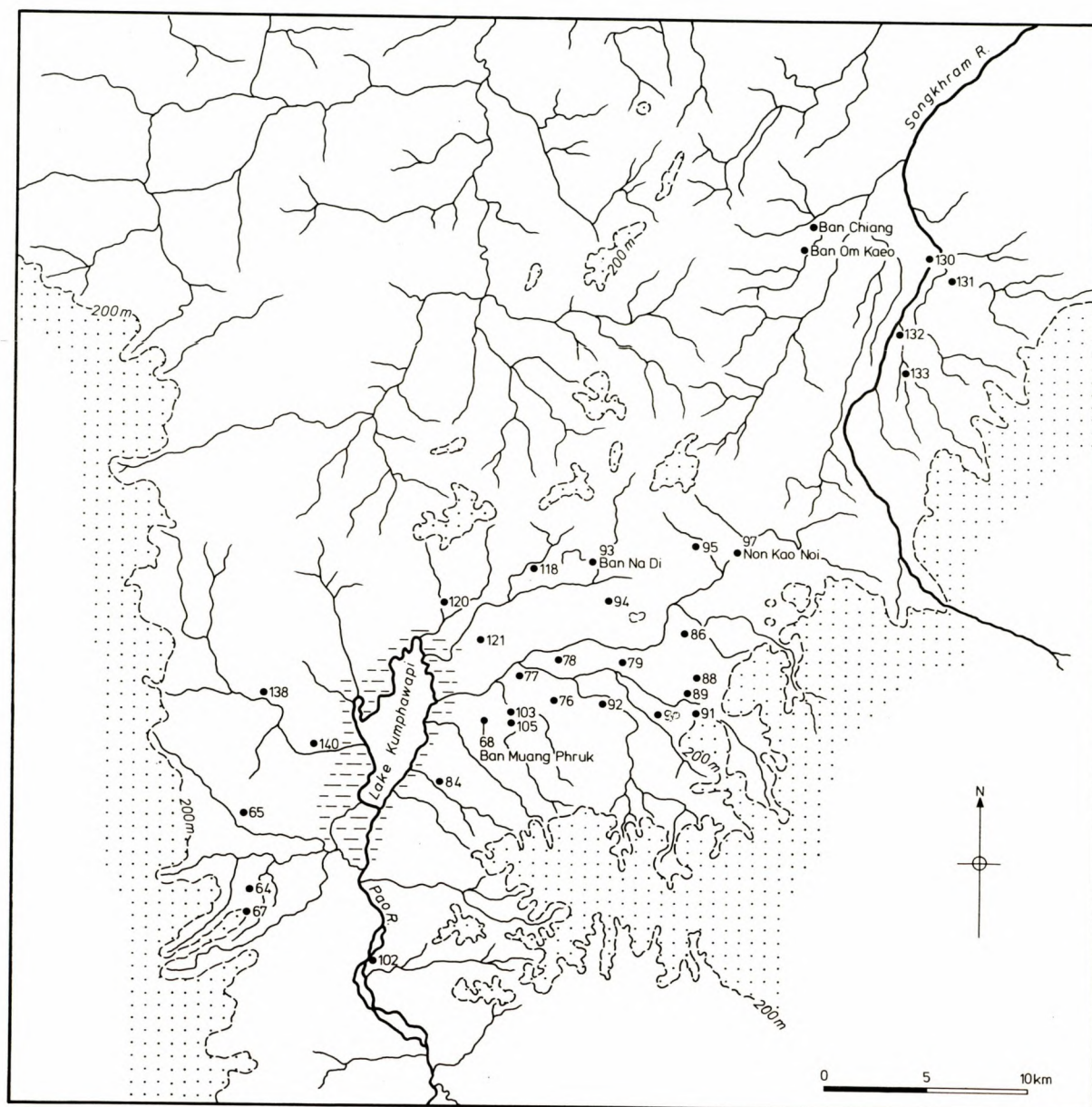


FIGURE 8.1: SAKON NAKHON BASIN ARCHAEOLOGICAL SITES.

