REGIONAL AND INTERREGIONAL INTERACTION ON THE KHORAT PLATEAU

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INTRODUCTION

Exchange and other forms of interaction between communities have played an indispensable role in the development of Southeast Asian societies. As Jean Kennedy (1977) argued in her seminal study, diversity and interaction among culturally differentiated societies is not peripheral, but lies at the core of Mainland Southeast Asian evolution. This paper explores late prehistoric and early historic Mainland Southeast Asian exchange patterns, focusing on the Khorat Plateau of northeast Thailand.

The authors began investigating the evolution of northeast Thailand exchange networks in 1979-80 during the first year of survey and excavation by the Khorat Basin Archaeological Project (KBAP I) in the Phimai region. Phimai, a large town located in the upper Mun River basin in the southwest portion of the Khorat Plateau (Fig. 1), served early in the second millennium AD as a major Khmer regional administrative, commercial and religious center. Based on the initial research, Welch (1989), in a paper presented in 1986, suggested that the bases of the early historic Khmer market and temple redistribution systems were established at the local and regional levels in the late prehistoric period. Since the writing of that paper additional research has been conducted, including X-ray fluorescence analysis of Phimai region sherds in 1986, analysis of Ban Prasat pottery in 1987, and a second year of survey and excavation in 1989 (KBAP II). Our data now derive from a total of 137 field surveyed sites and five excavated sites: Ban Tamyae and Non Ban Kham on the alluvial plain, Muang Phet in the uplands south of Phimai, and Ban Tajae and Non Si Fan Noi in the terrace zone northwest of Phimai. The research undertaken has involved further investigation of questions raised in Welch's earlier study. This paper discusses some implications of the new data and suggests new approaches to interpreting the available information on regional and interregional interaction.



FIGURE 1: ARCHAEOLOGICAL SITES ON THE KHORAT PLATEAU

HISTORIC EXCHANGE NETWORKS

The Khmer Exchange System

During the tenth century AD the Khmer rulers in Angkor began extending their influence north of the Dangraek Mountains. By the reign of Suryavarman I (c.1007-1049) the upper Mun River valley, including Phimai, had fallen within the sphere of influence and power of the Khmer kings (Coedès 1951). Evidence of this expansion includes Khmer inscriptions, the construction of the earliest Khmer style temples in this region, and the presence of 11th century Khmer and Chinese pottery. Kenneth Hall (1975) suggests that Suryavarman's interest in this region relates to an expansion of Khmer commercial activities during his reign, especially westward into the Chao Phraya basin. Phimai might

have formed one of the vital links connecting Angkor with that area. Woodward (1975) has noted the strong artistic influence that the style of the Phimai temple had upon the Khmer temple at Lopburi. Connections between the upper Mun River valley and Angkor remained strong for the next 200 years and a road was constructed linking Phimai and Angkor. After the reign of Jayavarman VIII (c.1181-1215), Khmer control began to weaken. The period of Khmer dominance, roughly AD 1000-1300, is referred to as the Lopburi Phase.

Examination of more recent trade relationships between Angkor and Phimai can assist in understanding the early historic linkages. In the report of his visit to the temple ruins at Phimai in 1912 Prince Damrong (1969: 69) mentions that Phimai was a town of many merchants and traders. From interviews the authors learned that throughout the first half of the present century a thriving trade was maintained between Phimai and the Tonle Sap region of Kampuchea. During archaeological survey around Phimai, we spoke with many villagers who had either gone to Kampuchea as traders or who as children had accompanied their fathers on such expeditions. During the dry season after the rice harvest, caravans set off for Kampuchea on two or three month expeditions. Traders took metal bowls made in Bangkok, silk and cotton cloth from Khon Kaen and salt from Khorat salt domes to trade for Tonle Sap fish. With the salt the Khmer could preserve their surplus production of fish for export. The fish, along with wood for furniture, were then taken to Surin, Khorat, or Phimai to be sold. The traders came from several villages, but all lived within approximately 10 km of Phimai. Phimai was clearly the focal point of this trade activity.

