Household economy and gendered labor in the 17th century A.D. on Guam

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The gendered division of labor in household economies is well known in documentary accounts of many societies, although archaeological evidence for it is often elusive. Our study compares ethnohistorical accounts of household organization with archaeological patterns at a 17th-century village on the island of Guam in the Marianas archipelago to determine if these different sources of evidence provide similar insights. We investigated archaeological assemblages from two *latte* (megalithic) buildings to document their economic activities. Unexpected differences in their assemblages revealed that economic activities varied between the two latte buildings. They were domiciles of a single economically integrated household, but their disparate functions likely signaled a gendered division of labor. This study reveals aspects of gendered labor that documentary accounts do not fully describe. Our findings suggest that the assumption that domestic buildings were functionally redundant in traditional societies must be tested on a case-by-case basis.

Keywords: Mariana Islands, Guam, Chamorro, household, gender, colonialism

Introduction

The Spanish colonized the Mariana Islands almost 150 years after Ferdinand Magellan initiated Europe's first contact with Guam in A.D. 1521 (FIG. 1); they were fascinated by the *latte* (megalithic) buildings that were constructed of stone pillars (*haligi*) supporting wooden superstructures (FIGS. 2, 3). However, latte buildings were not described in detail, and their construction waned rapidly once the Spanish fully dominated indigenous Chamorro society by establishing a Jesuit mission on the island of Guam in 1668. Consequently, Spanish accounts offer relatively limited insights into the construction of these buildings, leaving archaeological research to provide critical access to these distinctive examples of precolonial vernacular architecture.

Archaeological and documentary evidence indicate that latte buildings served a variety of functions including sleeping, food consumption, craft production, storage, and ancestor veneration (Carson 2012; Craib 1986; Dixon *et al.* 2006; Graves 1986; Russell 1998; Spoehr 1957; Thompson 1940). Other activities undertaken in proximity to latte buildings included sports competitions, oratorical events, food preparation, feasting, gardening, and performances such as dancing and singing (Dixon *et al.* 2006: 56–57). Thus, latte buildings formed the focus of activities in the daily domestic and public lives of the contact-period Chamorro, and the archaeological study of these structures can illuminate the organization of the Chamorro household economy.

Although archaeological studies of latte sites are detailed (Craib 1986; Egami and Saito 1973; Graves 1986, 1991; Thompson 1932), the organization of economic activities within and around them is not well documented, with the exception of work by Dixon and colleagues (2006). Their investigations at six latte sites on Tinian suggested that food preparation, consumption, craft production, and the interment of human burials was undertaken along the front, back, and ends of latte buildings (Dixon *et al.* 2006: 65–66). The study by Dixon and colleagues (2006) is valuable in documenting economic activities within individual latte buildings and their immediate extramural areas. However, it is unknown whether economic activities at various latte buildings in the same village were generally redundant or variable.

Accordingly, our excavations during three seasons (2008–2010) at two latte buildings in the Guam National Wildlife Refuge (GNWR) focused on the patterning and organization of household economic activities. The two latte buildings were found to be

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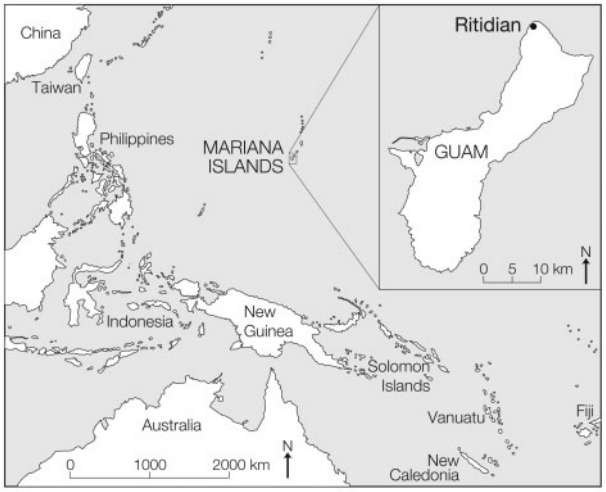

Figure 1 Location of the archaeological excavations at Ritidian on the island of Guam.

occupied during the last moment of traditional Chamorro society before the Spanish instituted the *reducción* (reduction) policy in 1682, when the islanders were forcibly relocated from their scattered settlements into six mission towns (Russell 1998: 305). Our study was designed to determine whether contemporaneous latte buildings were relatively redundant or variable in their economic functions. Thus, we excavated contiguous units to examine the spatial organization of economic activities at two adjacent latte buildings and their extramural areas. Such an approach offered an effective means to clarify the spatial dimensions of economic organization (Kahn 2003; Kirch and Kahn 2007: 209–212).

Our research revealed that individual latte buildings are characterized by archaeological assemblages resulting from different tasks, indicating some degree of variation in their subsistence and craft activities. One latte building was used for food processing, cooking, and storage, while the other latte building was used for the production and use of fishing gear and canoes. A review of ethnohistorical accounts (Russell

Figure 2 Europeans inspecting a latte ruin on the island of Rota in 1819. Courtesy of the Micronesian Area Research Center.

