

# Debating a great site: Ban Non Wat and the wider prehistory of Southeast Asia

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*Explanations of the factors determining the trajectories of prehistoric human societies, from their emergence to their disappearance, rely above all on the chronological accuracy of the information available. (Bocquet-Appel et al. 2014: 53)*

## Introduction

Almost half a century has elapsed since the first area excavation of a prehistoric site in north-east Thailand at Non Nok Tha (Bayard & Solheim 2010) (Figure 1). A long and still unresolved debate has ensued, centred on the chronology of the establishment of rice farming and bronze casting, that has dovetailed with further controversies on the pace and nature of social change. Results obtained during the past 20 years of fieldwork focused on the upper Mun Valley of north-east Thailand, together with a new series of AMS radiocarbon determinations from key sites, have thrown into sharp relief contrasting interpretations of two issues: one centres on the timing and origin of the Neolithic settlement; the other on the date and impact of copper-base metallurgy. A consensus through debate would bring us to a tipping point that would see Southeast Asian prehistory turn to more interesting issues of cultural change.

## Chronology

Excavations at Non Nok Tha in 1966–1968 and Ban Chiang in 1974–1975 have generated alternative chronologies that encapsulate the very history of radiocarbon dating. Polarisation is seen in supporters of a long chronology (LCM) and a short chronology (SCM). Non Nok Tha and Ban Chiang began with Neolithic settlement followed by the introduction of bronze casting. Three stages in radiocarbon technology are involved:

- The excavators of both sites accumulated fragments of charcoal, often from grave fill, until there was sufficient material for a conventional radiocarbon determination. Despite internally contradictory results, a fourth millennium BC date for copper-base metallurgy entered the literature, preceded by a still earlier adoption of rice agriculture and a second millennium BC context for the first use of iron (Solheim 1968; Bayard 1972; Gorman & Charoenwongsa 1976). North-east Thailand was thus catapulted to the position of being one of the earliest

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centres of bronze casting and iron smelting anywhere, if not the earliest. An unresolved debate has ensued (Bayard & Charoenwongsa 1983; Loofs-Wissowa 1983; Higham *et al.* 2011, White & Hamilton 2014).

- Resolution seemed to appear with the AMS C<sup>14</sup> dating of organic temper in mortuary pots. Employing this technique, White and Hamilton (2009, 2014) now place the transition into the Bronze Age at Ban Chiang in the vicinity of 2000 BC. This is the basis for the LCM. Old carbon in potting clay may, however, lead to erroneously early determinations (Bonsall *et al.* 2002; Berstan *et al.* 2008).
- A conundrum presented itself when 76 radiocarbon determinations for the Neolithic to Iron Age sequence at Ban Non Wat, 280km south-west of Ban Chiang, placed the initial Neolithic settlement some centuries later than White's date for the Bronze Age at Ban Chiang, and the local transition into the Bronze Age at about 1000 BC (Higham & Higham 2009; Higham & Kijngam 2009, 2011, 2012a, 2012b). These determinations provide the basis for the SCM. Is it likely that the adoption of copper-base metallurgy took place a millennium apart in sites so close together? This Gordian Knot needed its own Alexander, and it came in the form of the third stage of radiocarbon dating, centred on the ultrafiltration of human bone to isolate uncontaminated collagen (Brown *et al.* 1988; Higham *et al.* 2006), linked to Bayesian statistical analysis of the sequenced determinations (Buck *et al.* 1996; Bronk Ramsey 2001; Bayliss *et al.* 2007). By identifying the start, end and duration of key phases, the pace of cultural change can take centre stage in illuminating the key issues to be addressed.

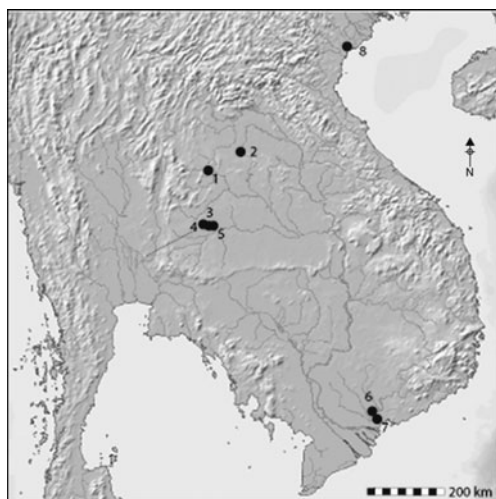


Figure 1. Map of Southeast Asia showing the location of the sites mentioned in the text: 1) Non Nok Tha; 2) Ban Chiang; 3) Ban Non Wat; 4) Noen U-Loke; 5) Ban Lum Khao; 6) An Son; 7) Rach Nui; 8) Man Bac.