This trade may represent a continuation of long-established patterns or a recent revival of the old Angkor-Phimai trade. The essential features of this trade are likely to have been the same during the Lopburi Phase as they were in this century. Phimai not only linked Angkor with the Chao Phraya valley, but was also a source for salt, a critical resource needed around Angkor. In turn, the Khorat Basin was probably a crucial market for one of Angkor's major surplus products, Tonle Sap fish. Chinese stoneware jars and porcelains, Chinese silks, iron artifacts or ingots, forest products to be traded to China, and ceramics produced at the kiln sites in Buriram along the Phimai-Angkor road were other goods which may have entered this trade network.

Archaeological evidence from the Phimai region provides support for this view of Phimai-Angkor relations. Remains of Khmer temples are quite common in the upland and terrace zones. Several upland temples south of Phimai, such as Prasat Ku Sila Khan and possibly Prasat Prang, apparently served as resting houses along the road from Angkor to Phimai. Other temples, such as Prasat Nang Rang and Ban Ku in the terrace zone north of Phimai, are located near iron and salt producing sites and may be associated with the initiation of large scale industrial production. Near these temples Lopburi Phase settlements were founded at sites which contain no surface evidence of use during earlier periods. At some of these sites kilns and slag debris provide evidence for iron smelting.

Pre-Khmer Early Historic Trading Networks

Trade during the Lopburi Phase involved an intensification and re-arrangement of long distance trade networks that had developed in the preceding phase. During the Muang Sema Phase (AD 600-1000) contacts between Phimai and areas outside the Khorat Plateau were already well established. The introduction of Buddhist sculpture and carvings, Sanskrit stone inscriptions, and a new tradition of well-fired earthenware pottery about AD 600 marks the beginning of these early historic interaction systems. Goods and concepts from India and China were introduced into Khorat Basin societies by way of the coastal trade ports along the Gulf of Thailand and the South China Sea. The stimulus for the development of these new exchange links may have been the market demand in China and India for Southeast Asian products. Traders in the coastal ports, seeking new sources for ivory, rhinoceros horn, lac and cardamon, may have initiated the process of integrating northeast Thailand in the flourishing international trade of Asia. In recent centuries, when the Thai rulers in Ayutthaya and Bangkok extended their suzerainty over northeast Thailand, these items remained the objects demanded as tribute by those rulers, whose wealth and position depended in part on their participation in international trade.

At sites extending across the Khorat Basin from the large moated site of Muang Sema, near the foot of the pass crossing to the Chao Phraya basin, to sites in the Lam Pao River valley at the northern edge of the Khorat Basin, pottery similar to that found at Chao Phraya Basin Dvaravati sites makes its appearance. Most of these ceramics are probably wares locally made in a style similar to that of central Thailand. In excavations at Non Ban Kham, Muang Phet and Non Si Fan Noi in the Phimai region we have recovered several hundred sherds of well made, wheel-turned, high fired earthenwares which might have been produced in specialized local pottery manufacturing villages. It seems doubtful that items as bulky as ceramic vessels would have been transported across the Petchabun Mountains, but the establishment of specialized manufacturing centers was probably dependent upon the migration of potters or the diffusion of new techniques of pottery making from the Chao Phraya Basin.

In addition to the archaeological evidence, Chinese accounts of this period depict a route from the coast in Tonkin southwest across the Khorat Plateau to the Gulf of Thailand, thus potentially connecting Vietnam overland with Angkor and the Chao Phraya Basin (Smith 1979). Suryavarman's move to the west probably was an effort to take control of the existing trade networks between the Chao Phraya Basin and the Khorat Plateau and to turn these to the advantage of Angkor.

