A Preliminary Analysis of Ban Chiang Painted Pottery, Northeast Thailand

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THE DISCOVERY of a new ceramic complex can upset conventional ideas about the culture history of an area. The red-on-buff painted pottery of northeastern Thailand provides an opportunity to reevaluate assumptions of cultural development in Southeast Asia. This striking pottery is characteristic of the early bronze-using cultures of Northeast Thailand, and is represented at the sites of Non Nok Tha, Ban Chiang, and Non Ban Kho (Bayard 1971: 36), as well as at other sites in the area that have not yet been reported. The excavated sample in the hands of professional archaeologists is not large, nor has much detailed analysis of this pottery been published.

Although the red-on-buff ware is not the only ware at Non Nok Tha, it is associated with the layers containing the early bronze, stratigraphic layers 20 and 21 (according to Bayard's excavation, cultural level 3). Several vessels and assorted sherds are similar to the ware from Ban Chiang, a cemetery site northeast of Non Nok Tha. This site, first excavated by Vidya Intakosai in 1967, and then by other archaeologists from the Thai Fine Arts Department whose work is still in progress, is the richest source of this painted ware. The Applied Science Center for Archaeology at the University of Pennsylvania Museum recently ran a series of thermoluminescence tests on sherds from Ban Chiang; the following results were reported (Bronson and Han 1972: 323):

sample 104	surface?	4630 B.C. ± 520
sample 271	70–80 cm	3570 B.C. ± 480
sample 273	130 cm	3590 B.C. ± 275

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According to Nikhom Suthirak, the painted pottery from Ban Chiang comes from layers 2, 3, and 4 in his excavation. Layer 2 represents a late metal age occupation, layer 3 an early metal age one, and layer 4 a neolithic occupation (Suthirak 1972).

Although work is still in progress at Ban Chiang, recent publicity has resulted in widespread looting and destruction in the area. Collectors, both foreign and Thai, have purchased many of the best vessels. Representative vessels have been reported on the New York and London art markets, and, in spite of the stringent antiquities resolutions passed by many museums, some museums have already acquired or may still be able to acquire these vessels. The Thai government has now taken action to end the looting of this material. The area is closed to unofficial excavators, and there is a fine placed on anyone hoarding the vessels. The Fine Arts Department is registering the vessels in private collections, and has placed as many as possible in the National Museum, Bangkok.

This ceramic complex deserves immediate consideration if only because of the paucity of information on ceramic sequences in Southeast Asia. Its early dates, its association with early bronze, and its unique design techniques are reason enough to examine without delay whatever evidence is available. The urgency is all the greater since collections have left Thailand. For these reasons I am offering this preliminary analysis now, although my sample is extremely limited and the provenience is uncertain. The classification of shapes and designs presented here is limited to the data available to me at the time of writing—50 photographed vessels—and will need to be adapted considerably for a larger sample. Most vessels could not be measured, and the photographs show only one view or part view of each vessel.

I have begun analyzing a corpus of more than 1000 vessels, including those in the collections of the National Museum, Bangkok. Results of this work will be reported at a later date.

TECHNIQUE OF MANUFACTURE

All the vessels described here seem to be representative of special-purpose ceremonial ware specifically associated with burials. In this sample I am considering both painted and painted and incised vessels. Little can be said for certain concerning how these vessels were constructed. On the vessels I examined, there were no signs of unobliterated coils on the outside. The neck portion was made separately and joined to the body, leaving an identifiable ridge inside the vessel. The vessels were, no doubt, smoothed carefully with paddle and anvil after ring construction. Some anvil marks were visible inside the vessels. The anvil used may have been a short pestlelike baked clay instrument found at the site. Sherds from four vessels were thin-sectioned and examined microscopically for additional information. Sherds from a particularly thin-walled cord-marked vessel were composed of a fine compact paste with an organic temper which might possibly be rice husk. Thicker walled vessels were tempered with two distinct types of grog fragments, both types with a more compact paste than the surrounding vessel paste. In one section the grog fragments were grit tempered. When the same sherds were refired, they exhibited no change until reaching a temperature between 700°C and 800°C. The paint was not affected by the refiring. This dark red paint, applied before firing,

must have been a metallic oxide. Most of the vessels were finished with a buff slip before the paint was applied. The vessels are not completely symmetrical and may have slumped somewhat before firing.

The cylindrical pottery rollers found with many of the burials were clearly not used as tools for making the painted designs on the vessels. As a Thai archaeologist has already suggested (Kanchanagama 1972), they were probably used for design application on fabrics. He suggests that the printing technique calls for smearing the roller with paint, but I have observed no paint on any of them. However, there is a technique of bark cloth manufacture that utilizes similar shaped bamboo rollers. The paint is applied to the cloth and need never touch the roller, which acts like a stencil.

> The markers are placed under the outlined parts of the tapa. A wad made of strips of the leaf of a *Pandanus* species is dipped first into the vessel holding the medium made from *Aleurites* bark and then into the dye, after which it is rubbed over the cloth. The parts of the cloth lying over the ribs take on an even dark colour; the parts over the grooves where less dye reaches the cloth appear as lighter. (Kooijman 1972: 359–360)

Pottery rollers, then, were associated with fabric manufacture—possibly bark cloth—and not with painted pottery decoration. Further support for this argument comes from Samrong-Sen, where similar shaped calcareous limestone rollers were found with no associated painted pottery (cf. Mansuy 1902: 20).

Vessel Shape

I have arbitrarily separated the vessels in this sample into shape categories on the basis of whether they have pedestals. With a larger sample, this feature may prove to be secondary. This information may prove a useful supplement to the discussion of burial vessel types in the Non Nok Tha report (Bayard 1971: 43–44). In describing these vessel shapes, I will be referring to the following segments and their combination: neck or rim, body, base, and pedestal. Following Shepard (1971: 230), generally I will keep 'neck' as a loose term.

Vessels with pedestal bases

The most common body shape is an ellipsoid form with a rounded bottom covered by a low outflaring pedestal base. The neck variations include a low straight-sided neck and a higher outflaring neck. Body-pedestal juncture and body-neck juncture may be either angular or curved.

The same neck variations occur on a globular body, in addition to a composite concave-convex neck form not occurring on the ellipsoid bodies. Again, all examples have low outflaring pedestal bases.

Short squat-bodied vessels with low pedestals also occur with both low straight-sided necks and higher curved outflaring necks, the latter resembling Thai spittoons. One painted and incised vessel has a squat body with an extremely short straight neck.

Included here are very striking high pedestal goblets with sharply carinated bodies and distinctive beveled lips. This form occurs with both painted and painted and incised decoration.

Vessels without pedestal bases

The vessels with ellipsoid body shape all have rounded bottoms and are consistently larger than the vessels with pedestal bases. These larger vessels may have a clearly demarcated shoulder with a high outflaring neck. In some examples the lip is flattened. The neck-body juncture may be angular or curved.

