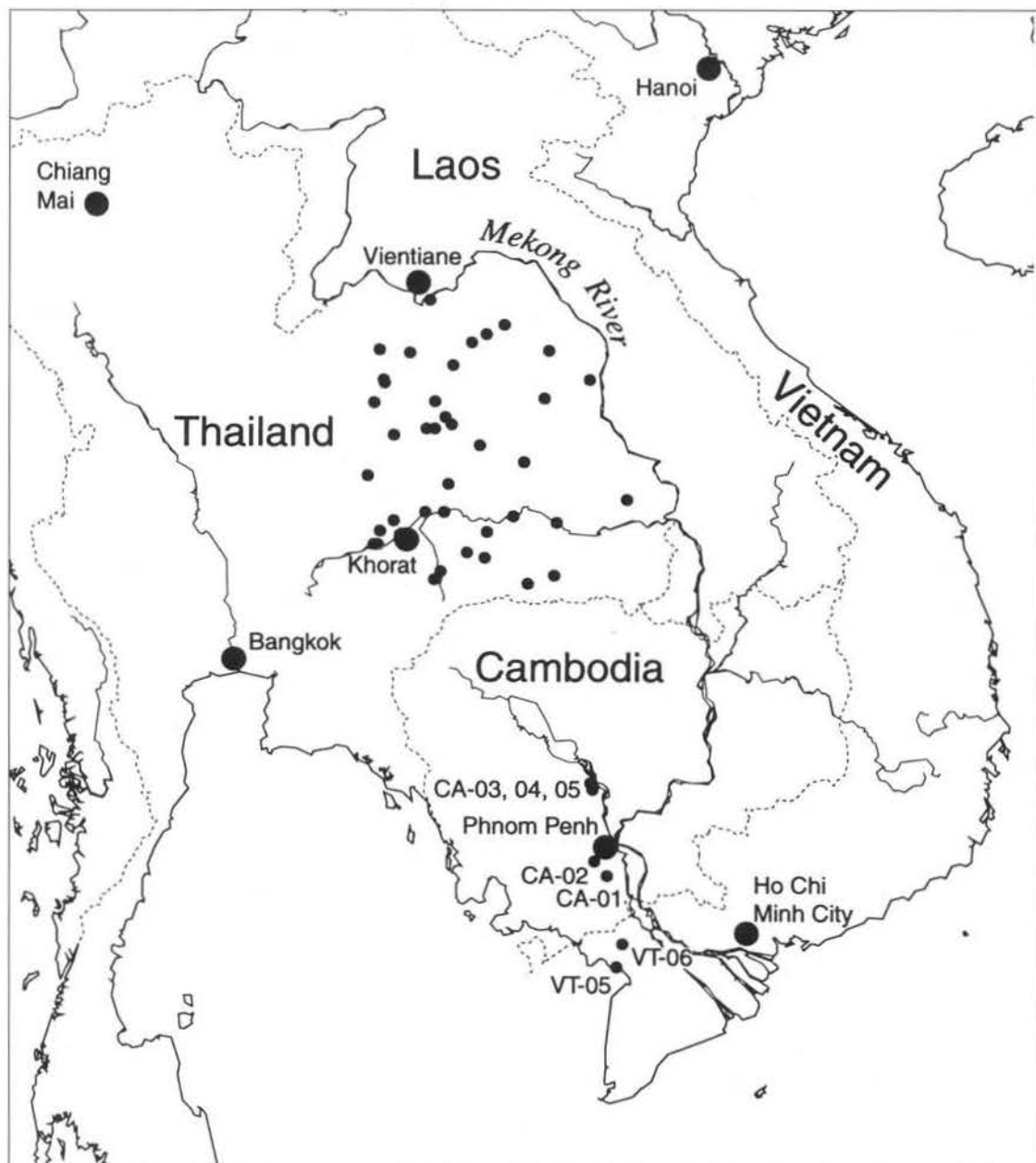


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Villages in Mainland Southeast Asia following the "Khmer" pattern of earthenware production (Map by Daniel Cole, Geographic Information Systems Coordinator, Smithsonian Institution).

- | Key: | Cambodia | Vietnam | Thailand |
|------|----------------------|----------------|---|
| | CA-01: Phnom Chisor | VT-05: An Loc | Dots indicate settlements of Thai-Khorat potters. |
| | CA-02: Damdek | VT-06: Dầu Doi | |
| | CA-03: Banb Chkoul | | |
| | CA-04: Andong Russei | | |
| | CA-05: Santuk | | |

KHMER EARTHENWARE IN MAINLAND SOUTHEAST ASIA:
AN APPROACH THROUGH PRODUCTION*

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Introduction

In this paper, we introduce the "Khmer" pattern of earthenware production that we have observed in Cambodia and Vietnam. We also describe earthenware production by Thai-Khorat people in Northeast Thailand, which we interpret —on the basis of core technological procedures— as a variant of contemporary Khmer production. We contrast this repertory of procedures, which can be observed well outside the borders of modern Cambodia, with those used by other earthenware-producing populations in mainland Southeast Asia. Finally, we present some hypotheses concerning possible antecedents for contemporary "Khmer" earthenware production. These hypotheses are presented as ideas for future research, which could be tested with the development of appropriate analytical tools by materials scientists.

When "Khmer ceramics" are mentioned, the objects that probably come to mind are the glazed stoneware vessels produced in the Angkorian empire between approximately the 9th and the 14th centuries. These handsome vessels are the Khmer ceramic objects that tend to appear in museum displays and private collections. The archaeologist Bernard-Philippe Groslier was the first scholar to point out that the relatively short-lived and specialized tradition of Khmer glazed stoneware was imbedded in a matrix of earthenware production that began in the region far earlier and continued after the demise of glazed stoneware production (Groslier 1981:10-15).¹ Few scholars or connoisseurs have followed on Groslier's insights concerning the enduring significance of Khmer earthenware production.

Because earthenware production has endured and can be observed in Cambodia today, it is tempting to conclude that what is seen is an unchanging continuation of the earthenware technology of the

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¹ Stoneware produced within Cambodia today appears to belong to a different technological lineage, introduced from Vietnam. Biagini and Mourer 1971: 211-19.

Angkorian period. Even Groslier employed a description of present-day production processes to hypothesize the manner of earthenware production by the Khmer of Angkor (Groslier 1981:10). This assumption of continuity is rash, however, until we understand far more than we currently do about the production technology (or, more probably, multiple technologies) of prehistoric and historic earthenware. Fortunately archaeologists are advancing this work. One purpose of our complementary research on present-day production is to discover, record, and codify the methods by which pots are made, with a view towards establishing a baseline for further archaeological investigation and research into how clay was handled in the past.