TABLE 8.3: The chronological distribution of Non Kao Noi fabrics.

level	orth.grog	blebs	BND 9	rice	Phimai?	none	stoneware	total
5	12	1	-	-	-	-	-	13
4	10 +	-	-	-	-	1	-	11
3	2	8 ++	1	-	-	-	-	11
2	4 +	7	-	1	1	-	1	14
total: 49								

Notes: + level 4: 3 specimens and level 2: 1 specimen are as for Ban Chiang Hian LXI and LX ordinary grog fabrics.

++ 3 specimens are as for Chi Valley blebs.

TABLE 8.4: Ban Chiang Hian fabrics.

level	orthodox grog			blebs	sand +	rice	Phimai?	total
	micaceous	silty	sandy					
11	7	12	4	1	3	-	-	27
10	4	7	6	1	-	-	-	19
9	8	1	5	1	1	1	-	17
8	3	-	2	-	-	1	-	6
7	2	3	8	-	1	-	-	14
6	3	6	7 +	-	-	-	-	20
5	-	-	3 +	-	-	3	2	8
3	-	-	-	-	-	1	3	4

Notes: one additional level 10 fabric has Roi Et similarities.

+ three level 6 and all level 5 sandy grog fabrics may have igneous associations.

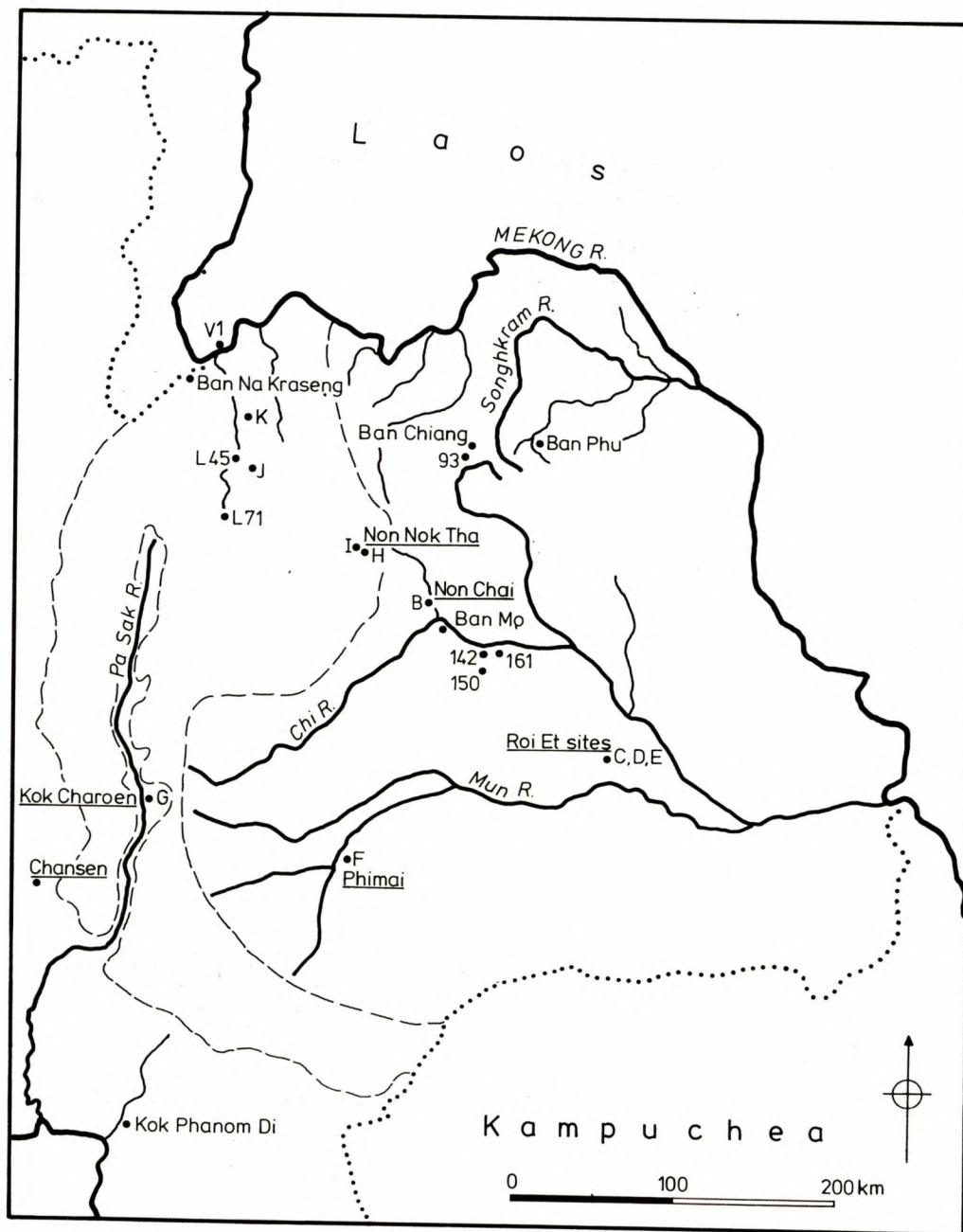


FIGURE 8.2: THE DISTRIBUTION OF ARCHAEOLOGICAL SITES CONSIDERED.



TABLE 8.5: The chronological distribution of Non Chai fabrics.

layer	phase	surface finish	temper	frequency
6	1	“red painted on black”	blebs +	1.33
5	1	“red slipped and polished”	grog ++	0.29
5	1	“red slipped with applique”	grog ++++	0.17
5	1	“black painted on buff”	blebs	0.14
4	3	“plain”	grog <	22.37
3	4	“carved paddle, red slip”	blebs ? +++	7.47
3	4	“red painted on buff”	rice ? <<	6.69
3	4	“painted with applique”	blebs	0.06
3	4	“carved paddle, painted”	blebs	0.92
3	4	“wholly red painted”	blebs	54.68
2	5	“carved paddle, smoothed”	rice	0.41
2	5	“cord-marked”	rice	5.43
2	5	“impressed”	rice	0.03

Notes: blebs + fabric is similar to “Roi Et white” (Higham 1977).