LATE PREHISTORIC EXCHANGE NETWORKS

The archaeological evidence from the first millennium AD contrasts with both the evidence of the subsequent early historic trade networks connecting the Khorat Plateau with coastal ports and the preceding long distance internal exchange networks of the first millennium BC. Early first millennium AD sites in the Phimai region contain few artifacts which can be attributed in origin to areas outside the upper Mun River basin. No Funan

style artifacts have been recovered from contemporaneous sites in the Phimai region. The extensive excavations conducted at sites in the Chi River Valley by Higham and Amphan (1984) and at Non Chai by Pisit Charoenwongsa (Bayard et al. 1984) have not, as far as we can determine from the published reports, produced any materials that connect this area with Funan. The primary evidence of external contact during this period is the presence of glass beads at Ban Chiang, Non Chai and Ban Na Di.

Regional Exchange Networks

Given this scarcity of evidence of long distance trade, Welch (1985, 1989) has emphasized the importance of late prehistoric regional exchange. The widespread distribution of Phimai black pottery over a large portion of the upper Mun River valley and the presence at sites near Phimai of tools of volcanic and metamorphic stone from the fringes of the Khorat Plateau are interpreted as evidence of the existence of one such regional exchange network. Phimai black is a distinctive pottery type, fired black or dark gray in a reducing atmosphere, tempered with rice chaff and decorated by burnishing geometric patterns (diamonds, cross-hatches, spirals, or simply horizontal and diagonal lines) on the vessel surface. It is found at numerous late prehistoric sites in the upper Mun River vailey dating between approximately 200 BC and AD 600, but is completely absent at sites elsewhere on the Khorat Plateau.

An analysis of Phimai region settlement sizes in terms of a rank-size curve produced a convex curve suggestive of a regionally focused economic system. The pattern of site distribution was interpreted as evidence of a two-level economic hierarchy: local and regional. Large, frequently moated sites might have served as local exchange centers for smaller village sites clustered around these possible market, temple, and/or élite centers. A larger regional system with Phimai as its center connected much of the upper Mun River valley. The regional exchange network functioned to procure essential goods from several environmental zones and distribute these to ensure some measure of security in the face of climatic unpredictability (Welch 1989).

Research conducted since 1986 has sought to examine three propositions postulated in Welch's paper:

- 1) that Phimai black pottery serves as a valid horizon marker for the extent of the upper Mun River valley late prehistoric exchange network.
- 2) that Phimai black pottery was primarily associated with specialized sites, such as economic and political centers, or specialized ritual contexts.
- 3) that Phimai black pottery was manufactured in a few specialized ceramic manufacturing centers from which it was distributed to other communities in the Phimai region.

Investigation and testing of these propositions has involved more extensive site survey in the Phimai region, including survey of transects leading out to sites as far as 50 km from Phimai, and X-ray fluorescence (XRF) analysis of prehistoric sherds, primarily Phimai black, from sites in the Phimai region.

The 1989 field research had as one of its goals the definition of the boundaries of the upper Mun River valley regional exchange system. Phimai black pottery appears to constitute a distinctive spatially and temporally limited horizon marker for the classic Phimai (200 BC-AD 300) and late Phimai (AD 300-600) phases in the Phimai region. Site survey was conducted along transects radiating N, NW, NE and SW from Phimai. In most cases time constraints forced the end of the survey before we reached the actual boundary delimiting the distribution of Phimai black pottery, but an approximate boundary has been established to the SE and NE (Fig. 2). Phimai black is found at Ban Thamen Chai, a site 20 km west of the town of Buriram. However, excavations by Elizabeth Moore in 1989 at Ban Takhong near Buriram revealed no Phimai black. To the NE Phimai black is present at Nang O on the Mun River 45 km downstream from Phimai. At Muang Yang 7 km farther east we found no evidence of Phimai black, although our surface collections there were small and inadequate to confirm its absence. However, in excavations by Silpakorn University (Phasook et al. 1988) at Non Krabuang Nok 7 km farther east no Phimai black pottery has been found. Phimai black is found in abundance at Non Muang Sida 38 km north of Phimai, at Muang Sai O 30 km south and at Khorat 55 km SW, the limits of our survey at present.

