

From site formation to social structure in prehistoric Thailand

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The archaeological record in mainland Southeast Asia from ca. 2000 B.C. to the formation of early states in the mid-first millennium A.D. is built on excavations in mounded settlements that incorporate habitation, industrial, and mortuary remains. For most sites, formation processes are not readily identified. White and Eyre (2010) have presented a new view of the social organization of the Southeast Asian “metal age” based on a reinterpretation of mortuary and settlement data, founded on their premise that the dead were interred in, under, or in conjunction with domestic residences rather than dedicated cemeteries. They argue that such house societies were instruments for remarkably long-term occupation of individual settlements by heterarchic, non-violent supravillage affiliative social groupings. A detailed examination of the evidence for such residential burial suggests a lack of convincing evidence until the Iron Age. Moreover, new dating programs have shortened the prehistoric sequence, leading to more rapid and intense social changes than hitherto suspected.

Keywords: Southeast Asia, heterarchy, residential burial, mortuary rituals, social change

Introduction

This paper is a response to a model for social organization in northeastern Thailand proposed by White and Eyre (2010). Their new and stimulating proposals are founded on the assertion that mortuary practices in the later prehistoric period encompassing their “metal age” involved residential burial. This practice, they argue, underwrote long term stability that precluded the establishment of entrenched social hierarchies. Much of their evidence for residential burial derives from erroneous reinterpretations of sites that I have excavated and published, within a chronological framework that is no longer generally accepted. Having investigated these sites, I provide new evidence for actual residential burial practices in the Iron Age, and offer an alternative model for social change that led first to unstable Bronze Age hierarchies and in due course during the later Iron Age, to a swift transition into early states.

Until the early 2nd millennium B.C., mainland Southeast Asia was occupied by hunter-gatherers descended from the Anatomically Modern Humans who expanded out of Africa over 50,000 years ago. Hunter-gatherer settlements have been identified in upland rockshelters, along former shorelines, and very rarely, in the broad lowlands that flank the major rivers. A major cultural dislocation occurred

with the establishment of agricultural villages, seen by most as the result of a southward expansion by rice and more rarely, millet farmers from China (Matsumura *et al.* 2007; Rispoli 2008; Zhang and Hung 2010; Bellwood 2011). Radiocarbon determinations from key sites place this in the first few centuries of the 2nd millennium B.C. (Higham *et al.* 2011). In the 11th century B.C., these farming communities became familiar with the properties of copper and tin, heralding the six centuries of the Bronze Age (Higham and Higham 2009). A third major change came in the 5th century B.C., when Southeast Asia was linked east and west with a major maritime exchange route that brought knowledge of iron, exotic display ornaments, and ideas expressed over time by syncretism of indigenous beliefs with aspects of Hinduism and Buddhism (Bellina *et al.* 2014). By the 6th century A.D., these crystallized into the formation of early states and major settlement changes (Stark 2006).

The archaeological record for these 25 centuries is reflected in mounded settlements mainly but not entirely restricted to terrain suited to rice or millet cultivation. It is a naturally rich habitat, in terms of wild fauna, aquatic resources and a monsoon climate that brings sufficient rainfall for agriculture. This environment is a factor in the finding that mounded prehistoric settlements were continuously occupied, some for centuries, others for millennia.

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Field archaeology began in the late 1960s, but very few mounded sites have been excavated and even fewer, fully published. Although they have the potential to illuminate cultural changes over a span of at least 100 human generations, these sites present several unusual technical problems to the excavator, which in their turn, have an impact on resulting models of social change. The first problem is that the areas hitherto opened by excavation are very small relative to the size of the sites in question. The largest area opened, at Ban Non Wat, still represents only about 1.7% of the site (FIGS. 1, 2). Therefore the nature of residences and locations of

activity areas are little known. A corollary is that where different parts of a site are examined, it is often the case that the sequences differ fundamentally. At Ban Non Wat some squares revealed only Iron Age occupation, another had Bronze Age layers under the Iron Age and a third, had phases covering a hunter-gatherer, two Neolithic, six Bronze Age and three Iron Age periods of occupation (Higham and Kijngam 2009, 2011).

A number of factors contribute to complex stratigraphic sequences in the sites examined, and challenge the excavator in synthesizing the chronology and the relationships between

