METAL AGE COMPLEXITY IN THAILAND: SOCIO-POLITICAL DEVELOPMENT AND LANDSCAPE USE IN THE UPPER CHAO PHRAYA BASIN

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ABSTRACT

While hierarchical models of socio-political development have been used to explain the emergence of Metal Age complex societies in the Old World, models that emphasise cultural progress and increasing degrees of social hierarchy have impeded our understanding of Thailand's socio-cultural development during the pre-state Metal Age (c.2000 BC-AD 500). To advance understanding of Metal Age societies in Thailand, White (1995:104) has proposed a heterarchy framework. This paper summarises the background and methodology of an archaeological survey project conducted in Nakhon Sawan Province, central Thailand in 2002. The project was designed to test heterarchical and hierarchical frameworks for best fit with Metal Age settlement patterns in the upper Chao Phraya region. Although analysis of the data is not yet complete, some initial observations are presented here.

Within Thailand, the prehistory of the eastern side of the upper Chao Phraya Basin has been investigated since the 1960s, and surveys and excavations within the region called the Kok Samrong-Takli Undulating Terrain (KSTUT) have demonstrated both its distinctiveness and importance for understanding long-term habitation of central Thailand. Recently, the author conducted an archaeological survey project within the KSTUT region in Nakhon Sawan Province, central Thailand (Figure 1). The project covered an area of approximately 55 km^2 and consisted of two fieldwork phases – initial reconnaissance followed by intensive survey. The survey area incorporates the prehistoric site of Ban Mai Chaimongkol and the protohistoric site of Chansen and extends across portions of the alluvial plain, middle terrace and high terrace. Previous archaeological studies in this area have recovered evidence of long-term human occupation beginning as early as the third millennium BC and continuing through the Dvaravati Period, around AD 500-900 (Bronson 1976; Watson 1979; Ho 1984; Thai Fine Arts Department 1988; Mudar 1993; Loofs-Wissowa 1997; Natapintu 1997; Pigott *et al.* 1997; Rispoli 1997). The survey work was completed in June 2002 and the collected data are now being analysed.

Preliminary evaluation has documented variation in site size across the three environmental zones during the Metal Age, with a large density of Bronze Age communities situated in the high terrace and smaller Iron Age communities found in the lowlands. The ceramic variations show that the Metal Age communities shared some ceramic patterns, combined with their own local designs. More research and analysis will be done to synthesise the relationships between environmental and ceramic variation. This paper summarises the background and methodology of the KSTUT archaeological survey project as well as presenting some preliminary findings.

THE HISTORY OF KSTUT RESEARCH

The KSTUT Project was developed due to interest in understanding Metal Age socio-political development in Thailand; how can one explain it, categorise it, and determine if and how it may have changed through time. Clear-cut answers to these questions have yet to be found.

The Metal Age in Thailand comprises two major periods: Bronze Age (*c.*2000-800 BC) and Iron Age (*c.*700 BC-AD 500) (White 1988; Bayard 1992; Pigott *et al.* 1997). However, such sequential development is not uniform throughout the region (Higham 1989, 1996; Glover and Syme 1993). A distinct Bronze Age that preceded the use of iron has been documented only in central and northeast Thailand, where important data have been recovered from small burial and mining sites.

Hierarchical models with implied cultural progress and increasing degrees of social hierarchy have been used to