The key to identifying a relationship between present-day and historical earthenware production in Cambodia is analysis of the technology used to form the vessel. As we have argued elsewhere (Cort et al. 1997), earthenware technology cannot be characterized solely by its materials and tools or by its finished form and decoration: the core of earthenware production is defined by the sequence of actions by which the vessel is shaped.² This core sequence of actions corresponds to the useful concept of *chaînes opératoires* developed by French ethnographers (e.g. Lemonnier 1992, Gosselain 1998). Through careful observation of potters at work, we can discover the processes by which contemporary pottery is formed. We can also describe the gender and social organizations that support its mode of production. Given the current state of ceramics material analysis, we are convinced it is not possible to extrapolate from contemporary production into the past with any degree of certitude.

Nonetheless, our close observation of the characteristic processes of present-day Khmer earthenware production, and our tracking of the distribution of these processes in mainland Southeast Asia, show that a distinctive "Khmer" earthenware technology cuts across modern political borders, linguistic boundaries, and all of the other usual definitions of ethnicity. In so doing, the distribution of this technology sketches a map resembling the Khmer domain at an earlier point in time. Earthenware is made according to a recognizably "Khmer" process by potters who identify themselves as Khmer not only in Cambodia but also in the Mekong Delta region of southern Vietnam. The pattern of related technology also reveals that "Khmer" ceramic technology is used by a group of potters in Northeast Thailand who do not define themselves as Khmer. Technological behavior may be said to have a long memory, even when its practitioners have forgotten its origins.

Our research on earthenware production in Cambodia follows that undertaken by André Souyris-Rolland, Roland Mourer, and Jean Biagini prior to 1970 (Souyris-Rolland 1950, Mourer 1968, Biagini and Mourer 1971) and, more recently, by students of the Department of Archaeology of the Royal Fine Arts University in Phnom Penh, who produced a videotape of pottery production in Kompong Chhnang in 1998 under the direction of Gerd Albrecht (Ros et al. 1998). Malleret's research in the Mekong Delta was also helpful (Malleret 1957).

Because our research is comparative, we have examined and compared production technologies—*chaînes opératoires*—in many areas of mainland Southeast Asia. The technology embodied in contemporary "Khmer" production constitutes one of six primary methods we have identified for producing earthenware pots in mainland Southeast Asia. These include the processes used by Cham-speaking people on southern Vietnam's seacoast, by Suay-speaking people in upland Laos, and by Thai and Lao in North and Central Thailand and lowland Laos (Lefferts and Cort forthcoming).

² Thus the discovery of potters' paddles and anvils at prehistoric sites such as Oc Eo or Samrong Sen does not insure that those potters wielded the tools in the same manner—as part of the same distinctive repertory of actions—as do contemporary potters in the same locales.

At the heart of the production process, constituting a key feature for distinguishing among the various primary methods, is the making of an initial form that is subsequently elaborated to produce the final vessel. We use the term preform to designate this initial form. In the case of "Khmer" earthenware technology, the preform is a hollow expanded cylinder with a finished neck and mouth rim and a shaped shoulder but without a base. As we will discuss below, we have documented two variations in approach to making the hollow cylindrical preform. In Khmer pottery-making villages within Cambodia, we found that potters used both variations: they could start either with a solid cylinder that was opened into a hollow cylinder or with a rectangular slab of clay that was stood on one long edge and joined along the narrow edges to make a hollow cylinder.³ In Khmer Krom villages in southern Vietnam, we saw only the slab method, while among Thai-Khorat potters in Northeast Thailand, we saw only the solid cylinder method. (See Map.)

In either variation, the overall approach to the shaping of the pot by Khmer potters is "transformative": clay sufficient for the whole pot is present from the beginning in the initial form and is "transformed" by a sequence of steps into the final product.⁴ This stands in marked contrast to "additive" processes used elsewhere in mainland Southeast Asia, whereby the mass of clay is slowly built up (by coiling or other means) to make the preform.

Through comparative observation and analysis of earthenware production we have come to recognize Khmer earthenware technology, based on the hollow cylindrical preform, as a significant contribution to the range of possible production technologies in Southeast Asia and, perhaps, the world. Moreover, this production is significant because it appears related to ethnic identification: the way Khmer potters make earthenware pots may help to define a segment of the range of technology that is part of Khmer culture.

How Khmer women in Cambodia produce earthenware pots

The following generalized description comes from our research conducted in Cambodia in January, 1997, with the invaluable assistance of Kim Sedara. This exploratory survey complemented work we have undertaken since 1993 in Thailand and Laos. Our observations and questions were informed by our previous research and hypotheses, discussed below. We paid visits of a few hours each to the earthenware producing communities at Phnom Chisor, Takeo Province, and Damdek in Kompong Speu Province, both south of Phnom Penh. Subsequently we traveled to Kompong Chhnang Province, northwest of Phnom Penh, where we spent two days looking at production in three villages: Banh Chkoul, Andong Russei, and Santuk. We observed the process used to make a jar for carrying and cooling drinking water and (in Santuk) a large pot for simmering special cakes. In the composite descriptions that follow we focus on the drinking water jar.

The first description describes the making of the preform using a slab of clay, the process we observed in all Cambodian villages we visited.

³ In Cambodia we observed the slab method exclusively, while the videotape (Ros et al. 1998) shows in careful detail the method starting with a solid cylinder. Mourer 1968: 6 also documented the fabrication of a cylinder as preform in three villages in Kompong Chhnang.

⁴ This term was suggested to us by Dr. Pamela Vandiver, Smithsonian Institution.

Figure 1

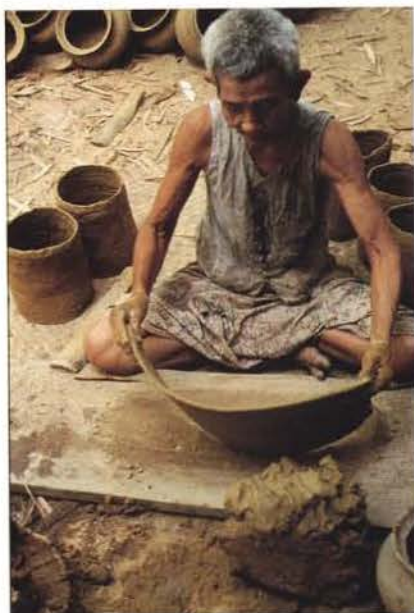
Potter Mrs. Onn shaping a clay slab to make a vessel preform. To the potter's left and right are finished preform cylinders. Cambodia, Kompong Chhnang, Banh Chkoul, 1997.



1. The potter, working on a length of wooden board placed on the ground, makes a thick roll of prepared clay (the quantity of clay necessary to complete the pot form). She spreads wood ash on the board and flattens and stretches the clay roll into a rectangular slab (figure 1). She lifts the slab (figure 2), stands it on one of its long edges, brings the two narrow ends together in front of her, and joins them to form a hollow cylinder without a base. (She forms one such cylinder for each of the pots she plans to complete that day; by the time she makes all the cylinders and proceeds to the next step, the clay of the first cylinder has had time to dry sufficiently to be worked.)