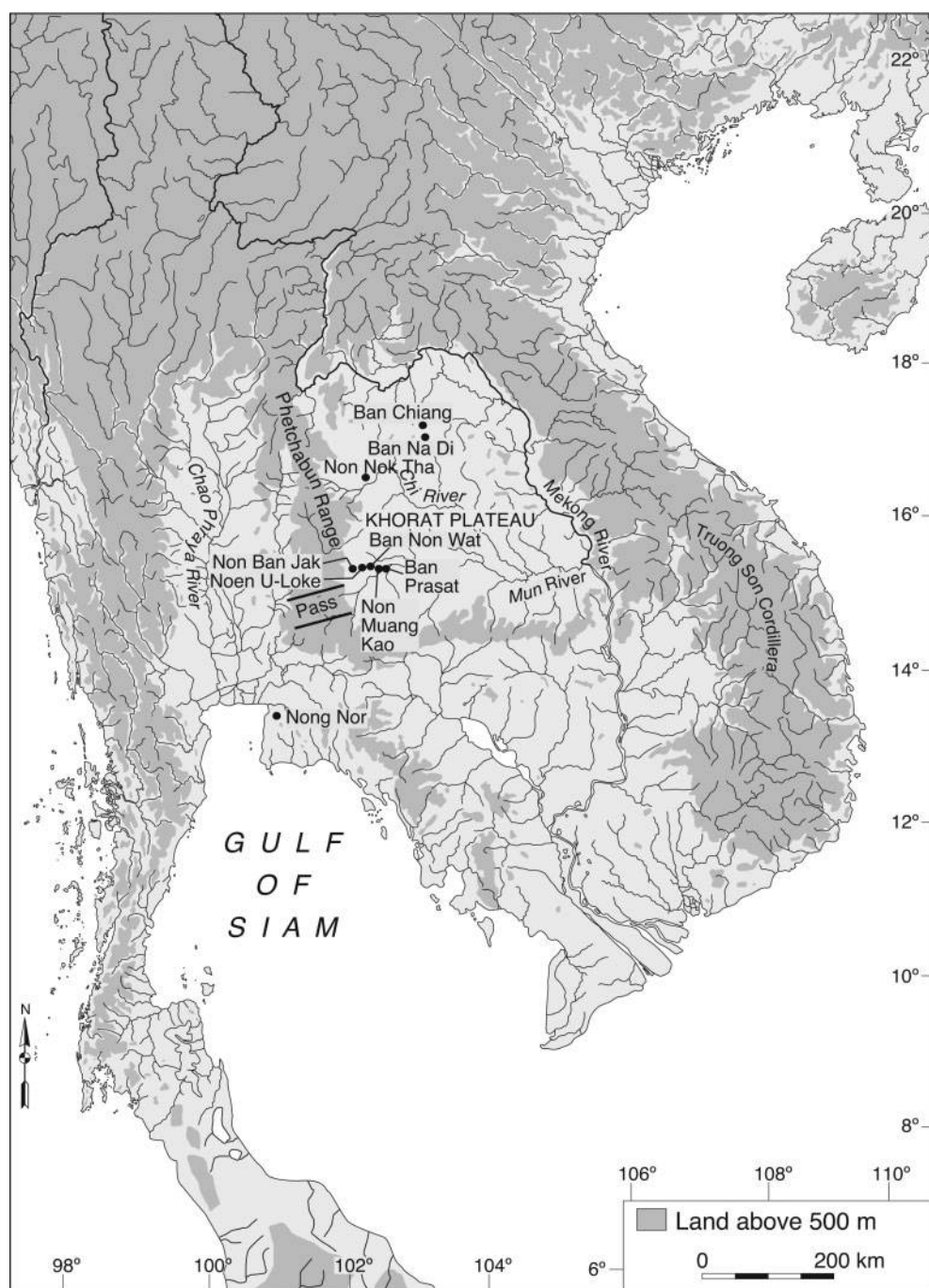


Figure 1 The location of the sites mentioned in the text.

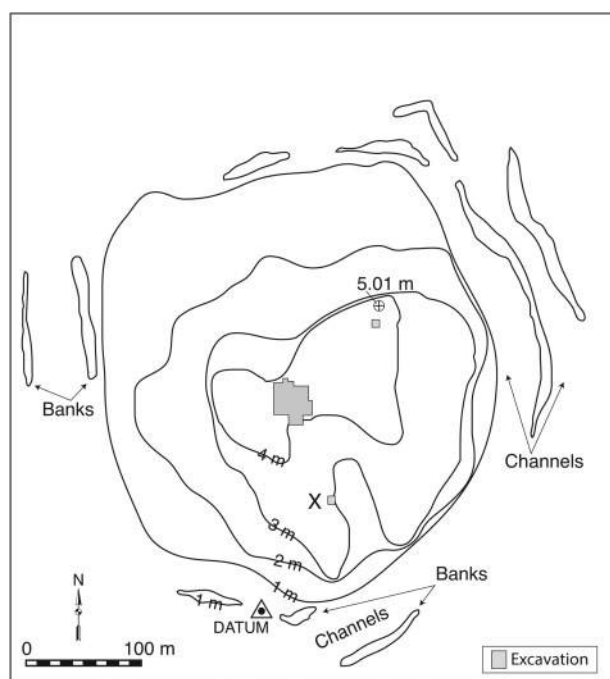


Figure 2 Plan of Ban Non Wat, showing the location of excavated areas.

identified contexts. Activities include bronze casting, iron smithing, pottery-making, open firing, ceramic kilns, kiln rake-out, middens, butchering floors, house floors and walls, rubbish pits, human jar and inhumation burials, drainage channels, a corral for domestic stock and palimpsests of postholes. Some sites were enclosed by high banks and moats linked with canals and dams (Parry 1992). To add to the maze of successive activities, one must add the impact of the rainy season on stratigraphic clarity, when torrential downpours would have led to redeposition within sites, the planing of surfaces and the deposition of flood lenses. Finally, bioturbation by insects at some sites has virtually obliterated stratigraphic integrity. Human burials are routinely encountered. While some were cut through and disturbed by later activities, including the digging of postholes and pits, many remained intact, and contribute significantly to models of social organization and change.

In an innovative paper, White (1995) summarized the information available from what she termed prehistoric cemeteries dating to the Bronze Age in Thailand as supporting a social system of heterarchy. A basic issue in this definition was the lack of any evidence for a specific area reserved for elite burials. In what she later described as an “Ah Ha” moment when examining the layer plans from the 1975 excavation of Ban Chiang, White rejected her earlier use of the term cemetery in favor of residential burial in, under and/or around houses (White and Eyre 2010: 63). White and Eyre then reinterpreted the mortuary evidence from other sites, concluding that the dead

were interred not in cemeteries, but within domestic contexts. This practice, the authors wrote, characterized the duration of the “metal age,” which they date from ca. 2000 B.C. to A.D. 500. They conclude that “the commitment to place suggested by permanent occupation of sites and residential burial over hundreds, and in many cases thousands of years at sites of metal age Thailand may at first seem unimaginable to an archaeologist born in the West” (White and Eyre 2010: 69). In terms of social organization, they then maintain that this continuity “argues for importance placed on bottom-up affiliation with societal collectivities rather than top-down coercion by/control by/exclusion from dominant subgroups as the ‘social glue’” (White and Eyre 2010: 69).

An Examination of the Evidence

Three fundamental points that underlie White and Eyre’s new model need to be examined: chronology, the definition of a cemetery, and the precise evidence needed to identify residential burial. They place the metal age of Thailand between 2000 B.C. to A.D. 500. This span derives from White’s (2008) proposed chronology for the site of Ban Chiang, based on a selection of seven from a set of 19 radiocarbon determinations on the organic temper from crushed potsherds and one from rice phytoliths associated with burials. This technique is now known to be flawed for several reasons, foremost being that clay itself can contain old carbon (Bonsall *et al.* 2002; Berstan *et al.* 2008). In order to obtain a more reliable chronology for this site, we have obtained AMS determinations from the bones of those who lived there (Higham *et al.* 2011). Following a Bayesian analysis of the results, the initial Neolithic settlement has been dated to the 16th century B.C., with the transition into the Bronze Age being placed in the late 11th century. This chronological framework, which harmonizes with results from the sites of Ban Non Wat, Ban Lum Khao, and Non Nok Tha (Higham and Higham 2009; Higham *et al.* 2014a), shortens the metal age by nearly a millennium, and implies a more dynamic pace of any detected social changes consequent upon the adoption of metallurgy.