++ a sandy Chi Valley fabric with biotite.

++++ bleached biotite, plagioclase feldspar and brown siltstone are present.

< biotite, brown siltstone, and phlogopite (?) are present.

+++ this grog is difficult to categorise as the fabric is dense. It probably represents a plastic clay. Several rice husk fragments are also present.

<< a dense sandy oxidised fabric with a light amount of rice husk “temper ?” It has “Roi Et white” overtones.

TABLE 8.6: The chronological distribution of Roi Et fabrics.

Non Dua:				
phase	level	temper	excavators' category	total
1	16	orth.grog +	“smoothed plain”	1
3	4	rice ++	“white ware”	1
-2 Don Taphan:				
phase	level	temper	excavators' category	total
2	28	rice +++	“Roi Et ware”	20
3	8	rice ++++	“coarse ware”	1
3	7b	rice ++++	“white slipped”	1
3	4e	orth.grog ++++	“thin white”	1

Notes: + a sandy fabric with a different mineralogy to earlier fabrics. It has possible igneous associations.

++ a similar mineralogy to the above fabric but lightly tempered with rice

+++ parent body is consistent with a sedimentary source.

++++ moderately micaceous matrix.



TABLE 8.7: The chronological distribution of Phimai fabrics.

Site	section No.	date	temper	total
Ban Suai	C1	0 A.D.	rice husk +	1
	C3	0 A.D.	rice husk +	1
Ban Tamyae	C2	500 B.C.	rice husk +	1
	C4	400 B.C.- 100 A.D.	rice husk +	1
	C5	post 0 A.D.	rice husk ++	1
Ban Prasat	C7	no data	rice husk +	1
Non Ban Kham	C6	200 B.C ?	sand ? +++	1

Notes: + moderately micaceous matrix

++ silty matrix

+++ it is unclear whether this fabric is tempered.

