Evidence for Maya Commoner Ceramic Production at Altar de Sacrificios

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A potential ceramic production area was excavated at Altar de Sacrificios in 2022, an exciting find for the Maya lowlands area that can reveal the organization of ceramic production in domestic commoner contexts. Studying ceramic production is key to conceptualizing economic and power dynamics within and between sites, and also to understanding both past forms of technology and the associated practices, which can reflect specific identities. Studying the organization of this production can provide insight on social structure, technological change, specialization of labor, production centers, raw material sources, and the distribution of ceramics, as well as address whether the people making the ceramics were the same ones using them. Such investigations can answer questions about community interactions, trade networks, social inequality, and economic systems. In general, very little research has been done on the activities of Preclassic Maya commoners outside of their agricultural activities and economic contributions due to poor preservation and general lack of interest in commoner homes and spaces (Robin 2003, 219; Hirth 2009, 13). There are some exceptions to this, but not for ceramic production specifically in the Preclassic period. This limits our understanding of the everyday life of commoners in the past, preventing a holistic conception of ceramic production practices among the Maya. Similarly, craft production studies in the Maya area have been limited to studies of chronology and exchange rather than the organization of production, especially when it comes to ceramics, because of the lack of identified production loci (Varela et al. 2001, 179).

Based on the excavation of a substantial assemblage from a commoner house that contains a potential firing feature, I develop a fuller understanding of craft production in commoner contexts using comparative data from Batán Grande and K'axob. Specifically, I investigate what domestic activities are reflected in the artifact assemblage from T106007H, a pit located in a house mound at Altar de Sacrificios. I then claim that Maya commoners acted as independent producers, making their own ceramics in surplus for food preparation, storage, and presentation (serving) at the community scale. A model I created using data synthesis from Altar de Sacrificios and two case studies from the region and time period support this claim, and future studies may use this information to identify similar production loci in other contexts. The data includes the structure's location, the firing feature itself, and recovered artifacts, which include ceramic production tools, carbonized ceramics potentially used as kiln furniture and wasters, and the finished products of the production. Given the focus of this study on ceramic production and its domestic household scale, it is key to understand how those topics have already been studied in the Maya region.

I. Craft Production at the Household Scale

While craft production has been heavily studied in the Maya region, most archaeological research has focused on exchange and economics of the finished products rather than the techniques that go into the production (Aimers 2012; Foias and Bishop 1997; Hirth 2009; Rice 2009; Varela et al. 2001, 179). This lapse occurs because it is difficult to establish production loci in the Maya area due to a lack of preservation and excavation, though it is not impossible when experimental and ethnographic analogies are used to identify kilns, production tools, and finished products (Varela et al. 2001, 177, 179; Longacre 1991). However, by 2001, no kilns from archaeological contexts had been identified in "the Yucatan, Guatemala, Belize, or El Salvador," making ethnographic data a major source of ceramic production traditions in the Maya region (Varela et al. 2001, 179). Ethnoarchaeology remains limited in its application due to the differences between pre-Hispanic and modern Maya culture and practices, but analogies from other pre-Hispanic sites can be useful (Varela et al. 2001, 174, 183-184). Outside of the Maya region, such

as in the Andean, Oaxacan, and American Southwest regions, there have been other archaeological studies of craft and ceramic production which can be used as additional sources of comparison and evidence for kiln and firing features, as well as production tools (Varela et al. 2001, 177-179, 183, 186; Foster 1959a, 53; Foster 1959b, 109).

Although ceramic production at the household scale has largely been limited by the lower level of preservation among Maya commoner households, it has been studied, especially at Late Classic sites (Normark 2009, 440). Previous methods include case study comparisons (Jordan and Prufer 2017; Varela et al. 2001), the use of ethnographic information (Varela et al. 2001, 184; Jordan and Prufer 2017, 78-83), use-wear analyses (Varela et al. 2001, 186; Jordan and Prufer 2017, 72-74), and experimental archaeology (Varela et al. 2001, 186-188; Wagner et al. 1994). In addition, detailed analyses of the sherds resulting from domestic production have been completed, such as the study of clay and mineral composition of recovered sherds (Wagner et al. 1994). Ceramic production areas specifically are often identified "based on the presence of primary firing features, raw materials, production tools," and an abundance of finished and by- products (Jordan and Prufer 2017, 66, 70).