Figure 2

Raising the clay slab to make a vessel preform. The potter will join the two narrow ends of the clay slab to form a cylinder. Cambodia, Kompong Chhnang, Banh Chkoul, 1997.



2. The potter places the cylinder on her work stand—usually a section of a palm-tree trunk, cut to an appropriate height (about 60 cm.) so that the potter can stand next to it to work comfortably. She shapes a rudimentary neck by striking the uppermost portion of the cylinder with the rounded back of a bamboo paddle held in her right hand, holding her open left palm against the inside of the cylinder to receive the blows, thus constricting the upper portion of the cylinder and everting the edge (figure 3). She expands the entire cylinder into an ovoid form by striking a wide, flat wooden paddle against the outside with her right hand and holding her open left hand inside to receive the blows (figure 4). She then shapes a flanged mouth rim on the everted upper edge of the cylinder (figure 5). Holding a moistened piece of cloth or a freshly-picked smooth leaf bent over the edge of the cylinder, she uses her precisely positioned hands as a template to create the desired rim profile as she revolves around the work stand, moving in both forward and backward directions as necessary.

At this point the preform is complete. The potter sets the cylinder aside to dry for some time, until the rim has stiffened but the clay is still workable. She works all the other cylinders in the same manner before moving to the next step.



Figure 3

Potter Mrs. Thi shaping a rudimentary neck on a vessel preform, using a bamboo paddle struck against her left hand held inside. Cambodia, Kompong Chhnang, Banh Chkoul, 1997.



Figure 4

Potter Mrs. Thi rounding the body of the vessel preform, using a wooden paddle struck against her open hand held inside. Cambodia, Kompong Chhnang, Banh Chkoul, 1997.

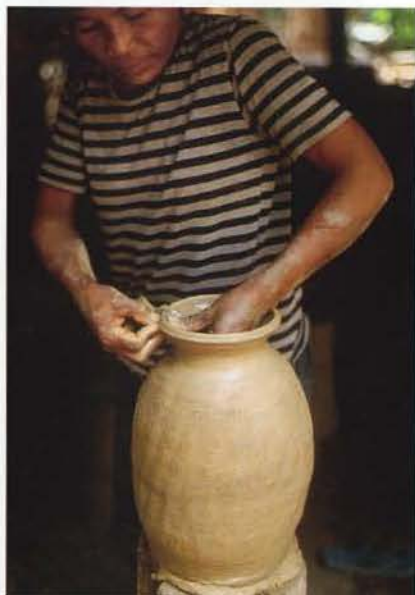


Figure 5

Potter Mrs. Thi forming the mouth rim on the vessel preform, using a fresh leaf. Cambodia, Kompong Chhnang, Banh Chkoul, 1997.

Figure 6

Potter Mrs. Nouv
expanding the
preform, using a
paddle and anvil.
Cambodia,
Kompong Speu,
Damdek, 1997.



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Figure 7

Shaping the angle
between neck and
shoulder, after
decoration has
been applied to
the shoulder using
a carved paddle.
Cambodia,
Kompong Speu,
Damdek, 1997.



Figure 8

Potter Mrs. Yeth
using a stick
with jagged end
to apply combed
decoration to the
shoulder.
Cambodia,
Kompong
Chhnang,
Andong Russei,
1997.



3. The potter returns the expanded cylinder with finished rim (the preform) to the work stand. She further expands and shapes the body, using a smooth paddle outside and a fired-clay anvil inside (figure 6). She pays special attention to defining the angle between the neck and the shoulder and the marked transition from the edge of shoulder to the belly. She adds a design to the shoulder using a paddle carved with a geometric pattern (figure 7) or a flat stick with a jagged end (figure 8). She works again on the body with paddle and anvil, expanding the shoulder and belly to their finished dimensions. She sets this vessel form aside to dry for some time while she works all the other forms in the same manner.

4. The potter inverts the vessel form, which still has an open base, on to its mouth rim on the work stand. Striking a narrow bamboo paddle held with her right hand against the palm of her left hand held inside, she bends the lower edge of the vessel wall inward, rounding and closing it, until there is just enough room to withdraw her hand (figure 9). She repeats this step for all the other forms.

Figure 9

Bending the lower
edge of the vessel
wall inward, in
preparation for clos-
ing the base.
Cambodia,
Kompong Chhnang,
Andong Russei,
1997.





Figure 10

Closing the base of the vessel, using a paddle and anvil. To the potter's right is an assortment of wooden paddles. In the background is a vessel form with incurved lower wall, ready for the base to be closed. Cambodia, Kompong Chhnang, Andong Russei, 1997.

5. The potter sits on the ground with her legs extended straight. She holds the vessel on her lap with her left arm inserted through the mouth and her left hand gripping a fired clay anvil. She uses a wide, flat wooden paddle held in her right hand to strike against the anvil all around the base, stretching the clay inward to close the hole and then rounding out the hemispherical base (figure 10). (In Takeo and Kompong Speu, the potter also uses a carved paddle, adding a textured surface to the body of the finished vessel [figure 11].) The vessel, with its form completed, is ready to be dried and fired (figures 12, 13). She completes the rest of the vessels in the same manner.

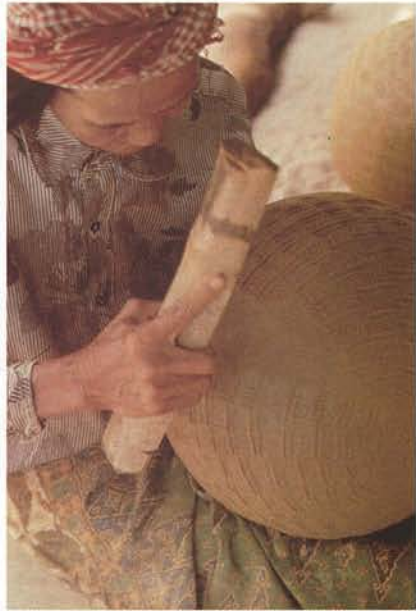


Figure 11

Applying texture to the base of a vessel, using a carved paddle. Cambodia, Kompong Speu, Damdek, 1997.



Figure 12. Potter Mrs. Now and her two daughters with finished water-carrying vessels. Cambodia, Kompong Speu, Damdek, 1997.

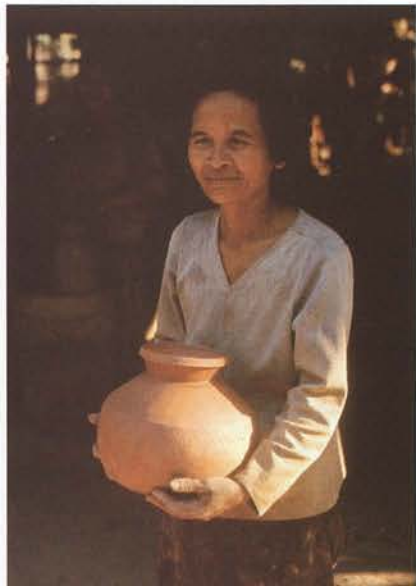


Figure 13

Potter Mrs. Yeth with finished water-carrying vessel. Cambodia, Kompong Chhnang, Andong Russei, 1997.