White and Eyre’s proposal that the dead were interred in, under, or in close association with houses rather than in designated cemeteries is based on the 1974–1975 excavation at the site of Ban Chiang. It begins with the questionable retrodiction that the modern practice in some Thai villages of raising a house on posts occurred in prehistory. While it is unquestioned that houses raised above ground level on posts were in use in the Dong Son and Dian Iron Age settlements of northern Vietnam and Yunnan, regional differences mean that it was not necessarily so for the Neolithic and

Bronze Ages of the Khorat Plateau. Houses in the Iron Age in sites I have excavated in the upper Mun Valley were constructed at ground level. During the Neolithic and the Bronze Ages, houses could have incorporated walls made of wooden posts, with the floors at ground level. Moreover, posts could just as well represent mortuary buildings as domestic houses.

The 1974–1975 excavation at Ban Chiang has never been published, but I participated in both seasons. The director, C. F. Gorman, and I spent a great deal of time during the excavation discussing how the site formed, and the relationship between the burials being uncovered and the pits, postholes, disturbances, midden remains, bronze casting areas and other structural features we uncovered. For most of the time, we were confronted with human burials “floating” in an undifferentiated reddish layer that had suffered severe bioturbation. It was impossible to relate the graves chronologically to any structural features.

The plan of the 1975 excavation cited and illustrated by White as the stimulus to her “Ah Ha” moment therefore deserves close scrutiny. The area opened covered just 3.5×17 m (A in FIG. 5). The graves illustrated lie in two rows, and their outlines were only recognized when uncovering the surface of the yellowish natural substrate through which they were cut. This same substrate was also peppered with areas of disturbance: postholes, pits, root holes, holes, and “disturbance from a higher level” (White and Eyre 2010: 64). The critical point, is that there is no way of ascertaining the contemporaneity or otherwise of the graves and the disturbances because we do not know the layers from which they originated. Moreover, the possibility of tracing patterns of postholes that might have described a residential unit is impossible in an area only 3.5 m wide.

Satisfactory evidence for a house contemporary with a set of burials would necessitate identifying the actual layer from which structural posts originated, and then tying them chronologically with the insertion of a grave. White and Eyre’s illustration satisfies neither of these conditions. The grave cuts illustrated were only recognized where they severed a clear natural substrate. The postholes form no pattern, some were cut into graves and therefore post-date them, and in no case was the original layer from which one was cut identified.

The third issue is one of definition. White and Eyre (2010: 68) noted that “Some may argue that there is no substantial difference for social interpretation if kin groups are interring family members in clusters in formal disposal areas, like cemeteries, separate from settlements, or in clusters in or around houses in a village.” In all sites involved, the dead were buried within, and not separate from, settlements.

Since Bronze Age settlements were not large, it is almost axiomatic that the cemeteries were placed near residences, even if the latter have never been satisfactorily identified for the six-century duration of this period. Where White and Eyre differ in their interpretation from my own, is that the Bronze Age cemeteries I have excavated at Ban Non Wat, Ban Na Di, Ban Lum Khao and Nong Nor present no convincing evidence for domestic contexts.

Thus, having concluded that the Ban Chiang burials were interred in, under, or in close vicinity to houses, White and Eyre examined and reinterpreted the evidence from other sites. Ban Lum Khao is a late Neolithic and Bronze Age settlement in the upper Mun Valley. White and Eyre (2010: 62), referring to our report, note that: “Layouts of graves are often illustrated without including the features from the surrounding occupation deposits (Higham and Thosarat 2004).” This is an elegant example of how ill-informed assumptions from published field data can engender erroneous interpretations. Our excavations at Ban Lum Khao took place near the edge of the site. No “surrounding occupation deposits” are to be found in the final report plans because there were none. We uncovered rows of Bronze Age graves, but no middens, no postholes and, indeed, no evidence for houses. Figure 3 shows the layout of the early Bronze Age burials together with all non-mortuary features encountered. The burials were cut into Neolithic pits. Apart from a small shell midden and one posthole, the excavation revealed an area demarcated for human graves near the edge of the site, in other words, a bounded cemetery located within a settlement.

My excavations at the site of Nong Nor encountered two phases. The first is a hunter-gatherer midden dated to the end of the 3rd millennium B.C. The second is a Bronze Age cemetery. The graves were cut deeply into the midden. There is no evidence at this site for Bronze Age habitation. It was again, a cemetery (Higham and Thosarat 1998).

These are but two examples where a theory does not fit the facts. However, erroneous assumptions based on reading field reports have ramified into questionable models of social organization, involving a lack of “elite lineages in centers controlling access to scarce resources” (White and Eyre 2010: 68). As we shall see, such elites are exactly what have been identified in the upper Mun Valley during the early Bronze Age, while further changes in the later Iron Age led directly into the rapid crystallization of early states (Higham 2014).

New Information From the Mun River Valley

Most information germane to a review of White and Eyre’s reinterpretation of the mortuary traditions