The globular body shape is represented in this category by vessels with low outflaring necks and composite concave-convex necks.

Short squat-bodied vessels with round bottoms occur with low outflaring necks, some of which are flattened at the lip. Several painted and incised vessels share this body form, but, as in the example with the pedestal, the neck is extremely short.

One painted and incised vessel in this sample has a strongly carinated angle at mid-height and a low straight-sided neck.

The range of vessel shapes described here is illustrated in Figure 1. Necks, bodies, and pedestals are all appropriate zones for decoration. When the body-neck juncture or the pedestal-body juncture is curvilinear, the two zones are treated as one continuous design field. In most of the vessels the neck, body, and pedestal are treated as separate design fields. The proportion of pedestal height to neck height contributes to the overall effect of balance and stability of these vessels. The painted decorations, to be considered next, are well adapted to the vessel shapes on which they occur.

DESIGN ANALYSIS

All of the vessels in this sample have painted or painted and incised decorations. In describing the designs, I am using Anna Shepard's terminology (Shepard 1971) as much as possible. From the available reports from Ban Chiang, we have limited stratigraphic evidence for ordering design classes. Suthirak describes the vessels in level 3 of the latest excavations as painted with crowded lines—triangular and curved—going right to the bottom of the vessels. Level 2 vessels are decorated with thin, widely separated spiral designs (Suthirak 1972). Similarly, in a statement issued by the Department of Fine Arts, Bangkok, in April 1972, the later designs are described as spiral, whereas formerly they were geometric and leaf patterns (Fine Arts Department 1972). In the absence of illustrative definitions of design classes and exact provenience, I will not use this terminology, nor infer any temporal relationships. Instead I will be concerned here with the principles of design construction. Since the process of design construction proceeds line by line, it should be possible to derive ordered operational rules approaching the decisions made by the potters in constructing these complex designs. Such rules are part of the tacit understanding that the artist must have to construct the designs. By concentrating on the process of design construction, and ultimately on the cultural rules that these potters utilized, I hope to be able to present more than a taxonomy of design motifs. The small size of the sample precludes the possibility of presenting such an analysis at this time. The design classes or themes outlined here are purely descriptive and may need substantial alteration as more vessels are examined.

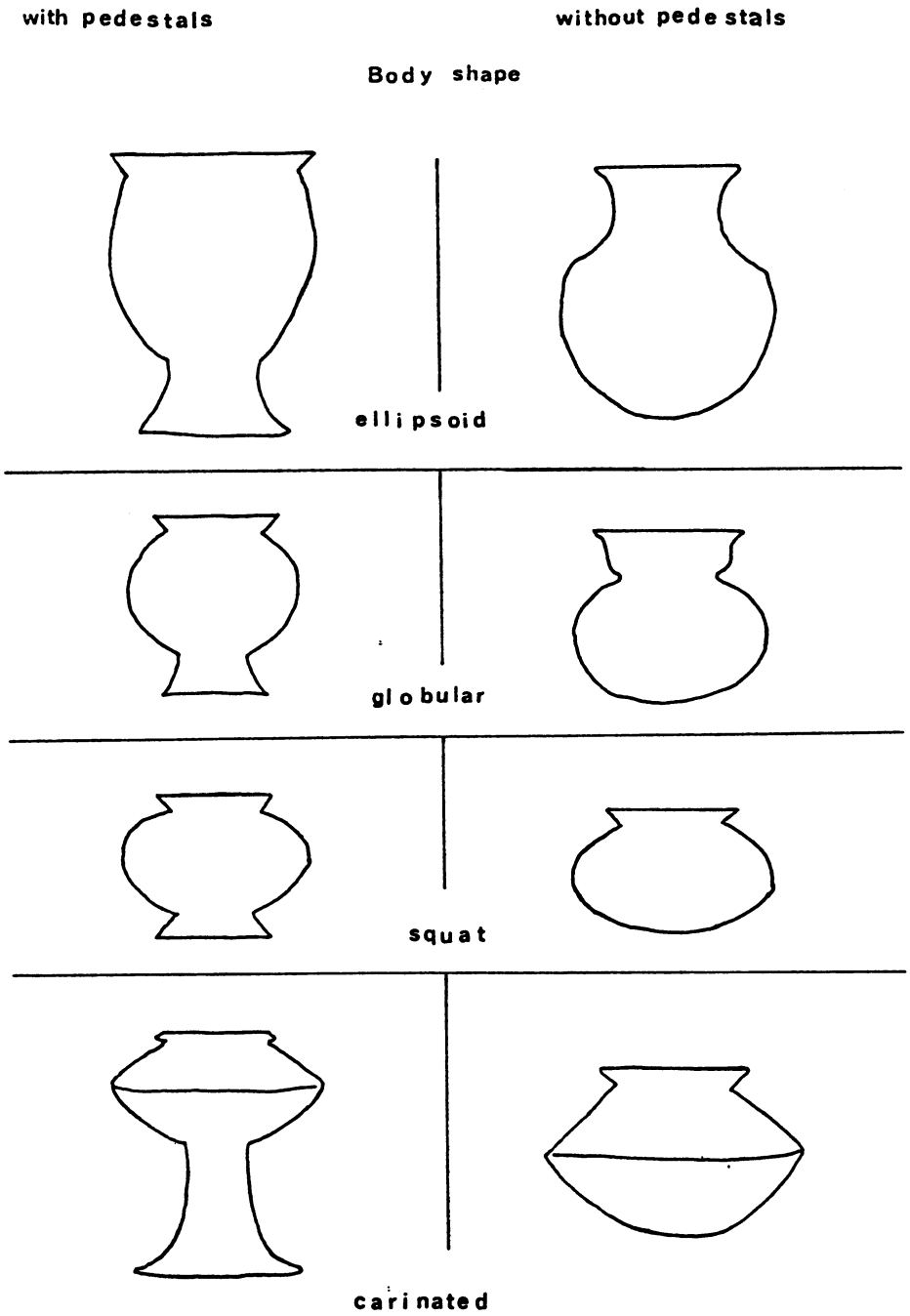

Fig. 1 Vessel shapes.

Design Class 1

At this point we cannot know whether all the vessels with spiral designs are contemporaneous. It is, however, striking that in a random collection such as this half of the vessels use spirals as the primary element in the design layout. Spiral

designs occur on vessels with and without pedestals. In most cases the spirals fill the entire decoration field of the body. All spiral motifs appear to have been carefully planned before being painted. There is no sign of crowding or stretching to fit the appropriate number of spirals into the available space. The spirals cover the portion of the vessel normally visible to the observer, and no attempt is made to carry the design to the bottom of the vessel. The quality of rendering of this design is not consistent. Some examples have crude and sloppy outlines, yet others show the most precise and careful production of the whole collection. The spacing of the lines forming these spirals suggests that some sort of jig may have been used. It is possible that a double or triple marking tool or brush was used.