Before conducting research in Cambodia we had already spent considerable time documenting Thai-Khorat potters working in Northeast Thailand. The Khmer potter's process of making the preform as a hollow cylinder from a slab of clay, as just described, seemed to us to correspond in effect to the process that we had documented among Thai-Khorat potters in Northeast Thailand, whereby the potter first formed a solid cylinder of clay, then opened it from both ends to make a hollow cylinder. When we asked a potter in Andong Russei about the use of this alternative process, she acknowledged her awareness of it and said she could switch from one way of making the preform to the other at will. Fortunately, the videotape produced by the Department of Archaeology students (Ros et al. 1998) records the parallel process for making the preform used by potters in Andong Russei. This process, as documented in the video, is as follows.

1. Working on a rectangular wooden board placed on the ground, the potter rolls the total amount of clay required for forming the pot into a solid cylinder. She stands the cylinder upright and sticks her thumb into the uppermost end. Gripping the cylinder with her thumb inserted into the hole, she carries the cylinder immediately to the work stand. (This abrupt transition may have been for the purpose of demonstrating for the video. Probably, in an actual working day, she would make all the cylinders required for the day's production before proceeding to the next step.)
2. The potter begins the process of opening the cylinder by sticking her thumb further into the cylinder and using her thumb and fingers to open the clay of the upper half of the cylinder into a trumpet shape. She then inverts the cylinder and opens it from the other end, thus forming a hollow cylinder, functionally equivalent to that made with a slab. She then proceeds as described above, beginning with step 3.

The finished drinking-water jar has a slightly flattened spherical body and a narrow, upright neck with flanged rim. In addition to the differences in the two procedures for making the preform noted above, we observed certain regional variations in the finishing of the vessel, sufficient that we could distinguish the origins of pots available in Phnom Penh markets. Most notably, the bodies of the drinking-water jars from Takeo and Kompong Speu have textured surfaces on the belly and base, consisting of interrupted paired raised lines like "equal signs" (=), produced by a paddle carved with parallel grooves arranged on the diagonal along the blade of the paddle (see figures 11, 12). (This texture is applied in step 5, above.) The bodies of vessels from the three villages in Kompong Chhnang province are smooth (see figure 11). In addition, the decoration on the southern vessels includes a narrow band of closely spaced vertical lines, applied in two or three tiers to the shoulder of the vessel just below the neck, using a wooden paddle carved with that pattern (see figures 7, 12). The decoration on the Kompong Chhnang vessels consists of a band of widely-spaced diagonal marks positioned just below the angle of the shoulder; sometimes a second band of identical decoration is added to the shoulder just below the neck (see figures 8, 13). This latter form of decoration is produced by "jabbing" the clay with the zig-zag carved end of a stick or a comb. (The evocative Khmer term for this type of decoration, *sak*, means "tattoo.") Regional differences in clay are also apparent in the fired color of the pots: southern pots are medium reddish-brown and somewhat sandy in texture (see figure 12), while Kompong Chhnang pots are golden-orange and fine-textured (see figure 13).

How Khmer women in southern Vietnam produce earthenware pots

The description that follows comes from our fieldwork in southern Vietnam in February 1998. Working with members of The Institute of Social Sciences in Ho Chi Minh City (ISSHO), we were able to visit two Khmer Krom communities in the Mekong River delta. In contrast to Cambodia where the Khmer form the majority population, in the Mekong Delta region of southern Vietnam the Khmer Krom form a significant minority concentrated in certain villages. Khmer Krom are the indigenous population of the area, into which Chinese and Vietnamese began moving in the sixteenth century. We visited the villages of An Lac (now known as Chau Long) in Tri Ton District, An Giang Province, and Dầu Doi in Sok Xoai Commune, Hon Dat District, Kien Giang Province.

Hon Dat District near the coast and Tri Ton District further inland form two nodes of Khmer Krom population along a ridge of higher land, surrounded by lower, swampy areas, that once was (and perhaps still is) a major settlement site for Khmer.⁵ This ridge probably extends north into Cambodia, but we did not have access to maps to confirm this. Until 1954, many more Khmer Krom villages made earthenware. ISSHO researchers told us that Tri Ton District had been a major center for pottery production until recent decades, shipping pots out by boats along the system of canals and rivers. We saw Tri Ton pots for sale in central markets in the Mekong Delta. We were told that they used to be transported all the way to Phnom Penh and that individual women today use shoulder poles to carry pots to sell on the Cambodian side of the border.

French observers and researchers remarked on the extent of Khmer earthenware pottery production in southern Vietnam during the time of the colonial occupation. Unfortunately, early commentary saw earthenware as "primitive" in comparison to the glazed stoneware produced in kilns by Chinese potters (Derbes 1880). Following Vietnamese independence, however, French attention turned to the Khmer. Louis Malleret wrote sympathetically on the fabrication of Khmer pottery (1957) as an adjunct to his archaeological work at Oc Eo. He noted that the production methods he saw in two Khmer communities in Tri Ton and Ba The districts closely resembled those he had observed in Kompong Chhnang, an observation with which we agree. The recently-opened Vietnam Museum of Ethnology in Hanoi acknowledges in its introduction to the exhibition section on pottery that Khmer use a distinctive technology to make pots, differing from Vietnamese as well as from other "minority" groups.⁶

Like the technology of earthenware production in Cambodia, that of the Khmer potters in the Mekong Delta (the area known to the French as the Transbassac) is "transformative," starting with the total mass of clay necessary to form the finished pot and manipulating it through a sequence of steps into the final form. Our description indicates the minor variations in procedures between the two villages.

⁵ Hon Dat District is best known to many Vietnamese as the setting for a 1960 novel, based on actual events, about the uprising of the Khmer Krom against the South Vietnamese government in the late 1950s (Anh-Duc 1969). The narrative includes the Vietnamese author's perspective on potters: "His mother had been a pretty girl when she was young, with the brown, sun-tanned skin of local Khmer girls, and the balanced, undulating way of walking so typical of the Khmer women who made clay pots to sell. Their trade made them walk long distances every day, thirty kilometers on an average, the distance from Hon Dat to Rach Gia, the provincial capital... What grace in the way they place the *ca-om* of water on their heads and walk. Along the sandy paths from the river with their *ca-om* jar on their heads, they never touch it with their hands, their arms balanced freely and supplely (sic)" (Anh-Duc 1969: 59).

⁶ Vietnam Museum of Ethnology 1998: 116-17 represents Khmer in Vietnam with an image of a potter from An Giang Province making a preform from a clay slab. The same potter is shown in Nguyễn 1997: 81-83, along with more extensive information on the Khmer population in Vietnam.