From these methods, as well as broader analyses of sherds recovered in the region, it seems that Maya commoners produced both utilitarian and decorative vessels in surplus (beyond what was needed for household activities) based on their intended recipients, which often depended on the organization of production. Utilitarian vessels include undecorated jars and bowls used for storage and cooking and constitute the majority of sherds recovered by archaeologists in the Maya area (Jordan and Prufer 2017, 66). These vessels were usually produced and used at the household level and sometimes sold on the open market in later periods, all without elite supervision or interference (Jordan and Prufer 2017, 66). However, Late Classic elites may have received their utilitarian vessels through tribute, as their production in elite spaces seems to cease during this period (Ball 1993, 244-245; Jordan and Prufer 2017, 68). Decorated vessels, on the other hand, could be used by their creators and owners to show off their abilities, status, or identity, exchanged via trade or as a gift, and given to the elites as tribute. Decorated vessels, especially polychrome ones, are almost always associated with elite

production rather than commoner (Jordan and Prufer 2017, 67; Ball 1993, 259). Both types of vessels could be hand-formed (Wagner et al. 1994, 67) or mold-made (Varela et al. 2001, 186). The organization of production often determined who decorated vessels would go to and benefit most. Commoners who specialized in the production of these vessels are often divided into two categories: independent specialists, who made their products in surplus and could choose what to do with them (usually exchange), and attached specialists, who worked in workshops attached to palaces of the elite to whom all of their products went (Rice 2009, 126). Archaeologists in the Maya area tend to differentiate between the two based on the location of ceramic production loci (near or far from elite residences) and the amount of finished products found within.

Most Classic Maya agriculture was organized at the household level (with the exceptions of some urban centers, like Caracol, and a few rural areas with clear administrative intervention, like Chawak But'o'ob), but it is not clear if the same goes for craft production or the organization of household economies in general (Robin 2003, 319). At the very least, household archaeology studies have revealed "commoner part-time specialization in lithic and cloth production" (Robin 2003, 320; Sheets and Simmons 2002). In the case of Cerén, households produced things that they needed but also produced in surplus, which indicates manufacturing and trade beyond the orders and control of nobles (Sheets and Simmons 2002). Sheets and Simmons (2002) argued that these economic decisions made by commoners could have improved the bargaining power of households by increasing their independence and curbing the power of those involved in the broader economy. Similarly, it is important to note that "households frequently intensify production on their own, for internal reasons and without external pressure," further signifying this self-directed move for independence and increased economic standing (Hirth 2009, 18; Carballo 2010, 134).

This study investigates Maya commoners who, although studied much more in recent years, are still far less understood than nobles, especially in terms of ceramic production at the household scale. In addition, most commoner studies have focused on their agricultural roles and economic contributions rather than their craft production roles, especially in terms of ceramics (e.g. Robin 2003, 319; Hirth 2009, 13). There are some exceptions, notably Sheets and

Simmons' study of the production of ritual items at the household level in Cerén which was facilitated by a volcanic eruption preserving the site (2002). The details of the domestic are often overlooked in favor of larger systems and processes, despite those details being fundamental to the understanding of broader concepts. Understanding craft production is the gateway to conceptualizing household economics (production, trade, etc.) and therefore how these small-scale economics articulate with broader social economics and social processes. As Robin states, the poor preservation of commoner homes impede these detailed studies (2003, 321; McAnany and Lopez 1999, 147; Carballo 2010, 166). Thus, the substantial data set I have from T106007H gives me a unique opportunity to provide this level of detail.