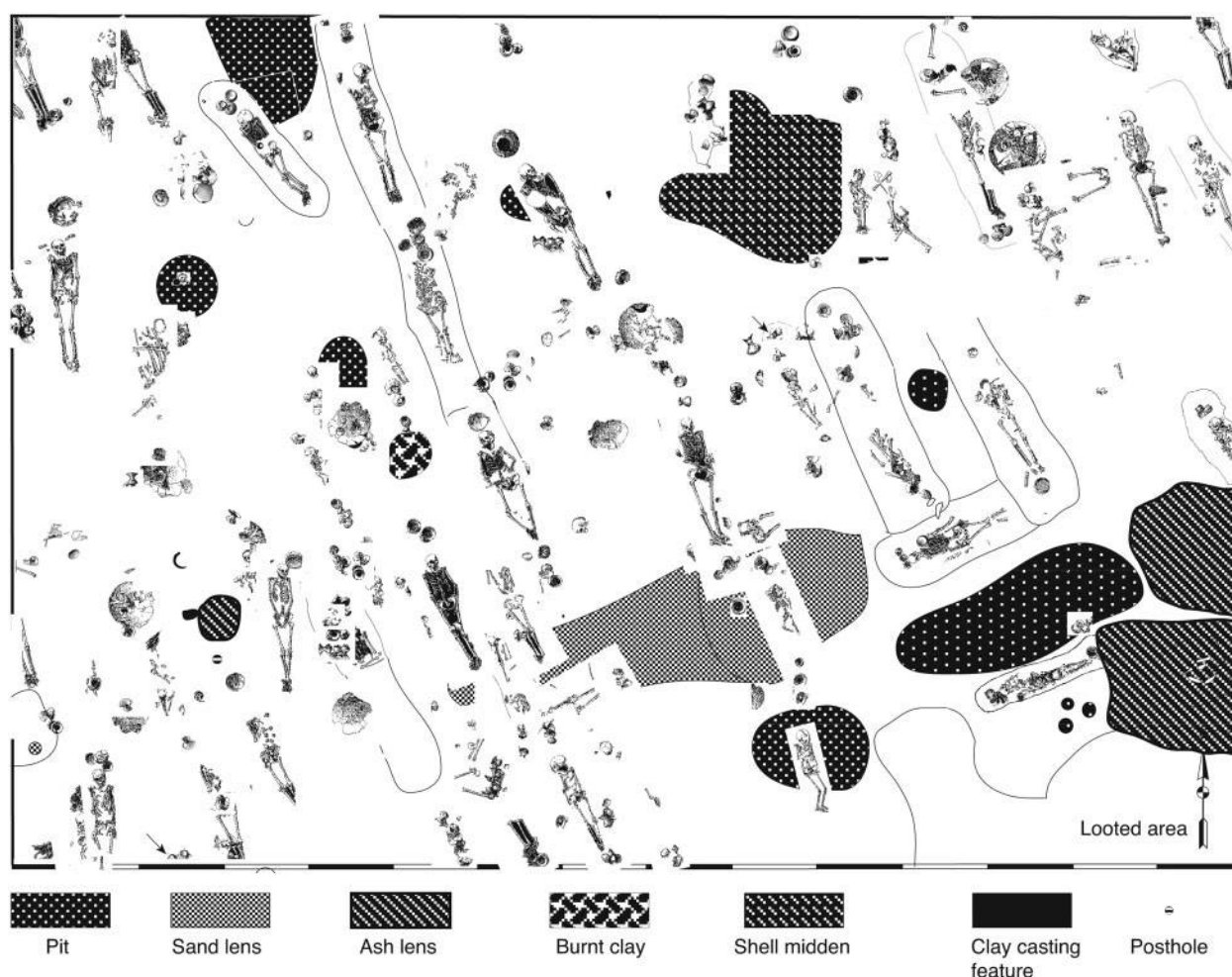


Figure 3 Plan of the Bronze Age 1 cemetery at Ban Lum Khao, with all non mortuary features identified. Scale in m.

comes from the upper Mun Valley of the Khorat Plateau (FIG. 1). Ban Non Wat is a moated settlement occupied from the Neolithic to the late Iron Age. This sequence dovetails during the Iron Age with the results from three other moated sites nearby: Noen U-Loke, Non Muang Kao, and Non Ban Jak.

The largest of many areas opened at Ban Non Wat lay in the center of this settlement. In a stratigraphic sequence three meters deep, we encountered over 650 burials and occupation remains divided into 12 phases dated to between 1750 B.C. and A.D. 500 (FIG. 4). The digging of graves, pits, postholes and other disturbances within this stratigraphic sequence, as at Ban Chiang, make it difficult to align a given phase of burials with residential remains until the Iron Age. Figure 5 shows the features that were identified near the surface of the natural substrate. We see Neolithic period middens, many postholes, and burials from initial hunter-gatherers, Neolithic 1 and 2, and Bronze Ages 2, 3 and 4. Relating any of these to evidence for residences without identifying contemporaneity among the various features, given the lack of any pattern of walls or presence of floors, is simply not possible (Higham and Kijngam 2009). However, it is noted that there was a marked lack of postholes

and other evidence for habitation in the central area dominated at the time by rich early Bronze Age graves.

What can be said is that this central area of the community was used for interment of the dead throughout the prehistoric occupation. The earliest burial was one of several in a flexed position which probably represent hunter-gatherers. Graves showed no sign of nucleation. The Neolithic 1 burials concentrate in the northwestern part of the excavated area, while the Neolithic 2 graves were more widespread, and in several instances, individuals were interred in pairs.

Only seven Bronze Age (BA) 1 burials were found, deeply cut into the natural substrate, and were markedly richer in terms of offerings than their predecessors. BA2, dated to between about A.D. 900 and 1000, incorporated rows of outstandingly wealthy men, women and infants (FIG. 6). These graves were again deep, and although a large area was excavated and all potential occupation evidence was minutely recorded, there is no pattern that might indicate burial association with houses. However, being centrally placed in the settlement, the burials must have been close to where people lived, and could represent a focal ritual area for the community.