## 8.4 Excavated Central Highland fabrics

### (i) Pa Sak Valley

Freestone recognised six fabric groups at Khok Charoen (Table 2.1), (Watson *et al.* 1982). Type samples of fabric groups 1 to 5 inclusive have been examined in thin-section. None bears any significant resemblance to any of the Khorat Plateau fabrics discussed above. According to Freestone, fabric group 6 contains fragments derived from an epidotized granitic rock. Thus all of the Khok Charoen fabric groups can be discounted from our consideration of Khorat Plateau wares.

### (ii) The Phu Wiang region

Bayard (1984:88-89), assumes a date 3000 - 2600 B.C. for the initial settlement of Non Nok Tha, "and a date between 500 B.C. and 200 A.D. for the end of the Non Nok Tha Phase". According to Bayard (1977:84), the Non Nong Chik and Non Nok Tha temper groups are substantially the same. Type specimens selected by Bayard for both sites have been examined in thin-section. In each case the fabrics are different to any previously discussed from Khorat Plateau sites. Most are readily understood in terms of the local geology. Several include igneous minerals. At Ban Na Di, two MP1 vessels (pots 62 and 64) are probably derived from near this area. Non Nong Chik fabrics examined from levels 8-5 (inclusive), are sandy and probably untempered. Fabrics from levels 1-3 are composed of a petrographically similar material. It is important to note that these are tempered with rice husk. Levels 1-3 at Non Nong Chik post-date the Non Nok Tha phase.

### (iii) The Pa Mong survey area

Bayard (*et al.*), conducted a site survey in the Loei region. Representative sherds surface collected from the Loei area sites of Non U Mung, and Non Na Nong Khong, and from Ban Tak Det in Laos (Bayard 1980), have been examined in thin-section. In each case the fabric displays a clear igneous association.

### (iv) Excavated Loei sites

Sherds from two recent excavations in Loei province (Rutnin pers.comm.), have been examined petrographically. These include four representative vessel sherds from Noen Phrik (Phrik Mound), and one burial associated sherd from Tham Pha Phim (Pha Phim Cave). Each of the vessel sherds belong to the same fabric group. It contains fragments of a weathered volcanic rock, probably a rhyolite. This is readily understood in terms of the regional geology. The rock fragments are probably natural inclusions.

The Pha Phim Cave sherd represents a different fabric group. Also igneous, in this case the mineralogy suggests a granitic or granodioritic source. This fabric is mineralogically equivalent to "Nga Ngua Buff", pottery surface collected from Non Na Nong Khong (Bayard 1980:70).



## 8.5 Khok Phanom Di

Over twelve hundred thin-sections of “whole” burial vessels, rimforms, ceramic anvils, prepared clay cylinders and modern clay samples have been examined. The implications of bleb tempered wares in the Khok Phanom Di assemblage are discussed below.

## 8.6 Temporal interpretative model

The evidence presented above is necessarily detailed due to the nature of the study area’s regional geology. This detail is central to the model outlined below. It has also been provided in the hope that it will stimulate the acquisition of further information on ceramics, and thus lay the ground for more precise alternative models. It is recognised the evidence could be interpreted differently to that in the proposed model. Further, it is stressed that the present model is considered the most appropriate only in terms of the current information.

We will approach the evidence from two directions. First, evidence considered peripheral to our purpose will be excluded. Second, a series of temporally sequential events will be correlated in order to provide a coherent chronological framework for Ban Na Di. This means that some changes in remote parts of the Khorat Plateau, and indeed beyond, will be considered.

To help bring into focus the likely origins of changes in Sakon Nakhon Basin pottery traditions, such as that evidenced by the dichotomy between MP1 and MP2 at Ban Na Di, we can reasonably exclude the Central Highland zone. This is because pottery from there either includes igneous minerals or displays a different sedimentary petrology to the Sakon Nakhon Basin clays. They contrast with the fabrics which dominate the known Sakon Nakhon Basin sites. For the origins of these changes, therefore, we must identify another sedimentary source zone.