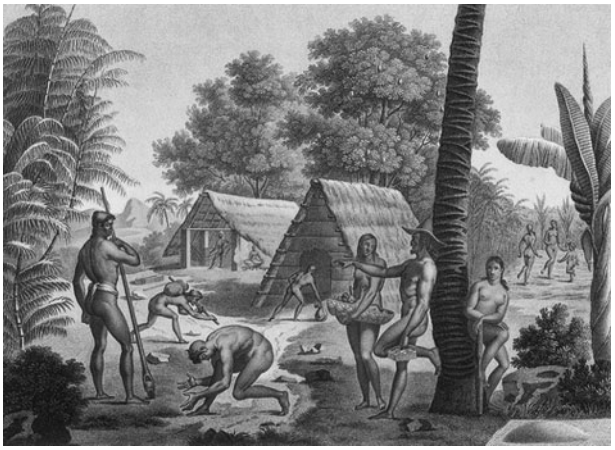

Figure 3 Village life on Guam, painted by J. A. Pellion in 1819. Courtesy of the Micronesian Area Research Center.

1998) indicates that the contrasting economic activities of these two latte buildings likely relate to an institutional division of labor by gender, and that these two buildings (and perhaps others) were part of one integrated household. This traditional system of economic organization originated before the contact period (which began with Magellan's visit in 1521) and persisted until the Spanish colonial period (which began in 1682 with the reducción). Before considering the implications of these findings, we review approaches that archaeologists typically use to investigate household economy and gender.

Archaeological Approaches to Household Economy and Gender

Recent decades have seen a proliferation of archaeological studies of traditional household economy (Flannery 1976; Kahn 2003; Wilk and Rathje 1982; Santley and Hirth 1993; Ashmore and Wilk 1988; Alexander 1999; Voss 2008; Pluckhahn 2010; Van Gilder 2001; Van Gilder and Kirch 1997). Most scholars agree that "…households are social groups with a material presence, defined not only by buildings but also by the remains of routine activities and habitual practices…" (Pluckhahn 2010: 332). Because households are a fundamental economic unit in the ethnographic world and their residues are abundant in the archaeological record, they are relatively accessible to scholars who study the past.

The usefulness of examining the household lies in the theoretical "counterweight" it provides to studies of large-scale phenomena, such as regional systems, cultural landscapes, and macroeconomies (Gerritsen 2004: 143). Household research provides archaeologists with an opportunity to examine traditional societies from a bottom-up economic perspective that approximates the lived experiences of past peoples (Pluckhahn 2010: 332; Gerritsen 2004: 143). The emphasis of household archaeology is on identifying and interpreting the material correlates of domestic

activities (Flannery 1976), along with gender, symbolism, and identity (Brumfiel and Robin 2008).

Although household archaeology focuses on how domestic activities relate to their surrounding political economies, research increasingly emphasizes the cultural significance of daily household activities. Archaeologists no longer view the household as an uncomplicated adaptive mechanism that follows broad macroregional processes (Hendon 1996: 45). Rather, the household is seen as a center of cultural production (Pauketat 2001) accomplished through the practice of daily domestic activities (Hodder 1982; Hendon 1996: 45).

While anthropologists agree that the division of labor between women and men is a fundamental characteristic of human societies (Durkheim 1964), this division is not the same among societies (Brumfiel and Robin 2008: 4). Even in societies that emphasize gender roles, the labor of men and women may overlap rather than divide into exclusive binary categories (Brumfiel and Robin 2008: 1–2). Nevertheless, cross-cultural analysis of ethnographic information confirms that a gendered division of labor in craft production (if not food production) is remarkably strong (Costin 1996: 121). In those instances where males and females do participate in the same general craft, they use different technologies, make different kinds of products, or supply a different population of consumers (Costin 1996: 122–122). Whether the origin of gendered labor lies in biological or cultural imperatives is debatable (e.g., Hays-Gilpin and Whitley 1998: 139). Here we follow Rice (1991) in arguing that gender symbolism and non-biological economic structures governed the division of labor in many, if not all, traditional societies.

Archaeological examinations of gender in past economies face challenges in developing an analytical framework for identifying male/female task differentiation (Spector 1998: 146). Spector (1998: 148) notes that a "task" is an activity with discrete parameters in terms of the segment of a population (e.g., household, gender) that practices it. To examine a task using ethnohistorical accounts, it is important to ascertain its season, frequency, and duration, along with its location and the materials (i.e., artifacts, structures, and facilities) that are required for its execution. An archaeologist armed with such information can engage in "activity mapping," whereby the temporal and spatial evidence of task performance—with respect to gender—can be evaluated by comparison with the archaeological record of artifacts, structures, and facilities. Our study used an artifact-based approach to gender that also considered the potential role of architecture in spatially segregating female and male labor. Documentary accounts of traditional society in the Marianas confirm that labor was indeed gendered (Russell 1998), and yet there has been little discussion of whether or not architecture was used to isolate male and female activities.

