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Review Article

Ban Chiang, Northeast Thailand, Volume 2: Metals

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Ban Chiang, Northeast Thailand, Volume 2A: Background to the study of the metal remains

Edited by JOYCE C. WHITE and ELIZABETH G. HAMILTON
Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology

2018. Pp. 265. Maps, Plates, Glossary, Bibliography, Index.

Ban Chiang, Northeast Thailand, Volume 2B: Metals and related evidence from Ban Chiang, Ban Tong, Ban Phak Top, and Don Klang

Edited by JOYCE C. WHITE and ELIZABETH G. HAMILTON
Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology

2018. Pp. 264. Maps, Plates, Glossary, Bibliography, Index.

Ban Chiang, Northeast Thailand, Volume 2C: The metal remains in regional context

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Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology

2019. Pp. 218. Maps, Plates, Notes, Bibliography, Index.

These three volumes, along with the forthcoming Volume 2D, the catalogue of metal and metal-related finds, present the results of a thorough, detailed study of the metals recovered during archaeological investigations in 1974 and 1975 at the village of Ban Chiang and three smaller sites in the northern part of northeast Thailand. At a time when little was known of Southeast Asian prehistory, the finding of very elaborately painted earthenware pottery vessels, probably prehistoric, at Ban Chiang stirred the interest not only of archaeologists, but also, unfortunately, from the standpoint of scientific investigation of the past, that of looters, dealers, and collectors of antiquarian art. In order to recover a sample of these vessels in their original depositional context, the Thailand Fine Arts Department and the University of Pennsylvania

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undertook one of the largest excavations of a prehistoric site carried out in Southeast Asia at the time. What subsequently caused added excitement in the media and the scientific community was the recovery of artefacts of iron that appeared to date to the second millennium BCE and of copper or bronze associated with dates in the fourth millennium BCE, perhaps as early as 3600 BCE, seeming to confirm similar early dates for bronze working from the nearby site of Non Nok Tha. Such early dates suggested the possibility of an independent development of metallurgy in Southeast Asia. Because of the importance of the excavation at Ban Chiang as a milestone in Thai and Southeast Asian archaeology, the site was later placed on the UNESCO World Heritage List.

After the initial publication of these findings, it became clear that the oldest radiocarbon and thermoluminescence dates were problematic and almost certainly too early, but the controversies that ensued about the actual dates for the Ban Chiang site continue to the present. These volumes place the age of the oldest copper-base artefacts at the beginning of the second millennium BCE and iron artefacts early in the first millennium BCE, resulting in longer periods of use of these metals than some archaeologists would accept. While the authors present their view of the likely absolute age of the metal remains in Volume 2A and discuss the contextual associations of the earliest metal in Volume 2B, early in Volume 2A they present a relative chronology consisting of a sequence of periods and phases based mainly on burial pottery types that allow subsequent discussion of temporal change while largely avoiding the use of still uncertain absolute dates.

The later dates for early metal use and especially the more in-depth analysis of the materials from Ban Chiang and other sites indicate that the metal and metallurgical remains from Southeast Asian sites do not represent an independent development of metalworking. As the analysis in these volumes shows, the earliest copper-base tools and ornaments were made using fairly advanced metalworking techniques, and the smiths had clearly acquired this knowledge from elsewhere. Nevertheless, despite the changing ideas about origins and age, these sites have produced important and relevant data concerning Southeast Asian prehistoric metallurgy. The assemblage of over 600 prehistoric metal artefacts, wires and rods, and amorphous pieces (probably melting and casting by-products) from these sites make up one of the largest, relatively well-preserved (with little corrosion) and well-documented samples of metal from any Southeast Asian site. Although the continuing controversy regarding the site, the large number of finds, and the untimely death of the U. of Pennsylvania project co-director Chester Gorman have delayed publication, the additional analytical time has been of value in that it has allowed a more thorough examination of the metal artefacts, frequently using scientific techniques that were not available at the time of the excavations. Of the metal remains, a larger number than from any other site in Southeast Asia have been subject to some kind of specialised metal analysis.