II. Expectations for Ceramic Production Loci

Several studies on ceramic production have been completed in the Maya region, but studies at Batán Grande and K'axob are most relevant to Altar de Sacrificios based on their time period (Formative/Preclassic at Batán Grande) and culture/location (Maya in Belize at K'axob). Batán Grande is a site along the Poma Canal in coastal northern Peru where fifty-seven kilns were found across a 500m stretch (Wagner et al. 1994, 67). Although Peru is outside the Mesoamerican region, it has been used for comparison by other archaeologists in the Maya region with sites such as K'axob and Uxbenka, and dates to the time period of the kiln at Altar de Sacrificios, hence its inclusion in my research. The kilns analyzed by Wagner et al. (1994, 67) date to the Formative period, although several seem to have been used or recreated continuously in the same spot across four layers of stratigraphy, representing a time period of approximately 800 BCE-400 CE. Nearly all of the kilns are double chambered and round in shape, appearing as two overlapping circles or a circle overlapping an oval once excavated (Wagner et al. 1994, 69). The circular chambers typically measure 70 centimeters by 70 centimeters (cm) while the oval chambers measure up to 140 cm by 70 cm, though both chambers are about 70 cm deep (Wagner et al. 1994, 68). These kilns were dug into clay-rich soil, are near water due to being along the canal, and often feature heat-discolored walls with carbon deposits left in the soil consistent with open firing at a temperature around 800°C (Wagner et al. 1994, 67-68). The original

site authors do not mention any artifacts aside from the abundance of carbonized ceramics they believe to be wasters (Wagner et al. 1994, 70, 78; Varela et al. 2001, 184).

K'axob is a Maya site located in Belize and was occupied from the Middle Preclassic to the Late Classic, though its kiln features were used during the Late Classic (McAnany and Varela 1999, 147; Varela et al. 2001, 179). The production loci were located somewhat far away from other residences in each cluster (Varela et al. 2001, 180). The pits were dug into bedrock, which contained no signs of other occupation or features (Varela et al. 2001, 181). The firing features are double-chambered, similar to Batán Grande, though rectangular pits are found in addition to round ones and connected by underground tubes (Varela et al. 2001, 182-183). The measurements are similar in terms of length and width but differ in depth. The antechambers measure around 94 cm by 70 cm by 50 cm while the main chambers are deeper, measuring around 96 cm by 83 cm by 100 cm (Varela et al. 2001, 183). The carbon deposits in the soil were also consistent with open firing around 800°C (Varela et al. 2001, 185). Assemblages of pottery production tools were found outside of the kiln pits, which led the authors to declare these loci as ceramic production workshops (Varela et al. 2001, 182, 177). These assemblages included several large shaped (sometimes burned) stones as well as a metate fragment, which the authors believe were used to grind temper and clay at the site (Varela et al. 2001, 182-183, 186). Reshaped sherds used as potter's tools to shape clay via "smoothing, scraping, incising, polishing, and boring" are abundant at the site (Varela et al. 2001, 186-187). The authors made this argument based on morphological similarities between the shaped sherds and modern potters' tools, as well as use-wear analysis that allowed them to place confidently each sherd into one of five categories based on what it would have been used for (Varela et al. 2001, 186-188). Several carbonized ceramics were found at the site, though the authors did not identify them as wasters in their analysis, but rather as burned sherds (Varela et al. 2001, 182-184). However, they do mention several large sherds they believe were used as part of the kiln structure (Varela et al. 2001, 185).

Although not previously found in archaeological contexts, the tools of modern Maya potters can be used to study craft production traditions in the region. Ethnographic studies among Mesoamerican

potters bring up turning implements such as a Maya *kabal* or a Coyotepec *molde* (Foster 1959b, 109; Foster 1959a, 53). With both the *kabal* and the *molde*, the vessel is built on top of the support and then turned very slowly, either to ease the working process in the case of the *kabal* or to better shape the rim of a vessel in the case of the *molde* (Foster 1959b, 109; Foster 1959a, 53-54). Both were typically turned by the potter's feet and were seen as precursors to a simple potter's wheel (Foster 1959b, 108, 116). Although before Altar de Sacrificios no similar tool had been found in a ceramic production locus, it is important to keep culturally similar tools in mind when attempting to identify such an artifact.