One suggestion of the earlier paper was that Phimai black may have been a specialized pottery whose use centered on the activities of élite secular or religious groups at large or other specialized centers. The KBAP II survey has clearly demonstrated that Phimai black pottery is widely distributed at sites of all types and all sizes throughout all three of the environmental zones in the Phimai region. Phimai black cannot be seen as a distinctive marker of élite status, as a ceramic chiefly used in ritual contexts, or as a ceramic associated with more centralized as opposed to rural communities. The contexts in which it is found, from rich burials to the eroding edges of small salt producing mounds, suggest use by all segments of society for both everyday and ritual purposes.

In 1986 XRF analysis of pottery sherds from the Phimai region was conducted to test the hypothesis that Phimai black pottery was produced in a few specialized ceramic production centers and distributed as part of the regional exchange network. Alan George at Chiang Mai University analyzed 72 sherds from 8 excavated sites in the Phimai region. We expected that sherds which produced similar wavelength spectra, resulting from similarities in element composition of the clays, would form spatial clusters. The similarities could be interpreted as the result of derivation from the same clay source. Thus, if pottery from several different sites produced similar spectra, these pots might be inferred to all have been made in a single manufacturing center.

Only two distinct groups emerged:

- 1) the Tamyae tradition sherds, clearly different from the Phimai tradition sherds, and
- 2) the red slipped sherds, forming a group reflecting the use in the slip of clays richer in iron than those used as the paste.

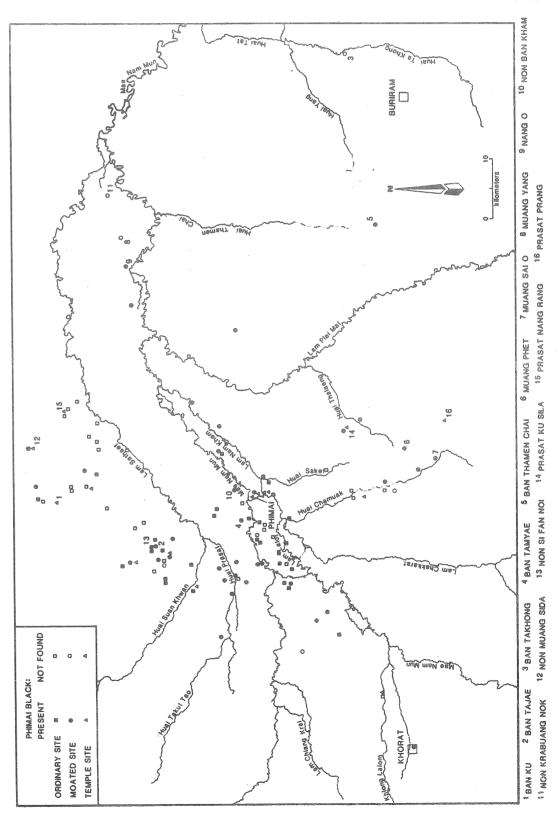


FIGURE 2: THE DISTRIBUTION OF PHIMAI BLACK WARE

The Phimai black sherds, which comprised the majority of the sherds tested produced a variety of spectra, but analysis failed to produce clusters of similarities which might represent spatially patterned groupings.

The results of the analysis thus failed to support the hypothesis of specialized manufacturing centers. Similarities in the wavelength spectra were not correlated with the location of sites; in fact even within sites the sherds were not similar. The most obvious result was in fact a lack of patterning. Three explanations might be offered:

- 1) the sample size is too small to detect patterning that was in fact present,
- 2) the actual prehistoric reality was one of manufacture of pottery in many localities using a variety of clay sources, or
- 3) the XRF technique is inappropriate for this type of analysis under the conditions present in the Phimai region.