At Ban Na Di, 4 of the 8 rimforms from the basal occupation level reveal a fabric mineralogically consistent with a source within the surrounding plagioclase zone. It is tempting to view this ware as having accompanied the initial settlers. Such a source would help explain the strong ties with Eastern Sakon Nakhon Basin traditions which are documented in anvils, crucibles, MP1 burial vessels and rim fabrics. It is an association which continued throughout MP1. It is also possible, however, that this early fabric represents some other event, such as the first attempts at exploiting clays close to Ban Na Di.

Vessels made from exotic fabrics were imported throughout MP1 (fig. 7.45). A clear dominance of Sakon Nakhon Basin sources is evident in both whole vessel and rim fabrics. One MP1c burial vessel (pot 65) has a possible Khorat Basin origin. Two vessels are consistent with a Petchabun piedmont source. One (pot 64), is from MP1b, the other (pot 62), from MP1c. The high value attached to this ware is suggested by a local copy represented by a MP1c vessel (pot 63). Although this vessel is very similar to pot 62 in form, surface finish and construction details are different (Table B.7 (Appendix two)). Exotic pottery from the Central Highlands is rare. Thus, this local reproduction is corroborative evidence of the prestige attached to exotic wares for mortuary furniture. It also reinforces the evidence from anvil and crucible fabrics of clear external relationships beyond the immediate environs. It is possible that such exotic wares were sent as mortuary gifts from more remote affines. Exchange networks involving prestige pottery are another mechanism for the circulation of exotic pottery. The rarity of pottery from the Central Highlands, however, suggests minimal contact of either kind. This



sources. Pottery production was important to the inhabitants of Ban Na Di throughout the sequence. This is reflected in the importation of quality clay, and the blending or differential use of local materials during both MP1 and MP2. Thus production persisted in the face of a lack of suitable local clay.

Cultural relationships, in terms of the ceramic technologies involved, illuminate two distinctive emphases. During MP1, a close association with what appear to have been Eastern Sakon Nakhon Basin pottery traditions dominates the external relationships. Anvils fashioned using nearby clay 6, and clays consistent with eastern sources over 50 km distant, hint at the presence of immigrant potters. Exchange alliances, involving marriage partners and the residential movement of individuals, is one mechanism which might help explain these factors. Mortuary vessels, occupation rimforms and industrial accoutrements all point to a close association with Eastern Sakon Nakhon Basin societies. The intensity of these links increased steadily throughout MP1.

Asymmetry between intensifying inter-regional associations and undeveloped intra-regional potentials may point to mechanisms which acted in unison to enhance some relationships but conserve others. It seems reasonable to infer that if societal adaptations vary because they relate to different environments, these will be reflected in broader cultural aspects. These may relate more to subsistence and technology, however, rather than to secondary cultural aspects such as pottery. Therefore pottery may often not be markedly distinctive even when it relates to cultures with different lifestyles. This factor could explain the lack of close connectivity between the Central Highlands and Sakon Nakhon Basin communities in terms of the exotic pottery spectrum at Ban Na Di.

Physical isolation, rather than cultural differences, may have initially hampered southern influences on the northeast. With the settlement of Non Chai, however, a pivotal location between north and south was filled. Whether this single event ultimately provided a catalyst for the subsequent northeastern developments is unclear. We will discuss the likely effects of this question in the final chapter.

Relationships beyond the Sakon Nakhon Basin throughout MP1 appear to have been limited. Commencing with the deposition of level 5, however, a series of dramatic and comprehensive changes are obvious. In terms of imported wares, the Eastern Sakon Nakhon Basin influence is initially weakened, and then almost replaced by Khorat Basin ceramic traditions. In concert with the initiation of this change, a tempering tradition relatively recent to the Upper Chi Valley suddenly penetrated the Sakon Nakhon Basin.