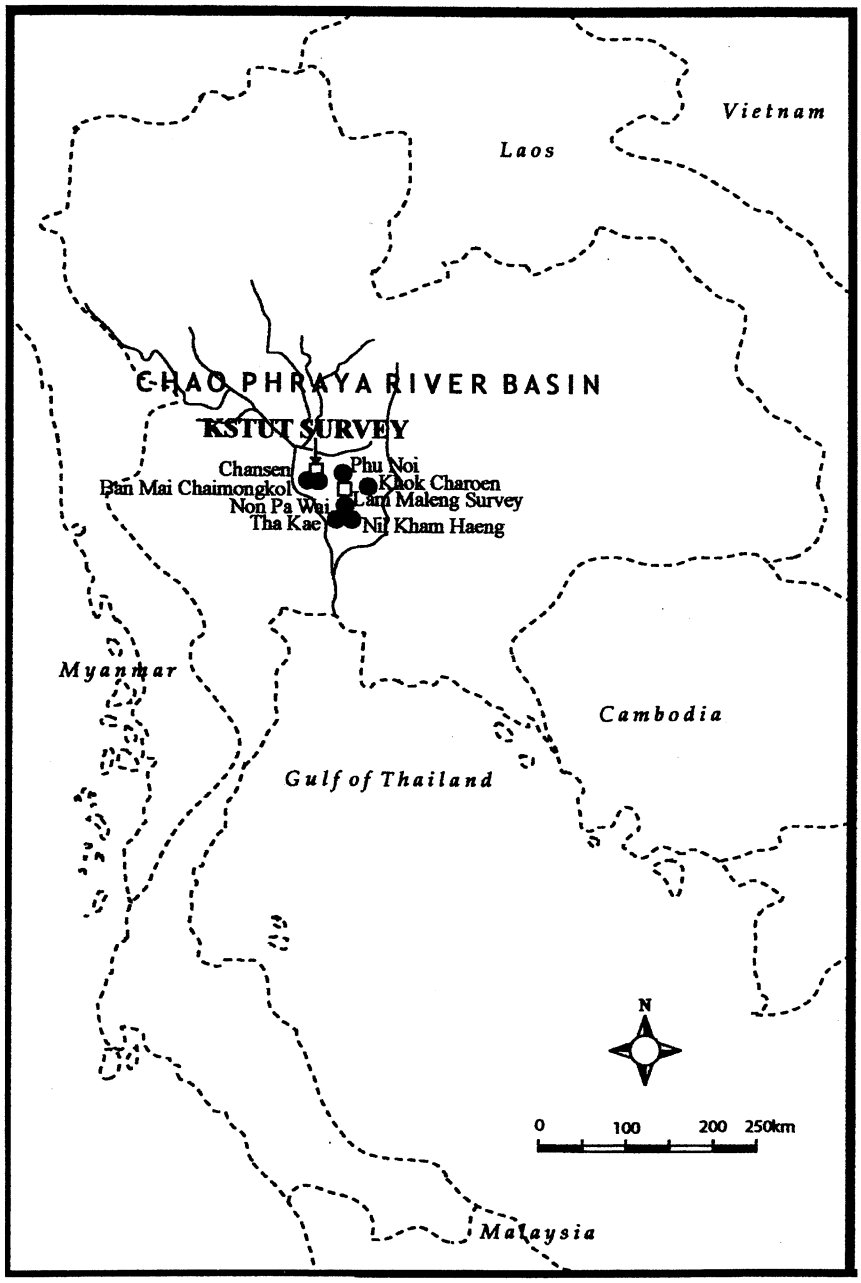

Figure 1: KSTUT Survey location and nearby archaeological sites in the eastern Chao Phraya Basin.

explain the emergence of Metal Age complex societies in Thailand (Higham *et al.* 1982; Welch and McNeill 1991; Mudar 1995). However, the application of hierarchical models has been questioned as impeding the understanding of the exact nature of socio-cultural development in this region (Penny 1984; Bayard 1992; White 1995).

Although the Metal Age communities in Thailand underwent two major technological transitions, there appear to have been no changes in socio-political structure of the kinds that coincided with the appearance and development of metal technology in other parts of the world (Penny 1984; Bayard 1992; White 1995). Current evidence suggests that complex societies of some sort may have occurred in Thailand during the Bronze Age, but that they were not markedly hierarchical (Muhly 1988; White and Pigott 1996). Major change does not seem to have occurred during the transition from Bronze to Iron Age (*c.*700 BC), although increases in degree of social complexity took place during the Iron Age (*c.*500 BC), preceding political centralisation and the emergence of states.

For the period between the late second millennium BC and the mid first millennium BC, it can be argued that existing data for Metal Age settlements in Thailand do not conform neatly to patterns predicted from hierarchical models. Metal Age populations in northeast Thailand engaged in community-based small-scale copper production; whereas in central Thailand the production was at more intensive and possibly industrial levels at small sites apparently unattached to larger socio-political entities (White and Pigott 1996).