Documentary Perspectives on Household Economy and Gendered Labor in the Mariana Islands

Early 17th-century Spanish documentary records offer clues on the organization of household economy and gendered labor among indigenous Marianas populations before they were colonized and drastically changed by European contact. In 1602, Juan Pobre de Zamora, a Catholic lay missionary, stayed from March to October on the Mariana island of Rota, where he wrote a detailed account of his visit. His report reveals that 81 years after Magellan's landfall on Guam, the Chamorro still practiced their traditional lifeways (Rogers 1995: 19–20). A recent synthesis by Russell (1998) of this and other accounts offers valuable insights into Chamorro subsistence and craft production, outlining key patterns that archaeologists can study. We used Russell's review to construct a model of Chamorro household economy and gendered labor to test in excavations at the GNWR. Before we turn to our particular archaeological case study, we briefly outline the major characteristics of Chamorro society, household economy, and gendered labor in the early Spanish colonial period.

Precolonial Chamorro subsistence strategies emphasized a mix of horticulture and foraging for marine and terrestrial resources. Women and men, and probably children, all contributed labor to farming. Juan Pobre de Zamora observed that "…they go to the hillside or jungle to see their farm plots where every able-bodied person goes to work…" (Driver 1983: 209). Unlike craft production, which often entails a stricter separation of the genders, food production in most non-industrial societies requires the participation of all individuals (Costin 1996: 134). Gardening and farming in the Mariana Islands involved root and tree crops: various species of taro (*Colocasia* spp.), yams (*Dioscorea* spp.), breadfruit (*Artocarpus* spp.), coconut (*Cocos nucifera*), banana (*Musa* sp.), pandanus (*Pandanus* sp.), Federico palm (*Cycas circinalis*), sugarcane (*Saccharum officinarum*), betel palm (*Areca catechu*), and betel pepper vines (*Piper betel*) (Russell 1998: 167, table 8). Although the scale of its production remains undocumented, there is archaeological, linguistic, and historical evidence that rice (*Oryza sativa*) was cultivated also before Spanish contact (Hunter-Anderson *et al.* 1995).

Juan Pobre de Zamora reported that Chamorro women were homemakers engaged in childcare and horticulture (Driver 1993: 17; Russell 1998: 147–148). Mat-making was also noted as a woman's "…principal skill and occupation…" (Driver 1983: 210). Women wove plant fiber mats to make mattresses,

blankets, hats, floor coverings, and wrappers for gifts (Driver 1983: 210). Accounts of the preparation and cooking of food are limited, but such activities were apparently the purview of women. Juan Pobre de Zamora observed the cooking of breadfruit by boiling in clay pots (Driver 1993: 39), and it is likely that other foods in Marianas diet (e.g., fish, roots, coconut, bananas, taro, and rice) were prepared in a similar fashion (Moore 2012). An illustration by J. A. Pellion, an artist who accompanied a French expedition to Guam in 1819, portrays (faintly) a Chamorro woman cooking with a large vessel atop a fire alongside a latte building (FIG. 3).

Specific information on the manufacture of pots in Guam during the early Spanish period is lacking, but it is likely that pottery was made by women. Crosscultural studies indicate that pottery production in small-scale societies (like the contact-period Chamorro) is most frequently practiced by women on a part-time basis, in tandem with other household activities (Arnold 1985: 99–108). Women can integrate part-time pot making with other household obligations (e.g., childcare, cooking); this is useful if male dominated patterns of subsistence such as deepwater fishing take them away from home for any length of time (Arnold 1985: 103). The Spanish described large feasts with as many as 1000 individuals that probably required the use of pots (Levesque 1993: 180), which were likely used also for storing water and foods such as rice that required protection from rats (Driver 1993: 12).

In contrast to women's activities, men's activities often focused on deepwater fishing using trolling, baited hooks, netting, spearing, and trapping (Russell 1998: 183). Fishing required the creation, maintenance, and repair of fishing gear including hooks (of shell and wood), trolling lures, bone-tipped harpoons, spears, stone and ceramic sinkers, and plant-fiber nets. Juan Pobre de Zamora observed that boys as young as four or five years of age were trained by their fathers to sail small boats and fish on the open sea (Driver 1983: 208). By the age of 16 or 18 boys could fish independently of their fathers. Juan Pobre de Zamora recalled that a successful fisherman would butcher and ritually salt game fish in "…the cleanest spot beside his house…" (Driver 1993: 209).

