



# Building from the Ground Up: The Archaeology of Residential Spaces and Communities in Southeast Asia

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## Abstract

Despite the ethnographic importance of the Southeast Asian house and household, an explicitly Southeast Asian “household archaeology” is still in its infancy. Nevertheless, archaeologists in Southeast Asia have undertaken excavations within habitation areas and residential spaces, identifying domestic debris, the partial remains of house structures, and activity areas. As a result, archaeologists of Southeast Asia have addressed many topics of relevance to those who use a household archaeology approach, including the identification and description of houses and household activities; the domestic economy; domestic ritual; diversity and variability both within houses as related to questions of identity, specifically gender and age, and between houses, especially as related to status; and identification of supra-household communities. In this review, I consider how archaeologists have addressed these themes using examples from a diverse set of geographic locations and time periods in mainland and island Southeast Asia. I conclude with suggestions for future research directions to continue building an archaeology of residential spaces and communities in Southeast Asia.

**Keywords** Southeast Asia · Dwelling · House · Village · Community · Residential burial · Craft production

## Introduction

Since the 1980s, household archaeology has emerged as a major focus of archaeological study around the world. Household archaeology describes a method or approach in which dwelling spaces and residential areas are excavated as a means to address a variety of research questions centered on the most fundamental component

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of society: the household unit (Ashmore and Wilk 1988; Douglass and Gonlin 2012; Wilk and Rathje 1982). Archaeologists excavate and study the material remains of houses, including the interior and exterior portions of the dwelling itself as well as artifacts, ecofacts, and features associated with these residential areas. As Wilk and Rathje (1982) noted in their early work defining household archaeology, the social component of the house—the household—varies over time and space. They described households as people who cooperate economically with one another (Wilk and Rathje 1982, p. 620). Others have used a broader concept that includes members who share a group identity and/or a set of goals (Chesson 2012). Co-residence in dwellings is not necessarily a requirement; in some societies, a household might consist of a nuclear family living in one house, whereas in other societies, a household might include members that do not all live in the same physical location. Nevertheless, even if the social units of households vary from culture to culture, an examination of households and dwelling spaces allows archaeologists to undertake what Tringham (2001, p. 6925) has called “a humanized reconstruction of the past.” Multiple research questions or topics have been addressed through household archaeology.

Early proponents of household archaeology focused on households as microcosms of society, arguing that through their careful examination, they could be used to understand the larger aspects of a culture (Bourdieu 1973; Flannery 1976; Rapoport 1969; Wilk and Rathje 1982). The identification and description of household activities, household production, and consumption, and the examination of the domestic economy were seen as ways to illustrate broader patterns of social and economic organization (Allison 1999a; Ashmore and Wilk 1988; Flannery 1976; Hastorf and D’Altroy 2001; Hirth 2009b; Wilk and Rathje 1982). Included in this is a recognition that the space outside and around the dwelling structure, including garden spaces and refuse areas, can be informative for understanding the household economy and social dynamics (Hardy-Smith and Edwards 2004; Hayden and Cannon 1983; Johnston 2005; Robin 2003; Stark 2014).

With the growth of feminist archaeology and gendered approaches to the past, increased attention began to be paid to the social makeup of households, specifically the men and women who lived in houses. This perspective grew partly out of structuralist models that saw a division between public and private life and an association of women with the domestic sphere; houses became a place to find women in the archaeological record (Brumfiel and Robin 2008; Conkey and Spector 1984; Gero 1985). However, studies quickly expanded to consider more nuanced questions about the social dynamics of households beyond just looking for women (Allison 1999b; Brumfiel and Robin 2008; Tringham 1991). Houses were not only “neutral locations” but also “a space within which certain kinds of social relations and identities are defined created and emphasized through meaningful action” (Hendon 2007, p. 274). Researchers have considered the ways that gender shapes the material culture of houses (e.g., Lawrence 1999), whether certain spaces in households were gendered (e.g., Goldberg 1999; Kahn 2016, pp. 343–345; Lee 2019), and how gender structured the domestic economy and household labor (e.g., Brumfiel 1991; Hendon 1996).

Using data from domestic contexts, archaeologists have also considered other aspects of identity such as age and status. For example, Meskell (1998) used the rich archaeological and historical record at Deir el Medina, Egypt, to explore the social relations of the diverse individuals who lived at the site. Based on the presence of wall paintings of women and depictions of the Egyptian god Bes, associated with women and sexuality, Meskell argued that the first room in the house was the domain of adult women. The elite male homeowners were better represented in the second room, a larger space with higher quantities of ritual fixtures and objects, as well as a divan, which was associated with male status. The back rooms of houses are generally undecorated and contained objects associated with food production, baking, and brewing, such as ovens and a mortar and quern. Meskell identifies these spaces as those used by slaves or servants, likely young women, whose presence is referenced in texts. Although it is unclear how servants or slaves would have been perceived as members of a household, in carefully considering how these rooms would have been used on a daily basis and by whom, Meskell breaks down the household as a monolithic concept and considers the individuals within a house, their identities, and their social relationships.

As datasets have grown, archaeologists have also emphasized the importance of identifying diversity and variability between households and within a community. Such studies can be informative for understanding questions regarding the sociocultural dynamics and economic organization of communities. One major topic is status and the identification of material indicators of elite and commoner houses, including relationships between household size and wealth (Kohler et al. 2017; Netting 1982; cf. Vésteinsson et al. 2019), the nature, quantity, and type of household possessions and connections to wealth or status (Smith 1987), and status and the placement of houses on a landscape (Coupland 2006; Weisler and Kirch 1985). More recently, it has become evident that a large comparative dataset of multiple houses over time is needed to determine similarities and differences between households. These data, combined with mortuary data, can be used to make more sophisticated interpretations about wealth and inequality in a community (Drennan et al. 2010).

Comparisons between urban and rural households have also been informative for understanding how different levels of state control and interaction affect the household domestic economy as well as the labor of individuals within households. Brumfiel (1991) compared quantities and proportions of cooking pots, tortilla griddles, and spindle whorls associated with women's textile production in different locations in central Mexico. In doing so, she was able to consider gendered differences in household labor and the domestic economy across sites in different environmental zones and with varying degrees of integration into the Aztec empire. In a more recent study, Franklin (2019) similarly identified differing gendered labor demands between urban and rural slave households. Labor demands on urban slaves at Coke's plantation were different from those who worked on larger rural plantations, as they spent less time on agricultural labor and more time working on diverse tasks. This included working at the slaveowner's tavern, as represented by ceramics, wine, and case bottles derived from the tavern. Urban slave household members at Coke's plantation could eat some of their meals at the tavern, thereby reducing women's time spent on food preparation; however, this seems to have been replaced

by sewing, as represented by higher quantities of sewing implements at Coke's plantation. In their comparative studies, Brumfiel and Franklin broke down monolithic assumptions about women's domestic experiences and emphasized how women's work was not "static and ahistorical" (Franklin 2019, p. 121).

Variability in domestic forms within a site also can reveal the presence of different ethnic groups. At Teotihuacan, for example, nonlocal architectural styles, material goods like ceramics, and objects with particular motifs associated with the Gulf Coast identified a particular neighborhood as an ethnic enclave known as the "Merchants Barrio" (Spence 1996). At the Carson site in Mississippi, researchers identified Cahokian-style pithouses and ceramics as well as Burlington and Mill Creek chert. Although it is unclear if this represented a colonization or diaspora event, the practice of building houses in Cahokian style represents a signaling of nonlocal Mississippian identity (Mehta and Connaway 2019).

The identification of a variety of domestic ritual practices has also become an important component of household archaeology. Such practices are frequently key for creating and perpetuating corporate, social, or lineage identities, such as the use of altars (Gillespie 2000b), the presence of ritual spaces within houses (González-Ruibal 2006), or the deposition of heirlooms (Joyce and Gillespie 2000). The practice of residential burial in particular is frequently associated with connections to ancestors and as "mnemonic devices for collective and individual memories" (Adams 2019, p. 4). Domestic ritual practices also can be protective and tie the household to cosmological principles (Plunket 2002). In Polynesia, a rich ethnohistoric record has facilitated the identification of the ritual symbols and cosmology behind the layout of houses (Kahn 2016, pp. 347–350) and even the identification of the house of a ritual practitioner (Kahn 2015). Domestic rituals often have impact beyond the house; several scholars in Mesoamerica have observed that domestic ritual practices were later coopted by elites and used to integrate their diverse constituents (De Lucia 2014; McAnany 1998; Pluckhahn 2010, p. 349; Walker and Lucero 2000).

Lastly, many scholars have considered groups of houses or supra-household communities. For many archaeologists, an archaeological village *de facto* represented a community (Birch 2013, p. 6; Canuto and Yaeger 2012, p. 698; Flannery 1976; Murdock 1949), and many studies have considered how community identities are formed or maintained in these contexts (Canuto and Yaeger 2000; Kolb and Snead 1997). In some cases, such as at the site of Kirikongo, Burkina Faso, neighborhoods of multiple houses may have been more meaningful to the social identity of the community than individual households (Dueppen 2019). This is demonstrated by shifts in house architecture, from more closed units to more open dwellings in which daily activities took place in the open, uniting groups of houses into wards. Archaeological household data from Çatalhöyük show similar patterns of supra-household integration (Kay 2020). At Çatalhöyük, some houses did not have ovens, hearths, or storage but were still being used; Kay suggests that people may have eaten their meals with other nearby households that did have these features, thereby reinforcing membership as part of a broader community outside the household.

One particularly widespread supra-household community, first articulated by Lévi-Straus, is the house society (Beck 2007; Joyce and Gillespie 2000; Lévi-Strauss

1982, 1987). House societies are a type of social organization in which a community is made up of corporate subgroups organized around a flexible kinship structure that extends beyond a unilineal family lineage (Gillespie 2000c). House societies have spatial and material components, in which there is commonly a connection to a particular place, as well as an important ancestor, although all members of a house society are not necessarily co-residents of a house (Gillespie 2000a, c). The material wealth of a house society is frequently based on a physical structure or house and/or heirlooms but also can include other assets, such as a rice field (Acabado 2013).

Just as villages are places where most of the population lived year-round and included “semi-regular face-to-face interactions” (Thompson and Birch 2018, p. 1), in urban contexts, neighborhoods are also residential areas that can act as integrative spaces of interaction between households (Arnauld et al. 2010; Keith 2003; Pacifico and Truex 2019; Smith and Novic 2010; Smith et al. 2014; Smith 2003). In state-level or urban societies, the study of neighborhoods has emerged as a way of expanding household archaeology to consider the diversity of communities and the social lives and identifies of their inhabitants (Pacifico and Truex 2019, p. 12). Scholars have also identified more specialized neighborhoods that appear to represent particular social groups, such as caste (Coningham and Young 1999).

Missing from many of these discussions are contributions from Southeast Asia’s archaeological record. Despite the importance of the Southeast Asian house and household in sociocultural examination (Sparkes and Howell 2003; Waterson 1997), the house has been of minimal study archaeologically. Part of this is due to preservation challenges; houses in Southeast Asia are traditionally made of organic materials that perish easily in the hot and humid tropical climate (Graham 1996). Additionally, many houses are raised on piles or posts, leaving living floors and associated household activities off the ground and archaeologically invisible. Archaeologists in Southeast Asia have undertaken excavations within habitation areas and residential spaces, identifying domestic debris, the partial remains of house structures, and activity areas such as floors, hearths, and postholes. However, such loci are frequently not excavated as houses (Nash 2009, p. 206). In many cases, residential data have been considered in aggregate at the site level, where groups of households made up a hamlet or village (Flannery 1976; Layton 1972). An explicitly Southeast Asian “household archaeology” is still in its infancy.