The results may reflect the difficulty of utilizing this type of analysis on pottery produced on a broad floodplain within which the clays were derived from numerous different source areas up various tributaries and then deposited and mixed on the floodplain. In a separate study John Shaw and Alan George (personal communication) were able to successfully distinguish sources of northern Thai ceramics by XRF analysis, attributing sherds to kiln sites in various river valleys of northern Thailand. In this case the clays in each of these small isolated mountain river valleys produced distinctive chemical signatures in terms of the relative abundance of different elements, differentiating the clays from those in other valleys. Clays from different sources on the broad Phimai alluvial plain may simply not be chemically distinct enough to allow successful application of XRF as a method of differentiating clay sources.

In conclusion, recent research has been relatively successful in defining better the spatial distribution of Phimai black pottery, but has been relatively unsuccessful in providing an understanding of the mechanisms by which exchange was effected in the Phimai region.

Interregional Exchange and Interaction Spheres

Due to the nature of our evidence, our studies of trade and interaction have been regionally focused. The 1989 KBAP II excavations reaffirmed the regional emphasis found in the KBAP I excavations. Only a bronze bell from Ban Tajae, a bronze bracelet fragment from Non Si Fan Noi and one (of the 70,000 prehistoric sherds excavated) Roi Et ware sherd found at Muang Phet could be positively identified as exotic trade items.

In contrast, Higham and Amphan (1984; Pilditch 1987) unearthed numerous artifacts at Ban Na Di which indicated long distance exchange links in the late prehistoric period. In addition to several bronze artifacts, numerous marine shell (*Trochus*) bracelets and exotic stone disks were recovered from burials dating to the first half of the last millennium BC. The difference in the types of goods probably results primarily from differences in the contexts from which the materials were excavated. The KBAP Phimai

region excavations have encountered few burials; almost all the material has been excavated from occupation contexts. At Ban Na Di, on the other hand, the exotic trade goods were found almost exclusively in burials.

Excavations by the Fine Arts Department (FAD) 6th Regional Branch at Ban Prasat demonstrated that exchange involving similar exotic trade goods did occur in the Phimai region. Ban Prasat, a village 13 km west of Phimai, is the location of one of the four largest moated sites in the Phimai region. The site, containing rich archaeological deposits to the base of its 5 m high mound, was first surveyed and tested with auger cores by KBAP I in 1980. In 1983, in response to looting of whole burial vessels, the FAD confiscated pots from dealers and undertook excavations to recover these vessels from their original contexts. The FAD excavated several burials which contained bronze ornaments, shell beads, *Trochus* shell bracelets and stone disks similar to those at Ban Na Di. The dating of these burials is uncertain; stratigraphically they definitely underlie classic Phimai Phase deposits. The authors suggest a Prasat Phase dating (600-200 BC) based on the presence of a few reddish-yellow streak burnished bowls of a type common in Prasat Phase deposits at Ban Tamyae.

Metha Wichakana analyzed the burial vessels, classifying them into ten type complexes based on form and surface decoration (FAD 1984). The most distinctive types are jars with extremely large flaring mouths. Many of these are red slipped; some are painted in red curvilinear patterns on a cream surface. Vessels of these types had first been encountered in burials during excavations in 1980 at Khorat, where they also underlay burials containing Phimai black pottery. Most of the vessels are tempered primarily with grog, although sand inclusions are also present.

What surprised the authors was that vessels of these types were almost completely absent in the excavations at Ban Tamyae only 8 km east of Ban Prasat. Only the FAD pottery type complex 8 included burnished bowls of a type commonly found at Ban Tamyae. Rim form and surface decoration distinguish the Ban Prasat pots from both the Tamyae and Phimai tradition pottery found at Ban Tamyae. Differences in the extent of firing (they are less well fired) further distinguish them from Tamyae pottery. Paste inclusions (grog rather than chaff) distinguish them from Phimai pottery.

In 1987 the authors had the opportunity to examine the Ban Prasat pottery, conducting a rapid type analysis of all the occupation level sherds from one 2x2 m excavation square. The sequence of pottery types in the Ban Prasat occupation deposits was almost identical to that at Ban Tamyae. Almost no sherds of the types of vessels found in the burials were present. This suggested that a specialized type of pottery was being manufactured for exclusive use in burials and perhaps other ritual contexts.