If we define the aesthetic problem faced by the artists as how to fill the field of decoration completely with spirals, then there are nine solutions represented in this sample (Fig. 2).

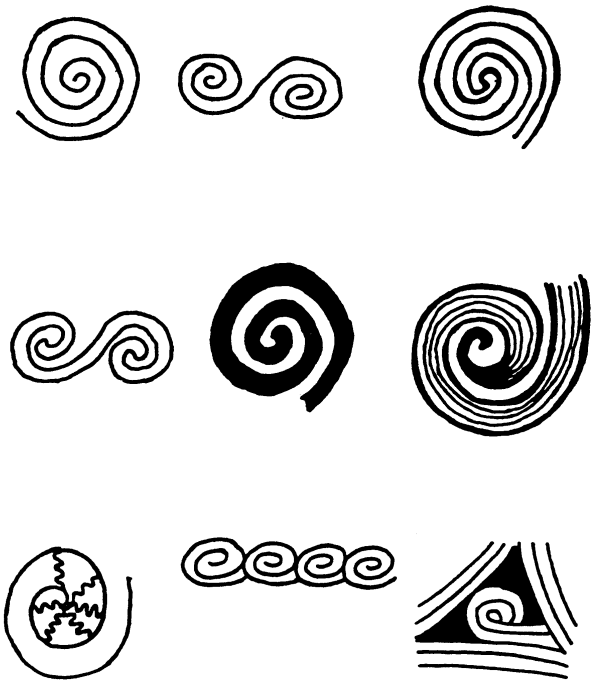

Fig. 2 Class 1 designs.

1. The artist may fill the space with independent single spirals—usually three per vessel—from a single focal point, and allow the spirals to interrupt each other. Intersections above and below the interruption constitute secondary design elements and use up the triangular spaces between the spirals. Secondary elaboration may be added to these pseudo-spirals to mask the juncture points (Fig. 3).

2. The artist may fill the space with single interlocking spiral pairs—usually two pairs per vessel. The starting point is the clockwise and counterclockwise interlocking spiral. This can be elaborated into a complex figure eight motif by adding connecting lines which fill the total space and give the impression of separate spirals. This impression is also created by the use of a red paint filler between the two spirals (Fig. 4).

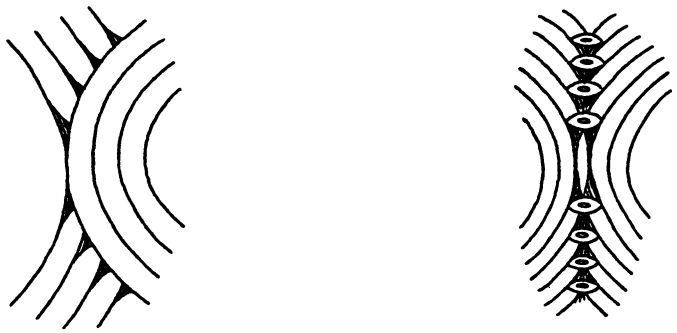

Fig. 3 Class 1 designs.

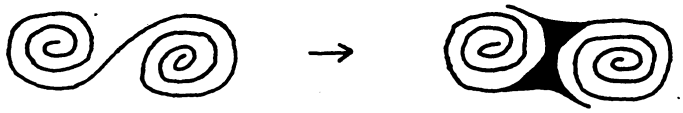

Fig. 4 Class 1 designs.

3. The artist may fill the space with double independent spirals originating from a single focal point. As in solution one, three double spirals usually fill the field (Fig. 5*g*).

4. The artist may fill the space with pairs of double interlocking spirals—usually two pairs per vessel originating from two focal points.

5. The artist may fill the space with spirals of alternate hue where red and buff are of equal value. Starting from double independent spirals, one spiral is painted solid, giving the impression of two reversible spirals, one red and one buff (Fig. 5*a-c*).

6. Designs may be constructed of fine multiple line spirals which collapse into a single line approaching the focal point (cf. Solheim 1970*a*: Plate 4).

7. The first spiral surrounding the focal point may be elaborated with a radial pattern of short wavy lines arranged like spokes around the focal point. This elaboration is common with multiple line spirals.

8. Spirals may be arranged in a modular band as part of another design configuration they do not dominate.

9. Spirals can be created in triangular gaps between larger spirals, triangles, or concentric arcs (Fig. 13).

Spiral pairs are usually arranged in bifold rotation on a vertical axis, but they may also be arranged on a horizontal axis.

Each decision to fill a space with spirals creates a new field for a secondary design. These secondary designs, then, occupy a field created from the execution of one or more primary designs. These fields are usually triangular and may simply be outlined heavily, or they may be crosshatched with webbing.

Spirals are generally the primary element in a motif; however, they are themselves used as fillers in triangular gaps created by other designs. There is no evidence to suggest that spirals were derived from representational elements such as snakes,

bird bodies, intestines, or human ears, as has been argued for Indonesian or Polynesian versions. But spirals are used in the construction of what I interpret to be a stylized face on the rim of vessel 18 (see Fig. 10).