In these volumes, the editors and primary authors, Joyce White, who took over direction of the project after Gorman's death, and Elizabeth Hamilton, are concerned with moving beyond the questions about age and origins to present an in-depth understanding of the procurement of metal ores, the manufacture of metal products, their distribution, and their use at consumer sites, and to place these activities in the

socioeconomic context of prehistoric metal-using Southeast Asian societies. The case they are making is that, by shifting the focus from questions about age and origins, the metal artefacts from the sites have the potential to answer many other questions about the early communities using these metals. The main objectives of this set of volumes are to present the results of the analyses of the metal and metalworking remains from the four sites, discuss their significance at these sites, and, more broadly, relate these finds to the remains at other prehistoric sites in central Mainland Southeast Asia that were ore mining, metalworking, or metal-consuming locations.

Volume 2A provides background information for the study, ranging from a brief description of the archaeological context of the remains (important since a detailed report of the excavations beyond White's dissertation has not yet been published), the archaeometallurgical theory underlying the analyses used in this study, the societal context of the communities that adopted the use of metals, and the geographic location of the copper, lead, tin, and iron ore sources in this part of the world, concluding with a discussion of the processes of both copper/bronze and iron metallurgy. The discussion of the geological history and geomorphological processes that gave rise to the current distribution of metal ores, considered brief by the authors, may seem quite detailed to the non-specialist, but several maps simplify and effectively clarify the text discussion. The presence of ore sources throughout the fold belt mountains around the middle Mekong basin and their absence on the Khorat Plateau is critical to interpreting prehistoric patterns of procurement and exchange in this region. The consolidation of the geological information in chapter 6 is likely to prove useful for those seeking to interpret the finds of metal artefacts and manufacturing by-products from regional archaeological sites.

The heart of Volume 2A is White and Hamilton's argument for the application of a new archaeometallurgy paradigm that focuses analysis on the processes of metal production and distribution and how metal technology and consumption functioned within the communities working metal or consuming metal products. Chapter 3 critiques previous theoretical approaches (what the authors call the 'conventional paradigm') to the study of prehistoric metallurgy in Southeast Asia. A major concern is rejection of the application of the standard Old World archaeological stages, such as Neolithic, Bronze, and Iron Ages, to the Southeast Asian prehistoric sequence. The authors' view is that behind the use of these technological stages and other universalist period and stage frameworks lie assumed correlations and especially an implication that advances in technology were critical to changes in social and political complexity. Their criticisms of assumptions, logical problems, and unsubstantiated conclusions in past approaches are valid and apt, although their discussion of processual approaches in archaeology seems to focus on a set of problems that this reviewer would see as reflecting the incorporation of older approaches and concepts into processual archaeology and not the core of this approach. They present their new archaeometallurgy paradigm as better reflecting the reality of how technology is adopted and changes in diverse ways in 'less linear, more complex, and messy' processes. This leads to their major point, presented in chapter 5, that the introduction and subsequent development of metal technology resulted in little change in the middle-range societies of prehistoric Southeast Asia. In their interpretation, metalworking technology became an element of the technological and socioeconomic systems of these

communities without changing the scale of political and economic complexity in a major way.

Volume 2B presents the results of the analyses of the metals (and artefacts used in metalworking) from Ban Chiang, Ban Tong, Ban Phak Top, and Don Klang. The first half covers the technical aspects. Hamilton thoroughly reviews the analytical methods used and what they can disclose. After classifying the metal artefacts into major types, Hamilton and Samuel Nash present a clear discussion of the results of the technical analyses and what these reveal about the manufacturing processes used. Similarly, chapter 5 presents the results of the analyses of the other artefacts, such as clay moulds and crucibles, used in the manufacture of metal artefacts. Throughout the volume, a multitude of artefact drawings and several colour plates illustrate the materials, and numerous tables clearly present the results of the studies.

The second half of the volume relates the metal finds to the contexts from which they came, be it as burial goods, in association with a burial, in a feature, or within the general soil matrix. For the burials, there are 11 pages of drawings and photographs illustrating the contexts of the metal finds. A few profile drawings of the strata and other features in the vicinity of some of the more important burials would have been helpful, but all else is very well illustrated. The examination of the non-burial remains, overlooked in some studies, provides valuable information for recognising the processes of manufacturing the artefacts that could not be determined simply by examining the completed artefacts found with the burials. Relating the analysed metal artefacts to their depositional contexts (the temporal and spatial locus of particular finds), critical to understanding the history of metallurgy and metal use, has been missing in previous technical reports.