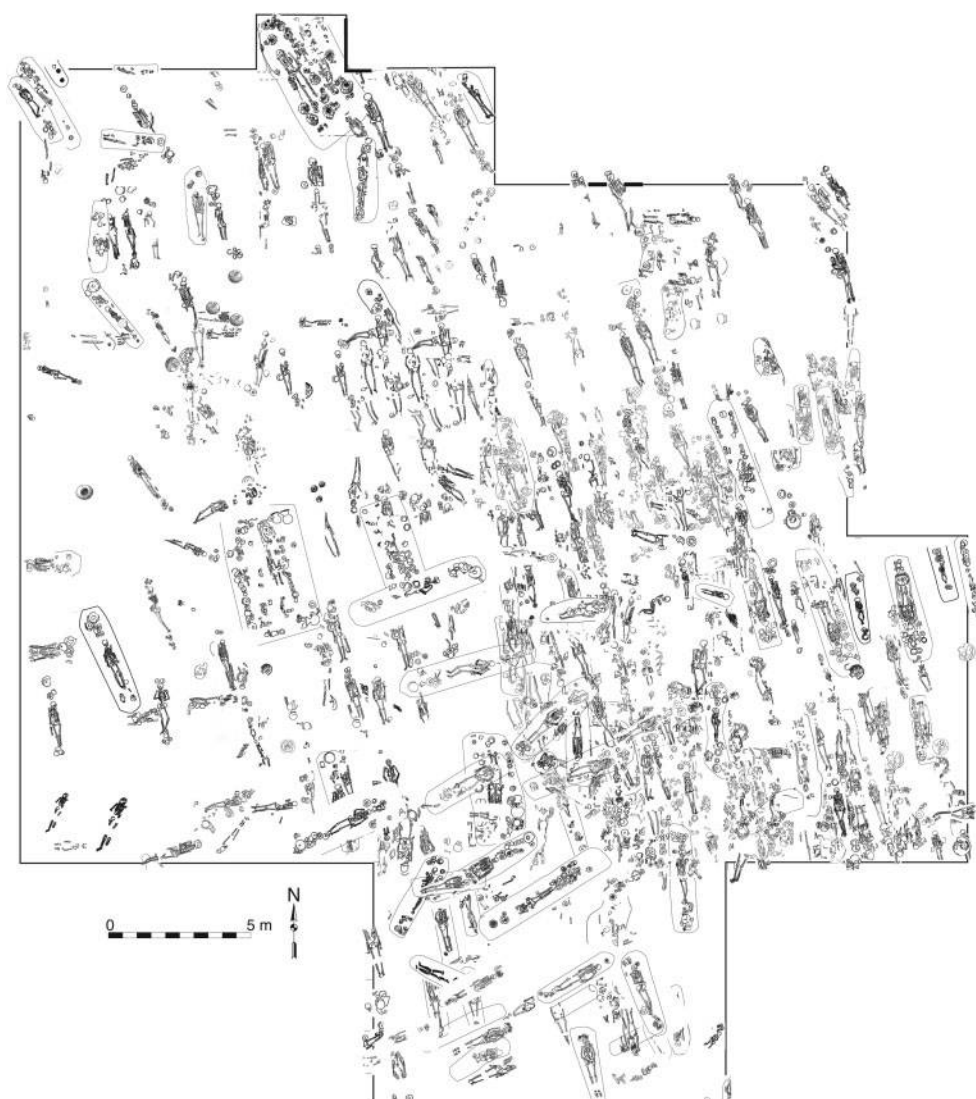


Figure 4 The location of burials from 12 mortuary phases in the central area of Ban Non Wat, showing about 2300 years of superimposed interments.

With BA4, burials became poorer and were distributed in rows and head to head across the entire excavated area (FIG. 7).

The Iron Age: A New Mortuary Tradition

BA5 graves formed a tight nucleus that merged seamlessly with early Iron Age (IA) 1 burials. These formed two groups, one with the head orientated to the south, the other to the north (FIG. 8). It was at this juncture that burials were found cut through or in the vicinity of clay floors that might represent residences. At Noen U-Loke, only 1.8 km to the east, the IA2 graves comprised two nucleated groups (Higham *et al.* 2007: 153). A burnt clay floor covered the later set and one of the graves had been cut through it. My published comment is that “While other burials of cluster B were sealed by the floor, this burial seems to have been cut through it, suggesting that the floor was in use during the accumulation of this cluster of graves” (Higham *et al.* 2007: 162). That buildings with clay floors and walls incorporated

burials is also seen at the excavation at Non Muang Kao, albeit in a very small excavated area (O’Reilly 2007).

The nature of late Iron Age mortuary practices in the upper Mun Valley has been greatly clarified at Non Ban Jak, a fourth moated Iron Age settlement (Higham *et al.* 2014b). The vital need to open extensive areas in order to identify spatial patterning is self evident from the structural planning identified at this site. Occupation took place during IA4, the final prehistoric phase that dates between the 4th to the 8th centuries A.D. The site has twin mounds. Excavations on the eastern rise identified superimposed clay and laterite wall foundations, clay floors, as well as town lanes. The walls enclose square and rectangular rooms, one of which, measuring 3.8×3.8 m, comprised a clay floor within thick clay walls bearing regularly spaced postholes which had framed wattle and daub walls (FIG. 9). Lidded ceramic vessels had been placed in three of the four corners, the fourth suffered disturbance. The room within contained

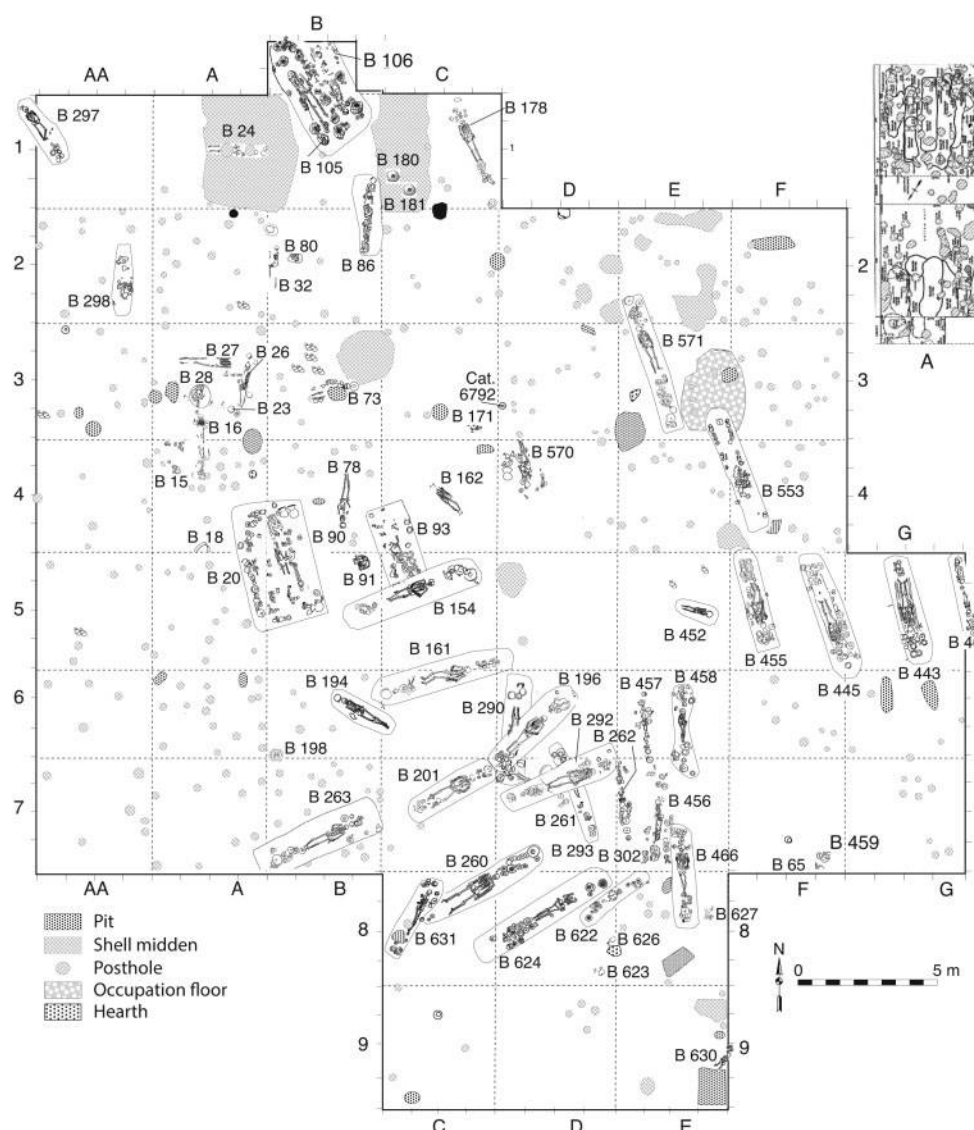


Figure 5 The plan of features identified on the surface of layer 5, towards the natural substrate at Ban Non Wat. Inset A: the area at Ban Chiang that stimulated White's "Ah Ha" moment.