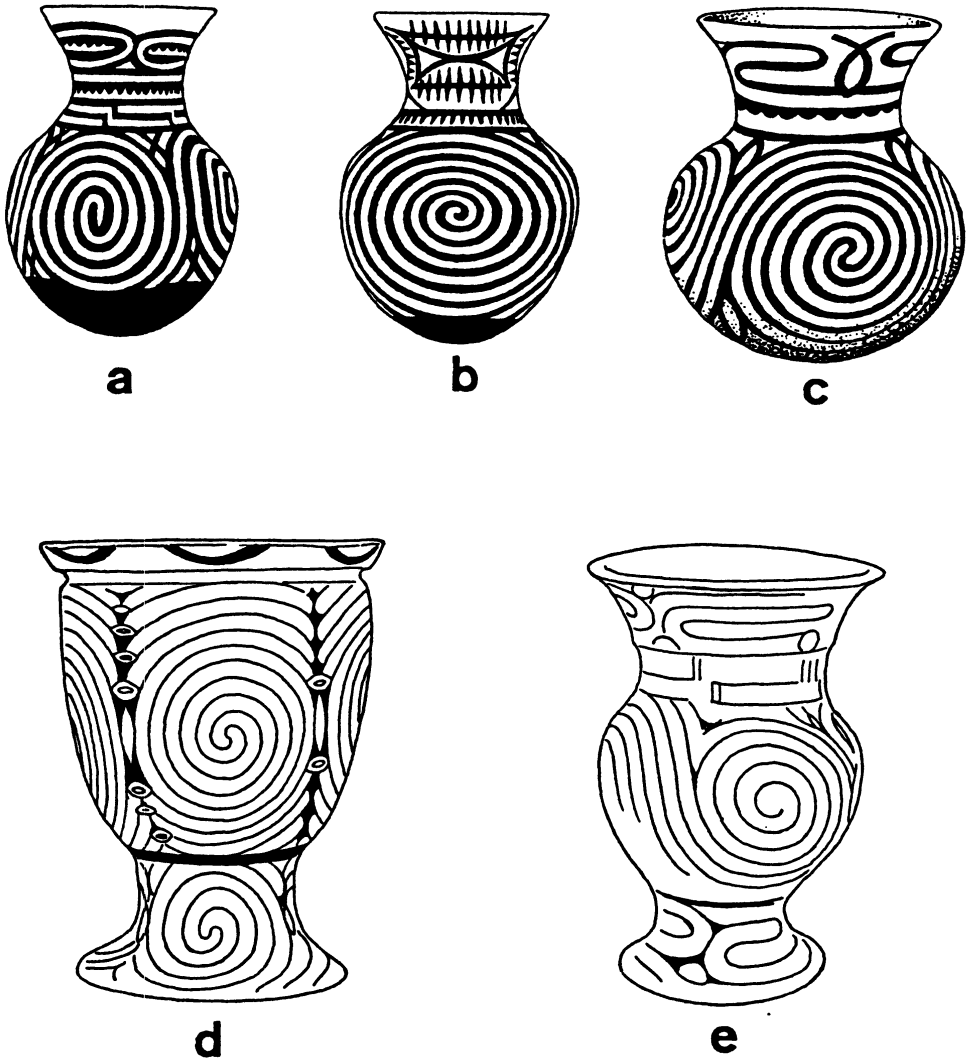

Fig. 5 *a*, vessel 13, approximate height 14 inches; *b*, vessel 22, approximate height 18 inches; *c*, vessel 28, after Solheim 1971: 338; *d*, vessel 26, approximate height 9 inches; *e*, vessel 10, approximate height 10 inches.

Design Class 2

A characteristic design motif common in this collection is best illustrated by the front view of vessel *a*, Figure 7. The starting point for this design is a curvilinear element resembling a sausage or an intestine. The arrangement of these elements into design motifs employs the motion of both longitudinal and transverse reflections (Fig. 6; Shepard 1971: 269).

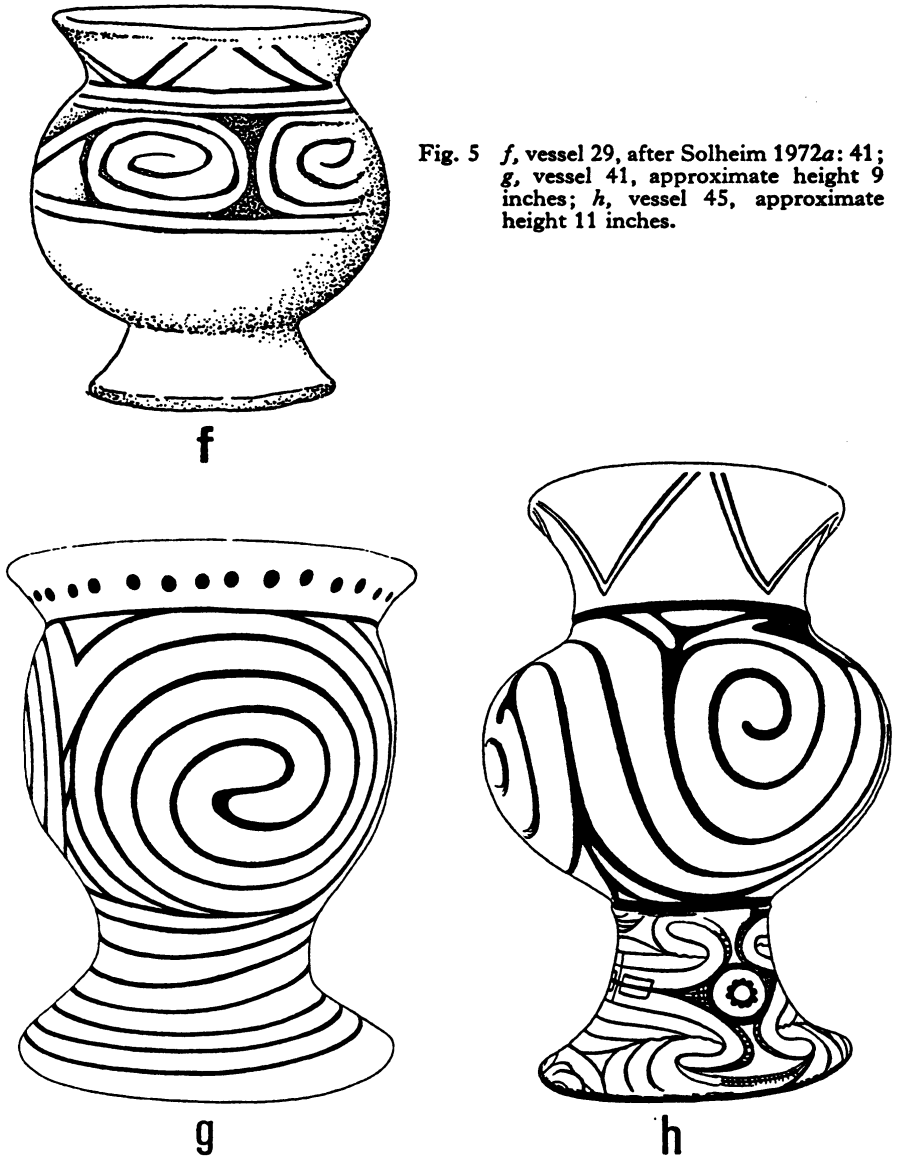

Fig. 5 *f*, vessel 29, after Solheim 1972*a*: 41; *g*, vessel 41, approximate height 9 inches; *h*, vessel 45, approximate height 11 inches.

The design may be continuous on both body and neck, or it may be restricted to the body or upper body. These figures may be left outlined on a buff background, or the background may be painted or crosshatched in red, leaving the unpainted buff figure predominant. The spaces created by the execution of these primary figures are filled with asymmetric meanders, circles, lozenges, or volutes similarly outlined in red paint.

As in design class 1 the layout is carefully planned before the designs are painted, and the most complex designs are rendered with exceptional skill.

What solutions are offered by the Ban Chiang artists to the aesthetic problem represented by this design class?