A new set of human collagen determinations from Non Nok Tha now place initial Neolithic settlement in the fourteenth century BC, with the Bronze Age cemetery falling between 900–600 BC (Higham *et al.* 2014). The bone collagen samples from Ban Chiang date initial Neolithic occupation to about 1500 BC, and a transition into the Bronze Age in the tenth century BC (Higham *et al.* 2011, 2015). These mirror the dated sequence from Ban Non Wat (Higham & Higham 2009). All place the initial Neolithic settlement of north-east Thailand and, by inference, much of mainland Southeast Asia, in the early to mid-second millennium BC, and the inception of the Bronze Age in about 1000 BC. Do advocates of the LCM still

support it, or do they accept the new SCM, with all its cultural implications for rapid social change rather than centuries of cultural somnolence?

## The Neolithic: intrusive farmers or indigenous hunter-gatherers?

Was there an indigenous 'Neolithic revolution' in Southeast Asia? There are two alternative explanations for the establishment of farming communities. The regional continuity model identifies local origins with little if any influence from elsewhere (White *et al.* 2004; White 2011). The 'two-layer' hypothesis envisages a demic diffusion south from the centres of origin for rice and millet domestication in the Yangtze and Yellow River regions (Fuller *et al.* 2010).

In Southeast Asia, the two-layer hypothesis has gained traction by tracing the course of Neolithic expansions southward (Rispoli 2007; Zhang & Hung 2010). At Man Bac, the cemetery population incorporates indigenous and intrusive individuals (Dodo 2010; Matsumura 2010). DNA from rice remains at An Son, Ban Non Wat and Noen U-Loke has identified *Oryza japonica*, which points to an origin in the Yangtze Valley (Tanaka *et al.* 2015), while the recovery of millet seeds from central Thai and coastal Vietnamese Neolithic sites indicates an origin in northern China (Weber *et al.* 2010).

Akin to Man Bac, it has been suggested that the initial occupation of Ban Non Wat involved a coalescence of indigenous hunter-gatherers and intrusive Neolithic farmers. The early Neolithic middens contain many shellfish, fish, rice and bones from the domestic dogs, pigs and cattle (Kijngam 2010). The pottery from these occupation contexts was decorated with painted designs, and impressed and incised (I&I) patterns that are widely matched in Southeast Asia. This initial context has been dated to the mid seventeenth century BC. The phase 1 Neolithic cemetery dates from about 1500 BC. Burials were either inhumed in a supine position or placed seated in huge lidded ceramic vessels. Grave goods included pots and domestic pig bones. A second group of burials, contemporary with Neolithic 1 graves, were found in the flexed position, characteristic of indigenous hunter-gatherers. Testing for the presence of two groups of people has involved the analysis of the isotopes in the teeth. Hardly any individuals reveal a distant origin, but unlike the assumed Neolithic group, a significant number of the flexed individuals were immigrants from a different habitat and did not have a diet that included rice (King *et al.* 2015). The mortuary offerings were quite distinct from the presumed Neolithic individuals in extended burials. The final word on the status of the flexed burials, however, must await the detailed analysis of the crania and dentition.

Did the two-layer model involve a homogeneous tsunami of settlement from a single source, or passage over several probably unrelated southerly routes at different times? What was the role of indigenous hunter-gatherers? Was there an indigenous Neolithic revolution? We know that small groups of hunter-gatherers occupied upland rock shelters during the millennia preceding the first lowland farmer settlements. There were also rich and sedentary coastal settlements, and, in Guangxi Province of southern China, large hunter-gatherer communities lived along river margins (Higham *et al.* 2011). Similar lowland, riverine sites in Thailand and Cambodia await discovery. That hunter-gatherers lived in such areas is suggested in the early flexed burials at Ban Non Wat. The strong

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probability of coastal settlement prior to the brief period when the sea rose above its present level in the third millennium BC cannot be identified due to the earlier inundation of Sundaland.

Evidence for burning and vegetation disturbance dating between 4400–1800 BC in the sediments of Lake Kumphawapi near Ban Chiang has been interpreted as the result of “anthropogenic activities usually associated with systematic plant cultivation” (White *et al.* 2004: 123). Present evidence, however, rather points to multiple expansionary population moves south by millet and rice farmers, who integrated, as seen at Ban Non Wat, Khok Phanom Di, Man Bac and An Son, with indigenous hunter-gatherers (Piper & Oxenham 2014).

The two-layer model has been further supported by the analysis of dental traits. Matsumura and Oxenham (2014) have identified a group representing indigenous hunter-gatherers who survive in the Andaman Islands, Australia and Melanesia, to which pre-agricultural individuals in Southeast Asia belong. A second group is found in north-east Asia and the Americas. They then encountered a series of significant findings in the dental traits of Neolithic and later prehistoric individuals in Southeast Asia. Northern features were particularly evident in the Red River delta region, which was relatively easily reached by southward expansion from the Yangtze Valley. But beyond, in less accessible areas such as the Khorat Plateau, there was a clinal distribution of northern traits.