Despite these challenges, archaeologists of Southeast Asia have addressed many topics of relevance to a household archaeology approach, even if they are not using data collected specifically as part of a household-centered research program. There are several recurring themes in this literature that are shared by those who practice household archaeology in diverse world areas: the identification and description of houses and household activities; the domestic economy; domestic ritual; diversity and variability both within houses as related to questions of identity, specifically gender and age, and between houses, especially as related to status; and the identification of supra-household communities (e.g., Carballo 2010; Gahr et al. 2006; Kahn 2016; Nash 2009; Pluckhahn 2010; Robin 2003; Stokes 2019). In this review, I examine how archaeologists of Southeast Asia have addressed these topics. I use the terms residential, domestic, habitation, or occupation broadly to refer to areas with evidence for habitation and domestic debris, including living floors, activity and

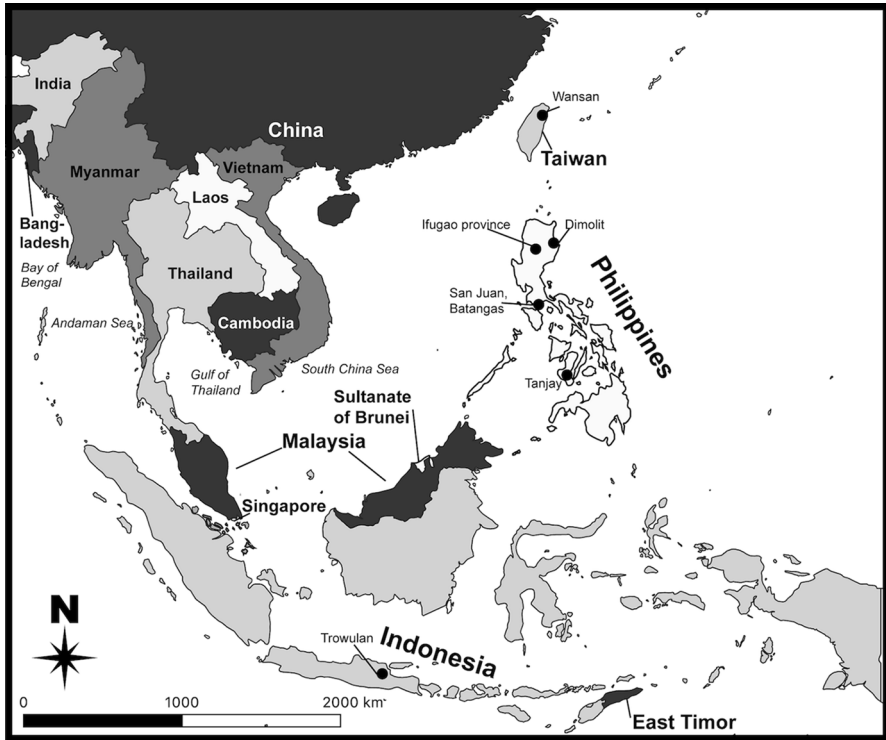
refuse areas, and the remains of dwellings. In many cases, discrete households are not always identifiable, so I also consider supra-household communities, from the site or village level to those beyond. I begin with a brief discussion of the cultural, historical, and theoretical background of Southeast Asia. I then review these themes; however, due to the unevenly distributed Southeast Asian dataset, my discussion moves between geographic locations and time periods to examine and explore how archaeologists have considered these topics in diverse ways. I conclude with suggestions for future research directions to continue building an archaeology of residential spaces and communities in Southeast Asia.

## **Cultural, Historical, and Theoretical Background on the Archaeology of Southeast Asia**

Southeast Asia has great ethnic and linguistic diversity (White 2011), and many scholars have struggled to define this area (Bellwood 2004; Blench 2017; Miksic and Goh 2017). Mainland Southeast Asia (MSEA) and island Southeast Asia (ISEA) fall within the hot and humid tropics with numerous subregions with distinct environmental and geographic diversity; a detailed discussion is outside the scope of this article (see Miksic and Goh 2017, pp. 44–73). For this review, I divide Southeast Asia into two regions based on contemporary political boundaries (Figs. 1 and 2). MSEA consists of the modern nations of Cambodia, Laos, peninsular Malaysia, Myanmar, Thailand, and Vietnam. ISEA consists of the Sultanate of Brunei, Indonesia, Malaysia, The Philippines, Singapore, and Timor Leste/East Timor. I also include data from Taiwan, as archaeological, biological, and genetic research shows the deep connections with MSEA and ISEA (Hung et al. 2007; Matsumura et al. 2019; McColl et al. 2018). Similarly, a recent example of house structures from the Dian region of southern China is included, as this area has longstanding connections with the Dongson culture of northern Vietnam (Yao 2018).

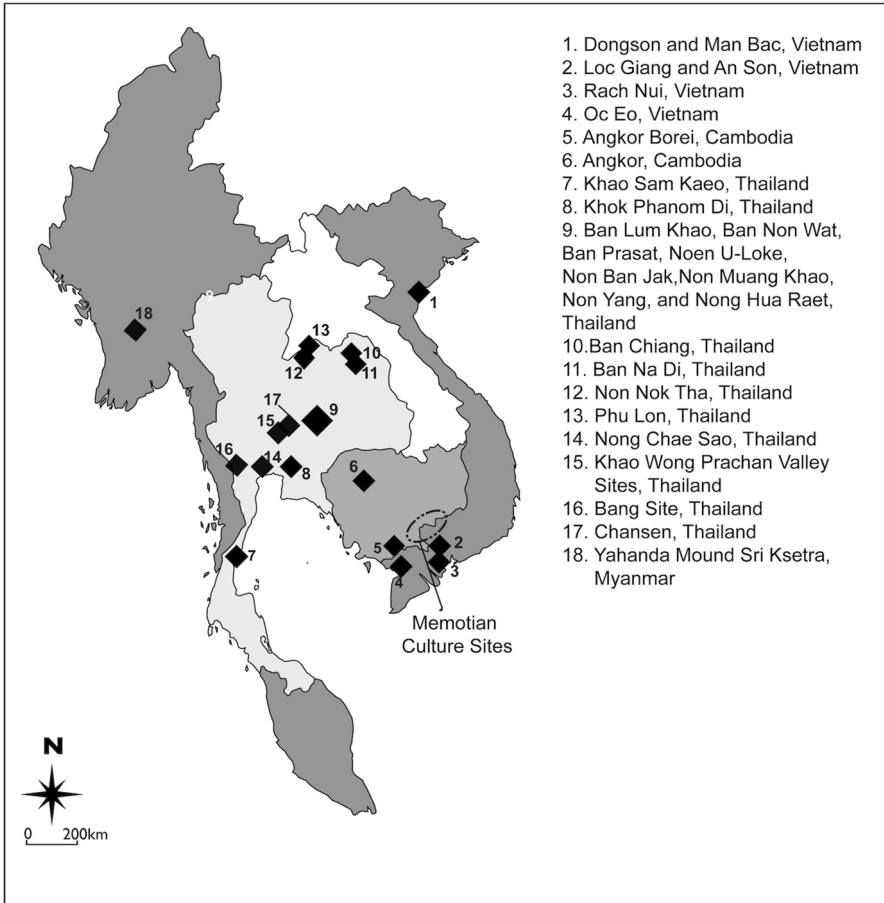
Much discussion in this review focuses on English-language archaeological material from MSEA. This imbalance is primarily due to the history of archaeological research in the region, which has largely been conducted by Western scholars, with English as the primary language of academic communication (Miksic 1995; Tan 2019). The focus of archaeological research in ISEA has largely been on human origins and evolution, as well as the origin and spread of the Austronesian ethnolinguistic group, with fewer domestic or occupation sites having been examined compared to MSEA (Hung 2019). There also are regional disparities in MSEA. The Angkorian empire has dominated much of the archaeological work in countries like Cambodia (Miksic and Goh 2017; Stark 2018), while prehistoric burial sites have been the focus of archaeological work in Vietnam, Laos, Myanmar, and Thailand (Higham 2014a).

Archaeological research in Southeast Asia is largely culture historical in approach and is undertheorized, dominated by what has been referred to as a “mid-20th century Anglophone paradigm” (White 2017, 2019). In this paradigm, research questions concentrate on macroscale analyses and “origins” research (e.g., human origins and evolution, the earliest farming communities, the earliest



**Fig. 1** Map of the countries in mainland and island Southeast Asia, including major sites in island Southeast Asia and Taiwan discussed in the text. Map by Alison Carter

metalworking, and the earliest hierarchies) (Miksic and Goh 2017, p. 8; Shoocongdej 2011; Stark 2016; White 2017). Developing a regional chronology for Southeast Asia has also been a challenge (Table 1). Due to the emphasis on culture history, many regions have their own local chronologies (Nguyen 2004; Paz 2017; Stark 2004). For example, MSEA has separate Bronze and Iron Ages, whereas bronze and iron technology entered ISEA together during the late centuries BC (Bellwood 2007). Additionally, many Vietnamese archaeologists use the term “Neolithic” to refer to not only settled agriculturalists but also hunter-gatherer communities (Nguyen 2004). Broadly speaking across many parts of Southeast Asia, the prehistoric period is largely described using the European three-age system (Miksic and Goh 2017; White 2017, pp. 83–86). Several scholars have expressed frustration with this system, as it does not neatly fit many Southeast Asia contexts, it assumes that cultural developments were in place that did not exist or have not yet been proven, and it is Eurocentric (Aung-Thwin 2001; Miksic and Goh 2017, p. 83; Paz 2017; Shoocongdej 2011; Stark 2016; Tanudirjo 1995; White 2017, 2018). Some have shifted to using these terms but in lowercase to separate them from the assumed attributes associated with them from their use in European/Western contexts (Tayles and Oxenham 2006; White 2017).



**Fig. 2** Map of major sites in mainland Southeast Asia discussed in the text. Map by Alison Carter

Recent publications, including a regional synthesis by Miksic and Goh (2017) and a summary of the Angkor civilization (Coe and Evans 2018), use an alternative chronological model followed by many Mesoamerican archaeologists (Pre-classic, Classic, Postclassic), in addition to established terms such as Paleolithic, Neolithic, Bronze Age, and Iron Age; however, this periodization system has not been widely adopted (Stark 2017). Recognizing these critiques, I occasionally refer to the widespread three-age system terminology to facilitate a comparative discussion, and when possible, I include specific dates or date ranges to clarify the time span under discussion.



**Table 1** Regional chronological terms

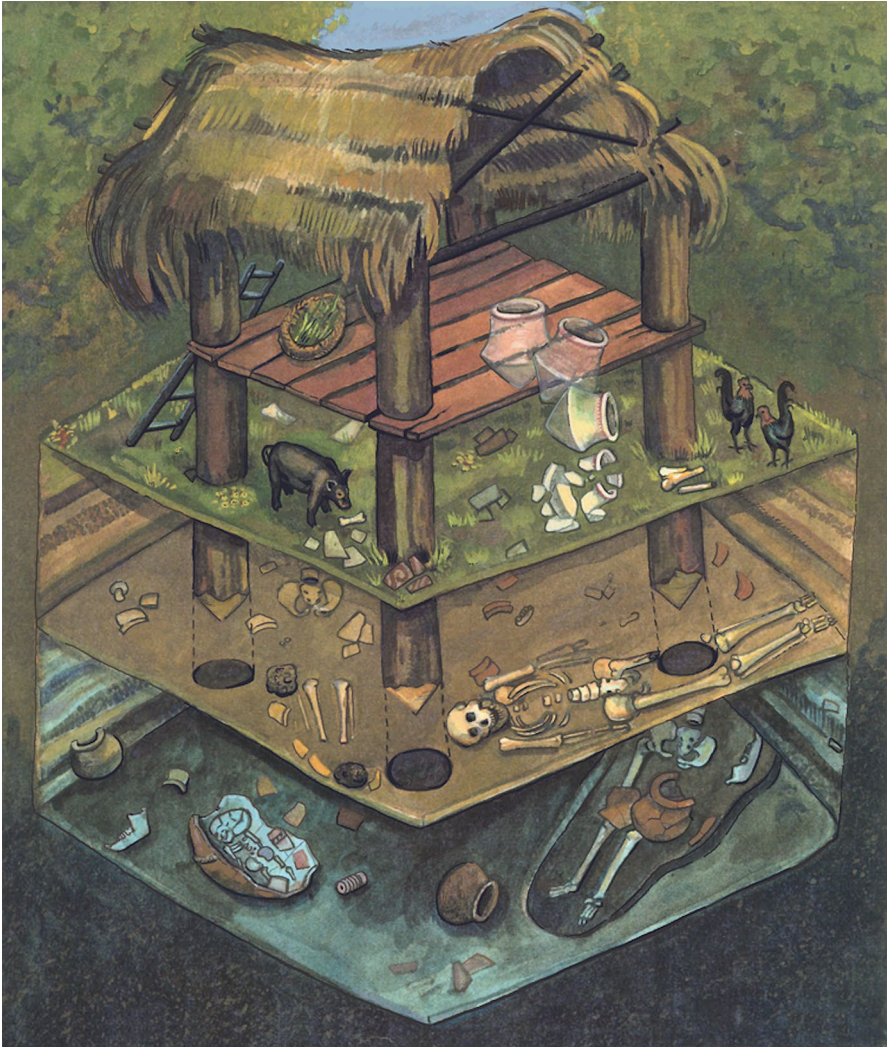
Time period	Mainland Southeast Asia (MSEA)	Island Southeast Asia (ISEA)
Neolithic Period: introduction of agricultural communities and widespread appearance of sedentary villages. Frequently associated with widespread use of pottery	Approx. 2200–1600 BC *Some Vietnamese archaeologists use the term Neolithic to extend as far back as the late Pleistocene and Middle Holocene, associated with the Hoabinhian culture	Approx. 2500–1 BC (although with local variation, see review in Bulbeck 2014)
Bronze Age: introduction of copper/bronze metallurgy	Approx. 2000–1500 BC to 500 BC *There is considerable debate regarding the timing of the introduction of bronze technology	Referred to as Metal Age. Approx. 500 BC Bronze and iron technology entered ISEA during approximately the same time period
Iron Age: introduction of iron technology and widespread contact with South Asia	Approx. 500 BC–AD 500	Referred to as Metal Age. Approx. 500 BC Bronze and iron technology entered ISEA during approximately the same time period
Protohistoric period: associated with foreign written documents and emerging indigenous inscriptions	Early-mid 1st millennium AD	Early-mid 1st millennium AD