From the case studies and ethnographic information discussed above, I have created a model for identifying expected ceramic production loci in the Mesoamerican region (Figure 1). The evidence is divided into feature information (which I call Feature Attributes) and artifact information (Ceramic Production Tools). Feature Attributes are further divided into mound and pit (or suspected kiln) data. The mound itself should be distant from any nearby households, meaning it should be farther from the nearest household than any of the related households are from each other. Easy access to water, past or present, and the associated resources (such as river cobbles) are also indicators of ceramic production; in this case, the water should be within easy walking distance. The kiln pits should be dug into bedrock or sterile soil, likely for ceramic production specifically. It is possible that later kilns would be dug down into non-sterile soil from a previous occupation, but neither of my case studies exhibited that behavior. The pits can be either round or rectangular in shape, though round tends to be more common to earlier (Formative or Preclassic) use. Carbon deposits in the soil consistent with firing techniques in the area are also common in kiln and firing features; all three studies presented showed signs of open kiln firing at about 800°C. At sites with multiple pits that show signs of firing, underground tubes often connect them and they can be thought of as double chambered kilns, with one chamber used to fire and another used to manage the temperature of the kiln.

Ceramic Production Tools include polishing and grinding stones, which may appear similar to hammerstones and manos, round on one side but easy to hold with one hand. Reshaped sherds used as production tools have also been found at multiple sites

(Uxbenka and K'axob, though I only recorded K'axob in my model), and usually appear as pentagonal, triangular, quadrilateral, and diamond shapes (Varela et al. 2001, 186; Jordan and Prufer 2017, 73; specific graphics outlining these shapes can be found in Jordan and Prufer 2017, 73 and in Varela et al. 2001, 188). Carbonized ceramics are also commonly found at kiln features and, when specifically identified as wasters, may confirm a site as a ceramic production locus. These ceramics often appear burned from refiring, and wasters are large in size as they are used to shield other vessels.

Although not mentioned in the other case studies, I have included the ceramic disk and red sandstone pedestal as I argue they provide evidence of ceramic production. I have also added the specific case studies I am using in my argument and how Altar de Sacrificios compares to them. While this model should not be used as the only metric for identifying production areas, it is a good model for compiling evidence and provides a starting point for researchers seeking comparative case studies.

III. The History of Research at Altar de Sacrificios

Altar de Sacrificios is a pre-Columbian Maya ceremonial center occupied continuously from the Middle Preclassic to the Terminal Classic, approximately 900 BCE - 900 CE (Viñals and Munson 2023, 13, 21). It is located in the Maya lowlands in modern Petén, Guatemala, near where the Pasión and Salinas rivers converge to become the Usumacinta River, on which the Mexico-Guatemala border is based (Viñals and Munson 2023, 10; Figure 2). It is west of Ceibal and is considered rural, rather than an urban core (Viñals and Munson 2023, 11). Explorers found and recorded the site, first in 1882 by Alfred Maudslay and later in 1885 by Teobert Maler (Viñals and Munson 2023, 11). In 1914, Sylvanus Morley and Herbert Spinden visited the site and referred to it by the name of the nearby San Felix River (Viñals and Munson 2023, 11). Morley returned with a team in 1937 on behalf of the Carnegie Institute and discovered Groups II and III, publishing recordings of their hieroglyphic inscriptions in 1938 (Viñals and Munson 2023, 11; Morley 1938). From 1958 to 1963, A. Leyard Smith and Gordon Willey investigated the site on behalf of the Peabody Museum of Archaeology and Ethnology and documented Groups A and B, focusing on monumental architecture, burials, and ritual deposits (Willey and

Smith 1969; Viñals and Munson 2023, 12). A team on behalf of PAALS, or Proyecto Arqueológico Altar de Sacrificios, led by Jessica Munson of Lycoming College, Lorena Paiz Aragón, and Esteban Viñals of the University of the Valley of Guatemala, has been investigating the site since 2016, focusing on daily Maya life during periods of change and instability during the Preclassic and Classic periods (Viñals and Munson 2023, 14).