While the Tamyae and Phimai pottery belong to traditions which are found only in the upper Mun River valley, the Prasat burial pottery possesses characteristics which may link it with other pottery-making traditions on the Khorat plateau. The most obvious of these is the use of red curvilinear painted designs on a buff surface, which clearly recalls the classic painted Ban Chiang pots. In fact in the original exhibit of the pots from Khorat at the Phimai National Museum the expression "evidence of Ban Chiang culture in Khorat

Province" was coined in reference to these pots. This expression has unfortunately been repeated in a display of Ban Prasat pottery at the new Ban Chiang Museum.

These pots are certainly not "evidence of Ban Chiang culture in Khorat Province". Aside from significant differences in the forms of the vessels there is also the problem that the Khorat and Ban Prasat burials almost certainly predate the Ban Chiang burials. However, although denying an identity in culture, we do not want to deny a relationship between the Ban Prasat and Ban Chiang burial assemblages or perhaps between these and other first millennium BC grog tempered, red slipped and painted pottery traditions on the Khorat Plateau, particularly those found at Ban Chiang Hian and Non Chai. It seems likely that these similarities in ceramic styles and in other artifacts reflect a level of shared ideas, expectations, and perhaps behaviors among members of different societies in northeast Thailand.

The important point here is that culture, as a concept which focuses on the features distinguishing discrete population units, is not the most appropriate concept in terms of which to interpret intersocietal interaction (cf. Schortman 1989: 53). Kennedy (1977) has criticised the tendency in Southeast Asian historiography to see cultural traits as identifying strictly bounded linguistic and ethnic groups sharing a fixed, cohesive culture. Ethnic identities are not fixed, but are instead flexible mechanisms by which human actors adapt and adjust their behaviors in relation to others in situations of interaction and by which human groups adapt to the diversity of their social environments. Differentiation and modification of ethnic and other salient social identities, including status distinctions in stratified societies, are products of the social interaction of groups (Kennedy 1977:153-154: Schortman and Urban 1987; Schortman 1989).

Joseph Caldwell's (1964) concept of the interaction sphere provides one alternative archaeological framework for interpreting the relationships among these late prehistoric Khorat Plateau sites. Caldwell developed his concept of the interaction sphere to explain the widespread similarities in mortuary practices among Middle Woodland societies in the eastern United States. Burials over a wide area contain strikingly similar assemblages of grave goods including pottery vessels, clay pipes and offerings imported from distant areas; e.g. marine shells from coastal Florida and Georgia, obsidian from Yellowstone, and copper from northern Wisconsin. Based on these similarities the term "Hopewell culture" had originally been used to relate the societies practising this form of interment. However, while similarities in burial pottery are present, local populations possessed their own distinctive ceramic and lithic traditions for manufacturing everyday artifacts.

Caldwell defined Hopewell not as a culture but as an interaction sphere, a set of social, ideological and trade connections among at least segments of widely scattered populations expressed in their sharing of similar burial patterns and reflecting institutionalized cooperation among the leaders of neighboring societies. This framework places the development of local, discrete societies within an interregional context, and it ties the spread of goods and ideas to the development of social complexity.

The possible analogy with Mainland Southeast Asia during the first millennium BC is clear. Distinct traditions of ceramic manufacture characterized different regions on the

Khorat Plateau. However, a widespread tradition of manufacturing pots perhaps primarily as burial vessels may have cross-cut many of these regions. In addition, other aspects of the mortuary ritual, including inclusion of goods that were traded over long distances, such as *Trochus* shell bracelets, were shared among societies in these different regions, societies which did not all share a single culture. The specialized burial assemblages of the Ban Na Di Mortuary Phase 1, the Prasat Phase at Ban Prasat and the Ban Chiang Late Period are indicators of interaction among at least segments of each of the societies inhabiting these sites.