**Fig. 3** Contemporary raised houses in Cambodia. Photo by Alison Carter

## Identifying Houses and Household Activities

What do Southeast Asian houses look like and how does one identify a house in the Southeast Asian archaeological record? Houses can be built both on the ground and raised on posts or piles. Raised houses appear to have been the dominant architectural type in both the past and among MSEA and ISEA communities today (Fig. 3) (Dumarçay 1987; Izikowitz and Sorensen 1982; Sparkes and Howell 2003; Tainturier et al. 2006; Waterson 1997). In this house construction style, the primary living area is raised on posts or piles, sometimes only slightly but often many feet above the ground so that the area underneath the house can be used as a covered living space (Dumarçay 1987) (Fig. 4). Materially, what can be identified of these dwellings are the posts themselves (if preservation conditions allow), but postholes are more commonly found. As the space underneath and around a house is frequently used for daily activities, a floor surface and/or “living floors” that include scatters of flat-lying artifacts and other evidence for activities such as hearths or food preparation areas may also be detected. Supplementary Table 1 lists sites with identified house architecture/residential spaces in the literature. In this section, I highlight some of these dwelling structures, those on piles and on the ground, to demonstrate the diversity of material remains associated with dwellings and residential spaces



**Fig. 4** The “Splatt” theory: An artist’s conception of how the archaeological site of Ban Chiang, Thailand, was formed. Image shows a raised house, with living space underneath and burials under house floors. Drawing by Ardeth Anderson. Courtesy of the Institute for Southeast Asian Archaeology and the Penn Museum

in the archaeological record. Following this, I discuss how archaeologists have used material remains from residential areas to make inferences about household activities. I also review several ethnoarchaeological studies that have aimed to identify material correlates for domestic activities.

## Dwellings on Posts or Piles

Raised dwellings are the most commonly described and depicted house form. Houses on posts or piles are most frequently identified by their postholes; a horizontal excavation is needed to see the complete floor plan. The upper or elevated parts of the house are usually composed of organic materials and generally are not preserved. Ethnographic or art historical depictions can help one to imagine the roof construction and complete appearance of a dwelling (e.g., Henriksen 1982). Perhaps, the earliest house structure identified in the Southeast Asian archaeological record is preserved wooden piles found in situ in 1937 at the Dongson site in Vietnam that were interpreted as posts for houses (Fig. 2) (Janse 1958). In addition to these preserved wooden or bamboo posts, Janse also identified animal bones, ceramics, ground stone tools, bronze artifacts, and net sinkers dated to the time of the Han Dynasty (206 BC–AD 220) (Janse 1958, pp. 28–32). Janse reported that these piles represent the remains of houses similar to the two- and three-dimensional depictions of raised houses on bronze drums associated with the Dongson and Dian cultures (Fig. 5).

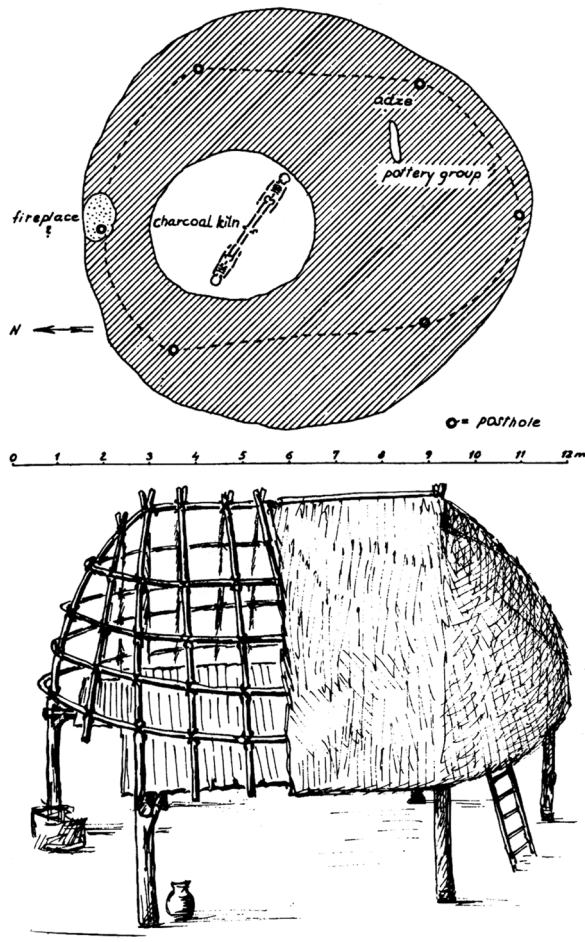
A few years later, piles for houses also were reported in excavations at Oc Eo (Fig. 2) in southern Vietnam associated with the Funan civilization dating to the early-mid first millennium AD (Malleret 1951). These, too, seemed to correspond with reports by a fifth century AD Chinese visitor to Funan who described “raised



**Fig. 5** Image of a Dian culture bronze model of a house raised on posts or piles, from the Shizhaishan site, Yunnan Provincial Museum, Kunming, China. Photo by H. Sondaz from Wikimedia Commons and reproduced under a CC By-SA 4.0 license: <https://creativecommons.org/licenses/by-sa/4.0/>

dwelling” made of wood with thatch roofs (Coedès 1968; Pelliot 1903). Houses on piles have also been depicted in bas reliefs at the ninth century AD Javanese Buddhist monument of Borobudur, on 10–12th century AD incised bricks from Muara Jambi, Sumatra (Tjoa-Bonatz 2013), in 13th century AD paintings at Bagan, and on the 12th century temple of the Bayon in Angkor, Cambodia (Fig. 2) (Dumarçay 1987, 2005). A Chinese visitor to Angkor in 1295–1296 also described houses on stilts (Zhou 2007, pp. 49–50).

The first complete pile-dwelling house structure in MSEA was identified in 1965–1966 by a Thai-Danish project at the site of Nong Chae Sao village in Radburi Province in southwestern Thailand (Figs. 2 and 6) (Henriksen 1982). Henriksen’s



**Fig. 6** Top: Map of the soil discoloration, postholes, and features identified as belonging to the dwelling at Nong Chae Sao, Thailand. Bottom: Artist’s reconstruction of the house. Originally from Henriksen (1982). Thanks to the Merete Aagaard Henriksen and the Nordic Institute of Asian Studies for permission to reuse this material

description of finding this house exemplifies some of the challenges in excavating dwellings in Southeast Asia. The Thai-Danish expedition had been excavating around a charcoal kiln but were finding minimal artifacts and features. It was not until after it rained that an oval patch of differently colored soil appeared in their excavations, and the researchers thought that this might be the outline of a house. They expanded their excavation trenches with a goal of exposing the complete feature and identifying house posts, but they recognized that finding actual posts was unlikely due to the humid conditions and termite activity. They did identify postholes but worried that these features could also have been due to animals or tree roots. To confirm they were postholes, they removed an additional 10 cm of soil; as the features persisted, they felt they had properly uncovered the remains of a house raised on piles (Fig. 6).

Dating to 1800–1300 BC, the house was associated with the Neolithic “Ban Kao” culture. Charcoal associated with a possible hearth, potsherds, stone adzes, and grinding stones was found in and around the house. Burials of two individuals also were encountered 0.5 m under the house floor. The excavators proposed that the house may have had an oval thatch roof with rounded gables, similar to constructions by the ethnic minority group known as the “Black Thais” or Lao Song Dam people (Henriksen 1982; Sorensen 1982) (Fig. 6). However, Sorensen (1982) observed that the modern people who built the houses report they were too hot to live in and wondered if this house type may reflect a cooler climate in the past or if there even was a connection between the ancient and modern cultures as represented by their house construction. This example highlights several themes of importance for those practicing household archaeology, including the identification of a house structure and activity areas, domestic ritual and residential burial, and analogies with ethnographic examples. However, the identification and reporting of this structure did not immediately inspire additional studies or closer examination of these topics.

More recent examples of houses on piles are largely portions of dwellings encountered during other research projects. The coastal Vietnamese site of Rach Nui (c. 1900–1440 BC) (Fig. 2) has some of the best evidence for Neolithic aboveground dwelling structures (Oxenham et al. 2015). Preservation conditions at this site permit greater insight into house construction techniques. Wooden beam slots were embedded in a hard clay platform, and there were postholes and carbonized logs and wooden joists. Buildings and floor surfaces may have been supplemented with lime mortar. The high quantity of termite frass suggests that inhabitants had to frequently replace their dwellings. Structures at the edge of the site that contained human and animal coprolites may have been a separate waste disposal area.

The identification of wooden and organic materials like that at Rach Nui is unusual; postholes are more common intermixed with mortuary contexts or other activities. With careful recording of these features and their associated artifacts as well as horizontal excavations, archaeologists can identify discrete dwelling spaces. In an innovative study from the Neolithic (3700–2700 BP) site of Wansan, Taiwan (Fig. 1), spatial statistics were used to identify clusters of postholes that could represent dwellings (Chiang and Liu 2011). The posthole patterns did not show a clear outline of a single structure, such as at Nong Chae Sao but instead likely represent

multiple construction events in the same general location over time. Several clusters were identified, which indicated different house structures or groups of houses. The distribution of lithics, ceramics, and burials also were mapped and showed an association with the posthole clusters. These artifact clusters in association with posthole patterns confirmed the interpretation that postholes were likely dwelling spaces.

In recent work at Angkor (9–15th centuries AD), mounds on which houses were built were used as a proxy for a house or household space (Carter et al. 2018, 2019; Stark et al. 2015). These studies have focused on smaller-scale excavation units (largely 1 × 2 m) over a larger geographic area, and while some postholes were identified, complete dwelling structures have not yet been uncovered. In the final field season, multiple 1 × 2 m units were excavated across a single mound, including contiguous units that followed major features in an attempt to better identify a dwelling space and associated activities. Based on the concentration of postholes and features on one part of the mound and the relatively low concentration of ceramics in comparison to other habitation locations across Angkor (Carter et al. 2018), archaeologists proposed that the ~600-m<sup>2</sup> discrete mounds within the Angkor Wat temple enclosure represents the space allotted for a single household (a dwelling and surrounding exterior house space) (Klassen et al. 2021). Although this assumption requires further testing, it was the basis for a recent diachronic demographic study of the low-density Angkorian urban settlement (Klassen et al. 2021).

## Ground Dwellings

Ground dwellings are less common but have been reported archaeologically and in the historic and ethnographic literature (De Raedt 1977) (see Supplementary Table 1). Excavations at the Dimolit site (Fig. 2) in the Philippines in the late 1960s uncovered the outlines of two complete squarish houses measuring approximately 3 × 3 m (Peterson 1974). Postholes were found in a trench, as well as compact living floors, each with a hearth in the southeast corner. Radiocarbon assays date the structures to 3170–5340 BP. Peterson (1974, pp. 31–32) suggested they were seasonally occupied during the dry season due to stratigraphic evidence of regular flooding. Peterson proposed these were ground-level dwellings, not houses on piles, although this interpretation has been debated (De Raedt 1977; Hutterer 1976).