Consensus that there were expansionary movements into Southeast Asia by established farmers opens many avenues for future enquiry. Early Neolithic settlements are few and far between, but they display a nexus of common features: individuals were interred in a supine and extended position, associated with ceramic vessels that were decorated with incised, impressed and painted designs. From Myanmar to Vietnam, some of the dead were also accompanied by large bivalve shells. They raised domestic pigs and dogs, while cattle were present at Thai sites but absent from Neolithic settlements in coastal Vietnam. According to DNA analyses at An Son, they cultivated the Chinese rice species *O. s. japonica* (Bellwood *et al.* 2013), yet there are also marked regional differences. In Central Thailand, millet seems to have been preferred to rice. Forms of pottery vessels also vary significantly between regions.

We are still at an early stage of understanding what happened, and, to move forward, we need to identify more sites, excavate large areas and deploy the battery of new ideas and techniques that are transforming our understanding of related cultural changes in Europe. Thus, the role of indigenous hunter-gatherer populations in the transformations brought about by the ingress of farmers is unknown, whereas in Europe, Barrett (2014: 41) has described “attempts to provide hunter-gatherers with an active and strategic role in the history of their own transformation”. Before the recent identification of domestic architecture at Rach Nui in southern Vietnam (Oxenham *et al.* 2015), hardly a single Neolithic house was known in Southeast Asia, but the potential of household archaeology is plainly to be seen in the faunal analyses of Hachem and Hamon (2014). This list could go on. It has to be asked if the Neolithic period involved the arrival of a handful of immigrants that led to prestige transmission (Mills 2008), or was there indeed an influx of new populations leading to regional patterns of integration with the indigenes? In either case, there will be

a need to explore the extent to which ceramic forms and motifs are an accurate reflection of social entities (Dietler & Herbich 1998; Gosselain 1998). This approach will necessarily involve the potential of archaeological science to identify broad relationships through the analyses of isotopes and aDNA.

## Bronze Age origins: China or the Altai?

The SCM places the transition into the Bronze Age in about 1000 BC, a context that harmonises with an origin in the progressive southward expansion of copper-base metallurgy originating in the early states of China (Pigott & Ciarla 2007). This contradicts the LCM, which has identified the origins of the Ban Chiang Bronze Age in the Seima Turbino metallurgical tradition, centred between the Altai Mountains and the Dneiper River. This remote but direct origin necessarily bypassed the Chinese lowlands because the LCM at 2000 BC would precede bronze casting in the Central Plains of China (White & Hamilton 2009, 2014).

LCM radiocarbon dates are unreliable, and unanimity on new charcoal, shell and collagen AMS dates would direct attention to the social impact of copper-base technology. Until the excavation of Ban Non Wat, the evidence tended to suggest very little social change occurred for least 1500 years. Few metal artefacts were interred with the dead, and no site provided evidence for a wealthy elite. The areas opened at Ban Chiang were very small and mortuary offerings during the Bronze Age were minimal. Even in the larger excavations at Non Nok Tha and Ban Lum Khao, human burials were not wealthy. Analyses of the larger mortuary samples have struggled to find any evidence for a wealthy elite (O'Reilly 2004; Bacus 2006; Higham 2011; Higham *et al.* 2015 in press).

This evidence suggested to me 25 years ago that Bronze Age settlements were autonomous, 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). This view was echoed by the proposal for heterarchy, and the observation that no north-east Thai site has revealed a distinct, isolated area exclusively for well-endowed graves (White & Pigott 1996). Further support came from the suggestion that the Bronze Age mortuary ritual involved residential burial (White & Eyre 2010). The reinterpretation of ‘metal age’ mortuary contexts concluded that the excavators in each case have missed the vital taphonomic point, that domestic structures housed the deceased. It is argued that such house societies were instruments for remarkably long-term occupation of individual settlements by heterarchic, non-violent supravillage affiliative social groupings (White & Eyre 2010).

The interpretation of a Bronze Age heterarchy persisting over a period of at least 1500 years has been overturned not only by the SCM, but also by the unprecedented mortuary wealth seen in the early Bronze Age elite at Ban Non Wat, where the elites were interred with exotic marble and marine shell bangles, tens of thousands of shell beads and copper base tools and ornaments, as well as a wide range of finely painted ceramic vessels (Figure 2; Higham 2011).