The impact of the use of iron remains controversial (Penny 1984; Welch 1985; Bayard 1992; Mudar 1993). The traditional view argues for a close relationship between the appearance of iron, water buffalo, wet rice agriculture and chiefdoms (Gorman 1977; Higham 1989). Some scholars believe that this time period represents a transition from autonomous to hierarchical societies. The argument is based on evidence of intensification of agricultural production, increases of sophistication in rituals, and increases in relatively large and moated sites appearing around the end of the first millennium BC. However, recent evidence shows a lack of rigid social stratification with the initial use of iron. For example, in the western margin of northeast Thailand, the Iron Age communities were characterised by widespread small settlements (Penny 1984).

A Heterarchical Framework

Thailand is a region where archaeological data challenge the applicability of the cultural evolutionary approach to

the development of social complexity and the state. The concept of "heterarchy" provides an alternative approach (Crumley 1987, 1995). This concept is being applied to archaeological cases in many parts of the world (Ehrenreich *et al.* 1995). In contrast to hierarchical models, heterarchy considers variable trajectories of complex socio-political development that incorporate flexible and shifting ranking. Thus the relationship of entity A to entity B can be superior in one context, yet equal or inferior to it in another context (Crumley 1995; McIntosh 1998). In other words, hierarchy is not absent in heterarchical systems, rather hierarchy is viewed as just one among various mechanisms of complexity.

Joyce White has proposed a heterarchical framework for understanding prehistoric Metal Age communities in Southeast Asia (1995:104). She defines four characteristic patterns, which emerged by the second millennium BC:

1. cultural pluralism;
2. flexibility in social status systems;
3. indigenous economies that tend to be community-based and lack monopolies by a single center; and
4. cooperative-competitive strategies of political organisation that de-emphasised violence.

White does not explore the repercussions of these patterns for prehistoric settlement.

KSTUT PROJECT AND METHODOLOGY

One way the development of socio-political complexity can be examined is through the evolution of settlement systems. Settlement system studies provide a means to identify regionally based evidence for dynamic socio-political units that shift in allegiance and economic articulation (Crumley and Marquardt 1987). The few previous settlement pattern studies of pre-state societies in Thailand have tended to draw their interpretive frameworks from hierarchical models. Nonetheless, this limited work indicates potential for applying a heterarchical framework to settlement system analyses. For example, Ho's reconnaissance survey (1992) in the Pasak river region identified localised ceramic variability; specifically three subregional ceramic complexes were observed. Welch's work (1985) in northeast Thailand showed Iron Age exploitation of the full range of regional landscapes from alluvial to upland zones. Mudar's survey (1993) in east central Thailand demonstrated on the basis of changes in rank-size distributions that the region became more integrated during the Metal Ages. She also demonstrated, contrary to settlement studies in other parts of Metal Age Thailand, that lands unsuitable for wet rice cultivation were favored in the KSTUT. This finding is extremely significant in the context of the long history of prehistoric research in Thailand that investigated the development of complexity and state formation as intimately related to intensive wet-rice agriculture.

This research project has been designed to test heterarchical and hierarchical frameworks for best fit with settlement patterns on the KSTUT. Evidence to support hierarchical settlement models might find trends toward site hierarchies and strategic controls over resources. A heterarchical model might expect the data to identify:

1. differentiation in site sizes, not limited to lands favorable to wet rice cultivation;
2. subregional ceramic variation;
3. long duration of such variation and possibly geographic shifts in ceramic subregions over time;
4. lack of association between ceramic subregions and distinct environmental zones; and
5. evidence for economic specialisation in small as well as large sites.

In the field, a one-month reconnaissance survey was conducted over an area of approximately 1000 km^2 in order to define areas of greater site densities among environmental zones. The intensive survey was conducted from the beginning of January until early June in 2002. During the intensive phase, a team of five workers walked the landscape 15-25 m apart from each other.

The survey focused on collecting data to refine knowledge of:

1. settlement distributions in time and space;
2. settlement attributes, including size, surface features, surface artefacts, and observable site formation processes;
3. environmental variations; and
4. a refined framework for prehistoric cultural chronology.