Possible ground-level dwellings have also been reported at several Neolithic sites (late third–second millennium BC) in Vietnam. At An Son (c. 2400–1000 BC) (Fig. 2), a series of occupation floors and postholes were identified although there was not a clear house plan. These features may have been ground dwellings because associated hearths were found inside them (Bellwood et al. 2011; Nishimura and Nguyen 2002). A similar series of hard clay floors and associated occupation debris including pottery, stone tools, and animal bone also were identified at the nearby site of Loc Giang (1900–1200 BC) (Fig. 2) (Piper et al. 2017). Researchers propose that inhabitants were adding lime to the soil to harden the floors (Piper et al. 2017, p. 35) and that they were ground-level dwellings based on their similarities with An Son. Although Rach Nui, mentioned above, contains more evidence for aboveground

dwellings, the presence of a burnt wooden floor has been proposed as evidence for ground-level dwellings as well (Oxenham et al. 2015).

Several ground-level dwellings were identified at Non Ban Jak, northeast Thailand, dating circa third through sixth centuries AD (Higham 2017b; Higham et al. 2014). Houses were constructed with white clay walls and floors. Earlier house structures appear to have been buried and then replaced with new dwellings following the same orientation. Burials were found throughout all houses and sequences, frequently concomitant with walls and floors. Ceramic kilns and furnaces with slag inside of these houses suggest that pottery production and iron smithing took place inside houses.

A rectangular building with clay walls and floors as well as postholes representing a second wooden structure was uncovered at the site of Khok Phanom Di, Thailand (c. 2100–1500 BC) (Fig. 2) (Higham and Bannanurag 1990). Both features appeared to cover burials and have been interpreted specifically as mortuary structures. However, these mortuary contexts were found in association with food remains as well as “implements used in day-to-day activities” including fishhooks, net weights, and shell tools (Higham 1989, p. 38). This association of domestic activities with burials is similar to residential burial contexts that are not uncommon in MSEA (see Supplementary Table 2); therefore, it is possible these features also represent dwelling spaces.

Semisubterranean dwellings and possible pile dwellings were identified at the site of Shangxihe (1300–250 BC) associated with the Dian culture in Yunnan Province in southern China (Yao et al. 2020). The semisubterranean dwellings were rectangular buildings, identified by the presence of a sunken floor, a raised bench area, a central support post, and posts on the exterior of the structure. Several dwellings crosscut one another, indicating they were built and rebuilt over time.

Houses made of brick or stone do not seem to appear until the second millennium AD, although a Chinese visitor to the polity of Lin-yi in central Vietnam (fourth century AD) described a house with brick walls coated with lime and built on a terrace or platform (Coedès 1968, p. 49). Residences made of brick have been found at the 14th century AD Indonesian site of Trowulan (Fig. 1), capital of the Majapahit empire (Miksic 2009, 2012). Many houses appear to have had a well in the front of the house, cobblestone floors, and brick-lined drains at the back of the house (Miksic 2012). Two-story stone houses have also been identified in the Philippines dating to the 18th or 19th century AD (Barretto-Tesoro 2015).

## Household Activities

Given the challenges of identifying discrete houses, archaeologists in Southeast Asia have used novel methods to identify household activities in ancient domestic spaces. As noted above, in her study of residential areas at Wansan, Chiang found artifacts in association with posthole clusters (Chiang and Liu 2014). Although specific in situ activity areas could not be identified, careful study of the artifacts associated with each posthole cluster indicated that all households undertook similar activities,



including woodworking, weaving, lithic tool production, and activities associated with subsistence and food preparation (Chiang and Liu 2014).

Living floors or house floors are common at many residential sites across Southeast Asia (Supplementary Table 1), and their careful examination can provide valuable insights into domestic activities. Analysis of hard clay floor surfaces at the northeastern Thai sites of Ban Non Wat and Nong Hua Raet (Fig. 2) dating from the Neolithic to the Iron Age (c. 2000 BC–AD 500) provides a model for such studies. An initial soil chemistry study identified elements, primarily calcium, iron, potassium, and phosphorous, associated with anthropogenic activities, which verifies that these hard clay surfaces were active living floors (Kanthilatha et al. 2014a). A second study identified fatty acids, primarily from animals and likely ruminants, within the hard floor surfaces, which suggests that animal processing took place within domestic contexts (Kanthilatha et al. 2014b). A more recent study used phytolith and diatoms to identify the clay source for the floors and demonstrate that whole rice plants were transported to these domestic areas for storage and/or processing (Kanthilatha et al. 2017). These studies show promise for continued scientific analysis on hard floor surfaces to determine the types of activities that took place within domestic contexts.

Studies of residential spaces at Angkor have also begun to offer insight on household activities within a state-level society. Preventative archaeology at Trapeang Ropou around the Siem Reap airport near the Angkor Archaeological Park (Fig. 2) has uncovered evidence for rural habitation around the capital of Angkor (10–13th centuries AD) (Bâty and Bolle 2005; Bâty et al. 2014). Numerous features were identified in the large-scale excavations, which allowed researchers to provide a detailed description of the agriculturally focused activities that took place within and around the house structure, including the keeping of animals, betel nut chewing, food processing, possible household production of palm sugar, and likely household gardens (Bâty et al. 2014).

Palaeobotanical remains from residential spaces in temple enclosures at Angkor include plants associated with household horticultural practices, including citrus fruits, bananas, palm trees, and long pepper (Castillo et al. 2020). Notably, cotton seed fragments also were identified, suggesting that cotton processing and textile production might have been household activities within these spaces (Castillo et al. 2020). This study shows the importance of palaeobotanical analyses as part of the investigation of household activities, as textile production was otherwise materially invisible.

## Ethnoarchaeological Studies

Ethnoarchaeological studies are important for identifying patterns in material culture distribution and behavior that can assist in the identification of household activities. Perhaps the earliest ethnoarchaeological study of a house in Southeast Asia was undertaken in the Visayas in the Philippines by de la Torre and Mudar (1982). They examined the economic status, family history, physical setting and dwelling structures of the property, the interior of the house, including an inventory of a variety of household goods, and the kinds of plants found around the houses. They also

considered the visibility of the property in the archaeological record, what would be recoverable, and how archaeologists might interpret the material remains that would be preserved. An important finding from their work was that artifact distribution did not necessarily correlate with activity areas around the house, as the most frequently used spaces were regularly cleaned, with refuse accumulated on the edges of house areas.

A later ethnoarchaeological project among the Chaw Lay, a nomadic indigenous group on the island of Phuket, Thailand, confirmed this observation (Engelhardt and Rogers 1997, 1998). Researchers noted that material remains of a variety of activities taking place in the raised houses could be found on the ground or floor surface underneath houses. Additionally, important activity areas were documented around the raised house, including outdoor kitchens, water areas or wells, and areas for socializing and processing near trees (Engelhardt and Rogers 1998). However, post-depositional processes such as sweeping, animal interference, and rains and flooding can affect the placement of material objects associated with particular activities and activity areas, making them difficult to identify archaeologically. Houses were frequently moved or removed, complicating the interpretation of postholes. Although archaeologists have suggested that driplines or patterns from rain runoff from roofs of houses might leave an archaeologically identifiable signature that, if carefully excavated, could mark the outline and orientation of a house (Engelhardt and Rogers 1998, p. 154), this is unlikely given the ephemeral nature of other components of dwellings.

An ethnoarchaeological study of Kalinga refuse disposal patterns in the Philippines demonstrates the utility of examining middens to make inferences about household activities (Beck and Hill 2004). Researchers identified the presence of different types of middens, including those used by single households, multiple households, and the broader community within a single village. Such middens could be distinguished from one another by their artifact density and richness as well as their location, with communal middens appearing as the village experienced population growth. This work established that particular refuse areas could be tied to specific households or household groups, including extended families. Beck and Hill argue that archaeologists can use middens to make inferences about households and their activities, especially if they can use other archaeological data to infer residence patterns at their site. These limited ethnoarchaeological studies not only provide material correlates for some household activities but demonstrate that understanding the spatial distribution of such activities within house structures may be difficult or impossible due to preservation conditions and frequent cleaning of high-use activity areas. Soil chemistry is one way of identifying specific activities and their spatial distribution; however, archaeologists also need to consider evidence in aggregate, such as at the Wansan site.

## Domestic Economy

A substantial amount of research in prehistoric Southeast Asian archaeology has focused on craft production, especially metallurgy and ceramics (Lim 2019; Pigott and Ciarla 2007). Although the focus of this research has largely been on understanding how the metals and ceramics were produced, it is likely that many of these tasks were undertaken in a domestic context. In MSEA, and especially Thailand and Laos, researchers have proposed that prehistoric bronze or copper-base metalworking was organized around villages or communities that were likely kin based (White and Pigott 1996). No sites show strong evidence for control over the raw materials and processing of metal nor the working and exchange of finished projects (cf. Higham 2011a; Pigott 1998; Pryce et al. 2011; Tucci et al. 2014; White 2019; White and Pigott 1996). Regional or village-level variation in the types of objects produced points toward decentralized production (White 2019, p. 159; White and Hamilton 2019).

One such example of decentralized production is the copper mining site of Phu Lon (Fig. 2) in northeast Thailand, which was in use for circa 2000 years, most intensively in the first millennium BC (Pigott 1998, 2019; Pigott and Weisgerber 1998). Multiple groups seemingly exploited this resource over time, based on the heterogeneous ceramic remains, faunal remains, and the lack of evidence for permanent settlement. Metalworking remains, including hammerstones and anvils, at the ore processing and copper melting/smelting area known as the Pottery Flat were found in clusters that could represent workstations for small groups (Pigott 2019). Pigott, drawing on Burton (1984), explained these patterns by using an ethnographic analogy with stone quarrying by the Tungei in Papua New Guinea, suggesting that family groups traveled seasonally to Phu Lon to mine copper, either to smelt the ore at the site or to transport it back to their villages for processing (Pigott 1998, 2019; see also White and Hamilton 2019; White and Pigott 1996).

In the Khao Wong Prachan Valley (Fig. 2) of central Thailand, Non Pa Wai, Nil Kham Haeng, and Non Mak La are among a cluster of valley settlements that were part of a major regional copper production center (Higham et al. 2020b; Pigott 2019; Rispoli et al. 2013). While there are Neolithic contexts at Non Pa Wai and Non Mak La, copper production at several sites in the valley ranges from circa 1200 BC to well into the first millennium BC. These sites were closer to copper ore deposits, and at the first two sites inhabitants undertook more intensive copper production (Pigott 2019; Rispoli et al. 2013). At Non Pa Wai and Nil Kham Haeng, habitation debris was intermixed with evidence for production, such as ore, slag, and crucibles, whereas at Non Mak La mortuary contexts were more evident (Pigott 2019). Based on modest habitation evidence at Non Pa Wai, primarily ceramics and faunal remains, the site might have been occupied only seasonally. In contrast, domestic debris from Nil Kham Heng and Non Mak La includes pottery, animal bones, living floors, and burials (Pigott 2019; Rispoli et al. 2013). Researchers argue that this intermixing of residential and manufacturing debris, with no evidence for attached workshops or hierarchical control, suggests kin-based production. Notably at Nil Kham Heng, some households appear to have produced one type of artifact, a

socketed cordiform implement, a possible commodity for trade, which in turn could suggest a kind of community specialization (White and Pigott 1996).

At other sites in central and northeast Thailand, the casting of metal also is presumed to have been a village-based activity due to the large number of crucibles and crucible fragments found in these locales (White 2019). At Ban Non Wat, hard floors dating to the Iron Age (c. 500 BC–AD 500) were found in association with pyrotechnological features including metalworking crucibles (Duke et al. 2010). The small scale of these features, as well as their association with pits believed to be related to salt production, has been interpreted as evidence for seasonal household production (Duke et al. 2010; see also Halliwell et al. 2016). However, there also may have been some degree of metalworking specialization, based on the presence of “founders’ burials” or individuals interred with their metalworking tools (Hamilton and White 2019; Higham 2012; Pigott 2019; Pigott and Ciarla 2007; White and Hamilton 2019). These burials most probably represent local craft producers (White 2019, p. 160). Scholars have argued that some of these craftspeople in northeast Thailand could have been itinerant specialists, as the clays used to produce crucibles sometimes differed from those used in local pottery (Cawte 2007; Vincent 1988).

Earthenware ceramic production is another craft that seemingly took place at the household or community level (Lim 2019; Stark 2003). Some studies have suggested that the diversity of ceramic types produced at a site is related to different kinds of production. For example, at the site of Chansen, Thailand (Fig. 2), the presence of both high-quality and low-quality earthenwares with different fabrics and tempers during Phases II and III (c. AD 1–500) led Bronson (1979, p. 328) to argue that there might have been more specialized or full-time potters who produced higher-quality ceramics for the local regional market, while less skilled part-time potters at Chansen produced lower-quality vessels.