Volume 2C broadens the discussion to the entire region of northeast and central Thailand and Laos, focusing first on the known ore sources. Vincent Pigott summarises what is known about ore mining and smelting sites, providing detailed description and thorough discussion of two major copper mining and smelting locations, the Khao Wang Prachan Valley in Lopburi province in central Thailand and the Phu Lon Complex in Loei province along the Mekong River in northeast Thailand, as well as a brief review of the more recently discovered complex near Sepon in Savannakhet province in southern Laos. All three complexes seem to have focused on copper mining and smelting, with alloying and final casting done elsewhere. Pigott concludes that several technological features link the three complexes to one another and to certain metal-consuming sites. T.O. Pryce uses lead isotope characterisation to demonstrate that some of the copper-base artefacts at Ban Chiang and Don Klang were made of copper from the Sepon ore sources in Laos.

Hamilton and White then summarise, in a clear, well-focused, and detailed review, metal use at regional prehistoric sites that, generally, is quite thorough. There are a few exceptions, such as the Ban Prasat site in the Upper Mun River Valley, where the authors rely on brief statements from a secondary source. The Ban Prasat excavations uncovered richly-furnished burials with large quantities of bronze ornaments, including unusual face ornaments associated with two burials. The inclusion of information from primary Thai language sources on this and a few other sites would have broadened their review of copper/bronze use in the area; although, in the absence of quantitative information or specialised analyses

for the materials, the omission does not affect their conclusions. White relates the sites under review to one another chronologically primarily on the basis of similar ceramic assemblages and the presence of selected key artefacts rather than radiocarbon dates. A fold-out chart links the stratigraphic sequence at Ban Chiang to the other three sites analysed in these volumes and presents an initial attempt to relate the stratigraphic sequence of layers at each of these sites to those at other metal-using sites in Thailand and Laos. The chart illustrates the widespread distribution of the incised and impressed (i&i) pottery that marks the earliest occupation at many agricultural settlements and highlights her proposed correlation of the components of the sites in the northern Khorat Plateau with those in the Upper Mun River Valley. While there will be disagreements with some of White's correlations, particularly for bronze-using sites, the chart's breadth of coverage will make it a useful starting point for those attempting to synthesise the flow of cultural events and changes in central Mainland Southeast Asia.

The large-scale excavation at Ban Non Wat receives major attention with a critique that focuses on both inadequacies the authors perceive in the analyses conducted to date and the very different interpretation of the finds from that site by the excavators compared to that of the authors for the Ban Chiang metal. This critique reflects the volumes' main points, which White reiterates in the concluding chapter. Metal analysis must be detailed, consist of a large sample, and include metal smelting and casting debris from the general soil matrix and not just finished burial artefacts. The authors conclude that copper-base metallurgy and metal use are associated with medium-scale agricultural societies that over several millennia remained decentralised; while helping to integrate these societies, metallurgy did not lead to more complex state societies. Therefore, to speak of a Southeast Asian Bronze Age and an Iron Age, especially as indicating stages of not just technological but sociopolitical development, is seen as misleading.

All three volumes have been well edited both with regard to the very rare occurrence of typographic errors and the clear presentation of the information and arguments. The volumes are necessary reading by anyone with an interest in Southeast Asian metallurgy. Aspects of the background information presented in the first volume will prove useful for many; for example, the authors review the data from other early metal-using societies and interpretations of the data, showing that the Southeast Asian situation is different in particulars from many of them, but not really anomalous. Portions of these volumes are of necessity quite technical and presentation of the results of the classification and technical analyses will seem detailed to the general reader, although invaluable to the specialist. On the other hand, those sections dealing with the provenance of the metal at Ban Chiang and the other sites in central Mainland Southeast Asia will be important for all students of Southeast Asian archaeology. After these many years, the volumes provide not only a detailed report of an important set of data from one of Southeast Asia's most significant sites, but also a synthetic review of what is known about prehistoric metalworking and use in the region.