Site locations were recorded with a Global Positioning System (GPS). Site sizes were measured based on surface artefact distributions. A systematic surface collection of artefacts was conducted at each site using a transect-and-collection-at-nodes strategy in order to retrieve a representative sample of artefacts. Unlike previous surveys, evidence for craft production such as pottery anvils, metal, shell and stone working debris, and ceramics beyond temporally diagnostic sherds were explicitly sought. Current land use and land use history were documented through interviews with local inhabitants.

To provide a chronological framework, the study area includes two excavated sites: the prehistoric site of Ban Mai Chaimongkol and the protohistoric site of Chansen. The survey's ceramic sequence incorporates the long overlapping chronologies from the two sites. The Chansen sequence includes a prehistoric Iron Age deposit and five historic phases (Bronson 1976). The Ban Mai Chaimongkol

ceramic sequence was delineated in Onsuwan's MA thesis and includes three Bronze Age and two Iron Age subphases (Onsuwan 2000) (Figures 2 and 3). Also, ceramic information from other KSTUT sites, such as Phu Noi (Natapintu 1997) and the Khao Wong Prachan Valley sites (Rispoli 1997) is incorporated.

PRELIMINARY SURVEY RESULTS

The KSTUT systematic survey covered a total area of about 58 km^2. Twenty five open-air sites and 7 cave sites were documented. The chronology of these sites has not yet been fully analysed, but they appear to belong to the Metal Ages up through the Early Historic Period.

The survey region covers three geographical zones: the lowland alluvial plain; the middle terrace; and the high terrace. In general, the distribution of sites shows a somewhat randomly-dispersed nature, but there is significant variation in site size. Interestingly, settlements of various site sizes, small to large, are distributed across the three geographical zones (Figure 4). For preliminary analysis, a site is considered large if its area is greater than 10 ha. Those sites smaller than 10 ha are designated as small to medium. Of the 25 open-air sites, there are 8 large sites and 17 small to medium sites. A total of 6 sites were found in the alluvial plain zone. They consist of 3 large sites, including Chansen, the biggest site in the study area, and 3 small to medium sites. Twelve sites were documented in the middle terrace zone, 11 of which are small to medium sites and one being a large site. In the high terrace, there were 4 large sites and 3 small to medium sites, as well as a number of cave sites located on an adjacent mountain. The Thai Forestry Department provided assistance for a survey of some of these cave sites. Seven out of 30 previously documented cave sites were visited, and ceramic samples were collected from each (no lithics were found). The preliminary evaluation indicates a large number of Bronze Age communities situated in both the upland terrace and lowland plain zones, and a smaller number of Iron Age communities found mainly in the lowland plain.

During the fieldwork, an effort was made to look for reliable indicators of site location. While the river system was a helpful guide, it by no means guaranteed site discovery. For the past 40 years the alluvial plain has been transformed through a number of irrigation projects. The old river systems have been altered and most of them do not appear on available maps. Interviews with local villagers provided some idea of previous watercourses, but clearly more research is needed on this subject. In the middle terrace, most sites are located near large to medium-sized swamps or ponds. In the upland area, most sites are located in the vicinity of perennial streams. One interesting

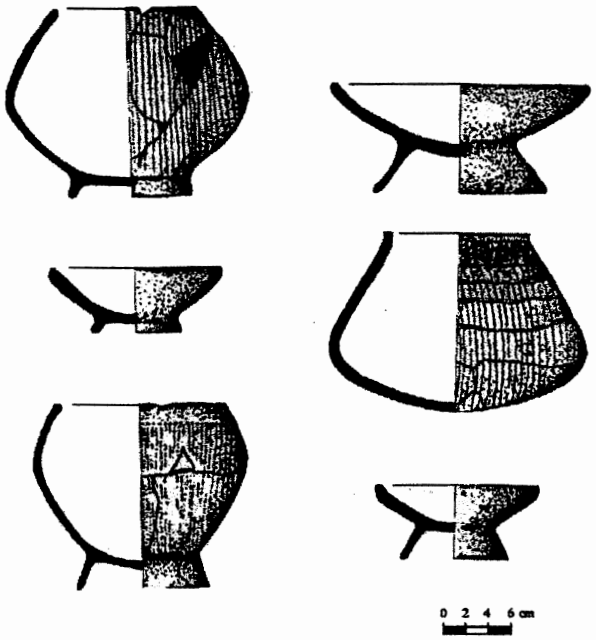

Figure 2: Bronze Age ceramics from Ban Mai Chaimongkol (Onsuwan 2000).