Figure 14

Potter Mrs. Hang using a woven mat to raise a clay slab to make a vessel preform. Behind the potter are finished preform cylinders. To the right, finished vessels rest on their mouth rims to dry. Vietnam, Kien Giang, Hon Dat, Sok Xoai, Dầu Doi, 1998.



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1. The potter works on a rectangular wooden board resting on the ground. She kneads the required amount of clay into a long, fat coil. She covers the wooden board with a piece of cloth (in An Lac) or a flexible woven mat (in Dầu Doi). Placing the clay coil on top of that surface, she flattens and stretches the coil into a slab expanded to the size of the board (65 x 27 cm). The potter in An Lac uses the cloth to help lift the slab and turn the slab over. She then removes the cloth, stands the slab on edge, and joins its two short ends to create a hollow cylinder. The potter in Dầu Doi uses the mat to lift the slab without turning it (figure 14), letting the mat fall away as she stands the slab on edge and joins the two short ends to create a hollow cylinder. The potter makes a cylinder for every vessel she plans to make that day.

Figure 15

Potter Mrs. Sung using a paddle and anvil to thin the upper edge of the preform cylinder, prior to forming the mouth rim. Vietnam, An Giang, Tri Tôn, An Lac, 1998.



2. After the cylinder has stiffened somewhat through drying, the potter places it on the work stand, which consists of a section of palm-tree trunk. She uses a paddle to expand the diameter of the upper edge and round out the shoulder, striking the paddle with her right hand against the open palm of her left hand held inside the cylinder, then against a wooden anvil (figure 15). She shapes the rim, using a moistened fresh leaf collected from a tree that grows in the village held with both hands over the rim while she revolves around the stand. At this point the preform is complete. She sets it aside to dry somewhat while she works on the other cylinders.

Figure 16

Using a paddle and anvil to shape the body of a vessel on which a mouth rim has been formed and decoration applied to the shoulder using a carved paddle. To the right, cylindrical preforms with finished mouth rims await this step of forming. Vietnam, An Giang, Tri Tôn, An Lac, 1998.



3. The potter returns the preform to the work stand. She holds a fired clay anvil in her left hand against the inside of the clay wall and wields a wooden or bamboo paddle in her right hand against the outside in order to round out the body to a gently convex profile. She uses a carved wooden paddle to apply decoration around the shoulder just below the neck. She again uses a smooth paddle and the anvil to do additional shaping of the rim and body (figure 16), making a particular effort to taper the lower body inward in order to decrease the diameter of the opening (to assist in the subsequent step of closing the base). (In Dầu Doi the potter also applies a different decoration to the rest of the shoulder and the belly, using another section of the carved wooden paddle she used to apply decoration around the neck.) She sets the form aside resting on its rim to dry somewhat.

4. In order to close the base of the vessel, in An Lac, the potter sits on the ground with the form on her lap and her legs stretched out in front of her. She strikes forcefully with a wooden paddle held in her right hand against a wooden anvil held inside the form in her left hand in order to shift the still-plastic clay toward the center and close the hole (figure 17). She then works over the lower half of the vessel with the paddle and anvil to round out the form.

In *Đầu Doi*, where finished pots have compressed, lenticular bodies broader than they are high, resulting in a wide base, the potter first rests the inverted vessel on its rim on the work stand in order to begin closing the base. Holding a fired clay anvil in her left hand inside the vessel, she paddles excess clay toward the center until just a small opening remains (figure 18). Then she cuts open a small hole off center to one side of the base and uses the circle of clay cut from that hole to patch the central hole, paddling it into place (figure 19).⁷

Next the *Đầu Doi* potter sits with her legs stretched forward, resting the vessel on a hollow ring of plastic-covered straw held between her knees (figure 20). She forms a small disk of clay by hand and attaches it over the hole cut out from one side of the base. Then she uses the pattern-carved paddle to add the pattern that appears on the belly to the broad base, while also compressing and strengthening the base.



Figure 19
The vessel with closed base, showing the small hole cut to one side of the base, from which clay was taken to close the hole in the center. A clay patch for that off-center hole awaits attachment. Vietnam, Kien Giang, Hon Dat, Sok Xoai, *Đầu Doi*, 1998.

⁷ We were not able to ascertain the technical reason for this procedure. We happened to see the process of closing the base for a very large cooking vessel, which probably presented special technical problems. We were unable to observe the closing of the base for a water jar of a size comparable to that made in An Lac, which might not have required the special patching procedure. Nor were we able to observe the closing of the base for the large pot of comparable size made in the Kompong Chhnang village of Santuk; it would be interesting to know if that broad-based vessel is finished with the same patching procedure.

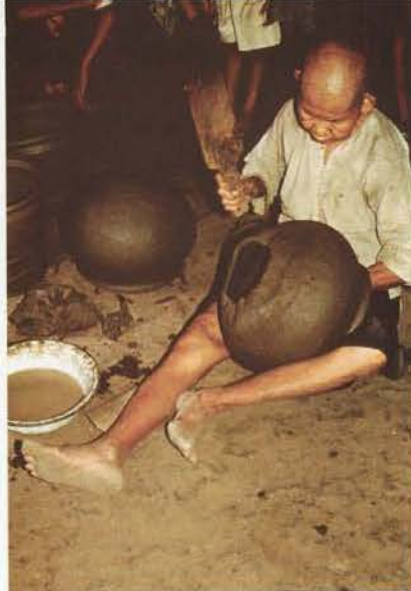


Figure 17

Closing the base of the vessel, using a paddle and anvil. To the potter's right rests a vessel with closed and shaped base. Further left are two preforms with finished mouth rims. Vietnam, An Giang, Tri Ton, An Lac, 1998.



Figure 18

Potter Ms. Y bending the lower edge of the vessel wall inward, using a paddle and anvil, in preparation for closing the base. Vietnam, Kien Giang, Hon Dat, Sok Xoai, *Đầu Doi*, 1998.



Figure 20

Potter Ms. Tam finishing the closed base of the vessel, using a pattern-carved paddle and anvil. Vietnam, Kien Giang, Hon Dat, Sok Xoai, *Đầu Doi*, 1998.

As in Cambodia, in Vietnam too the finished vessels of the two villages can be distinguished by the decoration applied to the neck and by the presence or absence of texture/decoration on the body and base. In An Lac during step 3 the potter applies decoration in a single band just beneath the neck, in a pattern of closely-spaced vertical lines (quite similar to the decoration used in Kompong Speu) or of simple geometric patterning (resembling that used by Thai-Khorat potters) (figure 21). The pattern is cut into one edge of the broad, flat face of a wooden paddle.

During step 3 in Dầu Doi, the potter uses a complexly carved wooden paddle to impart a band of "seed" parallel lines edged by a "centipede" zigzag border around the neck and a vertically-striped pattern over the belly and lower wall (figure 22, second from right; see also Malleret 1957: fig. 2). One face of the paddle bears both designs in separate zones (for use around the neck and shoulder), while the other bears only the striped pattern (for use on the belly and base). In step 4, she uses the same paddle to apply the vertically-striped pattern on the base (figure 23).