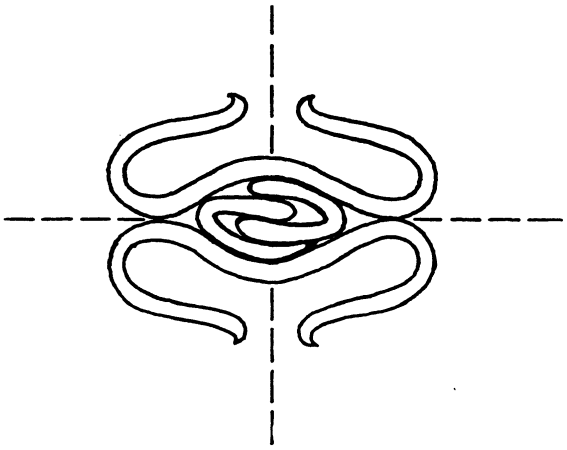

Fig. 6 Class 2 designs.

1. The motifs may be arranged on a vertical axis around the body of the vessel, with a minimum of two motifs per vessel. Fillers above and below the figures are lozenges, circles, or meanders, as in Figure 7*a*. A similar layout with the elements much simplified is illustrated in Figure 7*b*.

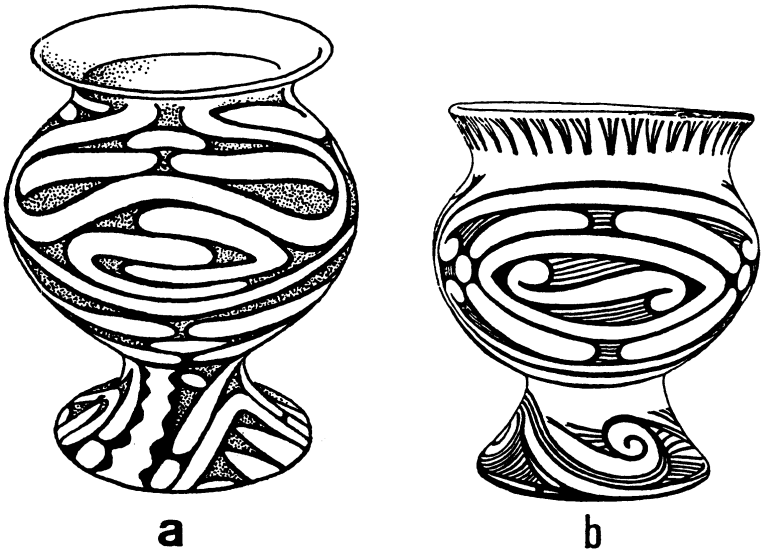

Fig. 7 *a*, vessel 1, approximate height 9 inches; *b*, vessel 36, approximate height 9 inches.

2. The motifs may be arranged alternately on a vertical and horizontal axis, as in several vessels that are not illustrated.

3. The motifs may be compressed laterally and reduced in size to fill an entire vessel body, or upper body, as in Figure 8. The decorated portion is separated from the undecorated portion by a dentate or scalloped line elaboration.

Fig. 8 Vessel 23, approximate height 10 inches.

4. The most complex and intricate rendering of this design motif occurs on large round-bottomed vessels. The neck is treated as a separate design field. The entire body is covered with pairs of compressed arcs surrounding a central heartlike figure. This layout is repeated four times around the body of the vessel. The circle and lozenge fillers have been reduced to a single dot. The overall effect of complexity is achieved by the additional fine lines used to fill every available space within the design field. The bottom of the vessel is left undecorated, but within the area defined as a field for decoration, no empty space is permitted (Fig. 11).

The fine lines above and below the arcs complicate the pattern and emphasize the end points of the curves. But they do not act as the background red cross-hatching, as in other solutions. On one vessel the central heartlike motif has been expanded, forcing the arcs above and below to condense. This reduction in complexity permits a second set of arcs above and below the motif, although the detail is reduced. Without showing the intricate structure inside the arcs, the design layout could be simplified as in Figure 9.

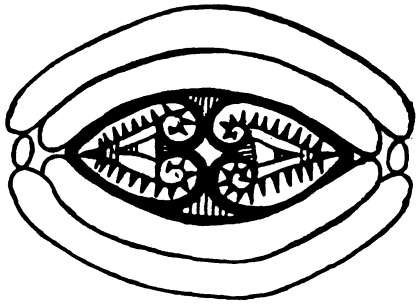

Fig. 9 Class 2 designs.

The neck designs, separated from the body design by one or more lines, deserve special mention. Motifs commonly used on the neck are composed of intersecting arcs arranged on a vertical or a horizontal axis and elaborated by rows of dentate triangles. Another neck design is composed of bilaterally symmetrical spirals and volutes which I interpret as a stylized face (Fig. 10).

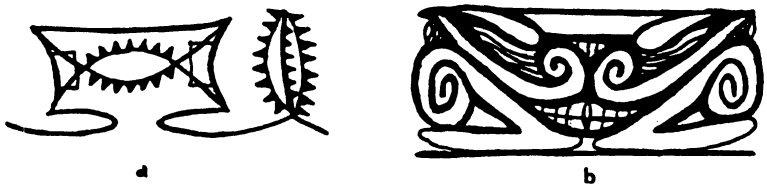

Fig. 10 Class 2 designs.

Two bilaterally symmetrical volutes form eyes and eyebrows, while the triangular mouth area is elaborated with cross-hatching which gives the impression of teeth.

This representational interpretation may be unjustified, but it is appropriate if we consider this whole design class as bearing some relation to the squatting-figure motif so prevalent in Southeast Asia (Fraser 1966, Schuster 1951). The squatting or "hocker" figure (Bertling 1931: 35) is commonly portrayed with discs, called joint marks by Schuster (1951: 55), between flexed elbows and knees (Fig. 11). This interpretation is, of course, premature, particularly in such a small collection, but the possibilities are sufficiently intriguing to invite further research.

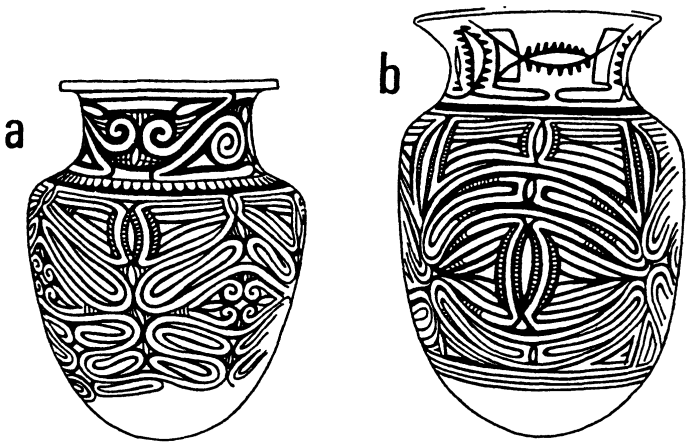

Fig. 11 *a*, vessel 18, approximate height 20 inches; *b*, vessel 17, approximate height 20 inches.