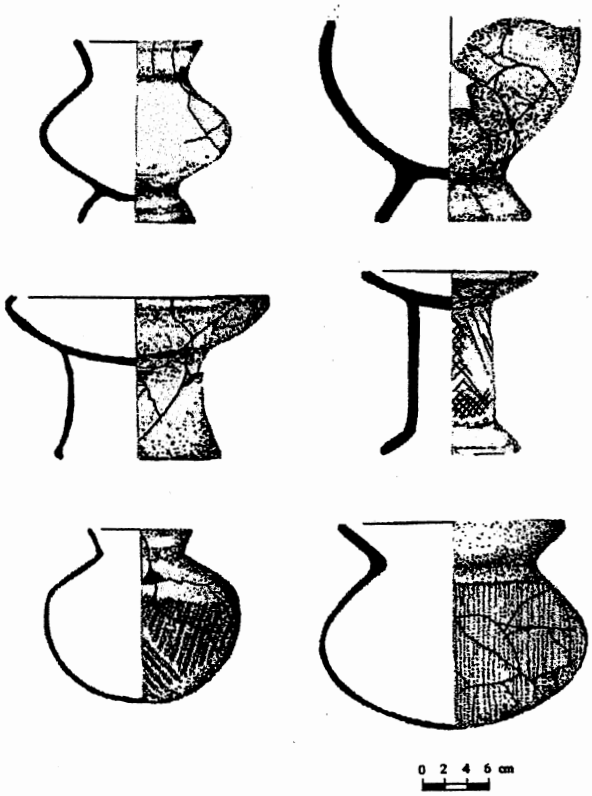

Figure 3: Iron Age ceramics from Ban Mai Chaimongkol (Onsuwan 2000).