Chamorro women and children gathered shellfish along the coasts and reefs and both men and women engaged in net-fishing. Claassen (1991: 276–277) documents the near-universal role of women and children as the primary collectors of shellfish and the Chamorro example fits this pattern. Chamorro prized some shellfish species as sources of protein, whereas others (e.g., Tridacnidae [*hima*]) were valued as raw materials for adze blades. Similarly, Isognomon shell was used for making gorges and fishhooks (Russell 1998: 187–188). Shellfish, such as Tellinidae and Strombidae, from sandy flats within a reef were probably gathered by women and children (Russell 1998: 187). Because other shellfish, such as Turbinidae, inhabit areas that were visited during offshore fishing expeditions (e.g., patch reef areas and exposed reef tables), they were most likely gathered by men.

Table 1 summarizes the organization of gendered labor from key documentary sources from the Spanish period. Although some activities (e.g., farming and net-fishing) involved both men and women, other activities (e.g., cooking, pottery production, mat-making, deep-sea fishing, canoe-making, and the production and use of fishing gear) were segregated by gender (TABLE 1). The sharpest division of labor is seen in deep-sea fishing by males, and the preparation of plant foods by females. Spanish period accounts are silent on whether *specific* buildings were used for particular economic activities in traditional Chamorro society.

Many contact-period Polynesian societies beyond the Mariana Islands adhered to religious and ideological taboos that required the spatial segregation of certain activities according to gender. In contact-period Hawai′i, for example, women and men used separate eating houses (Malo 1951: 27–28) and other structures were used as canoe sheds and/or as men's houses (Handy and Pukui 1958). This contact-period pattern has also been documented in the archaeological record of food preparation and consumption in pre-contact Hawai′i (Van Gilder and Kirch 1997; Van Gilder 2001). Of course, it is possible that gender segregation in the Marianas was not as strictly demarcated as that found in Polynesia, but archaeological study of this issue is necessary.

An Archaeological Case Study

Our study sought to examine—using independent data—whether different economic tasks were practiced by males and females in different latte buildings. The University of Guam and University of Hawai′i hosted three archaeological field schools (2008–2010) that involved excavations at two latte buildings in the GNWR; preliminary findings from the first two seasons are described elsewhere (Bayman *et al.* 2012). The study area is situated on a sandy coastal plain, seaward of an uplifted limestone cliff.

Table 1 Gendered division of labor in contact-period Chamorro society as reported by Juan Pobre de Zamora (Driver 1983) and other sources (Russell 1998).

Task	Female	Male
Farming	+	+
Deep-sea fishing	−	+
Coastal marine foraging	+	+
Cooking	+	−
Canoe and fishing gear production	−	+
Plant fiber mat-making	+	−
Ceramic vessel production	+	−

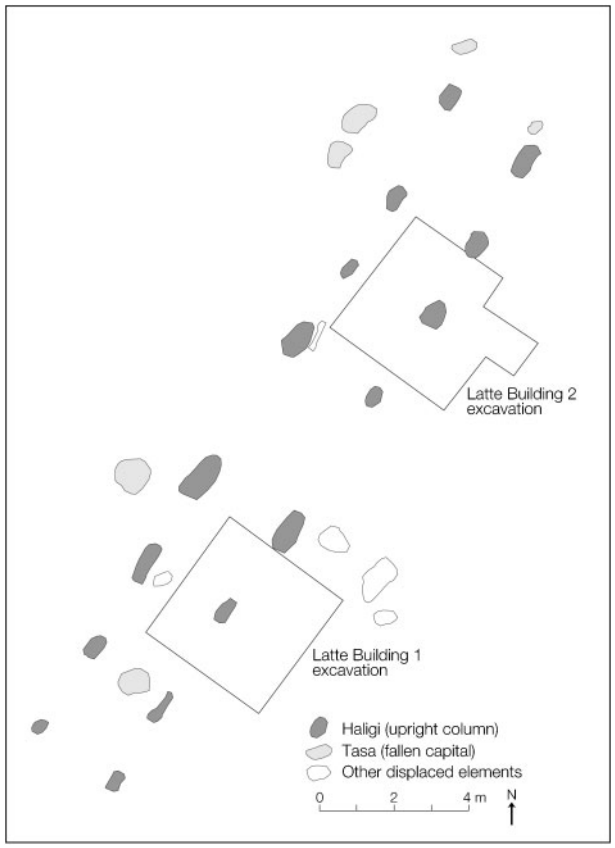

Figure 4 Plan of the excavations. Note the paired rows of coral *haligi* and scattered *tasa* (capitals). Tasa originally rested atop the haligi and supported wooden superstructures.

Early archaeological research

The first archaeological study in the GNWR area was part of an archipelago-wide effort in the 1920s by Hans Hornbostel. His work recorded a Spanish mission church (Casa Real) and the nearby cluster of latte buildings and he also excavated a grotto (Thompson 1932: 20). Subsequent efforts by other researchers documented the rich archaeological evidence of both pre-contact and early Spanish period occupations at GNWR (e.g., Osborne 1947). The Spanish-period archaeological record is corroborated by a map produced by Alonso Lopez in 1671 where he indicated "Ritidian" as a village with a Christian church (le Gobien 1700: 75).