Design Class 3

All the vessels of this class share important features of pattern construction. The patterns are adapted to the same basic vessel shape—ellipsoid bodies with rounded bottoms and outflaring necks. The sloping shoulder limits the design field. In all vessels the pattern is constructed in horizontal bands with some degree of variation permitted within these bands, particularly in zone 3, where each vessel is patterned differently.

zone 1—neck area is painted solid red;

zone 2—denticulate band bordering a solid red line;

zone 3—pattern of spirals or meanders in red against a buff ground which continues to the shoulder;

zone 4—design enclosed by a red denticulate band pointing downward.

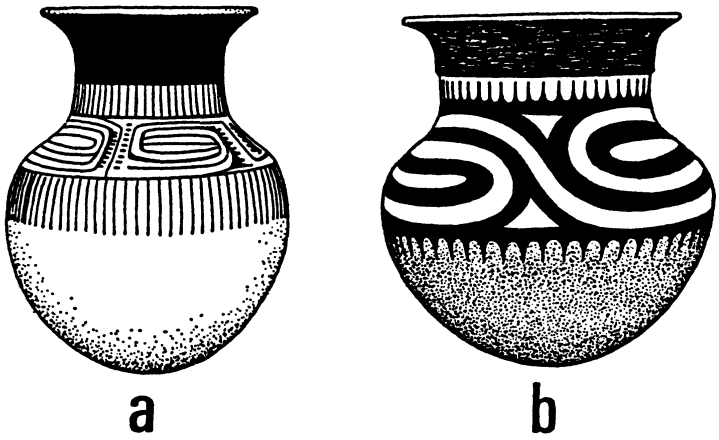

Fig. 12 *a*, vessel 16, approximate height 14 inches; *b*, vessel 15, approximate height 12 inches.

Zone 3 is subdivided into four panels separated by vertical line elaborations (Fig. 12*a*). An exception occurs in vessel 15 (Fig. 12*b*), where the design unit is repeated four times without any panel subdivision. The repeated element may be modular band spirals or curvilinear meanders, depending on whether the curved lines are arranged around a center point or a field of successive focal points. The design class is homogeneous compared to the wide range of variations present in the spiral class. The artisans decorating these pots all shared the same patterning ideas, although some variations were likely in zone 3, and differences in ability or care give the impression of further variation.

Design Class 4

This design configuration fills the entire body surface with concentric figures. In this sample only pedestal vessels were used, with the pedestal serving as a separate design field. The neck-body juncture may be curved, continuing the design field to the lip of the pot. The neck may also be treated as a separate design field.

The concentric figures, generally repeated four times, may be triangular, square, circular, or lens-shaped (Fig. 13*b*). The figures are all drawn with fine lines and are repeated identically in each quadrant. In one vessel (Fig. 13*a*) corners of the triangles are elaborated with short fine lines. The horizontal line under the neck ends in a small spiral on either side of the vertical panel subdivision. This secondary feature is also adapted to the triangular spaces between the lens-shaped figures. These triangles may either be painted solid red or filled with a single spiral in each space. Spiral fillers or the solid painted triangle may also be used with concentric circles. The vessels decorated with concentric squares have additional line elaborations on either side of the four vertical panel subdivisions. These may be painted

dentate or scalloped lines. The centers of all concentric figures are painted solid, or in the case of the triangular center of vessel 25, crosshatched (Fig. 13*a*).

Fig. 13 *a*, vessel 25, approximate height 10 inches; *b*, vessel 30, approximate height 11 inches.

Design Class 5

Design class 5, composed of multiple line figures, may be unjustified when a larger sample is studied. This class has less internal consistency than the others and is based on a similarity in technique of line application rather than consistency in design patterning. Many vessels illustrated by You-di and Charoenwongsa (1972) are composed of sweeping arcs of multiple line figures which are not organized around a central point, as are spirals, and are not concentric figures. Vessel 9 (Fig. 14), for example, is composed of vertical arched bands which cross each other freely. This intersection is emphasized by a small circle containing eight "spokes." Detail is added by double and triple lines running horizontally across the main bands. The major bands may be composed of three to five fine lines which follow so exactly as to suggest that a multiple-pointed tool was used. Emphasizing heavier lines are added to the outer edge of most bands. These figures may fill the entire surface of the body, or leave portions of the buff background showing through. The

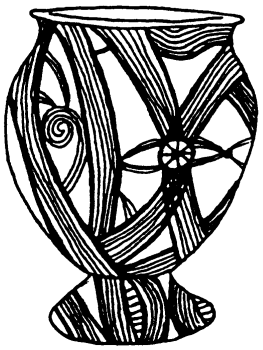

Fig. 14 Vessel 9, approximate height 11 inches.

bands often ribbon under and over each other, giving the illusion of depth to the design field. In many cases these multiple line figures suggest that the artist was preoccupied with creating illusions of perspective on a two-dimensional field.

Painted and incised vessels

Incising as a decorative technique on pottery is present at Non Nok Tha, skillfully executed with complex designs in level 1 (Bayard 1971: 15), and also appearing later at the site. But the vessels to be described here are painted within incised lines, a technique not mentioned for Non Nok Tha or Ban Chiang, to my knowledge. These painted and incised designs occur on four different vessel shapes: small squat bowls with short necks with and without a short pedestal, a larger carinated vessel, and a high pedestal carinated goblet. The decorative motif on the first two vessels is limited to the shoulder area, and consists of a band of incised fork elements with dentate elaboration on the prong (Fig. 15).

Fig. 15 Decorative motif from painted and incised vessel.

These elements are filled with red paint. The design field is bounded with a single incised line above the motif, and the surface of the vessel below the band is cord-marked. The whole pot was cord-marked first, then incised, and then painted within the incised lines. The carinated vessel has curvilinear meanders on the shoulder, and is bounded above and below the design with a painted line edged with incising. These curvilinear meanders appear again on the shoulder of the high pedestal goblet, but the meanders themselves are left unpainted against a red painted background. The meanders are edged with incised lines. This band is repeated twice on the high pedestal, with unpainted lines bounded by incision separating the bands (Fig. 16). The incision is rather angular on the curves, and the strokes appear awkward rather than free or bold.

Fig. 16 Vessel 32, approximate height 8 inches.

GENERALIZATIONS

The painted pottery in this collection is well made and exhibits a wide range of abstract curvilinear designs. The compositions are complex in many cases, and,

with the possible exception of the "hocker" theme of design class 2, are generally nonrepresentational. Within some design themes there is close standardization. For example, the treatment of double independent spirals on pedestal ellipsoid vessels is so standardized as to suggest the closest possible relations in time and/or space. Once closely controlled larger scale excavation has been undertaken, and a chronology is established, it may become possible to recognize personal styles of individual artisans.

The designs are constructed without visible structural guidelines, although it is likely that some sort of jig or guiding tool was used to form the spirals. Horizontal boundary lines, often dentate, are commonly used to separate body and neck, and to mark the bottom of the design fields. Both bilateral and rotational symmetry are the motions employed in arranging design units on the vessels. The units themselves, however, are often asymmetric—spirals, for example—and give an impression of dynamic motion rather than stability. I have mentioned the possible concern with perspective and creating illusions of depth. Illusion is also created by the ambiguity of figure and ground, particularly with spiral designs.