three inhumation graves; an infant lay in one corner, an adult and child towards the center. None of the graves had been replastered with new flooring after burial, but white clay, perhaps part of a collapsed wall, partially covered the adult. This I have interpreted as a ritual chamber. Were these ritual structures, or domestic dwellings? Earlier chambers featured infant graves cut centrally through the floor. One building had suffered a conflagration that preserved detailed structural features. Thus, a kitchen contained cooking vessels still in place over a hearth, and thick concentrations of carbonized rice grains. Floors contained household debris including potsherds and faunal remains. It is suggested that this was a residence that incorporated an infant grave in one of the rooms. The building was located in a town context where craft activities were being undertaken: a ceramic kiln still containing a massive pot lay in the same orientation and adjacent to a house wall.

The western mound also comprised a sequence of structures. Being a larger exposure, it was possible to identify individual rooms on the basis of the clay wall foundations and plastered floors. These were associated with inhumation graves that were cut through the floors. The dead were found in the same orientation as the walls (FIG. 10). There can, again, be little doubt that these were residential buildings, on account of the occupation debris that had accumulated on the floors. Although a chemical analysis of the floors to identify possible room functions has not yet been completed, Kanthilatha and colleagues (2014) have recovered evidence for fatty acids on floor surfaces from Ban Non Wat. It is concluded on this basis that the Iron Age occupants of the upper Mun Valley practiced residential burial rituals not near but actually within houses.

The mortuary traditions in the upper Mun Valley of Thailand between 1750 B.C. and A.D. 600 thus show temporal change. Burials were invariably

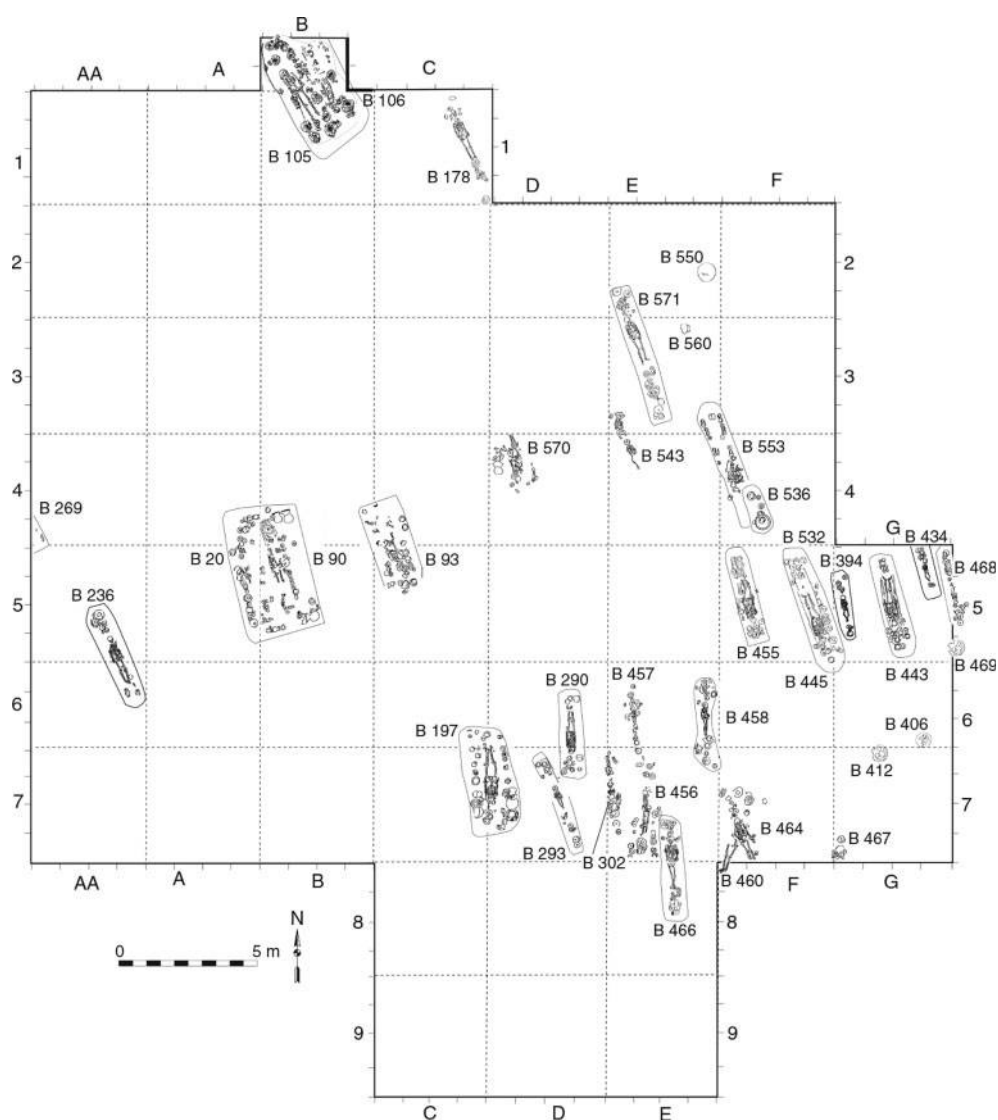


Figure 6 The distribution of Bronze Age phase 2 graves at Ban Non Wat.

located within settlements. During the Bronze Age, the available evidence suggests the use of what White and Eyre (2010: 68) describe as “ritual family loci”, in other words, intravillage cemeteries. The pattern of interments usually involved rows of burials, but at the unusually large excavation at Ban Non Wat, Bronze Age 4 graves also formed columns in which the dead were laid out head to toe with others (Higham 2011). During the early Iron Age at Ban Non Wat, the dead were contained in log coffins that began as a dense concentration and then over time resolved into individual deep graves. In the upper Mun Valley sites, later Iron Age burials were found cut through house floors and within walled rooms.