In island Southeast Asia, archaeologists have studied earthenware ceramics from household contexts at Tanjay, Philippines (Fig. 1) to better understand village or regional economies and the amount of elite control over the production and trade of these objects. From the late centuries BC to the early centuries AD, ornate earthenwares were used as grave goods and possibly were displayed as status items in households in the central Philippines (Junker 1999). These appear to have been made by part-time specialist potters at the household level, who were sponsored by chiefs. It was not until the mid-second millennium AD that production became more centralized, but not in all areas of the Philippines, as work in Ifugao Province (Fig. 1) during the second millennium AD suggests elites did not control pottery production and distribution; instead pottery was consistently produced at the household level for local use (Acabado et al. 2018).

These examples demonstrate that crafts were organized at the household level, yet because they were not investigated specifically as part of a household archaeology program, it is difficult to ask deeper questions about the role these crafts played within the domestic economy, such as who produced these crafts, how labor was allocated within a household, and how this changed over time. The study of crafts in Southeast Asia has largely focused on prehistoric households that lack the rich ethnohistoric and historic data used in other parts of the world to address such

questions. However, there have been several ethnoarchaeological studies that provide models for the organization of production at the household level.

Several long-running ethnoarchaeological studies of earthenware ceramic production in both mainland and island Southeast Asia have emphasized the village-level organization of production, with earthenware pottery primarily made by women, and knowledge passed from mother to daughter (Graves 1985; Lefferts and Cort 2003, 2008; Stark 1991). The Kalinga Ethnoarchaeological Project produced several comprehensive studies of household production and consumption of ceramics (Stark and Skibo 2007), elucidating the number of cooking pots found within a household (Beck 2009), how Kalinga pottery was exchanged and its relationship to agricultural production (Graves 1991; Longacre and Hermes 2015), how community-based specialization emerged (Stark 1991), and how social relations impacted spatial patterns in pottery distribution (Stark 1992).

In northeast Thailand, researchers studied the production of ceramics and salt at a household level to understand the organization of these tasks and, in particular, the gendered components of household labor (Halliwell et al. 2016). They found there was not a strict gendered division of labor for either task and that the organization and intensity of these crafts was based on the weather, agricultural demands, distribution of resources near a site, and consumer demand for products. Although these studies have been minimally applied in Southeast Asian archaeology, they provide one source of data to further consider the household organization of craft production and its role in the domestic economy.

## Domestic Ritual

Ethnographic studies demonstrate the importance of domestic ritual practices in contemporary Southeast Asia, from the presence of household shrines for local spirits (e.g., Pearce 2011) to rituals associated with the construction and protection of houses (Grow 2011; Luco 2006). Limited examples from the archaeological record intimate that domestic ritual practices might have been widespread across mainland and island Southeast Asia in the past as well. Several examples may be deposits associated with house construction and protection, but the most widespread practice might be the practice of residential burial (see possible examples in Supplementary Table 2). Here I review the available evidence, with the longest discussion centering on residential burial. While scholars globally and in Southeast Asia have examined how residential burial practices reinforce community identity, debates from sites in Thailand focus less on burial as a domestic ritual practice and more on how the interments themselves are related to questions of status and emerging sociopolitical complexity.

## Ritual Deposits or Offerings

Several unusual deposits found in habitation contexts might represent offerings associated with construction or consecration rituals. At the prehistoric (possibly Iron

Age) site of Non Yang, Thailand (Fig. 2), Nitta (1991) observed smashed jars placed underneath a clay wall and proposed they might be ceremonial offerings. Unusual pottery deposits have also been reported at other sites in Thailand. At Non Ban Jak, pairs of pottery bowls (one bowl placed upright and a second placed on top as a lid) were frequently found in association with structures, including placed in the corner of structures (Higham 2017b, p. 376; Higham et al. 2014). O'Reilly (1997, p. 147) reports similar bowls found in association with floors and walls at Non Muang Kao, Noen U-Loke, and Ban Prasat (Fig. 2).

More convincing evidence comes from historic-period sites for which ethnographic analogies can be made. For example, at the rural Angkorian habitation site of Trapeang Ropou, a Chinese coin was found at the base of a posthole, which may have been placed as part of a ritual deposit. Similar practices are reported in Siem Reap, the province in which Angkor is located, in the mid-20th century as a means of ensuring prosperity for the household (Luco 2006; Porée-Maspero 1961). My own excavations of a residential space within the Angkor Wat temple have identified the presence of a possible ritual deposit of a complete vessel under an occupation surface. At the 12–14th century AD site of Pondok, Sumatra, a ritual deposit placed underneath the main house post included an iron knife, beads, and a bowl. This is apparently a widespread ritual within the Malay cultural sphere meant to provide protection to the house and its inhabitants (Tjoa-Bonatz 2013, p. 71).

## Residential Burial

The practice of residential burial may have been widespread in Southeast Asia (see Supplementary Table 2), but it has not been well studied. White and Eyre (2010) argued that residential burial sites in Thailand, in particular, may be underreported due to the ephemeral nature of the dwellings themselves and the difficulties in determining the location of grave cuts. Furthermore, they argue, many excavation reports and published illustrations of burials focus on the grave cuts themselves, without contextualizing them in relation to other features, including occupation debris (White and Eyre 2010, p. 62). Such challenges extend to sites outside Thailand.

The few studies that have identified and discussed residential burials emphasize how these practices provide a connection between the dead and the living, frequently creating and reproducing identity and memory for individuals, families, and the community (Adams and King 2010). Excavations on the Yahanda Mound at the Sri Ksetra site in Myanmar provides one such example (Stargardt 2021). This site is associated with the Pyu indigenous culture, which was increasingly influenced by Hinduism and Buddhism during the site's occupation in the first millennium AD. However, the inhabitants maintained an indigenous cremation burial practice, and there are several instances of houses being constructed on top of these burial spaces. This connection between the living and the dead appears to have been a way to maintain a local identity in the face of increasing sociocultural changes and influence from India.

At the Wansan site, residential burials were placed underneath floor surfaces, and in some cases individuals were buried with jade zoo-anthropomorphic figurines,

which Chiang (2015) argues were important ancestral symbols. When looking at the artifacts associated with particular house clusters, Chiang observed that houses clusters without these ancestral figurines were more likely to have “foreign” objects (e.g., imported pottery vessels and stone tools). These foreign objects represented connections and contacts with communities beyond the site. However, the presence of foreign objects did not indicate that these particular households had a higher social status. In fact, house clusters with ancestral figurines had greater access to and therefore may have more strongly controlled local resources, requiring those without ancestral ties to look outside the community to supply some of their material needs. Chiang (2015, p. 161) argues that these house clusters might have represented house societies and that the use of local resources and ancestor figurines would have reinforced the collective group identity, perhaps even linking members of different house clusters together if they shared an ancestor. House societies often define their membership through connections to an important ancestor, and burials of important ancestors within occupation contexts connected the living to the dead through integrative rituals, which also tied family groups to a particular place (e.g., Gillespie 2002).

The residential burial of individuals within the same location over multiple generations is seen at several sites in Thailand, which White and Eyre (White 1995; White and Eyre 2010) have also connected to the house society model. A house society emphasized corporate group identity that White and other have argued was heterarchical, flexible, decentralized, and fluid (O’Reilly 2000, 2003; White 1995; Wolters 1999, pp. 122–125). One of the primary lines of evidence for this type of social organization is drawn from mortuary data and grave goods, in which many sites showed a range of mortuary wealth. Burials were not all equal, but at many sites it is difficult to see clear divisions between wealthy and poor burials (O’Reilly 2000, 2003; White 1995). There also are instances where some burials or burial clusters show clearer evidence for ranking; White and Eyre (2010, p. 69) argue this may be due to the recognition of “individualized identities.” Other differences may be due to social or subsistence stress felt by the community or the presence of oscillating social organization similar to the Kachin in Myanmar (Leach 1954; White and Eyre 2010, pp. 69–70). However, White and Eyre (2010, p. 70) have argued that overall social organization in Metal Age Thailand was based more on corporate groups than on individuals, as partially represented by the practice of residential burial.

White and Eyre’s interpretations have been challenged, most notably by Higham (2015a, 2017b), who has provided his own perspective on the mortuary data from Thailand. Higham’s interpretations have largely followed the Saxe-Binford approach, which focuses on burials as representative of social status and the social organization of a society (Adams and King 2010; Brown 1995; White and Eyre 2010). He argues that White and Eyre misunderstood published materials from three sites he excavated: Ban Non Wat, Ban Na Di, and Ban Lum Khao (Fig. 2), that these sites do not have clear evidence for domestic contexts and that the dead instead appear to be buried in separate cemeteries located very near a village and dwelling spaces (Higham 2015a, p. 384). In a later publication, Higham (2017b, pp. 370–371) did record burials in relation to clay floors at Ban Non Wat, Noen U-Loke, Non Muang Kao in northeast Thailand and living floors at Nil Kham Haeng in central Thailand.

Such distinctions may not be significant, however, as Gillespie (2010) has argued that burials outside but near dwellings can still be considered a form of residential burial.

Instead of being a widespread practice, Higham contends that the best evidence for residential burial within a dwelling occurs at a single Iron Age site: Non Ban Jak (Fig. 2), where he identified house structures with postholes, clay walls, and floor surfaces, with burials placed underneath (Higham 2015c, 2017b; Higham et al. 2014). Higham argues that the appearance of residential burials in this context has significant implications for sociopolitical organization during this period. In his model, a shift to residential burials coincided with a period of intensified rice agriculture, the construction of moats around many sites in northeast Thailand, the appearance of exotic artifacts from South Asia, and an increase in mortuary wealth signifying the emergence of entrenched hierarchical elites (Higham 2015a, 2017b; Higham et al. 2019). Burials in dwellings “reinforce inherited rights to property, wealth and status by the members of the kin group in question” (Higham 2015a, p. 394). In contrast to White, Higham (2015a) argues that the mortuary data from Thailand suggest that residential burial was *not* a longstanding practice that helped facilitate heterarchical social organization and prevented the emergence of elites and sociopolitical hierarchy. Instead, it was part of the suite of changes that led to the emergence of state-level societies in the first millennium AD.

Higham does agree with White on several points. Although he argues that residential burial was not the norm in Southeast Asia, he notes a longstanding practice of burial in cemeteries *near* occupation areas, which may have fulfilled a purpose of “ritual family loci” similar to burial under or around houses (Higham 2015a, p. 390, quoting White and Eyre 2010, p. 68). Additionally, he concedes that in some cases mortuary wealth waxed and waned, such as during the Bronze Age at Ban Non Wat, suggesting some degree of flexibility in social organization. He also acknowledges that developments were localized and that there may have been regional differences, with sites like Ban Non Wat, which was located on an important trade and communication route, having stronger evidence for the emergence of elites than other sites (Higham 2015a, p. 394).

At the same time, some of Higham’s assertions regarding the presence of hierarchical social organization and entrenched elites deserve to be more critically examined. A review of the evidence suggests that residential burial was more widely practiced in mainland Southeast Asia than previously believed (Supplementary Table 2). It is likely that residential burial is underreported due to complications in identifying residential structures and grave cuts (White and Eyre 2010, p. 62). It is true that many of the examples date to the Iron Age; however, this could be attributed in part to bias in the archaeological record in which Iron Age sites are more archaeologically visible and more frequently studied (Higham 2014b). For example, Higham (2014a, pp. 105, 130–131, 196–197) lists 32 “principal” Neolithic sites in MSEA, 71 Bronze Age sites, and 75 Iron Age sites.

Higham (2015a, pp. 394–395) argues that residential burial began in the Iron Age and was associated with emerging elites, as well as major sociopolitical, economic, and environmental changes. However, this association between residential burial and emerging hierarchies also needs to be more deeply interrogated. Evidence for



the presence of entrenched elites at Non Ban Jak and other sites in northeast Thailand is not clear. A careful reading of the mortuary data from three nearby sites, Ban Non Wat, Noen U-Loke, and Non Ban Jak, highlights this complexity (Higham et al. 2019). During the first part of the Iron Age (Iron Age 1 or 420–100 BC, see Higham 2011b for discussion of Iron Age phasing and mortuary sequence), there is no clear differentiation in status within the mortuary data at Ban Non Wat, and the dead appear to be buried in a cemetery. During Iron Age 2 (100 BC–AD 200) burials appear to be clustered at Noen U-Loke, but again there is no evidence for status differences in mortuary wealth. It is not until Iron Age 3 (AD 200–400) at Noen U-Loke that some adults within the burial cluster groups show evidence for greater wealth. Iron Age 3 also was a period of regional climatic changes, which appear to have led to the construction of moats around many sites to facilitate access to water. Higham and others have argued that these moats were controlled by elites within the communities (Higham 2014b, 2015a, 2016; O'Reilly 2014). However, the mortuary wealth at Noen U-Loke during Iron Age 3 was not sustained, and in Iron Age 4 (AD 400–600), burials at Non Ban Jak were placed in residential structures and mortuary wealth fell off (Higham et al. 2019). Scholars have observed that residential burial often marked territoriality (Parker Pearson 1999), but it was frequently associated with corporate groups rather than marking elites in a hierarchy (Adams and King 2010, p. 4 see also other papers in this volume). The nature of hierarchical social organization at sites like Non Ban Jak has not been clearly explained by Higham, and his observation that property rights may have belonged to a kin group suggests that corporate group social organization should be more deeply considered.