Relatively few early Spanish-period documents refer to the Ritidian area. Alonso Lopez, a Jesuit priest, observed that 400 individuals attended mass at the Ritidian church of San Xavier (Levesque 1995: 303) suggesting that the area sustained a sizable population. Chamorro resistance to the Spanish is also evident at Ritidian: a priest was killed in 1681 or 1683 (Fritz 1904: 32). The Spanish found control of the area too costly and it was abandoned during the reducción of 1682; as stated above, at that time the region's indigenous population was forcibly relocated into fewer settlements elsewhere on the island.

Field school research

Our site consists of two latte buildings that are located in the northern part of Guam (FIG. 1). Each of the two latte buildings has four rows of paired haligi (FIG. 4); a modal number for latte buildings in the Marianas archipelago, although they range from three to seven rows (Russell 1998: 225). The long axis of each latte building parallels the coast and the limestone cliff face. The two buildings are located in close proximity and occupants of each structure likely shared the small common area between their distal ends. The symmetrical end-to-end alignment of the two latte buildings, their construction in the same shallow cultural deposit, and the recovery of a few contact-period artifacts (i.e., a Venetian glass bead, forged iron, and an East Asian porcelain sherd) from the structures indicate their contemporaneous contact-period occupation.

The Venetian glass bead recovered from Latte Building 2 is notable because such beads circulated in the Pacific between the 16th century and late 19th century. Although precise dating of glass trade beads is notoriously difficult because they often served as heirlooms (Sprague 1985: 101), this bead postdates Magellan's visit to Guam in A.D. 1521. The presence of Spanish-period forged iron nails and fragments at both latte buildings is notable; prior to colonization in 1668 the Chamorro traded fresh water and produce in return for forged iron nails and scissors from passing ships (Driver 1993: 15). The East Asian porcelain is apparently contemporaneous with either the late Ming dynasty, which ended in A.D. 1644, or the first decades of the subsequent Qing dynasty (Gascoigne 2003: 153–179). The contact-period artifacts indicate that the latte buildings were constructed and used sometime between Magellan's visit and Ritidian's forced abandonment during the reducción of A.D. 1682.

The Ritidian area thus offered an opportunity to examine the archaeological record of traditional Chamorro household economic organization shortly before intensive Spanish colonialism. The following sections outline our field and laboratory methods, and our preliminary findings and their implications for archaeology of the Mariana Islands.

Fieldwork and assemblage analysis

Subsurface archaeological assemblages were recovered from Latte Building 1 and Latte Building 2 by excavating a series of 1×1 m units (FIG. 4). Excavation units at both latte buildings focused on their landward sides. Sixteen contiguous 1×1 m units were excavated at each latte building for a total of 32 units (FIGS. 4, 5). Each unit was excavated in 10 cm arbitrary levels and all sediments were sieved using 1/8-in mesh. Excavations continued until non-cultural deposits were encountered, typically near the bottom of the third level. In each unit, a 2 L sample

Figure 5 Completed excavation at Latte Building 1. Photo by H. Kurashina.

was collected from the interface of the cultural and non-cultural deposits.

The site consists of a single stratigraphic layer atop the non-cultural substrate and there is no evidence of feature overlap. A 2 m-deep exploration unit near Latte Building 1 confirmed that deeply buried archaeological deposits were lacking in the immediate study area, and that our site reflected a single occupation. Knowing this, our analysis of archaeological assemblages from the two latte buildings investigated whether or not they were used for similar activities.

Analysis of excavated assemblages entailed counting and weighing cultural materials according to categories: ceramics, chipped stone, shell and stone adzes, fishhooks, marine shells, animal bones, beads, iron nails, bone tools, and charcoal (TABLES 2, 3). Artifacts with clearly identifiable functions (like fishhooks and adzes) were counted; most materials that were not easily counted (e.g., marine shells and charcoal) were weighed. Some materials like ceramics and chipped stone were both counted and weighed.

Although excavation sample sizes in the two latte buildings were comparable, we standardized the artifact counts and/or weights per excavation unit statistically (TABLES 2, 3). Doing so enabled us to more easily compare relative differences in the abundance of various cultural materials in the excavation units at the two latte buildings.

Latte household economy: Archaeological expectations

Our field research examined whether latte buildings were used for redundant economic activities or whether their activities varied. If the two adjacent latte buildings that we excavated at Ritidian were functionally redundant, we reasoned that they should produce archaeological assemblages with comparable content and relative abundance (controlling for excavation sample size and recovery). If both latte buildings, for example, were used for the preparation and storage of food, their assemblages should yield relatively equivalent amounts of ceramics, marine shell, and faunal remains, once such material categories were quantitatively standardized. Similarly, if craft production or other economic activities were practiced at each latte building with comparable degrees of intensity, the archaeological signatures of such activities (like shell adzes, fishhooks, and bone tools) would be similar.