There are major problems in clearly defining this interaction sphere. Chronology is still uncertain and what is known indicates that not all these assemblages are contemporary. It is also not clear to what extent the definite distinction between burial and occupation pottery evident at Ban Prasat is true at other sites. The Ban Chiang red painted pottery is clearly a burial pottery, but in the absence of analysis of the occupation level sherds from Ban Chiang the types of ordinary pottery remain unknown. At Non Chai and Ban Na Di red painted and red slipped pottery sherds are commonly found in occupation deposits postdating the Ban Na Di Mortuary Phase 1 burials (Higham 1989). It is not obvious from the report on Ban Na Di by Higham and Amphan (1984) to what extent the burial and occupation pottery differ from one another.

The presence of exotic materials and objects of rich artistry in the late prehistoric burials suggests the exchange of prestige goods under the control of high status members of societies. These high status groups maintained separate social identities and used these items as symbols to mark their distinct status from other members of their own societies. At the same time the sharing of the same or highly similar symbols among élite groups in different societies and the interaction required in obtaining these prestige items established patterns of cooperation and shared identity.

While the presence of regional and long distance exchange networks implies peaceful interaction among groups and no doubt the formation of alliances among the élites of different societies, it must not be forgotten that trade also involves competitive relationships. Alliances were no doubt temporary and shifting. Evidence of competition is visible in the construction of the enclosing moats and walls around sites during the late prehistoric period.

Our final point then is that an understanding of the exchange of prestige goods among the emerging élites in late prehistoric northeast Thailand is only a first step in explaining the emergence of complex societies. The prestige goods economy was of importance in the evolutionary development of societies in that it fostered interaction, the exchange of essential goods and the spread of innovations. However, we would not see competition for prestige goods in and of itself as the driving force behind increasing social complexity. The symbolic display of status through such goods and the competition for their attainment are only manifestations of the more crucial underlying changes that were occurring within these societies. We find it more critical to ask within what kind of ecological context prestige competition is embedded, and to what kinds of selective

pressures participants in societies with such practices are responding. What sources of competition gave rise to hierarchically organized societies? (cf. Athens et al. 1989).

Land was probably not a scarce resource and thus not the major source of competition. Suitable agricultural land was almost certainly in large supply relative to the size of the population (Welch 1985). However, groups were clearly competing with one another in the late prehistoric period for access to essential resources. Kennedy (1977:144-146) proposes that competition over access to diverse upland resources was a prime factor giving rise to increased complexity in lowland societies, with centralization giving a competitive advantage, especially to societies relatively distant from such resources. Competition over control of lowland sources of essential trade goods such as salt, and over the routes by which the trade was conducted, might also have fostered the emergence of more complex political units. Welch (1985, 1989) has suggested that control of the distribution of food resources within a regional network to counteract local perturbations in an area of high climatic unpredictability was of importance. Finally, leaders were surely competing, as they have throughout historic times, for control of manpower which could be used in productive activities.

CONCLUSION

While we have discussed the concept of interaction sphere in terms of its potential applicability in interpreting the evidence of interregional interaction in the late prehistoric first millennium BC, the concept may be equally valuable in interpreting the types of interaction that characterized the early historic period. The introduction of Buddhist and Hindu concepts produced new ideological links tying together high status élite identities, while control of the production of primary goods for international trade provided a new source of wealth and power. These later interactions are not unrelated to the earlier networks, but involved a transformation of them, extending an internal articulation to an external articulation with interstate commerce (Kennedy 1977:145). The Phimai-Angkor salt-for-fish trade is but one example of the maintenance of internal Southeast Asian exchange in a period of international trade. The actual developmental process remains obscure, in part because of the scarcity of evidence of interaction above the regional level on the Khorat Plateau in the early first millennium AD. Whether this is due to the unrepresentative nature of the archaeological evidence or reflects an actual contraction in long distance trade and relative regional isolation is an open question requiring further archaeological investigation. Whatever the results of future data collection, what is critical is that we interpret the evolution of Southeast Asian complexity in a framework reflecting the diversity of its societies and the complexity of the interactions of both competitive and peaceful exchange which related these societies to one another.