The Social Implications

Transforming the results of field archaeology into theoretical interpretations of social organization and change over time is a procedure that demands an intensive and accurate assessment of the

excavated evidence. This can only be undertaken by the excavator, or by others reliant on detailed, published reports. As is shown by White and Eyre’s misinterpretations of the evidence from the sites described above, the latter can lead on to ramifying errors of interpretation. It is agreed that semantics aside, early Neolithic to late Bronze Age mortuary traditions of Thailand involved burial in “ritual family loci”, which I see as synonymous with the term “cemetery.” All the cemeteries I am familiar with in Southeast Asia were located within the confines of village or town settlements. Once this is appreciated, many of the social implications of Bronze Age mortuary behavior proposed by White and Eyre conform to what I have long suggested. Thus, in 1989 I wrote that Bronze Age settlements were autonomous, and that “the attainment of status was flexible rather than fixed, and that the relative position of each autonomous settlement was given to fluctuation, and therefore instability” (Higham 1989: 187). What has emerged from over

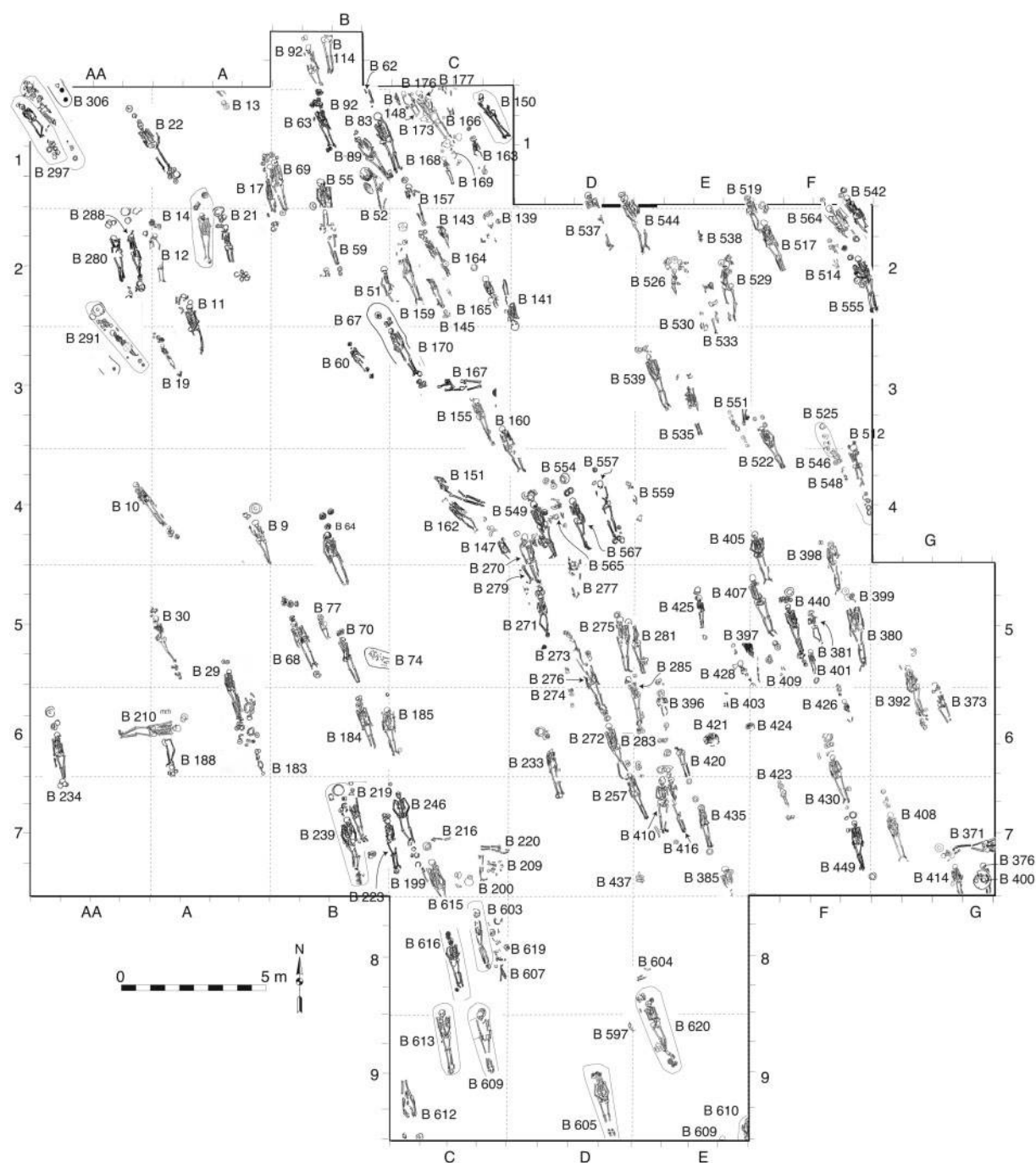


Figure 7 The distribution of Bronze Age phase 4 graves at Ban Non Wat.

20 years of fieldwork in the upper Mun Valley builds on and requires some modification to such earlier models for social organization.

At present, we see that the course of the Bronze and Iron Ages in the upper Mun Valley witnessed at least two instances of marked fluctuation in the attainment of status. Both need to be understood in the context of the geographic location of this region. The strategic importance of the upper Mun Valley lies in its command of the eastern portal of a pass over the Phetchabun Range that links the region to the central Thailand (Higham and Rispoli 2014) (FIG. 1). The Mun River itself flows east to its confluence with the Mekong. It is thus on the jugular

exchange route that controlled access to exotic valuables. During the Bronze Age these included marine shell, marble, tin and copper. The Iron Age expanded the list to include glass, carnelian, agate, gold, and silver. The Mun River region was also a major source of a vital commodity: salt. Prehistoric settlements are thick on the ground, sometimes almost within hailing distance of each other.

Ban Non Wat reveals a record of continuous settlement but fluctuating mortuary behavior. Thus while the form of ceramic vessels placed with the dead during the late Neolithic recur in BA1 burials, the wealth in terms of exotic marine shell and marble ornaments, and the number of pots soared.



Figure 9 A ritual mortuary chamber at Non Ban Jak, dated to the late Iron Age (about A.D. 500–600).

control access to and ownership of exotic prestige goods, including the new medium, copper, and expressed their status in lavish mortuary rituals that involved the immolation of their valuables, and the pots that reflect feasting. Copper artifacts were relatively common in the BA1–BA3A burials at Ban Non Wat, but absent at contemporary Ban Lum Khao. There are more marble and shell bangles and beads on just one individual at the former site than the entire assemblage at the latter. I have suggested that this reflects restricted access to symbols of elite status by a segment of the population at Bronze Age Ban Non Wat (Higham 2011).



Figure 10 The layout of the mortuary period 3 Iron Age graves at Non Ban Jak. On the left, the graves alone are illustrated, while on the right, the associated walls and floors are included.



Figure 11 A man from Bronze Age 3A at Ban Non Wat, interred with multiple exotic marine shell and marble bangles. Scale 10 cm.