The production and use of tools was vital in traditional Chamorro economy, both during and after Spanish contact and colonialism. Chamorro artisans used marine shell and stone adzes to carve wood for watercraft, structures, and containers. Therefore, we expected that the fabrication of fishhooks would be signaled by the presence of at least some unfinished hooks or the debris from their production. Although bone awls were likely used for a variety of craft activities, the production of fishing nets and sails was particularly important. Finally, if the occupants of the two latte buildings had access to high-value goods such as beads or iron nails, such materials should be comparable in their respective assemblages.

Subsistence activities

Archaeological assemblages from Latte Building 1 revealed a concentration of food preparation and storage activities. Such evidence included broken ceramic vessels, chipped stone, shells, charcoal, and plant microfossils. Food preparation was reflected in the high frequency of thick-walled ceramics, which the Chamorro likely used to cook various foods (Arnold 1985: 128–151; Butler 1990). Ceramic vessels with relatively thick walls and sufficient temper can

Table 2 Artifact assemblage from excavations at Latte Building 1 (16 units).

Category	Count total	Standardized frequency/unit	Weight (g) total	Standardized weight (g)/unit
Ceramic	3097	193.60	20,161.5	1260.1
Chipped stone	367	22.90	2815.5	176.0
Shell adze	5	0.31	–	–
Fishhook	9	0.56	–	–
Marine shell	–	–	15,915.8	994.7
Animal bone	–	–	179.0	11.2
Bead	4	0.25	–	–
Iron nail	1	0.06	–	–
Bone tool	3	0.18	–	–
Charcoal	–	–	660.0	41.3

withstand repeated use over a fire to boil and simmer plant foods and animal protein including shellfish. The dietary and nutritive value of plant foods is often elevated with the use of ceramic vessels for processing and cooking, and they also enable populations (especially in the tropics) to be more sedentary because of food storage in nonperishable containers (Arnold 1985: 136–141). Shellfish can also be consumed more easily after they are boiled in pots because the muscle attachments that bind their bivalves are weakened (Ikawa-Smith 1976: 515); cooking also removes poisonous toxins in some shellfish.

Excavation units for Latte Building 1 contained more ceramics than excavation units in Latte Building 2 (TABLES 2, 3); Latte Building 1 also had more charcoal and more fire-cracked rock from remnant surface hearths. Large ceramics in Latte Building 1 were easily refitted indicating that at least some whole vessels were broken in situ, possibly after site abandonment. Surprisingly, ceramics from vessels that could be easily restored were not detected during the excavation of Latte Building 2.

Plant microfossils offered evidence of plant cultivation and preparation in the immediate vicinity of Latte Building 1. Plant residues from in situ broken vessels in Latte Building 1 were extracted and identified through the analysis of pollen, phytoliths, and starch grains (M. Horrocks, personal communication 2008). Several cultigens were detected in the samples: taro (*Colocasia esculenta*), breadfruit (*Artocarpus* sp.), sweet potato (*Ipomoea batatas*), and yam (*Dioscorea nummularia*). The recovery of sweet potato from Latte Building 1 is particularly notable since it was introduced to the western Pacific by the Spanish (Yen 1974). Other plant microfossils in the vessels included *Pandanus* sp., palms, ferns, herbs, grasses, and possibly coconut.

The relative abundance of chipped stone flakes and scrapers at Latte Building 1 corroborated the ceramic and plant microfossil evidence for the processing and cooking of starchy foods (e.g., breadfruit, taro, yams, and sweet potato) (Russell 1998: 193). During the early mission period, breadfruit was peeled and quartered in preparation for storage. Other food processing implements from less durable materials, such as wood and shell, were also likely used (Russell 1998: 193), although they were not recovered during our excavations.

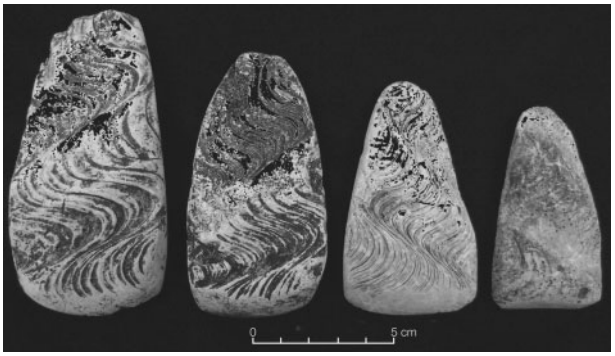

Figure 6 Selected shell adzes from the excavations: the left two adzes are from Latte Building 1; the right two adzes are from Latte Building 2. Photo by M. Carson.

An emphasis on the preparation and consumption of marine resources at Latte Building 1 was marginally corroborated by the relative abundance of broken shell (e.g., *Strombus gibberulus, Tridacna* sp.) (TABLES 2, 3). The average weight of marine shell (per unit) at Latte Building 1 was 994.7 g, whereas the average weight (per unit) at Latte Building 2 was 930.7 g. Thus, it is likely that marine resources were consumed (if not cooked) at both latte buildings.