I suggest that in the strategic Mun Valley, metallurgy was one factor in generating a competitive social milieu in which charismatic and ambitious leaders commandeered the



ownership of prestige valuables. Maintenance of elite status was projected by competitive feasting documented in the food remains and the vessels placed with the deceased. Such competitive emulation within and between communities was inherently unstable, being dependent as much on good fortune as social planning (Higham 2011).



Figure 2. Burial 197 from Ban Non Wat, belonging to the second phase of the Bronze Age (c. 900 BC); it is a wealthy male, interred with several copper implements, exotic marble and marine shell ornaments and ceramic vessels; one pot was decorated with a row of dancing figures.

and axes, with barely a single contemporary burial containing a bronze artefact.

As with the initial Neolithic settlement, the establishment of copper-base metallurgy across the lowlands of Southeast Asia awaits detailed analyses of the mechanics of cultural transmission. Given the complexities of mining, smelting and casting, it is initially considered unlikely that simple verbal instruction was involved. According to Eerkens and

Location is key. Ban Non Wat commands a pass over the Petchabun Range that leads on to the Central Thai copper mines (Higham & Rispoli 2014). In an easterly direction lie the Mekong and the Sepon copper deposits. The inhabitants of Ban Non Wat controlled salt deposits. Elites were not confined to Ban Non Wat; the nearby site of Ban Prasat has burials of similar wealth. Other demarcated ritual loci might be awaiting discovery elsewhere. I anticipate this in my model that identifies the role of charismatic individuals who manipulated access to the new media for exhibiting status—copper, marble, marine shell, cloth, animals and doubtless less durable items—to their own advantage. At death, their prestige valuables were immolated with them, to the accompaniment of feasting. I stress that this social milieu was competitive, and the maintenance of elevated standing for a given social group was not guaranteed (Higham 2011).

This new dawn for our appreciation of the Bronze Age invokes new research objectives. We need to strengthen research into the social organisation of copper extraction. Did elites also control mining, smelting and the exchange of ingots? Pryce's research into copper sourcing has identified exchange networks (Pryce *et al.* 2011). How was the casting of copper-base artefacts organised? We have the conundrum at Ban Non Wat, of a founder interred with multiple moulds for casting bangles

Lipo (2007), a combination of visual, verbal and repeated instruction is the most successful means of transmitting technical expertise successfully. Southeast Asia is the perfect milieu for exploring this issue, given the regularity, for example, with which founder burials have been identified from southern China to north-east and Central Thailand. Was the Ban Non Wat founder an itinerant, or a dependent specialist who guarded his skills and passed them down to his descendants through scaffolding, a procedure that “involves the integration of novices into normal craft production by providing as much assistance as necessary to ensure success” (Ferguson 2008: 52).

## Conclusions

Movius (1960: 355) once noted of the Upper Palaeolithic that “Time alone is the lens that can throw it into focus”. This applies with equal force in Southeast Asia, where it involves deciding between the LCM and the SCM. Consensus on chronology opens issues that are significant well beyond Southeast Asia. Archaeological and biological evidence reveals the widespread establishment of Neolithic farming settlements. In my view, this reflects a series of intrusive movements of farmers from the lowlands of the Yangtze and Yellow Rivers. Genetically determined variations in tooth morphology suggest that the impact on the indigenous hunter-gatherers varied markedly between regions. Is it possible, archaeologically, to trace separate corridors, be they riverine or coastal? Alternatively, was there one major expansion of rice farmers into Southeast Asia, followed by local diversification of ceramic styles? What was the impact on, and contribution by, the indigenous inhabitants? Was there an earlier and indigenous process of plant and animal domestication, and if so, where is the evidence?

The prehistoric sites on the Khorat Plateau that witnessed the transition from the Neolithic into the early Bronze Age have now furnished virtually identical dates. I suggest that knowledge of copper-base metallurgy spread rapidly, but what was the source and the mechanism of knowledge transfer? Is it possible to identify evidence for experienced entrepreneurial miners and founders exploring Southeast Asia for copper, and possibly tin, ores to exploit? Founder burials are known from Hong Kong to Central Thailand. How can we best explain the rapid rise of social elites at this very juncture, and the remarkable weight of exotic marine shell and marble jewellery that they wore at Ban Non Wat? Why were these individuals at Ban Non Wat so wealthy, but their contemporaries at Ban Chiang and Non Nok Tha so poor? Does this reflect the advantages of location on a major arterial exchange route? Or could it be sampling error, given the very small areas opened relative to total site size? In her review of three of the four volumes reporting on the 2001–2007 excavation seasons at Ban Non Wat, White (2013: 911) noted that it is a great site, concluding that:

*how the new data can best be conceptualised socially, economically and politically, and then integrated with the larger set of regional data for this period, will likely engage regional archaeologists for at least the coming decade.*

This, at least, is unlikely to be a cause of further debate.

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