Subsequent to changes in the indigenous pottery tradition at Ban Na Di, late in the 1st millennium B.C., relationships with the southern cultures develop in quantity and depth at the expense of established Sakon Nakhon Basin relationships. Ceramics from the Chi Valley in the first instance, and by c. 200 A.D., together with Mun Valley wares, increase at the expense of Eastern Sakon Nakhon Basin pottery. By c. 500 A.D. ceramics originating in the Khorat Basin exceed, for the first time, exotic Sakon Nakhon Basin wares. Equally important, however, are the concurrent changes in industries interrelated with pottery production. We can defer an examination of these factors until chapter nine, and confine our present inspection of the evidence to that directly involved with pottery *sensu stricto*. A key question is the origin of bleb-tempered wares during the period preceding the level 5 change in the local pottery tradition. Clearly, the prime candidate is Non Chai. Both temper species and mineralogy are distinctive enough to rule out any of the alternatives.

Rutnin (1979) noted that the majority of bleb-tempered sherds were from red-painted or slipped wares, which concentrated in layer 3 at Non Chai. Similar wares characterise level 5



at Ban Na Di. This surface decoration contrasts sharply with MP1 treatments, as Table B.8 (Appendix two), shows. The implications of this correlation for “Ban Chiang Painted Ware” are examined in chapter ten.

Bleb-tempered pottery is predominant among basal Ban Muang Phruk wares. If the earliest levels are subdivided into lower and upper portions, however, a clear dichotomy between the surface finish of rimforms is evident. Table 8.8 below, illustrates this.

TABLE 8.8: Ban Muang Phruk: The surface treatments of early rims.

level	spits	red slip/paint	%	plain	%	total
5	21 – 19 +	2	22.22	7	77.77	9
5	18 – 16 +	8	72.72	3	27.27	11

Note: + inclusive

Rutnin reported that at Non Chai plain wares were the second most common surface finish, comprising 22.37 % of the total. They concentrate in the upper two layers and retain the early temper species (Rutnin 1979:119-121). None of the lower level 5 Ban Muang Phruk plain rim types occur at Ban Na Di, but several are morphologically similar. For example compare BND US 58 with BMP US 192 (Higham and Kijngam 1984:36, 55). Of the eleven upper level 5 Ban Muang Phruk rim types, six match level 6, and five match level 5 specimens at Ban Na Di.

This early emphasis on plain surfaces might be explained by a lack of local raw materials or knowledge of them. Suitable raw materials for red pigments are locally available, however, so this is unlikely. In view of potters’ capacity to copy, imitation of local preferences may have been a stimulus, particularly if the Ban Muang Phruk inhabitants were a minority group. This site may have been an early forerunner of a much larger movement of people from the Khorat Basin, because the plain surface finish soon gave way to the preferred treatment evident in the Non Chai slipped or painted bleb wares. This interpretation is, of course, speculative.

The movement of people using a range of different pottery manufacturing methods into the Sakon Nakhon Basin from the south is a possibility which gains explanatory force when a wider view is taken. A summary of known ceramic sequences, using “temper-typing” in a very general way, reveals a temporal regularity in potting tradition changes within the Khorat Plateau. This began in the south and progressed northwards. It is unnecessary, for the present, to determine whether the Khorat sites were manufacturing centres, although all or many may have been. We need not presume so. Our purposes are here served if we can establish that the fabrics were consistent with the regional sedimentary terrain. Furthermore, added support would come, if they were consistent with the Khorat Plateau geology, if we could categorise their temper species in terms of areal and temporal distributions.

The difference between Khorat Basin fabrics and Sakon Nakhon Basin wares is in most instances apparent. Accepting for the moment that “fibre and clay” or “chaff with grog” equates with blebs, this temper may have been present at Roi Et, (Higham 1977:111-137), and Phimai, (Welch 1985:199-203), by the middle of the first millenium B.C. This information is, unfortunately, tenuous without detailed petrographic evidence. To resolve this dilemma, we need now to cast our net still wider.

Pottery excavated at Khok Phanom Di (fig. 1.1), includes bleb-tempered wares. These are present throughout occupation levels, in burial fabrics, and in one of the many ceramic anvils.