Higham and others have also noted that inscriptional data points to an emerging elite class by the mid-late first millennium AD, (Higham et al. 2019, p. 17; Vickery 1998), but how widespread this was is unclear. As both Higham (2015a, p. 395) and White (1995, 2011; White and Eyre 2010) have observed, sociopolitical development was regional and localized in Thailand. Furthermore, ethnographic examples from Southeast Asia point toward variation in the amount of centralization within corporate groups (Hayden 2011). It is important to remember that heterarchies are not unranked societies (Crumley 1995), and thus the presence of wealthy burials is not automatically an indicator of *hierarchical* social organization.

This dialog has obscured deeper considerations of the role that residential burials played as part of domestic ritual practice. The result is that the discussion has become polarized and presented, perhaps inadvertently, as a dichotomy in which residential burials either mark the presence of an emerging hierarchy of entrenched elites or a heterarchy organized around corporate groups, such as a house society. In fact, residential burial may be more widespread than previously believed, and it likely held diverse meanings for the different communities in which it was practiced.

## Diversity and Variability Within Communities

Who lived in these ancient dwellings? Aside from the few scholars who have used the house society model (Adams 2019; Chiang 2015; White and Eyre 2010), few scholars have considered household composition and social dynamics. Data from

domestic contexts and especially mortuary contexts, however, can be used to tell us more about the social makeup of ancient communities. Here I consider how archaeologists in Southeast Asia have used data from habitation, ritual, and mortuary contexts to consider questions about community diversity and variability as related to status, gender and age, individuals, and the presence of intracommunity groups.

## Status

Debates regarding residential burial highlight how mortuary data have been used to consider questions regarding sociopolitical organization within communities. A small number of scholars have also used the material remains of dwellings to identify the presence of elites and consider questions regarding status within communities. Two 19th century stone houses from San Juan, Batangas, Philippines (Fig. 1), have been identified as belonging to local elites (Barretto-Tesoro 2015). The construction materials, location of the houses near the church, and household goods that included foreign ceramics and Western medicine all point to these as residences of high-status individuals (Barretto-Tesoro 2015). The structures also reflect Spanish colonial influence on town planning and vernacular architecture. Studies at the 14th century AD site of Trowulan also identified an elite neighborhood. While many residences had brick architecture and clay roof tiles, ceramics, and food remains, elite residential areas were differentiated by the presence of higher quantities of Chinese ceramics (Miksic 2009, 2012).

In excavations at two locales in Tanjay, dating to the 11–14th centuries, there were clear differences in house architecture, with postholes in one location being larger and the house compound surrounded by a stockade (Junker 1999). These households also had higher densities of prestige ceramics, including porcelain. Studies of house middens from high-status residential zones also uncovered evidence for higher quantities of water buffalo and pig, which scholars associate with feasting (Junker and Niziolek 2010). Additionally, there also were higher quantities of larger cooking pots associated with feasting activities and dragon jars that were used to ferment and store alcohol. Over time, the evidence points to the increasing intensity of competitive feasting activities, which researchers relate to the emergence of larger and more powerful chiefdoms in the region and competition over trade (Junker 1999; Junker and Niziolek 2010). These household data have elucidated the social strategies (feasting) used by elites to secure and increase their power.

The best example of status differences from prehistoric residential contexts comes from Wansan, where careful mapping and recording of excavated materials identified activities that took place within these house structures (Chiang and Liu 2014). Comparisons of material remains between households also showed notable differences in access to specific objects, such as those made of jade, which suggest status differences within the community, perhaps associated with ancestors and the control of local resources (Chiang 2015).

## Gender and Age

Investigations of gender and age in Southeast Asian archaeology have thus far been limited but are informative for considering the roles and status of individuals within their communities and how they may have been transformed during different life stages (Bacus 2007a, b; Higham 2002). One unique consideration of age and gender comes from a study of rock art from western Thailand dating to circa 2000–1 BC (Shoocongdej 2002). Motifs from multiple sites depict the activities of men, women, and children. In these scenes, men are involved in hunting while women are more frequently involved in agricultural plowing. Both men and women are depicted in ritual scenes and in positions of status. At one site children are depicted as participating in a dancing ritual and holding musical instruments.

Data from mortuary contexts have shed light on gender relations and division of labor, as well as considerations regarding the status of the very old and very young within a community. Although focused on burials and skeletal remains, these studies have relevance for household archaeology in that they allow us to consider the social makeup of ancient households. Isotopic data, in particular, have provided insights into marital residence patterns. At the Neolithic sites of Ban Chiang and Khok Phanom Di, Thailand, and Man Bac, Vietnam (Fig. 2), all associated with the transition to agriculture, strontium isotopes shifted over time such that women had a narrower range of isotopic signatures associated with the local isotope ratios, while men's strontium isotopes signatures had wider variations (Bentley et al. 2005, 2007; Oxenham et al. 2021). Researchers suggest that this may represent a widespread pattern of matrilocality at the time (Bentley et al. 2007). In contrast, at the Bronze Age site of Ban Lum Khao strontium isotope signatures combined with artifacts such as bangles and pottery suggest the presence of a group of women who originated from outside the site and a patrilocal marriage system (Bentley et al. 2009). Isotopic studies from the later Iron Age sites of Noen U-Loke and Angkor Borei, Cambodia (Fig. 2) indicate minimal migration by people outside these respective communities during this period (Cox et al. 2011; Shewan et al. 2020).

Results of isotopic studies and examination of skeletal morphology also point to a sexual division of labor and some gendered differences in diet at prehistoric sites like Ban Chiang, where men had higher rates of dental caries but also might have eaten more meat (King and Norr 2006), Ban Lum Khao, where women had higher numbers of caries and men had higher rates of attrition (Domett 2002), and Ban Non Wat, which shows changing carbon isotope ratios and therefore dietary differences between men and women during the Neolithic and Bronze Age periods (King et al. 2013).

Grave goods also can provide insights into gendered division of labor and activities that were undertaken by men and women in the domestic sphere. At the Neolithic site of Khok Phanom Di, the presence of pottery anvils in the burials of women seems to indicate a gendered aspect to pottery production (Higham 2002). At Noen U-Loke, burials dating from the later Iron Age show that both men and women were buried with spindle whorls, pointing toward a widespread practice of this craft within the village. However, women tended to be buried with iron sickles, evidence for a gendered division of agricultural labor (Higham 2002). At the Neolithic site of

Man Bac, grave goods may indicate specific ideological or cosmologically gendered differences (Oxenham et al. 2021). Several adult and subadult males were buried with shells; some were holding them in their hands. A female burial contained a unique shell disk necklace, a nephrite adze, and an unusual ceramic vessel in the shape of a drum. These items are associated with high-status individuals in southern China and may represent the burial of a shaman (Oxenham et al. 2021).

Despite these examples, many prehistoric sites in Southeast Asia do not show strong gender divisions (Bacus 2007a). For example, a study of grave goods from the Neolithic to early Bronze Age site of Non Nok Tha, Thailand (Fig. 2) (Bacus 2007b) demonstrated that gender was not strongly expressed in grave goods and that both men and women were involved in metal production as represented by the presence of metalworking tools in burials of both sexes.

Critical examinations of age are an emerging topic of discussion in bioarchaeological considerations of identity (e.g., Sofaer 2011), and bioarchaeologists in Southeast Asia have already begun to address these issues. Examinations of the elderly can be informative for identifying instances of achieved status and the economic and social roles people played in their community. Similarly, considerations of the young bring up issues regarding when an individual becomes a full member of the community and the social and economic roles children may have played in their households. A recent study at Non Nok Tha considered burial treatment of elderly individuals to understand how age was related to identity within the community (Ross and Oxenham 2016). Many older adults (as well as subadults) had shell jewelry and were buried in specific locations within the cemetery. Additionally, the skulls of several older adults had been removed and placed on their chests. Researchers interpreted the differential burial treatment of adults in their 30s–50s as evidence that age was an important facet of identity.

A study of subadult burials at Man Bac has added to the discussion about conceptions of childhood and the social roles of children (Oxenham et al. 2008). There appears to have been a high rate of fertility at the site, with a large number of subadult burials. Many individuals who died before adulthood had health problems, which the researchers attribute in part to the increasingly agricultural focus of the community. All community members including subadults had some kind of mortuary treatment, and some children had special treatment. As Oxenham et al. (2008, p. 205) argue, these practices suggest that “children were also people.”

A study of infant burials at Khok Phanom Di identified multiple sets of twins that were buried together (Halcrow et al. 2012) in the cemetery but frequently in an unusual, crouched position and facing one another. This differential burial treatment suggests that they were a valued part of the community but also considered different from the older subadults and adults in the cemetery (Halcrow et al. 2012, p. 850). One infant at Khok Phanom Di also was buried with a small clay anvil (Higham 2002). One can speculate that children may have been learning crafts like pottery production from a young age and were an important part of the domestic economy.

A notable study of an individual burial from Ban Non Wat also demonstrates how individuals are part of their communities, especially those who might have needed extra care (Domett et al. 2016). Researchers focused on Burial 676, a young adult female dating to the early Bronze Age (1050–1000 BC) whose grave was dug into

a Neolithic shell midden and located near other burials that may have been family members. Her grave goods included ceramics, freshwater bivalve shells, pigs' feet, and a marble bangle. The individual also was extremely short (143.5 cm) and had signs of nutritional stress, cavities, and healed fractures. Her strontium isotope signatures suggest she immigrated to the site, perhaps as a teenager, but despite this her grave goods, especially the comparatively rare marble bangle, imply she was a full-fledged member of the community and was mourned in death. These examples remind us that households contained many different individuals with diverse life experiences.

### Subgroups Within Communities

In prehistoric Southeast Asia, the identification of subgroups or diversity within communities has largely drawn from skeletal data and mortuary evidence. Early discussions of this topic began with MacDonald (1978), who argued for two groups within the Bang, Thailand (Fig. 2) site based on different burial orientations that were not associated with status or chronology. Sites like Khok Phanom Di or Ban Non Wat, with long-term habitation and extensive mortuary data, have allowed for the identification of burial clusters, which are frequently associated with particular family or kin groups (Higham 1989, 2011b). The emphasis in these studies has been on using burial placement, mortuary data, and grave goods to identify changing status and possible elite or high-status kinship groups within the communities (Higham 1989, 2011a; Higham et al. 2019). At Khok Phanom Di, a series of inherited cranial abnormalities and tooth ablations allowed for the creation of a hypothesized genealogy that spanned several mortuary phases (Higham 1989). In a recent study at Man Bac, probable kin groups were identified based on nonmetric cranial traits (Oxenham et al. 2021). The presence of particular grave goods, biological traits, and body modifications suggest that there were perhaps two or more corporate groups in which kinship was an important component of group membership.

In early Neolithic contexts in MSEA, research questions have centered on identifying possible indigenous and/or intrusive agricultural groups within sedentary communities and using these data to better understand the peopling of Southeast Asia (Higham 2013, 2017a; Higham et al. 2011). Researchers have used craniometrics (Matsumura et al. 2019), dental traits (Matsumura and Hudson 2005; Matsumura and Oxenham 2014), isotopes (King et al. 2015), and ancient DNA (Lipson et al. 2018) to look for the presence of different populations. Currently, there is broad support for a “two-layer” hypothesis in which agricultural communities from Northeast Asia moved into MSEA circa 3,800 years ago with minimal intermingling with the indigenous Melanesian hunter-gatherer population (Matsumura et al. 2019). Isotopic evidence at Ban Non Wat indicates that movements of these populations must have been gradual, as there is little evidence for long-distance migration despite changing burial practices seen at the site that suggests intrusive populations (King et al. 2015). There also is little evidence for violence or conflict between these two groups. At Khok Phanom Di the presence of hunter-gatherer burials with rice and other burials with agricultural tools points to peaceful interaction (Higham 2017a).