While this was the decoration we recorded, we were shown some finished pots made with smooth walls and only a band of the paddle-impressed "seed" and "centipede" design around the neck above an undulating band of combing incised freehand on the shoulder, resulting in a pot more similar in appearance to smooth-bodied Khmer pots made elsewhere (figure 24). We were told that the overall body decoration or the lack of it could be specified by the consumer and was not essential to the fabrication of the vessel.



Figure 21
Finished vessel, showing
paddle-applied shoulder
decoration and smooth
body. Vietnam, An Giang,
Tri Ton, An Lac, 1998.



Figure 23
Potter Mrs. Hang
with finished vessel,
showing paddle-
applied decoration
on shoulder and
body. Vietnam, Kien
Giang, Hon Dat,
Sok Xoai, Dầu Doi,
1998.



Figure 22
Set of tools (left to right):
fired clay anvils; worn-
out carved wooden pat-
tern paddle; bamboo
paddle; new carved
wooden pattern paddle,
with patterns for neck
(upper left quadrant) and
body (remaining three
quadrants); plain wooden
paddle. Vietnam, Kien
Giang, Hon Dat, Sok
Xoai, Dầu Doi, 1998.



Figure 24
Stack of fired
vessels with
paddle-
applied shoul-
der decoration
and
smooth body.
Vietnam,
Kien Giang,
Hon Dat,
Sok Xoai,
Dầu Doi,
1998.

How Thai-Khorat women in Northeast Thailand produce earthenware pots

When we began our intensive research on present-day earthenware production in Northeast Thailand in 1993, we discovered that several different ethnic groups living in the region produced earthenware pots, but that the most numerous and most widespread were people who identified themselves as Thai-Khorat. The description that follows is based on our observations in thirty-three Thai-Khorat pottery-making communities.

1. Working on the ground on a wooden board, a sheet of plastic, or a woven mat, the potter shapes a mass of kneaded clay sufficient to make one vessel into a thick solid cylinder. Standing the cylinder on one end, she uses her right thumb to open a hole in the end. Then, with her thumb and fingers, she expands the hole into a deeper, trumpet-shaped opening. She inverts the cylinder and opens the other end in the same way. She presses a wooden or bamboo stick through the upper hole and the length of the cylinder. Holding both ends of the stick, she turns the cylinder horizontally and revolves the cylinder on the stick to expand the diameter of the opening, creating a thick-walled, hollow cylinder (figure 25). This is allowed to dry while the potter makes a cylinder for each vessel she will make in the course of that day.

2. The potter stands the expanded cylinder on her work stand, which is a section of tree trunk or an inverted wooden mortar.⁸ To gently expand the cylinder and form the rudimentary shape of the vessel, the potter holds her open left hand against the inside of the cylinder and wields in her right hand a wooden paddle against the outside of the cylinder. The paddle, which bears a pattern of closely-spaced straight lines carved on its flat face, leaves that texture on the expanded cylinder. To shape the mouth rim, the potter lays a folded and moistened strip of plastic (in the past, a section of pineapple leaf) over the upper edge of the cylinder. Gripping the strip and the clay beneath it with her right hand held firmly in a sequence of prescribed positions, she revolves around the cylinder on the stand to shape an everted rim, moving both backwards and forwards at various stages of the process. Then she uses a slender wooden rod with geometric designs carved onto its four sides to impress a single band of decoration around the neck. She puts aside the completed preform to dry somewhat.

Increasingly Thai-Khorat potters are replacing the stationary work stand with a turntable device fashioned from a bicycle wheel. When they use this turntable, they stand in one place and spin the wheel by kicking it with their right foot, allowing the wheel's momentum to move the cylinder rim within their hands (figure 26).



Figure 25. Potter Mrs. Saun shaping a hollowed-out cylinder to make a vessel preform. The bamboo stick used to pierce the center of the cylinder lies to the potter's left. These cylinders will be used in stacked pairs to make large vessels. Northeast Thailand, Khon Kaen, Nam Phong, Wang Thua, 1995.



Figure 26

Forming the mouth rim on a vessel preform, using a strip of plastic. In this village, a turntable made from a bicycle wheel has replaced the stationary work stand. Northeast Thailand, Khon Kaen, Nam Phong, Wang Thua, 1995.

⁸ The basic use of such a mortar, carved from a solid log of wood, is for husking rice, but potters use it for pulverizing temper as well as, inverted, as a work stand.

Figure 27

Expanding the pre-form, using a paddle and anvil. Northeast Thailand, Khon Kaen, Nam Phong, Wang Thua, 1995.



3. The potter returns the expanded vessel form with finished rim (the completed preform) to the work table or turntable. She reaches into the neck with her left hand, holding a fired clay anvil against the inside of the wall, and wields a smooth wooden paddle against the outside of the vessel with her right hand to further expand and shape the vessel body (figure 27). At this point, if she has not done so already, she may impress a single band of decoration around the vessel shoulder just below the neck, using one carved face of the wooden rod (figure 28). (Some potters have replaced impressed decoration with painted decoration.) She sets the vessel aside to dry on its mouth rim.

Figure 28

Set of tools: (left to right): fired clay anvil; wooden paddle (smooth side up, carved textured side down); three carved wooden rods used for applying shoulder decoration. Northeast Thailand, Khon Kaen, Nam Phong, Wang Thua, 1995.



4. The potter sits on a low wooden stool and rests the pre-form on her thighs. She strikes a wooden paddle against the outside of the wall, receiving the blows on a fired clay anvil held in her left hand against the inside, to expand the vessel body and, working downward, to close the hole in the base (figure 29). After this shaping, she places the roughly formed vessel right-side up in a stand fashioned from the neck and shoulder of a fired, broken pot, stood rim down, and sets it aside to stiffen somewhat.

5. The potter sits and holds the vessel in her lap and inserts her left hand, holding a fired clay anvil, through the vessel mouth. Wielding a smooth wooden paddle with her right hand on the outside against the anvil on the inside, she refines the rounded shape, further increasing its volume and smoothing its surface. She rests the completed pot upside-down on its rim to dry. Many Thai-Khorat potters now add feet in the form of clay rings to the bases of their water-cooling jars, and they also make clay lids (figure 30).

Figure 29

Potter Mrs. Bok closing the base of the vessel, using a paddle and anvil. To the potter's right rests the stand, made from the mouth and shoulder of a broken pot, in which the form will dry before its final finishing. Northeast Thailand, Khon Kaen, Nam Phong, Wang Thua, 1995.



Figure 30. Potters Mrs. Bok and her daughter with finished water-cooling jars. Northeast Thailand, Khon Kaen, Nam Phong, Wang Thua, 1995.