Blebs are associated with a kind of slip. Some are related to fabrics whose parent



bodies are consistent with clays examined from within the large tract of sedimentary terrain surrounding the site. But in each case they appear exotic. Such marked fabric variability suggests bleb temper was regionally widespread (Vincent 1987). We have already noted, in chapter six, that grog may be closely associated with sedimentary terrain. Khok Phanom Di is pre-metallic, and occupation was probably confined to the period 3000-1500 B.C. (Higham *et al.* 1987:148).

At Ban Na Di, the first bleb-tempered fabric occurs later than 1000 B.C. It is consistent with a Chi Valley derivation. At Ban Chiang Hian, blebs are represented by two rimsherds and one bodysherd. Each has a red painted or slipped band. Their fabrics, although consistent with a sedimentary source, differ from both the postulated local wares and those from the other Khorat sites already discussed. The rims have both been classed “TYPE BCH 2” an “infrequent type” by Chantaratiyakarn (1984:593-594). Their provenance suggests a late first to early second millenium date. In figure 8.3 they are compared with rimforms US58 from Ban Na Di and US192 from Ban Muang Phruk.

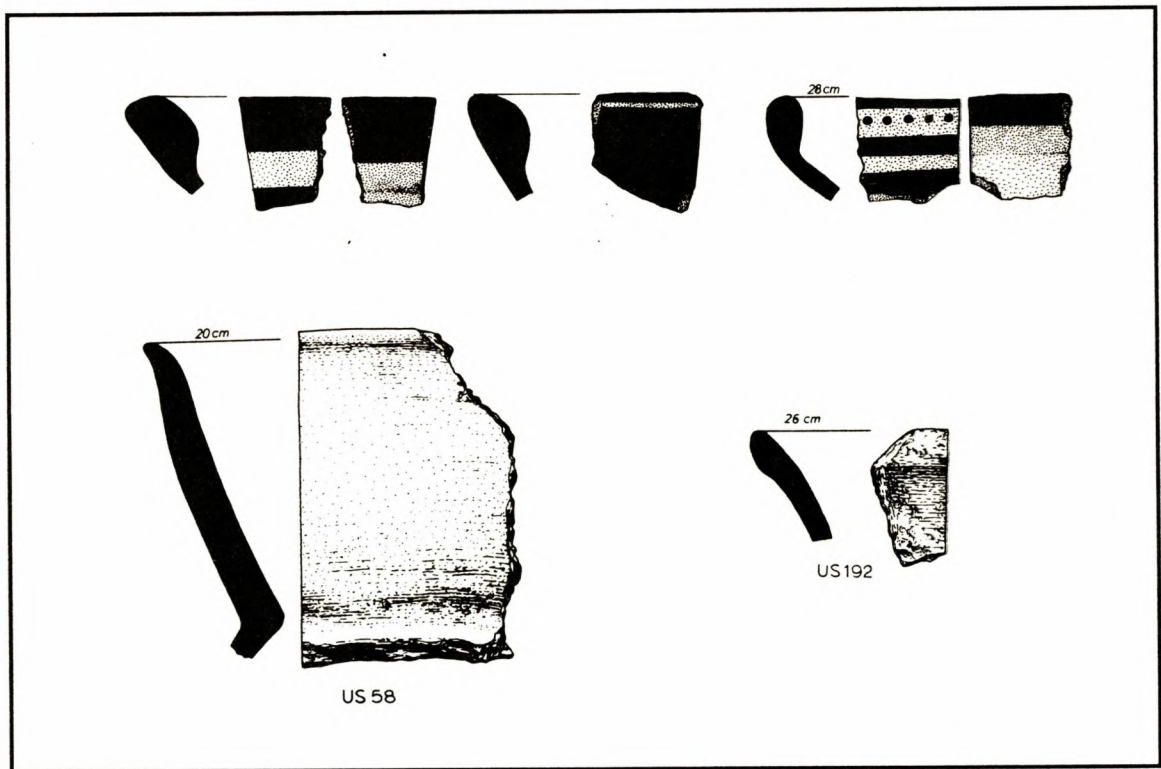


FIGURE 8.3: COMPARISON OF BAN CHIANG HIAN, BAN NA DI AND BAN MUANG PHRUK RIMFORMS. (Upper row: “TYPE BCH 2”)

Current background evidence, viewed in combination with the areal and temporal distributions of bleb-temper, suggests an early origin outside the Khorat Plateau, followed by a gradual movement within the plateau from south to north. Thus it seems reasonable, at this stage, to view the movement of bleb wares into the Sakon Nakhon Basin as the culmination of a generalized process which originated far to the south beyond the plateau’s borders, probably about two or so millenia prior to its initial introduction into Ban Na Di.