The six mounds excavated in 2022 show continuous occupation from the Late Preclassic through the Late Classic (Viñals and Munson 2023, 37). T106, on the fringe of the district, contains unit 007, in the lowest strata level (H) of which a large assemblage of ceramics was found and extends into sterile soil with carbon deposits (Viñals and Munson 2023, 45). Radiocarbon dating done on the pit feature indicates that it was likely in use from 150-50 BCE, situating it in the Late Preclassic (Figure 3).

IV. Site Context, Methods, and Data

Altar de Sacrificios can be thought of as a paraurban city due to its contrasting distance from true urban centers and low population density with its strategic location along the Usumacinta and architectural investments towards diverse socioeconomic interactions (Munson et al. 2024, 4-5). For example, Altar de Sacrificios has one of the highest overall estimated populations in the Upper Usumacinta Confluence Zone, but the population density is relatively low (Munson et al. 2024, 18). Even beyond the site's core, several larger special administrative or economic buildings are located within 250 m of water sources, possibly signifying a need for easy transportation of people or goods (Munson et al. 2024, 20).

T106, the feature I am investigating, was excavated during the 2022 field season and analyzed in 2023 (Viñals and Munson 2023, 9, 18). It is located on alluvial soil in El Trapiche, a residential district where the Pasión and Salinas rivers converge to form the Usumacinta, and just south of a paleocanal that may have been active during Maya occupation (Viñals and Munson 2023, 37; Figure 4). Because of this proximity to water, both clay and river cobbles were and still are abundant. El Trapiche district contains several mounds, of which only a few have been excavated. Those that have been excavated nearby to T106 were all residences (T104, T105, T107, T99, and T362), though it is suspected that one of the unexcavated mounds to

the east of T362 may have been one of the previously discussed "special" administrative or economic structures (Munson et al. 2024, 20; Figure 4). This means that there were several families living nearby who likely used or benefited from the kiln in T106.

Mound T106, located on the fringe of this excavated cluster, contains three episodes of construction. The upper two episodes were residential occupations during the Late Classic, while the lower episode seems to have been a Late Preclassic occupation. The pit I argue was a ceramic production area is located beneath this earliest occupation, in the northeastern corner (Figure 5).

V. Excavated Artifacts

In the pit feature T106007H, 825 total artifacts were recovered. Seven hundred fifty were ceramic sherds, of which 380 were slipped, 291 were unslipped, and seventy-nine were too eroded to tell. Twenty-three sherds came from jars, eighty-two came from bowls, seven from plates, and the rest (638) were indeterminate. In addition to the 750 sherds, there were two ceramic handles discounted from analysis. One hundred eighty-four of the slipped sherds were carbonized; eight of these were bowls, four were plates, and the rest were of indeterminate form.

All ceramics bigger than twenty-five millimeters in diameter were analyzed, counted, and weighed using a two-step system that combined type and modal (form and frequency) analyses (Viñals and Munson 2023, 20). This is the same system used by Takeshi Inomata's team at Ceibal, with the goal to refine the chronology and focus on form (Inomata et al. 2017). For the first step, Munson's team used the well-established type-variety system in the Maya area (e.g. Douglass and Gonlin 2012; Hendon 1996; Hirth 2009; Wilk and Ashmore 1988). The types at Altar de Sacrificios are based on the initial ones established in Richard Adams' early ceramics study at the site, which were then refined based on other work done in the Maya lowlands (Adams 1971; Ball 1993; Gifford 1960; Brady et al. 1998; Inomata et al. 2017; Culbert and Rands 2007; Viñals and Munson 2023, 20).

The seventy-three non-sherd artifacts include chert and obsidian lithics, two earspools, one unidentified faunal fragment, one ceramic figurine, four bajareque fragments with impressions, and, most interestingly, a modified red sandstone block and a ceramic disk,

polished and slipped on one side, that fit together near-perfectly (Figure 6). The disk is 12.4 cm in diameter, 1.1 cm tall, and weighs 205 grams (Figure 6). Its slip is reddish black, and it may have been refired. The edges have been rounded, though its unslipped side is somewhat rough. The block measures 15 cm x 16 cm and is 6 cm tall, weighing 1,360 grams (Figure 6). It has a round depression on the top on which the disk fits and is both roughly shaped and textured.