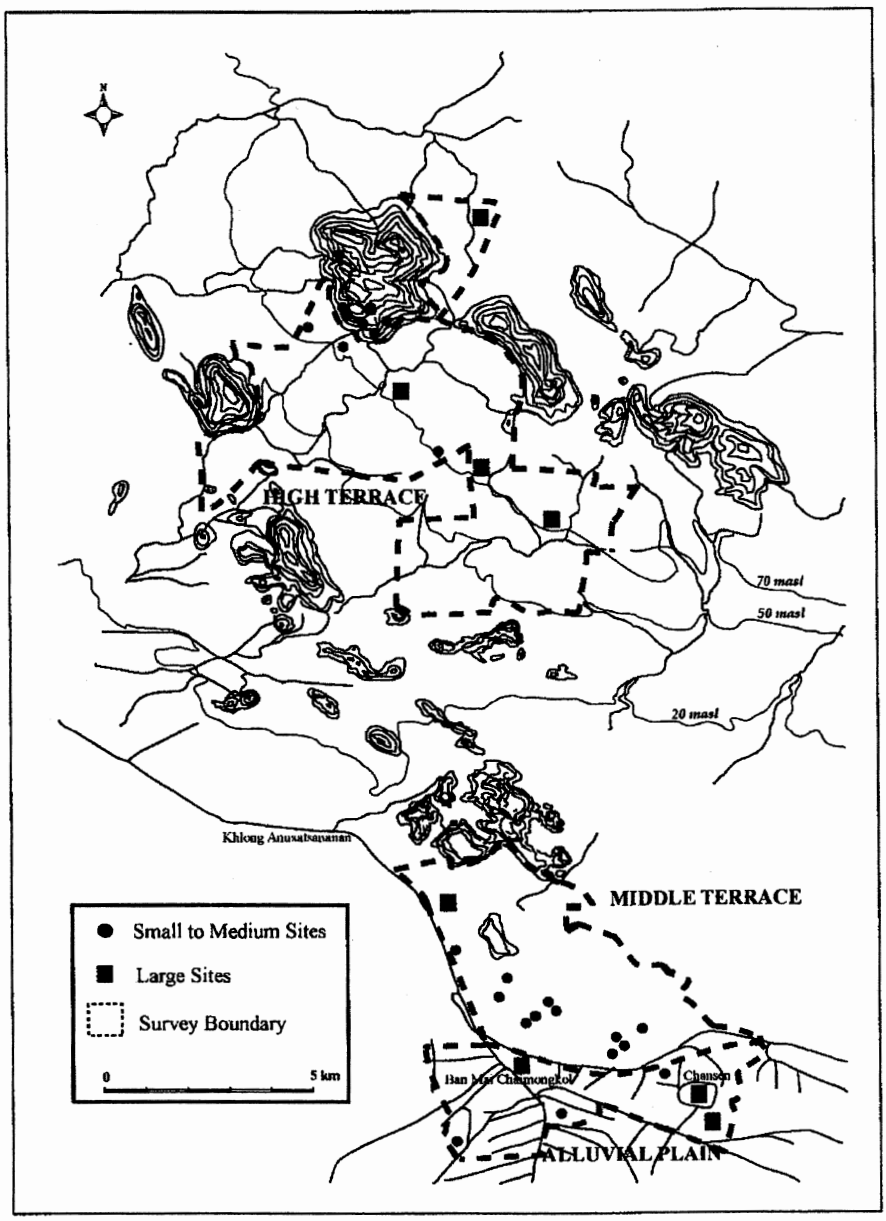

Figure 4: KSTUT Survey area and archaeological sites discovered during survey.

observation on how to find sites in the upland region relates to the degree of slope. Six of the 7 sites in the upland area are located along a steep slope at 70 m above sea level, on a marl terrace where the soil consists of sizeable limestone nodules.

The ceramic variations show that the Metal Age communities shared some ceramic patterns combined with their own local designs. The Metal Age ceramic forms and decorations show markedly lower degrees of standardisation than the early historical ceramics. So far, there is no evidence that ceramic subregions are associated with distinct environmental zones. Rather, ceramic types such as long pedestal dishes and medium restricted vessels without necks could be found in high terrace, middle terrace and lowland sites. Other types of artefact recovered include spindle whorls, polished stone adzes, copper-based and iron tools, shell and stone bracelets and beads, and glass beads. There is no clear evidence for economic specialisation, for a distribution of special artefacts at only large sites, or for warfare.

Most of the sites were easy to recognise by their mound-like features. About 60 percent of the sites appear to have served as both mortuary and habitation areas, while the remaining 40 percent probably served only as habitation areas. The entire survey area had been occupied and cleared out for planting seasonal crops; less than 5 percent of the area contains forest regrowth. Repeated plowing has made for good ground visibility and exposed numerous artefacts on the surface. However, this makes it more difficult to identify site formation processes and surface features. Site looting is a serious problem, especially in the lowland and the middle terrace zones. Current land use in the lowland focuses mainly on growing rice, but also includes tamarind, papaya, coconut and other vegetables. A mixture of rice fields and other field crops such as millet, corn, pumpkin and ground peanuts are planted in the middle terrace. In the high terrace zone, one finds teak forests as well as plots of corn, sugarcane, sunflower, eggplant and mung bean.

CONCLUSION

Archaeological survey data in addition to excavation data enable us to understand regional history. Based on tentative preliminary analysis, the regional data recovered during the KSTUT Project appear to fit better into a heterarchical framework of socio-political development than they do with a hierarchical one. Based on the preliminary results, at least three out of five hypotheses appear to be supported by the data. There is evidence that differentiation of site size is not

limited to lands favorable to wet rice cultivation; that significant ceramic variation does exist during the Metal Ages; and that ceramic subregions during this period do not appear to be associated with distinct environmental zones.

The data suggests numerous Metal Age communities of various sizes scattered across the landscape. Contrary to previous assumptions, it appears that Bronze Age communities exploited more than one type of environment and inhabited both upland terrace and lowland plain zones (apparently preferring the upland terrace for habitation). Most of the Bronze Age sites in the lowland have evidence suggesting continuous settlement into the Iron Age, while there is less evidence of Iron Age settlement in the upland zones. There does not appear to be a significant change in site size frequency between the Bronze and Iron Ages. It is not yet clear whether Bronze and Iron Age communities had different subsistence patterns. There is a need for tighter regional chronology and more refined excavation methodology in order for us to be in a position to compare data across different landscapes.

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