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REFERENCES

- Athens, J.S. Hunter-Anderson, R.L., Ward, J.V. and Welch, D.J. 1989. Landscape change, agriculture, and complex societies on tropical Pacific islands. Paper presented at the Circum-Pacific Prehistory Conference, August, Seattle.
- Bayard, D., Pisit Charoenwongsa and Somsuda Rutnin 1982-3. Excavations at Non Chai, Northeastern Thailand, 1977-1978. Asian Perspectives 25: 13-62.
- Caldwell, J. 1964. Interaction spheres in prehistory. In J. Caldwell and R. Hall (eds), *Hopewellian Studies*, pp. 134-143. Springfield: Illinois State Museum Scientific Papers No. 12.
- Coedès, G. 1951. Inscriptions du Cambodge, Vol. 3. Paris: Ecole Française d'Extrême Orient.
- Damrong Ratchanuphap 1969. Account of Travels, Part 4: Travels in Monton Nakhon Ratchasima, Udon, and Roi Et. In Thai, Mukdahan.
- Hall, K.R. 1975. Khmer commercial development and foreign contacts under Suryavarman I.

 Journal of the Economic and Social History of the Orient 18:318-336.
- Higham, C.F.W. 1989. The Archaeology of Mainland Southeast Asia. Cambridge: Cambridge University Press.
- Higham, C.F.W. and Amphan Kijngam 1984. Prehistoric Investigations in Northeastern Thailand.
 Oxford: BAR International Series 231.
- Kennedy, J. 1977. A Course Toward Diversity: Economic Interaction and Cultural Differentiation in Prehistoric Mainland Southeast Asia. Ph. D. Dissertation, University of Hawaii, Honolulu. Ann Arbor: University Microfilms.
- Phasook Indrawooth, Sinchai Krabuangsang and Payao Narkwake 1988. A study on the archaeological site at Ban Krabuang Nok, Chum Phuang District, Nakhon Ratchasima Province. In Premier Symposium Franco-Thaï: La Thaïlande des Débuts de Son Histoire au XVième Siècle, pp. 453-67. Bangkok: Silpakorn University.
- Pilditch, J. 1987. The typology of the Ban Nadi jewellery: the social and economic implications. Proceedings of the Third International Conference on Thai Studies, Vol. 2, pp.277-290. Canberra: Australian National University.
- Schortman, E.M. 1989. Interregional interaction in prehistory: the need for a new perspective.

 *American Antiquity 54:52-65.

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- Schortman, E.M. and Urban, P.A. 1987. Modeling interregional interaction in prehistory. In Michael B. Schiffer (ed.), *Advances in Archaeological Method and Theory*, Vol. 11, pp. 37-95. San Diego: Academic Press.
- Smith, R. B. 1979. Mainland South East Asia in the seventh and eighth centuries. In R. B. Smith and W. Watson (eds), *Early South East Asia*, pp. 443-456. New York and Kuala Lumpur: Oxford University Press.
- Thailand Fine Arts Department 6th Branch 1984. Report of artifact analysis, Ban Prasat Site,
 Tambon Than Prasat, Amphoe Non Sung, Nakhon Ratchasima. Ms. in Thai by Metha
 Wichakana. Phimai: Fine Arts Department.
- Welch, David J. 1985. Adaptation to Environmental Unpredictability: Intensive Agriculture and Regional Exchange at Late Prehistoric Centers in the Phimai Region, Thailand. Ph.D. Dissertation, University of Hawaii, Honolulu. Ann Arbor: University Microfilms.
- ---- 1989. Late Prehistoric and Early Historic exchange patterns in the Phimai Region, Thailand.

 Journal of Southeast Asian Studies 20:11-26.
- Woodward Jr., H. W. 1975. Studies in the Art of Central Siam, 950-1350 A.D. Ph.D. Dissertation, Yale University, New Haven. Ann Arbor: University Microfilms.