Of these artifacts, I was particularly interested in the forms of the ceramic sherds, the carbonized sherds, the red sandstone block, and the ceramic disk. The carbon deposits in the pit feature were also of interest to me. To investigate, I combed through the literature for other examples of and comparisons to the available data, which I found in the case studies of K'axob, a Late Classic Maya site in Mexico, and Batán Grande, a Formative site in Peru, as well as in ethnographic studies, such as those of George Foster, all of which dealt with ceramic production in the region or time period. I then compiled the similarities and differences among these studies into a heuristic model demonstrating evidence of ceramic production (Figure 1). In this model, a colored square indicates the presence of that evidence at the site, while a blank (white) square signifies it was either not found or mentioned in site reports and analyses (Figure 1).

VI. Evidence for Ceramic Production at Altar de Sacrificios

Based on comparative evidence compiled in this model, the pit feature (T106007H) represents a domestic kiln used by independently producing commoners at Altar de Sacrificios (Figure 1). The finished products were used for water and food storage, preparation, and presentation among the community.

First, I argue that the pit itself is a simple kiln where ceramics were fired because of the shape and location of the pit (which is comparable to other kilns in Mesoamerica), as well as the carbon deposits in the fill. The mound T106 is removed from the excavated residences T104, T105, T107, and T99 in the El Trapiche district. This location was probably intended to be far away from residences to prevent pollution, smoke, and heat from spreading to people's living quarters (Jordan and Prufer 2017, 78). Its proximity to raw materials was also ideal. The pit is near a modern river and a paleocanal that was likely active during the Preclassic. This would have provided a source of clay, river cobbles used to shape the vessels

and build the kiln, and abundant water for maintaining working clay, which is easy to access because of the site's alluvial sediments. Batán Grande was similarly situated on clay-rich soil near the water, likely for the same purposes (Wagner et al. 1994, 67). The pit is round, measuring 1.3 meters by 1.0 meters at its widest point, similar to the circular shape of the kilns found at Batán Grande in Peru, which date to the Formative Period (Varela et al. 2001, 183; Figure 7). At Altar, the pit reaches a depth of 1.24 m and was dug into sterile soil. The pits at K'axob were dug into the bedrock during the Late Classic; the Maya likely dug the pits at both Altar and K'axob due to a lack of previous occupations below the analyzed data (Varela et al. 2001, 181-182). Finally, the carbon deposits in the fill of the pit indicate that the pit was exposed to fire frequently and for prolonged periods, likely via open kiln firings at about 800°C, a number based on a refiring experiment done at K'axob (Varela et al. 2001, 183-185; Jordan and Prufer 2017, 71; Figure 7).

Multiple possible ceramic production tools were found in the pit, including polishing and grinding stones, shaped sherds used as scraping and incising tools, and a ceramic disk and shaped red sandstone block that were likely used to turn vessels, among many other uses (Foster 1959b, 109). The fifty-two chert cores and fragments were likely used to polish hardened vessels, and they may also have been used to grind clay and temper, like the metates and hammerstones in Mexico and the Southwest (Varela et al. 2001, 186; Jordan and Prufer 2017, 70; Figure 8).

In addition, several large and shaped ceramic sherds were found; at K'axob and Batán Grande, sherds shaped into "triangular, pentagonal, quadrilateral, and diamond forms" were used for smoothing, polishing, incising, and boring vessels before firing them (Varela et al. 2001, 186; Jordan and Prufer 2017, 73). At Altar de Sacrificios, shaped sherds matching the models laid out by Jordan and Prufer (2017, 73), McAnany and Varela (1999), and Varela et al. (2001, 188) for scraping and incising tools were found (Figures 9-14).