Quantitative differences in the abundance (via standardized weights) of animal bone (i.e., fish and birds) at the two latte buildings are also notable, since they do not parallel patterns for marine shell (TABLES 2, 3). The average weight of animal bone (per excavation unit) at Latte Building 2 was higher in comparison to Latte Building 1. While detailed analyses must still be undertaken to document the diversity of faunal species that are present, it is apparent that the consumption of fish and bird protein was more frequent at Latte Building 2 than at Latte Building 1.

Craft activities

While Latte Building 1 reflects food preparation, certain craft activities were concentrated at Latte Building 2 (TABLES 2, 3). The use and discard of *Tridacna* sp. shell adzes (FIG. 6) was much more common at Latte Building 2 than at Latte Building 1

Table 3 Artifact assemblage from excavations at Latte Building 2 (16 units).

Category	Count total	Standardized frequency/unit	Weight (g) total	Standardized weight (g)/unit
Ceramic	2302	143.90	10,982.7	686.4
Chipped stone	249	15.60	1629.8	101.9
Shell and stone adze	14	0.87	–	–
Fishhook	18	1.12	–	–
Marine shell	–	–	14,891.8	930.7
Animal bone	–	–	258.0	16.1
Bead	35	2.18	–	–
Iron nail	4	0.25	–	–
Bone tool	17	1.06	–	–
Charcoal	–	–	458.1	28.6

Figure 7 Selected shell fishhooks from the excavations. Top: the left three fishhooks are from Latte Building 2; the fourth fishhook is from Latte Building 1. Bottom: the left two fishhooks and the fifth fishhook are from Latte Building 2; the third, fourth, and sixth fishhooks are from Latte Building 1. Photo by Stephen Acabado.

(TABLES 2, 3). Certain woodworking steps and other crafts potentially required chipped stone tools. Although evidence exists for lithic core reduction at Latte Building 2, chipped stone is more abundant at Latte Building 1 (TABLES 2, 3). Chamorro men and women would have used chipped stone for a variety of activities including resource extraction, food preparation, and craft production. For example, women would likely have used lithic flakes to remove the sharp edges from *Pandanus* sp. plant fibers that they wove to make mats, sandals, and other items. Men would have used chipped stone for various activities including (but not limited to) woodworking.

A striking difference between the latte buildings concerns the production, use, and discard of fishhooks (TABLES 2–4; FIG. 7). Although finished and unfinished marine shell fishhooks were recovered from both latte buildings, and at least some fishhooks were made in both locales, finished shell hooks (n=5) are more abundant at Latte Building 2 (TABLE 4). The concentration of fishhook artifacts at Latte Building 2 (n=18) is associated with a relative abundance of Pearl shell debris, a common material for making hooks. Excavations at Latte Building 2 yielded 495 g of Pearl shell debris, whereas Latte Building 1 produced 400 g of Pearl shell debris. Moreover, Latte Building 2 yielded several coconut shell fishhooks (n=8) and an iron fishhook (n=1). In short, Latte Building 2 had a higher number of fishhooks made in a greater diversity of raw materials (i.e., shell, coconut, and iron).

Latte Building 2 had a concentration of adzes (n=12 of shell, n=2 of stone). Adzes of *Tridacna* shell and

Figure 8 Selected bone tools from the excavations: the left three bone tools are from Latte Building 1; the fourth bone tool is from Latte Building 2. Photo by S. Acabado.

stone would have been used in traditional Chamorro society for a variety of tasks including (but not limited to) the construction of canoes, containers, and other implements. The recovery of 1.16 kg of *Tridacna* sp. shell (within the larger shell assemblage) at Latte Building 2 may reflect the consumption of marine protein, as well as the production of shell adzes. Although the recovery of 1.25 kg of *Tridacna* sp. shell (within the larger shell assemblage) at Latte Building 1 is only marginally higher, its elevated abundance is related to marine resource cooking rather than to the production of adzes.

Bone tools were far more abundant at Latte Building 2 (TABLES 2, 3; FIG. 8); some (if not all) of the awls were likely used to make nets for fishing. The occurrence of adzes (for making watercraft) with fishhooks (for catching fish) and bone tools (for making sails and nets) underscores the value of both deep-sea and reef fishing at Ritidian. The fact that these three particular tools were so abundant at Latte Building 2 suggests its important role in both the craft and subsistence economies of Ritidian.

The production, use, and trade in beads at Ritidian inform us about the role of ornamental goods in Chamorro society. Beads were significantly more

Table 4 Fishhooks according to material type and stage of production.