At the Neolithic site of Man Bac, nonmetric cranial traits were used to identify kin groups, with mtDNA haplogroups and craniodental morphology used to determine if individuals were indigenous or migrants from East Asia (Oxenham et al. 2021). Both populations were identified, with the indigenous kin group being associated with distinct types of body modification and more elaborate burials.

As noted above, the practice of residential burial has been suggested as evidence for the presence of house societies in prehistoric Thailand and Neolithic Taiwan. These corporate groups are another example of intravillage subgroups (Chiang 2015; White 1995; White and Eyre 2010). One recent ethnoarchaeological study in West Sumba, Indonesia, specifically attempted to identify material correlates of house societies that could assist with identification of these subgroups and their activities in the archaeological record (Adams 2019). Twenty-five houses were examined to determine the wealth differences between them as well as their associated tomb building and feasting activities. Material culture also was examined to determine if a relationship between particular objects and tomb building and feasting activities could be identified. While wealthier households were found to be more likely to participate in these activities, the results of the study suggest there was little material culture within households to indicate their participation in feasting and tomb building, and identifying them archaeologically would be difficult. For this reason, Adams suggests that future archaeological work needs to look beyond the individual household to village-level patterns that would indicate corporate group participation in tomb building and feasting. Additionally, he argued that even though this was an important community activity, the variance in household wealth within villages indicates that these kinds of activities do not necessarily take place within egalitarian societies.

## **The Production and Reproduction of Supra-household Communities**

Much research in Southeast Asia has been at the site or village level, which is frequently perceived to represent intrinsic communities (Flannery 1976; Kolb and Snead 1997). More recent work in large-scale societies has begun to consider urban supra-household communities like neighborhoods. Here I consider how archaeologists have approached the production and reproduction of community identity in village sites and the presence of diverse communities within urban settlements.

### **Community Identity in Villages**

The production of pottery, likely in a domestic context, is one way that community identity can be produced and reproduced. Eyre and White (Eyre 2010; White and Eyre 2010) have identified approximately 13 ceramic subregions, or areas that contain multiple sites with similar ceramic morphology and style in northeast Thailand. Subtle variations in the ceramics indicate they were not made at a single site but instead point to shared pottery production techniques across sites (White and Eyre

2010, p. 66). These regional ceramic traditions appear to have connected potters and sites with one another.

Some pottery communities and ceramics traditions appear to be long-lived, lasting hundreds or perhaps more than a thousand years, as was the case at the Neolithic site of An Son, (Sarjeant 2014; White and Eyre 2010, pp. 67–68). These ceramics seem to have become important markers of community identity. Work at An Son has examined the presence of a particular formula or mental template in use for this nearly 1000-year period (Sarjeant 2014). A mental template is “the psychological mechanism that involves the ideal vessel that a potter has in mind prior to manufacturing the pot” (Sarjeant 2014, p. 280). This ideal form must be taught or communicated in some way by the potters themselves, their community of potters, or the consumers of the pottery (Sarjeant 2014). At An Son, the persistence of particular ceramic forms over multiple generations is likely due to the utilitarian or ritual functions of the vessels but also because these ceramics were an important part of the community identity; they played important roles “as reminders of the past, ancestry, and origin” (Sarjeant 2014, p. 284). Observations of ceramic production techniques and style (vessel shape and design) have also been used to identify larger regional styles that scholars argue represent cultural and economic interaction, as well as the presence of a widespread community of potters (Eyre 2010; Rispoli 2007; Sarjeant 2014).

One component of the study of ancient communities is the maintenance of boundaries between groups or communities (Kolb and Snead 1997). Sites demarcated by walls or moats were identified in the early-mid 20th century by several European scholars in southern Cambodia and Vietnam (Groslier 1930, pp. 576–577; Malleret 1959), central Thailand (Quaritch-Wales 1969), and northeast Thailand (Moore 1988b; Quaritch Wales 1957; Williams-Hunt 1950). Earthworks and ditches bounded these sites, distinguishing them as discrete units, with multiple examples present in the same geographic region. Early scholars were interested in determining the functions of the walls and moats as well as the nature and timing of these sites; however, more recent studies have examined how these sites represent a regional community identity.

The oldest of the moated/earthwork sites are located across an approximately 3000-km<sup>2</sup> area in the red soil (*terres rouges*) region of southeastern Cambodia and southern Vietnam. In Cambodia, these sites are known as Memotian culture sites (Fig. 2) (Groslier 1966). Thus far, 33 sites have been documented, although approximately 20 more are reported (Dega and Latinis 2013, p. 344, note 2). Early scholars believed they date to the Neolithic period (Groslier 1966; Malleret 1959). More recent research dates them to 2300–300 BC (Dega 2002). Most earthworks are approximately 5 ha in diameter, with a large earthen wall encircling a depression, interior platform, and entrance causeways (Dega 2002). The sites themselves are located on hills in a transitional zone between upland terraces and lowland floodplains (Dega and Latinis 2013).

Material culture shows great similarity between sites, with locally produced ceramics used primarily for cooking or household purposes and lithic tools that seem related to forest clearance, woodworking, and agriculture—likely swidden rice agriculture (Dega 2002; Dega and Latinis 2012, 2013). In a study of ceramics

from multiple Cambodian moated Memotian sites, similarities in vessel form and design point to frequent communication between sites, but there was little evidence for trade or interaction with communities in the lowland floodplains (Dega and Latinis 2012). Dega and Latinis (2013) argue that the swidden agriculture subsistence economy, involving forest clearance and the keeping of domestic animals and house gardens, was ultimately a successful adaptation to the local environment due to the presence of virtually unchanged earthworks sites for approximately 2000 years. Scholars have also observed similarities between these sites and ethnographically documented circular village sites of Mon-Khmer-speaking ethnic minority groups in the upland regions of Cambodia, Laos, and Vietnam (Kojo and Pheng 1998). Further work is needed to determine if there is a connection between this particular settlement pattern and these ethnic groups.

Two different types of walled/moated earthwork sites have been identified in central and northeast Thailand. Those in central Thailand are generally larger than those in the northeast, although with significant size variations (from 50 to 350 ha) and irregular oval or rectangular forms. Although few sites have been carefully investigated, they are associated with the Dvaravati culture dating to the mid-first millennium AD (Mudar 1999; Vallibhotama 1992). Many of these sites are concentrated in central Thailand (Gallon 2013; Mudar 1999), but moated Dvaravati culture sites have also been found in northeast Thailand (Murphy 2013). Numerous unmoated Dvaravati culture sites have also been recorded (Gallon 2013, p. 150). Many investigations of Dvaravati culture sites have focused on the visible brick architecture, epigraphy, and art associated with the practice of Buddhism, with less archaeological research on domestic contexts (Brown 1996; Murphy 2013; Quaritch-Wales 1969).

In contrast, the irregular circular moated sites of the Mun and Chi River valleys in northeast Thailand have been among the most intensely investigated prehistoric sites in MSEA (Higham et al. 2019). These sites consist of a raised central mound surrounded by one and sometimes up to five circular ditches and embankments. The sites range from 3–171 ha, with mounds ranging in size from 6–20 ha. Recent work has identified almost 300 moated sites in the region (O'Reilly and Scott 2015); unmoated sites exist but are less studied (Duke et al. 2016). Early scholars suggested the moats had multiple functions, including for defense, water storage, and agriculture (Moore 1988b; Vallibhotama 1984; Williams-Hunt 1950). Many of the site-level investigations have taken a culture-historical approach, focusing on the dates of habitation and change through time, especially related to major technological changes such as the introduction of bronze or copper metalworking and the appearance of social stratification as seen in mortuary wealth (Higham 2015b; Higham and Kijngam 1984; Higham and Thosarat 2004; Higham et al. 2007, 2014). Regional surveys also worked to document these sites in more detail (Moore 1988a, b; O'Reilly and Scott 2015; Welch and McNeill 1991).

These investigations reveal that many moated sites were inhabited prior to the construction of their moats, which appears to have been a widespread late Iron Age (AD 1–600) adaptation to increasingly arid environmental conditions (McGrath and Boyd 2001). In some cases, it appears that moats modified preexisting river channels near mounded sites, while others were constructed features (Boyd 2008; Boyd



et al. 1999). Some scholars (Higham et al. 2019; O'Reilly 2014) have argued that the moats may have been constructed or controlled by emergent elites at the moated sites, who then parlayed this into control of agricultural surplus, staple finance systems, and a sustained hierarchy. Higham in particular has implied that there was a shift to private land ownership, invoking a quote from Rosseau: "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" (Higham 2014b, p. 829, 2015a, p. 394, 2016, p. 433; Higham et al. 2020a, p. 74). Another interpretation has been offered by O'Reilly (2008), who argued that moats could serve as a kind of "symbolic boundary" related to the increased ranking and agricultural intensification seen at some sites and a need to demarcate these communities from outsiders.

While there is certainly evidence for intensified agriculture during the late Iron Age (Higham et al. 2019), the mortuary data discussed above does not clearly demonstrate the presence of an emerging hierarchy. Questions remain regarding the mechanisms that an emerging elite individual or family would use to maintain control of or restrict access to water stored in a moat or series of moats that encircled an entire site. What exactly is private land ownership in this context? With almost 300 moated sites in the region, one must ask if all moats represent the emergence of multiple entrenched elites at each site, or are they representative of diverse adaptations to increasing aridity, including community-level or collective responses? For example, scholars have proposed that the presence of moated and unmoated sites only a few kilometers from one another could represent the presence of an integrated community that shared diverse resources (Duke et al. 2016, p. 10). Furthermore, at some locations in the Upper Mun River valley, channels already ran near or around sites and were ostensibly a part of long-term community management of the landscape prior to Iron Age moat development (Boyd and Chang 2010).

Even during the later periods in which there are clear hierarchical social structures, sixth–eighth century AD inscriptional data suggest that land was communally owned (Vickery 1998, p. 299). Angkorian period rice field and water management patterns also suggest the presence of both large-scale state-organized and smaller-scale locally organized agricultural and hydraulic infrastructure, with some rice fields perhaps communally managed (Hawken 2013; Klassen and Evans 2020). Angkorian inscriptional data do not suggest that elites were major landholders until the late 11th–12th centuries AD and that during this period they were buying land that had previously been communally owned (Klassen and Evans 2020; Lustig and Lustig 2019). Archaeological and ethnographic data from other world areas have established that large constructions such as walls or fortifications and the management of hydrological features and intensive agriculture could be undertaken without permanent elites or even hierarchical social organization (Braemer et al. 2009; Davies 2009; Dega 2002; Erickson 2006; Fiskesjo 2001; Leigh et al. 2013; Smith 2003). A comparative study of semitropical societies, including Angkor, has emphasized the importance of cooperation and heterarchical organizational structures in managing water in such environments (Scarborough and Lucero 2010).

For these reasons, it is reasonable that alternative hypotheses be considered. In one such analysis, Boyd and Chang (2010) take a similar view as Dega and Latinis

(2013), that the more than 2000-year habitation at mounded sites in northeast Thailand reflect long-term sociocultural adaptation to the environment. In this context, the construction of moats during the late Iron Age is not presented as a new innovation by an aggrandizing elite but as an adaptation to an increasingly challenging environment meant to allow these communities to maintain their previous lifestyle. As Boyd and Chang (2010, p. 285) argue, “they changed in order to remain the same.”

A survey of sites in the Upper Mun River valley dating to the first millennium AD also suggests complex and localized responses to social and environmental pressures (Evans et al. 2016). Researchers surveyed sites in the region dating to the fourth through ninth centuries AD; a period when moats were being constructed and some large centers were emerging on the floodplains, with evidence for Indian religious architecture and powerful local leaders. Among other developments, Evans and colleagues observed the presence of new small–medium sites in previously unoccupied upland regions of the Upper Mun River valley. While some people may have moved to these larger centers, the establishment of new communities in the region suggests that some people chose to move away from the influence of these centers and seemingly resisted incorporation into their hierarchical social structure (Evans et al. 2016, pp. 465–467). These examinations, though brief, show that looking beyond evidence for emerging hierarchies can provide an alternative perspective to community developments and the emergence of moated sites in northeast Thailand.