Comparisons with other earthenware production technologies in mainland Southeast Asia

We perceive a clear relationship among the three earthenware pottery-making traditions described above, centering around the operational chains involved in shaping the preform. We have found this approach to the preform nowhere else in mainland Southeast Asia. Instead, we have documented five other quite different procedures for making the preform (Lefferts and Cort, forthcoming). A brief summary of those other approaches to the preform may help to show in sharper relief the relationship among the Cambodian, Khmer Krom, and Thai-Khorat procedures.

Among most potters in North-Central and North Thailand, in Laos among the ethnic Lao potters, and in Northeast Thailand among a very few of the small number of Thai-Lao earthenware potters (as a group they are greatly outnumbered by Thai-Khorat potters), the process of shaping the preform is additive. The potter begins by making a flattened disk of clay to serve as base. She constructs the walls of the preform by building up coils of clay (as round coils, or as coils flattened into narrow strips, or as rings). The result is a preform shaped as a cylinder with a flat bottom. This procedure makes use of a wheel employed as a turntable.⁹ (Some potters use a functional equivalent such as a plaited bamboo stand resting on an overturned jar or a board rotated on a wooden post or on the potter's thigh.) In the subsequent process of paddling, the potter carefully obliterates the edges of the flat base to create a round-bottomed vessel.

In two villages of Cham potters in coastal Vietnam, one of Suay potters in upland central Laos, and one of Malay potters in peninsular Malaysia, we have documented a different "additive" process that makes use of flattened clay coils to build the upper half of the pot, starting at mid-body and ending with the rim. The potter inverts this preform onto its rim and uses a metal or plastic hoop to scrape excess clay from the interior. Then she attaches a clay coil to the upper (i.e., mid-body) edge of the inverted form and continues adding coils upward and inward to complete the hemispherical lower half of the pot. She smooths the surface with a spatula. Notably, the set of paddle and anvil do not appear in this approach at all.

In one village near Ayutthaya in central Thailand and in two villages on the peninsula of southern Thailand, we have recorded a "transformative" method of making the preform, using a rapidly turning potter's wheel spun by an assistant. The female potter uses the centrifugal force of the spinning wheel to throw a hollow cylinder from a lump of clay and shape a mouth rim on its upper edge. She then cuts the cylinder from the lump so as not to leave any clay as a base. She subsequently uses paddle and anvil to close the hole in the base and expand the vessel to its final form.

In another "transformative" method recorded so far in one village of Vietnamese potters outside Hoi An, in central Vietnam, a woman potter uses a fast wheel, spun by an assistant, to shape a preform with a flat bottom and finished rim. She cuts the form off the wheel with the base intact. She then uses a metal hoop to scrape excess clay from the base and remove the edges to shape a round bottom. Although we have not yet surveyed earthenware production north of Hoi An, we suspect that this village represents the southern edge of an earthenware technology associated with communities of Vietnamese potters.

The sixth procedure is a single intrusion of pottery technology brought by Burmese potters to a village south of Chiang Mai a few centuries ago. The team of female and male potters works on a set of

⁹ In Northeast Thailand and Laos, male potters make flat-based stoneware jars, and they use a similar wheelhead, formed from a solid block of wood and revolving on a wooden pivot imbedded in the ground. Using a process of sequential coiling and throwing, they work with a partner who spins the wheel rapidly at certain phases of production so that the potter can refine the shape of the coiled form.

small wheelheads attached to tall pivots, using one wheel for each pot to be made during the course of the day. The pot is made in stages during the course of a day, with the woman using clay coils to build up a portion of the form (base and lower wall, then mid-body, then shoulder, finally neck and rim) and the man spinning the wheel fast while smoothing and finishing the form.

At greater levels of generalization, we might discern possible overarching relationships among these six basic patterns—for instance, by grouping all the procedures that result in preforms with open bases versus those that produce closed bases, or by separating the preforms finished with paddle-and-anvil consolidation from those refined by scraping. At the level of analysis presented in this paper, however, it is clear that the closely-related operational chains used by Khmer potters in Cambodia, Khmer Krom potters in southern Vietnam, and Thai-Khorat potters in Northeast Thailand create a technological "bloc" contrasting to the distribution of the other techniques elsewhere in the mainland of Southeast Asia.

Commonalities and differences of pots across political borders

Returning to a consideration of the vessels made using these related procedures, we can see resemblances among the products at various levels. In addition to the preform, a number of other distinctive technological similarities might be listed, including the preparation of temper from a mixture of clay and rice chaff shaped into small masses, fired, and pulverized.¹⁰ Minor differences in details—the temper is shaped into flattened ovals in Cambodia, into balls in Northeast Thailand—can be seen as variations on a theme. Other minor technological differences—the use of both bamboo and wooden paddles in Cambodia and Vietnam, versus wood only in Northeast Thailand—can be understood as dependent upon the local availability of materials. When we focus on the preform and are therefore confident that we are comparing "like" vessels in terms of core technology (*chaînes opératoires*), we can also proceed meaningfully to observe the differences among them in terms of the appearance of the finished products ("style"). These differences can be understood as the pragmatic responses to the tastes and demands of divergent markets, and as far more superficial and arbitrary than the technological differences described in the previous section.

The stylistic similarities in products of southern Cambodia and the Vietnam delta are most immediately obvious and can be explained readily by the easy and frequent interaction of Khmer-speakers across the border until the recent past. In particular, the similar neck decoration of the vessels from Kompong Speu and An Lac—bands of vertical stripes applied with a wooden paddle—suggests a close relationship between these two communities, which once participated in the same market. Although the potters in An Lac do not apply the "equal sign" texture to the bodies of most vessels in their repertory, including jars for transporting water, they do apply the texture to the body of the wide-mouthed lidded vessel used for cooking rice.

If this texture is interpreted as a form of decoration comparable to that of the vessels made in Dầu Doi (indeed, when does a texture intended to make wet pots less slippery become fine enough to be seen as "decoration"?), then a larger grouping emerges of the pots made in the southerly villages. The smoothness of the vessels made further north in Cambodia and in Northeast Thailand then becomes interesting as

¹⁰ Potters in Lowland Laos and North and Central Thailand add sand as temper. We are not certain of the extent to which this difference is a cultural "habit" and to which it is shaped by the consistency of local clay and the local availability of other materials.

well. We have seen that decorated and smooth pots are equally viable options in *Đầu Doi*, although decorated pots seemed more numerous. One potter in the village outside Ayutthaya that uses wheels to make bottomless preforms showed us a pot made in the recent past that bore similar overall texture on the body, and she explained the prevalence in the present day of smooth pots among that village's products by saying, "Adding the texture takes too much time." She implied that it is not rewarded by market price.¹¹ Are the smooth pots of the northerly "Khmer" sites market-driven simplifications of older, more thoroughly decorated models? Only archaeological investigation could answer that question. Intriguingly, a few sherds of complexly patterned earthenware similar to that of *Đầu Doi* were recovered during the 1996-98 French excavations within the Royal Palace precincts at Angkor.¹²

Was complexly-patterned earthenware, then, once a trademark of "Khmer" earthenware during the Angkorian period? Scattered clues suggest that such overall patterned pots were once made more widely in mainland Southeast Asia. Similar patterns appear on earthenware vessels said to be recovered from the Chao Phraya River in Ayutthaya and assumed to be several hundred years old, like the Chinese, Vietnamese, and Thai stonewares also retrieved by divers searching the river bed for remnants of Ayutthaya's activity as a major port city in the international trade network during the 15th and 16th centuries (Spinks 1976: pls. 4,5). Similar earthenware sherds have been excavated from the Ban Tao Hai kiln site north of Phitsanulok, which is dated to that era (Hein and Prachote 1985). Earthenware vessels of this type reached Japanese ports in the 16th and early 17th centuries, judging from the recovery of related sherds from datable archaeological strata in the port cities of Hakata and Sakai. Some intact vessels are preserved in Japanese collections of ceramics used for the tea ceremony (Cort 1993: 39-40, fig. 42).