Material type	Latte Building 1	Latte Building 2	Row totals
Finished shell hook	1 (11.1%)	5 (27.7%)	6
Unfinished shell hook	8 (88.9%)	4 (22.2%)	12
Coconut shell hook	–	8 (44.4%)	8
Iron hook	–	1 (5.6%)	1
Column totals	9 (100%)	18 (100%)	27

Figure 9 Iron nails and unidentified fragments of iron from the excavations. Photo by S. Acabado.

abundant at Latte Building 2, using standardized frequencies (TABLES 2, 3), and at least some shell beads were unfinished. The concentration of iron nails and other fragments of iron at Latte Building 2 (TABLES 2, 3; FIG. 9), and the Venetian glass bead offer archaeological evidence of Chamorro and European interaction. Written accounts confirm that more than 100 foreign ships visited the Mariana Islands during the contact period (Quimby 2011: 1). Notably, these accounts describe Spanish trade with Chamorro men who sought iron objects, especially nails, so they could fashion them into tools for constructing their canoes (Quimby 2011: 8–15).

Interpreting Household Economy and Gendered Labor

Our analysis of archaeological assemblages from two adjacent latte buildings indicates that differences existed in economic activities in the two structures within a single settlement during the early Spanish period. While these differences are likely due to an institutionalized system of gendered labor, this imperative did not always prevail in everyday practice. In the Chamorro language, for example, *mangkalamya* may be used to "…describe someone who was proficient in the tasks of the opposite gender, such as a man who was good at weaving…" (Bevacqua 2009), or a woman who was skilled at fishing. Perhaps such individuals resided in the Ritidian area. Evidence for the practice of certain craft activities such as fishhook-making at both latte buildings may suggest such behavior. In any case, our finding that individual latte buildings were largely used for particular economic activities is significant because some interpretations of latte buildings argue for redundant functions (e.g., Graves 1986: 144–145).

Differences in craft and subsistence activities at the two adjacent and contemporaneous latte buildings imply that their occupants were members of a single cooperative household. Such households were surely gendered, and perhaps the economic activities that were practiced at these two latte buildings were distinguished by age, and perhaps status (Russell 1998: 165–196). Adult males, for example, might have made and used the fishhooks and marine shell adzes that were discarded at Latte Building 2, whereas women could have made and used ceramic vessels that were needed for food preparation or storage (Pollock 1986: 133) at Latte Building 1.

The functional differentiation of latte buildings at Ritidian generally parallels "ancestral Polynesian" household and settlement organization, as construed by Green (1986) and elaborated by many others (Cordy 1981; Irwin 2004; Kahn 2003; Taomia 2000; Weisler and Kirch 1985). Green (1986: 53) argued that archaeology, comparative ethnology, and historical linguistics reveal consistent regularities in traditional Polynesian household organization; such households, depending on the status of their occupants, typically had two or more structures including "dwellings," "cooking/storage sheds," "canoe sheds," "men's houses," and/or "god houses."

Archaeological evidence that adjacent latte buildings at Ritidian were also functionally differentiated demonstrates that traditional Chamorro household economic organization should be investigated with broad horizontal excavation, as we did for this study, rather than with isolated units. Thus far, horizontal excavations at Ritidian indicate that some traditional Chamorro households included two adjacent buildings. This particular household could have included other nearby buildings, such as pole-and-thatch structures, that were not erected atop stone or coral haligi. While our excavations included areas immediately adjacent to coral haligi, even larger areas of investigation are still needed.

Preliminary findings of this archaeological study indicate that traditional Chamorro households, like early Polynesian households, were manifestations of a settlement pattern that persisted into the early contact period. This hypothesis provides a rationale for fieldwork and assemblage analyses at other sites throughout the Pacific. The testing of this hypothesis would strengthen models of Micronesian, Melanesian, and Southeast Asian influence (both biological and cultural) on Polynesian origins (Addison and Matisoo-Smith 2010).

Conclusions

Archaeological investigations of household economy and gendered labor are important for understanding the social and political organization of traditional (i.e., "non-western") societies. Our study of household economy and gendered labor in the Mariana Islands offers a snapshot of a society that was observed, but not yet irrevocably altered, by Western contact and colonialism. Our findings illustrate a method for documenting the artifactual and architectural correlates of household economies that were governed by an institutionalized system of

gendered labor. In Chamorro society, households included at least two buildings so that members of different genders could be segregated as they practiced their respective economic tasks.

Unlike other areas of Oceania (such as Polynesia) gendered labor in Chamorro society was not so strictly enforced and there was some degree of overlap in the spatial locations of male and female tasks. The tolerance for such flexibility was possibly due to the relatively high status of women in Chamorro society and the practice of matrilineal descent and inheritance (Souder 1992: 204). This pattern contrasts with some traditional Polynesian societies (e.g., Hawai′ian) that compelled a sharper division in gender roles (Linnekin 1990). The more robust division of gendered labor may have stemmed, in part, from the Polynesian focus on patrilineal descent.

Multi-building households prevailed in many pre-contact and early-contact societies. However, it is at times difficult to recognize this pattern in the archaeological record as we have done in the Mariana Islands. We believe that researchers elsewhere might profit from using our approach to discriminate household economies that required multiple buildings from those that did not.

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