The ceramic disk was likely a multipurpose tool used for smoothing coils, forming rims on large vessels, and turning vessels. The smoothing purpose is based on its similarity to the ceramic disks found in the Naco Valley of Honduras, which were used for the same task (Varela et al. 2001, 186). The argument that the disk may have been used to form rims and serve as a rotating support, such as a

Maya *kabal* or a Coyotepec *molde*, comes from ethnographic evidence (Foster 1959b, 109; Foster 1959a, 53; see "Expectations of Ceramic Production Loci" section for greater detail on these tools; Figures 15 and 16). However, both the *kabal* and the *molde* have primarily been found in Mexico (though foot turning pottery devices are also seen in Pakistan, Algeria, and Italy) and are typically made of wood or stone, not ceramics (Foster 1959b, 108; Foster 1959a, 53). This suggests that the disk was a turning device due to how well it fits into the red sandstone block; it may have been turned with hands instead of feet for ease of access and better mobility, depending on the size of the vessel. In turn, the sandstone block can be thought of as a pedestal, shaped to provide an even and elevated surface to work on (Figure 17).

The presence of a large amount of carbonized ceramics, which were likely refired as ceramic wasters and used as part of the kiln structure, also indicates that this pit was a ceramic production area. About 25% of the sherds recovered were carbonized, indicating that they were exposed to heat a second time, possibly through refiring (Figure 18). Interestingly, all of the carbonized ceramics were slipped, which likely means they were repurposed vessels that broke during use or during the firing process (Figure 18). Additionally, this implies that just under half of all the slipped vessels recovered were carbonized. Many of these carbonized sherds were fairly large. Known as ceramic wasters, these ceramic sherds, especially large ones, were placed in the kiln and refired to shield highly decorated vessels from others that might break while firing; these wasters were often from vessels that broke during the firing process in the first place before being reused (Jordan and Prufer 2017, 67). Refired ceramics also functioned as kiln furniture; they were positioned strategically around the kiln to maintain even heat throughout it (Jordan and Prufer 2017, 67). They may also have functioned as saggar kilns, in which highly decorated vessels were placed inside large pots around which a fire was then built (Rice 2009, 121). However, most of the carbonized sherds were carbonized on their broken surfaces, which could signify that they were refired after being broken (Figure 18). Significant amounts of carbonized ceramics, specifically identified as wasters, were found in and around the kilns at Batán Grande. At K'axob, carbonized ceramics were also found in a suspected kiln,

though they were not identified as wasters and may have instead functioned as part of the kiln furniture (Varela et al. 2001, 182).

Finally, based on the finished products of this suspected ceramic production, I believe these Maya were commoners producing vessels for food storage and presentation. A slight majority (51%) of the recovered vessels were slipped, 39% were unslipped, and the rest (10%) were too eroded to distinguish (Figure 19). Overall, most of the forms of the vessels were unidentifiable (85%), but of those that could be identified, most were bowls (11%), followed by jars (3%), and then plates (1%) (Figure 20). Among the unslipped vessels, jars were more abundant than bowls, which implies food and water storage (Figure 21). Unslipped jars have traditionally been used for food and water storage cross-culturally among commoners. As no one will ever see them except the people preparing the food, it is not necessary to make them decorative in any way, unless an elite is looking to demonstrate their status by ornamenting wholly utilitarian vessels. Cooking vessels (typically large, unslipped bowls) are expected to be damaged, or at least have any surface treatment ruined, in the process of cooking, so commoners rarely decorated them. Of the slipped vessels, the vast majority (ignoring indeterminate vessels) were bowls, and all of the plates recovered were slipped, suggesting they were used to present and serve food, as all who ate at the household would have seen these vessels (Figure 22). Residue analysis is underway for these vessels, which should be considered in any future studies involving this assemblage.

VII. Organization of Production

Due to the lack of any nearby elite residences, I believe that the commoners at T106 were part-time independent specialists who produced these ceramics specifically for their own personal use. If these ceramics were being exchanged at all, it was at the community level, likely at the open market. This is because while the ceramics are produced in surplus, meaning a greater amount than one household would use, it is still not enough for mass-trade, and it is more likely that multiple households, such as those in El Trapiche district, were using this pit to make their own ceramics, resulting in a greater total number left behind at the pit. Slipped bowls and plates, made for serving food, likely did not go outside the commoners' community, and the unslipped vessels (mainly jars and some bowls used for

storage and cooking) likely did not leave the households that made them.