### Communities in an Urban Context

Urban environments bring together diverse groups of people not linked by kinship networks, but whose regular interaction, often within neighborhoods, facilitate the formation of a type of community identity (Arnauld et al. 2010; Pacifico and Truex 2019; Smith et al. 2014; Yaeger and Canuto 2000). Researchers at urban sites in Southeast Asia have begun to identify the presence of neighborhoods largely based on unique material culture signatures associated with specific groups. At the peninsular Thai site of Khao Sam Kaeo (Fig. 2) (fourth century BC–first century AD), excavators identified locations with concentrations of Han Chinese, Indian, and Southeast Asian ceramics associated with South China Sea communities as evidence for ethnic neighborhoods or enclaves (Bouvet 2017; Favereau et al. 2017; Peronnet and Srikanlaya 2017). Local materials are concentrated in the southern portion of the site, with the northern portion home to a likely population of foreign merchants and craftspeople (Bellina 2017). Written documents and artistic depictions from the Trowulan site also suggest there were neighborhoods of foreigners within the city (Miksic 2012). Although these have not yet been documented materially, work from Khao Sam Kaeo suggests such studies could be fruitful.

Archaeological work at Angkor has identified walled temple enclosures as important loci of habitation, likely occupied by people who worked at the large state temples (Stark et al. 2018). Scholars have proposed that these sites were a type of neighborhood (Carter et al. 2018). Archaeologists have also identified the habitation of other more specialized religious communities such as asramas, in which people may

have been organized around religious study and practice (Chea 2018; Estève and Soutif 2010–2011; Pottier 2003). Investigations of non-temple enclosure residential spaces at Angkor have identified some pockets of long-lived habitation in the area dating from the 9th–17th centuries AD (Brotherson 2019; Heng et al. n.d.). Settlement patterns in one area of Angkor’s urban core, denoted the “Eastern District,” remained relatively unchanged, despite landscape transformations, increasing population density, and new temple construction in the rest of the capital. Scholars have proposed that this area had a resilient community identity that facilitated its long-term persistence in the dynamic Angkorian landscape (Heng et al. n.d.).

## Conclusion and Future Directions

Archaeologists working in Southeast Asia have been broadly considering many of the same questions as household archaeologists of other world regions, albeit with a limited residential dataset. Preservation conditions in Southeast Asia make the identification of complete dwellings difficult, but portions of dwellings and the identification of residential spaces are possible. Innovative studies have facilitated an understanding of the types of activities that took place in these spaces, largely centered on subsistence activities. Ethnoarchaeological research has provided material correlates for specific activities but also brings to light challenges with identifying *in situ* activity areas in the archaeological record. The identification of specific household activities can give us one lens into understanding the domestic economy; however, this has not been a major focus of archaeological research in Southeast Asia. Instead, studies of craft production, especially metalworking and pottery, provide indirect evidence for the practice of these crafts in a domestic context.

Two types of domestic rituals appear to be widespread in Southeast Asia: the deposition of offerings seemingly as part of a construction or consecration ritual and the practice of residential burial. Residential burial was likely an important component of identity construction for corporate groups, although the focus of much of this work has been on how these burials inform us about sociopolitical organization and less about the potential meaning of this ritual practice for inhabitants.

Few scholars have been able to address questions about who lived in houses and the composition of Southeast Asian households; however, other sources of data, especially burial data, have allowed scholars to consider questions regarding gender, status, age, and supra-household communities at the village or site level. Site-level studies have also identified how communities produced and reproduced their identities either through the production of objects like ceramics or through demarcating spaces on the landscape. Archaeologists working in urban environments are beginning to address these questions through the study of neighborhoods.

The next steps of this work involve building a more intentional archaeology of households and residential spaces. The specifics of this will vary from place to place and what can be achieved given time and budget constraints, as well as local regulatory frameworks, accessibility of sites, and permission from local stakeholders.

Large-scale horizontal excavations with careful stratigraphic control are the best way to expose complete dwellings and activity areas. Expanded excavation trenches have already been shown to dramatically change one's interpretation of the past (Higham 2015a, p. 386, 2017b, p. 371). A greater database of residential spaces over time and space is needed to build an adequate comparative dataset, understand similarities and differences within a community, and examine how these changed over time (Drennan et al. 2010). It is recognized that such projects are time consuming and costly (Nash 2009, pp. 243–244); two studies reviewed here that were able to conduct such comprehensive excavations were part of larger salvage or rescue projects (Báty et al. 2014; Chiang and Liu 2011).

Smaller-scale excavations of occupation spaces and midden areas also can be useful for understanding some basic aspects of residential activities and change through time (e.g., Carter et al. 2018; Stark et al. 2015). Such excavations must be spatially expansive so that it can be determined that excavations represent different houses (Drennan et al. 2010). Regardless, the study of residential spaces in Southeast Asia needs to move beyond making simplistic connections between archaeological dwellings and those in ethnographic and art historic depictions to asking anthropological questions about the inhabitants and their activities.

Ethnographic and ethnoarchaeological studies are an underutilized resource. While studies have examined craft production, house societies, and household activities, few have been tested archaeologically for reasons that are unclear. Models derived from the Kalinga Ethnoarchaeological Project have been applied more frequently outside Southeast Asia than within (Stark and Skibo 2007). Examples from other world areas provide models for how Southeast Asia's rich ethnographic record could be used to address many different archaeological questions. In one example, archaeologists in Mesoamerica have used the extensive ethnographic and ethnohistoric record to expand understandings of household organization (Carballo 2010), which is still lacking in Southeast Asia. Ethnographic and ethnohistoric work on gender in particular (Andaya 2007; Peletz 2009) could be further explored in the archaeological record, which has addressed this topic based largely on mortuary data. Ethnographic studies, for example, have identified particular parts of Cambodian residences that are strongly gendered and associated with particular food and ritual practices with material correlates (Népote 2006). The identification of such spaces and patterns archaeologically would not only add to the understandings of social dynamics within houses but also add to considerations of domestic ritual practices. Although applying ethnographic data to prehistoric residential spaces that are thousands of years old can be challenging, the careful use of ethnographic data in investigations of sites from the more recent past could prove fruitful.

To this end, Southeast Asian landscapes have been ethnographically documented as spiritually rich (Allerton 2009; Guillou 2017). Scholars have frequently invoked animist practices in Southeast Asia as being “indigenous,” predating the introduction of the world religions of Hinduism, Buddhism, or Islam (De Casparis and Mabbett 1992). This indigeneity implies a time depth that could be documented in the archaeological record. For example, the use of small domestic shrines to ancestral spirits or spirits of the land is widespread across many parts of Southeast Asia (e.g., Pearce 2011). Careful excavation of residential spaces could identify the presence

of such shrines in the past and how this and other domestic rituals have changed over time, especially with increasing influence from various world religions. Furthermore, such studies also could engage ontological discussions that acknowledge the spiritual component of households. Herva's (2009) study of 17th century AD households in Finland serves as an example of one such study. Drawing on folktales and historic documents that describe household spirits, Herva (2009, pp. 394–395) reinterprets building deposits as a ritual that “facilitated sociality between people and buildings” and made them into “animate entities.”

Several studies discussed here provide material evidence for household activities; however, the next phase of this work needs to consider how such activities are related to the domestic economy and household production and consumption, as well as the social dynamics of a household (Allison 1999a). Such studies, of course, require larger comparative datasets. While studies of ceramics and bronze metallurgy have emphasized community-based craft production, more focused work on households or residential spaces could facilitate a greater understanding of how labor was allocated within households and how this might have varied within and between sites based on internal and external pressures (Brumfiel 1991; Hendon 1996). Such considerations would allow archaeologists to break down community-level production to determine if, how, and why craft production might have intensified or varied within households (Carballo 2010; Costin 2001; Hirth 2009a). In some cases, it might be possible to identify that multiple households worked together to complete daily tasks (e.g., Goldstein 2008). Comparisons of urban and rural households have also been fruitful in terms of identifying how household production and consumption varies in relation to different ecological and sociopolitical pressures (Brumfiel 1991; Franklin 2019; Franklin and Lee 2020), as well as considering the complex relationships that urban households had with their nearby urban centers (Hirth 2013; Yaeger 2000).

Although large-scale horizontal excavations are ideal, archaeologists of Southeast Asia also can use smaller samples in combination with novel methods and multidisciplinary teams to maximize their data and make meaningful interpretations about the past. Soil chemistry analysis of house floors and palaeobotanical studies have already proven to be valuable for identifying otherwise invisible household activities (Castillo et al. 2020; Kanthilatha et al. 2014a). The addition of microartifact analysis (Ullah 2012) and microstratigraphy (Shillito et al. 2011) also could prove useful in identifying remains of household activities.

Diverse residential datasets are needed to better understand community organization and address persistent questions regarding the nature and timing of hierarchical social organization, which has largely relied on mortuary data. Already the small number of studies in northeast Thailand that have considered settlement data have complicated earlier interpretations based solely on burial data. Chiang's (2015; Chiang and Liu 2011, 2014) work in Taiwan provides a model for this kind of research, in that careful and well-documented excavation of residential areas was able to identify subtle variations between households that elucidated status differences and community dynamics.

The increasing attention to residential areas in urban centers like Angkor also shows promise for investigating questions regarding the organization of households

in a state-level society. Household studies elsewhere in the world have shown how domestic economies impact and are impacted by the state (e.g., Brumfiel 1991; Clayton 2013). There is potential to pursue such questions in Southeast Asia. For example, inscriptional data at Angkor suggest that large numbers of households supported both village and state-level temples (Lustig and Lustig 2015), but this has yet to be materially documented. One also can ask how state control affected craft production. Evidence from several Angkorian contexts suggests that production of stoneware ceramics and metals shifted from households to workshops (Grave et al. 2021; Polkinghorne et al. 2014). However, as Hendrickson and Leroy (2020) observed, iron oxide to produce brown glazes was used in ceramic kilns that are frequently found near iron production sites, which might suggest exchange of technological knowledge or even cohabitation between craft producers. These developments could be further explored with a focused examination of domestic spaces.

As cosmopolitan places, urban residences have the potential to help answer questions regarding the creation and reproduction of ethnic or religious identities and other “imagined communities” through the investigation of occupation areas (Isbell 2000). Better understanding of the organization of religious communities and their daily practices could be achieved through investigation of occupation areas associated with temples and places of religious practice and learning, such as monasteries and asramas. Studies of earlier urban centers of the first millennium AD have largely focused on religious architecture, but investigation of occupation areas could examine how households were transformed as these as communities became increasingly hierarchical, adopted Indian religious practices, and created new urban identities.

Recent archaeological work on contact period sites in the Philippines has emphasized evidence for resistance to colonization by indigenous peoples in the Ifugao region (Acabado 2018; Acabado and Martin 2016; Acabado and Barretto-Tesoro 2020). Continued work focusing on occupation contexts in colonized regions of Southeast Asia, such as Indonesia (Lape 2002), has great potential to speak to the broader archaeological literature on resistance and resilience in colonial contexts, which has largely overlooked Southeast Asia (Croucher and Weiss 2011; Lyons and Papadopoulos 2001; Voss and Casella 2011).

Lastly, the archaeology of residential spaces can expand the diversity of Southeast Asia’s archaeological record and contribute to decolonizing practices in archaeology. The archaeology of everyday activities, including the archaeology of residential spaces, can put the spotlight on ordinary people and the multiplicity of lived experiences in the past (Robin 2020). Recent studies elsewhere in the world have used residential data to highlight issues of interest to contemporary people, such as sustainable food practices and food security (Isendahl and Smith 2013; Logan et al. 2019; Spielmann and Aggarwal 2017). A recent community archaeology project in the Philippines demonstrates how a focus on the archaeology of settlement spaces of minority groups can help subvert nationalist and colonialist narratives that foreground the heritage of the dominant cultural group (Acabado and Martin 2020). The archaeology of residential spaces and household archaeology also can facilitate community archaeology and engagement with local stakeholders (Acabado 2020). Many ancient settlements, in contrast to

major temples and tourist sites, are located within or near contemporary habitation areas. Undertaking household archaeological research in people's backyards and including them as participants can facilitate the decolonizing of Southeast Asia's archaeology through community engagement.

There is much work to be done on the subject of residential spaces and communities in Southeast Asia. Despite these challenges, it is exciting that interest in households, villages, and communities in Southeast Asia is growing. Given the robust anthropological interest on this topic in Southeast Asia, it is hoped that archaeological work can begin to show similar diversity in both the locations and practitioners of this kind of research. There is great potential for Southeast Asia's unique archaeological record to speak not only to regional developments but to make contributions globally (Stark 2016; White 2017).

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