I have not been concerned here with constructing an arbitrary classification of vessel types, nor have I presented any seriation of this material. Recall that this description is based only on about 30 photographs of vessels, fewer vessels from collections, and a few sherds all claimed to be from Ban Chiang. There is no basis for higher-level interpretation at this point. But since design units may be presumed to have some cognitive saliency in the minds of the artists decorating these vessels, and are thus not arbitrary, this is a useful starting point for any analysis of this material. Once the rules of design construction are understood, then considerations of temporal and spatial variation can be undertaken. The excavator at Ban Chiang, Nikhom Suthirak, has noted that spirals as a design theme are late, as are pedestal vessels (Suthirak 1972). Photographs taken by visitors to Ban Chiang suggest to me that spiral designs and pedestal bowls may have an extremely long development at Ban Chiang. What does appear interesting, albeit on flimsy evidence, is the possibility that vessels from several different design classes may surround a single burial. However, without an understanding of the stratigraphic relation of the burials illustrated in newspapers and tourist photographs, these observations are meaningless. The lack of detailed information suggests that it is too early to incorporate chronological implications into this analysis. Before the designs can be ordered in time, or usefully compared, the first task must be to construct a formal analysis of them.

COMPARISONS

When a full analysis of this painted pottery is made, it will no doubt rank with the finest painted pottery known in Asia. Further, it will demand a place in a new model of Asian culture history which denies the primacy of China—particularly the Huang-Ho basin—for innovations traditionally associated with the Neolithic and Early Bronze age (cf. Bayard, in press; Gorman 1971; Solheim 1970*b*, 1972*a*, 1972*b*).

As yet the position of painted pottery in this new model is far from clear. The Ban Chiang painted pottery is unlike any other pottery known in Southeast Asia. It is only when we come into contact with pottery from the Sahuynh-Kalanay

tradition that we find painting used as a decorative technique—and then it appears between incised lines to emphasize the pattern (Solheim 1971: 177). The elements applied are simple geometric shapes repeated in horizontal bands—curvilinear scrolls, rectangular scrolls, meanders, zigzags, triangles, and chevrons (Solheim 1964: 376). The three-color ware from Niah cave, Borneo, is decorated with painted elements in black and red, or red on a tan base between incised lines. The elements of decoration include meanders, scrolls, triangles, and interlocking arches (Solheim, Harrisson, and Wall 1959: 169). The late neolithic or early metal age pottery from Tabon cave is decorated in the same manner (Fox 1970: 87, 97, Fig. 28). Heine-Geldern has discussed the Dongson motifs and their possible affiliation with Kalanay designs (Heine-Geldern 1966: 189). All these design elements are common throughout Southeast Asia and are not sufficiently distinctive to warrant genetic explanations. They occur in the Ban Chiang designs, but the design layouts are not similar. Discrete elements are not combined in symmetrical fields in Sahuynh-Kalanay complexes, but are repeated by a simple translation motion. There are few overall patterns arranged around a repeated primary element such as a large spiral. Instead the elements such as scrolls or triangles are treated as if they were all of equal artistic value—that is, all fillers in a horizontal band motif. Further research on this complex and the Sahuynh-Kalanay related complexes is bound to uncover relationships of some sort among these design styles. But more interesting than these "where" and "when" questions (Peterson 1973: 7) are the questions of what these shared design elements could mean in respect to cultural processes.

Comparison with the earliest painted pottery of China, Yangshao, suggests similarities of a different nature. My comments here will refer primarily to the Kansu Yangshao, since this material is so well illustrated. When Andersson dug the painted pottery sites in Kansu (1921–23), he was convinced that they were earlier than other painted pottery sites in Honan and Shensi, and that the designs were of the same family of designs as were found in Babylonia, Anou, and Tripolje (Andersson 1943: 271). The analysis by the Swedish archaeologists was exhaustive and illuminating, although their suggestions of western origins for some designs left room for archaeologists such as Fairservis (1959) to derive the total painted pottery complex from the West.

I will consider certain Kansu Yangshao designs using Chang's revised sequence of Andersson's original reconstruction (Chang 1968: 119).

The Ma Chia Yao vessels, which are the earliest, are characterized by black painting on a buff background, and are most commonly decorated with thick line spirals. These spirals are derived from concentric circles or loosely wound spirals joined by multiple lines to give the impression of running interlocking scrolls. In the Thai examples, spirals are commonly arranged in interlocking pairs, or with independent spirals connected by double or triple lines. The triangular gaps between spirals are elaborated in both the Thai and Chinese examples.

The Pan Shan vessels that I wish to consider briefly are all from burial sites where they served as grave offerings surrounding extended burials, as at Non Nok Tha and Ban Chiang. Palmgren isolates nineteen design families for the Pan Shan urns (Palmgren 1934). On eight urns surrounding the Pien Chia Kou burial (illustrated in Andersson 1943: Plate 76), there are five separate design classes represented. Four urns use spirals as the dominant motif. In the Ban Chiang

cemetery, at least one photograph I have seen shows vessels of several different design classes surrounding a single burial. Present in both the Thai and the Chinese designs are the dentate line elaboration, identified as the death pattern (Andersson 1925: 13), and intersecting arcs, identified as a cowrie shell representative of a woman's vulva, according to Andersson (1934: 304).

Spiral motifs on the Pan Shan urns occupy a dominant position on the design field, and are usually repeated four times. As in the pattern construction on the Thai vessels, there is generally a band separating neck and body designs, and delimiting the lower border of the design field (Palmgren 1934: 47–48). Palmgren believes that a heavy single line is replaced by multiple fine lines through the development of the style (Palmgren 1934: 50).

The spiral design layouts of the Ma Chang vessels to be considered here are best illustrated in Andersson's plates 108–111 (1943) (Fig. 17).

Fig. 17 After Andersson 1943: Plate 109, 4.

The commonest design layout illustrated for the following Hsin Tien period is reminiscent of the organization of zones in design class 3 of my sample. The rim section is painted solid with a serrated or scalloped line above the primary notif (Fig. 18). As in the Thai examples, this third zone varies considerably, and the

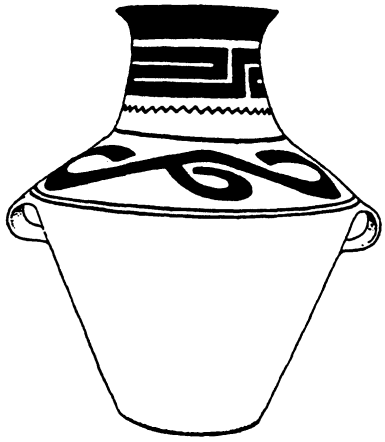

Fig. 18 After Andersson 1943: Plate 129.

design field is bounded on the bottom by a line elaboration. Although this "tent pattern," the primary motif in this figure, is much simplified here, it resembles the basic arc which is the starting point for design class 2.