Khorat Plateau ceramic industries may be traced through a series of temper changes which



together give an orthodox grog-blebs-rice sequence. To what extent this system can be generalised awaits future analysis. It is stressed, however, that this proposal does not exclude localised variations. Rice temper, for example, is present from the lowest levels at Ban Na Di. Its widespread use throughout the Sakon Nakhon Basin *in quantity*, however, was probably late. At Ban Chiang Hian the bleb-tempering method may not have been adopted. It should be noted, however, that this very large site was extensively fortified with moats and ramparts (Kijngam *et al.* 1980:41).

It should be clear by now that the proposed temporal model argues for a series of general trends. These were superimposed onto a mosaic of, often probably locally circumscribed, ceramic technologies, each falling under the rubric of a specific ceramic tradition. Similar general trends may characterise diffusion of new methods, either with or without population movements. Hence the Sakon Nakhon Basin sequence may have mirrored, in microcosm, several more widespread events. In the following chapter we will consider in detail the stratigraphic discontinuity at Ban Na Di. This may help illuminate the processes involved, and allow some insight into the kinds of effects the events postulated above may have had on local populations.

## Chapter 9

### The level 5/6 interface at Ban Na Di

A major stratigraphic break is evident in Ban Na Di at the level 5/6 interface. In pottery, this change is characterised by the replacement of the founding orthodox grog-tempering tradition with another highly distinctive technology. A different and more sophisticated range of pottery types is evident. Whereas during MP1 wares are rarely slipped or painted, the new assemblage is dominated by this surface treatment. The new ceramic tradition is accompanied by many changes in other aspects of material culture as well as mortuary ritual, but faunal and floral remains suggest a continuity in subsistence strategies throughout the prehistoric occupation (Higham and Kijngam 1984:698-701).

Deposition of lower level 6 material saw the last use of the excavated area for burials belonging to MP1. Evidence for *in-situ* bronze casting as well as the first recovery of iron slag were found in level 5 (Higham and Kijngam 1984:29).

If we are to account for these developments, it is important to establish whether a hiatus occurred between the end of level 6 and the beginning of level 5. We may address this question through a comparison of levels 8-6 with levels 5-3 pottery and industrial ceramics. Ceramic artefact groups which span the period in question are of special interest. The principal source of pottery during MP1 is from secure mortuary contexts, but the levels 5-3 wares derive mainly from occupation areas. Correlation with evidence from other Sakon Nakhon Basin sites, however, could be expected to corroborate that from Ban Na Di.

A central objective of the present study has been to consider a wide temporal and areal framework. If the model set out in chapter eight has achieved its objective, it will have shown that generalised processes underlie the changes at Ban Na Di. During MP1, very few exotic fabrics originated outside the Sakon Nakhon Basin. This emphasis changed markedly during the period levels 5-3 were laid down, when imports from the Khorat Basin become increasingly dominant. The MP1 local pottery manufacture is characterised by an orthodox grog tradition, but during the subsequent period, a bleb grog tradition is established. These developments mirror, at least partially, changes of a much broader nature which permeated the Sakon Nakhon Basin.

Temporal distributions of exotic fabrics provide insight into changing cultural relationships. When local changes occur in concert with regional changes, their role as information carriers is increased. If technological innovation accompanies such events, an enhancement of inter- and intraregional diversity is favoured. According to Renfrew (1972, 1975) growth in endogenous and exogenous exchange favours societal cohesiveness and the rise of central places. To explore these processes, we need to discriminate between local change and external influences at Ban Na Di.

Although the available data do not allow a detailed understanding of these latter events, a