A far greater degree of mortuary opulence and ritual complexity occurred during the early Bronze Age at Ban Non Wat than has been documented at any other site. However, it was not sustained at least in the area we excavated. *Prima facie*, there might seem a convincing measure of agreement with White and Eyre (2010: 70) in identifying a waxing and waning of status differentials during this period. However, our interpretations differ significantly. White and Eyre (2010: 68) favor heterarchic “bottom-up corporate modes of complexity” rather than “top down social, economic, or political structures (elite lineages in centers controlling access to scarce resources).” The latter, however, is precisely what we have identified during the early Bronze Age at Ban Non Wat and by inference, at Ban Prasat. This does, however, underline White and Eyre’s stressing the need to examine regionality. Where Ban Chiang was remote from arterial exchange routes and exhibited consistently poor Bronze Age burials, Ban Non Wat sat astride a key route, and early Bronze Age individuals were interred with unparalleled riches.

The second major change took place during the Iron Age. There are hints that burials were now located in houses during IA1 and IA2, and no doubt that they were from IA3. In their review of the theoretical implications of house burial, Adams and King (2010) emphasized issues that bear directly on such a change in mortuary ritual. Essentially, burial within houses links the living with the ancestors, and provides the social context for group identity. It reinforces inherited rights to property, wealth and status by the members of the kin group in question. The transition from interment in a ritual location within a settlement to one actually within the house might seem subtle, but as Laneri (2010) has shown for Mesopotamia during the late 3rd and early 2nd millennia B.C., the establishment of house burial took place at a time of marked economic change. Thus, the rise of merchant and entrepreneurial lineages at that juncture involved the formation of powerful households which disposed of increased wealth and social standing. At Titriş Höyük, the development of residential tombs took place as wine production and exchange for exotic valuables enabled competing merchant households to gain in social prestige and wealth.

As in Mesopotamia so in the Mun Valley moated sites, the advent of house burials took place at a time of fundamental economic and social changes. Long distance exchange brought carnelian, agate, gold, silver, glass and a massive increase in bronze ornaments. Salt extraction led to the formation of numerous production sites. Engineering works involved the construction of multiple banks that surrounded the settlements to capture and reticulate water in moats. Such an endeavor would have involved the marshalling of much labor. This took place at the same time that smiths were forging heavy, socketed iron plowshares. In northeastern Cambodia, Hawken (2011) has suggested that linear features associated with late Iron Age sites are rice field boundaries. Ban Non Wat incorporated an area at the western edge of the site for corralling domestic water buffalo and cattle. Rice was abundant: it was used to fill graves, and large quantities survived in the burnt kitchen floor of an Iron Age house at Non Ban Jak. As Rousseau (1993: 84 [1754]; Higham *et al.* 2014b) incisively wrote when addressing the origins of social inequality, “The true founder of civil society was the first man who, having enclosed a piece of land, thought of saying ‘this is mine’ and came across people simple enough to believe him.”

There is thus a compelling case for the development of an agricultural revolution in the upper Mun Valley that involved plowing with draft water buffaloes in land improved by access to irrigation if

the monsoon rains faltered. Plowing represents a quantum improvement in efficiency compared with hoeing (Goody 1971) and unlocked the potential for social change based on the ownership of improved land. It would also be naïve to suggest that the moats and banks that surrounded the dense concentration of Iron Age sites had no role in defense. This same period witnessed an increase in the manufacture of iron projectile points, one of which, a sharp barbed arrowhead, was found embedded in the spine of one young man interred at Noen U-Loke (Higham *et al.* 2007: 227).

Unlike the situation in the early Bronze Age, the social changes seen in the archaeological record for the later Iron Age did sustain entrenched elites, and the sequel was rapid state formation. The inscriptions that date to the 6th and 5th centuries in Cambodia and the Mun Valley describe predatory military campaigns, kings, and high status leaders named *pon*, who controlled labor, water resources, and the deployment of agricultural surpluses from centers dominated by impressive brick temples.

The importance of location in late Iron Age cultural changes confirms White and Eyre's stress on the regional groups defined on the basis of ceramic styles (White and Eyre 2010). Where the communities in the Mun Valley, central Thailand and the Tonle Sap plains of Cambodia could take advantage of their command of exchange routes and natural resources, those of the remote Sakon Nakhon basin represented by the sites of Ban Chiang and Ban Na Di do not present the same developments: there are virtually no large moated sites, no evidence for elite Iron Age mortuary practices involving residential burial, and little evidence for long distance exchange for exotic symbols of status (Higham and Kijngam 1984).

Conclusions

Translating the results of field archaeology into social theory necessitates an accurate assessment of excavated data within a properly founded chronological framework. Thai mounded sites dating from the Neolithic to the end of the Iron Age were occupied continuously for many human generations. It is often found that the dead were interred over presumed ancestors for centuries and on occasion, millennia. Very few sites have been excavated, and only five or six have been fully published. Excavation is demanding: seasons are always hot and may be punctuated with heavy rains. Direction necessitates fluency in Thai. The stratigraphy encountered is often fugitive and hard to interpret. White and Eyre (2010) have reinterpreted the published reports, suggesting that residential burial rather than cemeteries was the norm in the metal age of Southeast

Asia, and a vital factor in maintaining a heterarchic social order over a period of about 2500 years. This militated against the formation of entrenched hierarchies and fostered social continuity.

The new chronologies for Ban Non Wat, Non Nok Tha, Ban Chiang and Ban Lum Khao (Higham *et al.* 2011; Higham *et al.* 2014b; Higham and Higham 2009) have reduced the duration of the metal age as proposed by White by a millennium, meaning that any social changes following the adoption of metallurgy took place more rapidly than she has assumed. New information from excavations in the moated sites of the upper Mun Valley has pinpointed two instances of intense social change. The first in this strategically favored region saw a rapid and dramatic rise in mortuary wealth that endured for about two centuries at the start of the Bronze Age. The elite ritual burial location found in the center of Ban Non Wat is unlikely to be unique in this region, indeed equally well-endowed burials are known in a central position at the nearby site of Ban Prasat. The second social change was under way during the millennium of the Iron Age when the dead were interred in houses. This coincided with a sharp rise in the wealth of burials, ownership of exotic ornaments, increased conflict, an agricultural revolution involving plow agriculture in fixed rice fields, and the construction of banks and moats around large town sites. In the sequel, there was a swift transition into early states ruled by an entrenched social elite. This sequence is specific to the upper Mun Valley: other regions will have their own.

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