This discussion of design elements present in the Kansu sequence is far from complete, but it indicates a basis for comparison, and supports Solheim's suspicion that there may be a relationship between the Yangshao painted pottery and the painted pottery of Thailand. Further research will involve a consideration of the structure of the design field, the primary design elements themselves, and the rules of composition utilized in both cultures.

Implications

What kind of knowledge did the artist need to have in his head to create a correct and appropriate Ban Chiang burial urn? What other cultural groups that were near him in space or in time shared this knowledge? What cultural processes could account for these shared cognitions, and how are these processes expressed archaeologically? These are some of the questions that motivate a formal analysis of design styles. Comparison is not the primary goal of this approach, but more effective and meaningful comparison is possible if the design construction is laid out in terms of rules and their constraints. When we have an approximation of the rules these artists used to construct the designs, it may then be possible to distinguish between surface similarity of design elements and motifs, and similarity in rule patterning. At that point we may be able to say more about the similarity between Yangshao painted pottery, Ban Chiang painted pottery, and other artistic traditions in Southeast Asia.

Acknowledgments

The vessels described here are illustrated in various Thai journals, Thai newspapers, and scholarly publications in English. Most of the vessels were photographed in January 1972 in an antique shop in Bangkok. My other major source was a collection of sherds, restorable vessels, and complete vessels purchased at Ban Chiang, and owned by Mrs. Gloria Wittenbach Fitch and Mrs. Capitola W. Porter.

The sources for illustrated vessels are as follows: Vessel 1—photographed December 1971, weekend market, Bangkok; Vessels 2–27—photographed January 1972, antique shop, Bangkok; Vessel 28—illustrated in Solheim 1971: 338; Vessel 29—illustrated in Solheim 1972*a*: 41; Vessel 30—photograph from Cleveland Museum of Art, Edward L. Whittemore Fund; remaining vessels—from the collections of Mrs. Fitch and Mrs. Porter.

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REFERENCES

ANDERSSON, J. G.
1925 Preliminary report on archaeological research in Kansu Province. *Memoirs, Geological Survey of China,* series A, no. 5. Peking.
1934 *Children of the Yellow Earth.* New York: Macmillan.
1943 Researches into the prehistory of the Chinese. *BMFEA* 15.

BAYARD, D. T.
1971 *Non Nok Tha: The 1968 Excavation.* University of Otago Studies in Prehistoric Anthropology, 4.
In Press An early indigenous bronze technology in north-east Thailand: its implications for the prehistory of East Asia. In *Diffusion of Material Culture,* edited by H. H. E. Loofs.

BERTLING, C. T.
1931 De Minahasische 'Waroega' en Hockerbestattung. *Nederlandsch-Indië Oud en Nieuw* XVI.

BRONSON, BENNET, and M. HAN
1972 A thermoluminescence series from Thailand. *A* 46: 322–326.

CHANG, K. C.
1968 *The Archaeology of Ancient China.* New Haven: Yale University Press.

FAIRSERVIS, W. A., JR.
1959 *The Origins of Oriental Civilization.* New York: Mentor.

FINE ARTS DEPARTMENT
1972 Statement on Ban Chiang by Fine Arts Department, Bangkok, Thailand, April, translated by D. Bayard.

FOX, R. B.
1970 *The Tabon Caves.* Monograph no. 1, National Museum. Manila.

FRASER, D.
1966 The heraldic woman: a study in diffusion. In *The Many Faces of Primitive Art,* edited by D. Fraser, pp. 36–99. Englewood Cliffs, N.J.: Prentice-Hall.

GORMAN, CHESTER
1971 A priori models and Thai prehistory: a reconsideration of the beginnings of agriculture in Southeast Asia. Manuscript, Department of Anthropology, University of Otago, Dunedin, New Zealand.

HEINE-GELDERN, ROBERT VON
1966 Some tribal art styles of Southeast Asia: an experiment in art history. In *The Many Faces of Primitive Art,* edited by D. Fraser, pp. 165–221. Englewood Cliffs, N.J.: Prentice-Hall.

KANCHANAGAMA, PREECHA
1972 Terra-cotta rollers from Ban Chiang. *Archaeology, Journal of the Faculty of Archaeology, Silpakorn* 4(2): 174–178. (In Thai.)

KOOIJMAN, SIMON
1972 *Tapa in Polynesia.* Bernice P. Bishop Museum Bulletin 234. Honolulu.

MANSUY, H.
1902 *Stations Préhistoriques de Samron-Seng et de Longprao.* Hanoi.

PALMGREN, NILS
1934 Kansu mortuary urns of the Pan Shan and Ma Chang groups. *Palaeontologica Sinica,* series D, vol. 3, fascicle 1. Peking.

PETERSON, WARREN
1973 A new perspective on the relationship between migration, diffusion, and cultural evolution. Paper presented at the 25th Annual Association for Asian Studies Meeting, Chicago.

SCHUSTER, CARL
1951 *Joint Marks. A Possible Index of Cultural Contact between America, Oceania, and the Far East.* Amsterdam: Royal Tropical Institute.

SHEPARD, ANNA O.
1971 *Ceramics for the Archaeologist.* Carnegie Institution of Washington Publication 609. Washington, D.C.

SOLHEIM II, WILHELM G.
1964 Pottery and the Malayo-Polynesians. In: Movement of the Malayo-Polynesians. *CA* V(5): 360, 376–384, 400–403.
1970*a* Recent archaeological work in Thailand and the Philippines. *Bulletim da Sociedade de Geografia de Lisboa:* 223–228.
1970*b* Northern Thailand, Southeast Asia, and world prehistory. *AP* 13: 145–162.
1971 New light on a forgotten past. *National Geographic* 139(3): 330–339.
1972*a* An earlier agricultural revolution. *SA* 226(4): 34–41.
1972*b* The "new look" of Southeast Asian prehistory. *JSS* 60(1): 1–20.

SOLHEIM II, WILHELM G., BARBARA HARRISSON, and LINDSEY WALL
1959 Niah 'three colour ware' and related prehistoric pottery from Borneo. *AP* 3(2): 167–176.

SOMMARSTROM, BO
1956 The site of Ma-Kia-Yao. *BMFEA* 28.

SUTHIRAK, NIKHOM
1972 Report on prehistoric archaeological excavations at Ban Chiang, Ban Chiang township, Nong Han District. Translated by D. Bayard. *Silpakorn* 16.

YOU-DI, CHIN, and PISET CHAROENWONGSA
1972 Ban Chiang. *Archaeology, Journal of the Faculty of Archaeology, Silpakorn University* 4(1): 18–35. (In Thai.)