At the very least, the flexibility regarding surface decoration expressed by present-day potters underscores the danger of considering "style" as an enduring aspect of the technological process. Form is no more stable than decoration. A comparison of the shapes of Khmer and Thai-Khorat water jars, made using the same essential sequence of processes, shows the impact of different habits for the transporting and storing of drinking water and indicates just how flexible potters can be in response to their customers' expectations. The jars made in Cambodian villages for the transport of water from the source to the house have elongated necks and small mouths: they are carried on top of the head or against one hip, and this design prevents water from spilling out. In the house, they sit in rattan frames designed to keep them upright except when they are tipped to pour water into a cup. This type of jar with elongated neck and small mouth is not made in Northeast Thailand. Northeast Thai villagers transport water from the source using lacquer-sealed bamboo baskets or —more often nowadays— metal buckets balanced on a shoulder pole. They transfer the water to a wide-mouthed clay water jar at their destination. These water jars rest permanently on small wooden platforms adjacent to the house (to prevent seeping water from rotting the house structure). They have wide mouths (similar to the mouth of a cooking pot as made in Cambodia or Vietnam) into which a dipper can be inserted. As noted earlier, they are frequently made with ring-shaped feet for stability, and they are sold with matching clay lids.

¹¹ A similar comment was made by a potter in Sathing Maw, Songkhla Province, southern Thailand, who said that customer preference determined whether pots were made with smooth or complexly-textured surfaces.

¹² Mr. Marc Franiatte of the French Mission, Angkor, kindly showed us these sherds. We look forward to his pioneering analysis of the complete ceramic finds from the Royal Palace, the first component of which appears in the present journal.

In conclusion: some hypotheses of possible antecedents to contemporary Khmer production and its derivation

Observation of this technological relationship has led us to look more closely at the identity of the Thai-Khorat. The original Thai-Khorat villages clustered in the districts surrounding the modern city of Khorat (Nakhon Ratchasima) although communities of Thai-Khorat potters are now distributed throughout Northeast Thailand, often as appendages to Thai-Lao villages.¹³ According to community oral tradition, the migrations that dispersed the Thai-Khorat potters have taken place over the past two centuries. When Thai-Khorat defined themselves for us, they pointed to their use of Thai-Khorat dialect or their performance at village festivals of the type of folk opera known as *likay khorat*. Some older Thai-Khorat women in pottery-making communities near Khorat still wear the form of wrapped skirt called *phaa chongkraben*, a long cloth whose ends are pulled back between the legs and tucked into the waist at the back, although younger Thai-Khorat women, like their Thai-Lao neighbors, wear the tubular skirt *phaa sin*—if not trousers. This long wrapped skirt in particular bears a clear relationship to the garments of Khmer women in Cambodia and Khmer Krom women in southern Vietnam.

Nonetheless, the Thai-Khorat are distinct from other communities in the southernmost provinces of Northeast Thailand (Buriram, Surin, and Sisaket) that call themselves "Khmer." Thai-Khorat potters have moved recently into some of these "Khmer" villages, but they still maintain social and linguistic distinctions. (The Khmer women in such villages do not make pots, although in some locations they process and weave silk.) In other Khmer villages, the resident potters describe themselves as Suay. In only one pottery-making village in Surin Province did the potters identify themselves as "Khmer."¹⁴

The mixture of Khmer groups in the southern provinces of Northeast Thailand can be explained in part by the turbulent history of that region (see Paitoon 1984). Like Phimai, the city of Khorat was a center of population during the Angkorian period. By the 14th century, Central Thai influence emanating from Ayutthaya extended to the Khorat area, and Khorat became an important garrison and outpost of Central Thai administration. From 1794 through 1907, Siam under the Chakri dynasty, based in Bangkok, extended its influence over northwestern Cambodia, including Angkor. Meanwhile, in 1827, the Lao armies from Vientiane overran Northeast Thailand as far as Saraburi; the Siamese suppression of this rebellion led to the sacking of Vientiane and massive resettlement of Lao populations in Northeast Thailand. Thus the population of Northeast Thailand has been subject to repeated augmentation and churning, while the inhabitants of the Khorat and Phimai areas in particular maintained contact with northwestern Cambodia through trade and other means.¹⁵

The potters who identify themselves as "Khmer" are situated at a distance from the center of Thai cultural contact in Khorat. Possibly they represent remnants of Angkorian cultural presence, although their

¹³ The immigrant Thai-Khorat potters usually do not own farm land but depend entirely upon pottery production for household income (Lefferts and Cort 1999).

¹⁴ In this village we were not able to observe the production of preforms for vessels. One woman potter used a solid cylinder of clay attached upright on the work stand to make a series of lids for her pots, opening the upper end of the cylinder with her thumb for each lid, pinching out a rough form, and finishing the lid with paddle and anvil. This suggested to us that a solid cylinder might have been used for the body preform as well.

¹⁵ See Lefferts and Cort 1999: 31, note 14, regarding established long-distance trade. Undoubtedly smaller scale, informal trade and other forms of exchange also took place across the border.

population may have been augmented during the 19th century when the Thai controlled northwestern Cambodia. The Thai-Khorat, on the other hand, once concentrated around Khorat, may represent a different sort of Khmer-influenced peasant community surviving from the Angkorian period. One tradition holds that the Thai-Khorat people are descended from Khmer women and Central Thai soldiers who settled in the area (Seidenfaden 1958: 109-13). If so, it is possible to imagine that the Khmer women potters (holders and preservers of pottery-making knowledge) passed down the procedure for making the preform that is used by Thai-Khorat potters today.

Thus an earthenware ceramic technology closely related to that practiced in Cambodia and southern Vietnam today appears to be imbedded in the knowledge of the people of Northeast Thailand who call themselves Thai-Khorat. While much more remains to be understood about the historical factors that led to this resemblance, the evidence of the similarities in the core technological procedures gives witness to the relationship in the present day. We await the refinement of methods of analysis that will enable us to detect the core forming procedures concealed beneath the surfaces of archaeologically-recovered earthenware from this region.

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