These findings are significant as they highlight commoner craft production among the Maya. It is rare to find commoner craft production loci intact; such evidence provides a rare opportunity for study. Similarly, exchange and economy focused studies are much more popular than craft production technique studies in the Maya area, but understanding the processes and techniques of crafting objects before exchange can broaden our understanding of the spheres of exchange, as well as make it easier to identify the origins of specific ceramics and thus identify trade networks more thoroughly. My research provides a case study that can be used to compare commoner and elite ceramic production techniques and loci, which could facilitate studies of the articulation between commoner and elite practices or economic spheres, or even comparisons between the techniques of different regions. This in turn could answer questions about social structure and inequality, as well as community interactions through the distribution of ceramics. It could also be used to study technological change and the specialization of labor during the Late Preclassic to Early Classic transition.

VIII. Comparative Model and Implications

Previously, archaeologists have studied craft production at the household level through the use of case study comparisons (Jordan and Prufer 2017; Varela et al. 2001), ethnographic evidence (Varela et al. 2001, 184; Jordan and Prufer 2017, 78-83), use-wear analyses (Varela et al. 2001, 186; Jordan and Prufer 2017, 72-74), and experimental archaeology (Varela et al. 2001, 186-188; Wagner et al. 1994). Although my research was limited in that I could not do any experimental archaeology or proper use-wear analyses on the reshaped sherds, the model I created for Altar de Sacrificios will help future studies to condense case study and ethnographic information when building their own arguments for ceramic production at the household level, which will hopefully increase the amount of ceramic production loci identified in the Maya area. The model can also be adapted to track patterns across specific sub-cultures and time periods, leading to more nuanced and informative comparisons and analyses. Using a comparative model can also identify differences between sites more starkly. While the model may be limited to only

three case studies for now, each future comparison that features it will further its viability and usefulness.

Future studies could also remedy some of the limitations of this one, which include the lack of residue analysis, which was not completed before this essay was written, a lack of understanding of changes over time in the ceramics (i.e. how Late Preclassic ceramic practices morphed into Classic ones) due to the assemblage scale of the research, and the lack of interdisciplinary perspectives, especially ethno- and paleo- botanical ones. Use-wear analysis should be completed on the presumed shaped sherd tools to confirm or reject that they were used for scraping and incising. Finally, although I have offered several explanations for the ceramic disk recovered from the site, its matching red sandstone block, though I argue it to be a pedestal, has no equivalent in the literature or other case studies that I have encountered and therefore requires future investigation.

I have argued that the assemblage and pit feature at T106007H at Altar de Sacrificios represents a firing feature and ceramic production locus. The feature's location and shape, carbon deposits in the fill of the pit, and the tools and refired ceramics show its intended use by Maya commoners to produce food and water storage, cooking vessels for their households, and food presentation vessels for the community. The preservation of such a feature is uncommon in the Maya lowlands area; my interpretation will facilitate future comparisons using this data and more detailed and holistic craft production and household studies in the Maya region.

The model I created based on similar case studies can be used to identify other commoner ceramic production loci in the Maya contexts. Although my model may not help identify such loci outside of the Maya region, it can be used to compare commoner Maya ceramic production tools and features with those of other cultures. In addition, researchers in other areas can and should construct similar models to facilitate production loci identification and provide clear and concise comparative data. With these loci established, researchers can further investigate social structure, technological change, specialization of labor, production centers, raw material sources, and the distribution of ceramics, and then answer questions about community interactions, trade networks, social inequality, and economic systems.

Evidence	Batán Grande	K'axob	Altar de Sacrificios
Feature Attributes			
Mound: Location			
Mound: Access to Water			
Pit: Dug into Sterile Soil			
Pit: Round Shape			
Pit: Carbon Deposits in Soil			
Double Chambered Kilns/Tubes			
Ceramic Production Tools			
Polishing/Grinding Stones			
Reshaped Sherds			
Ceramic Disk and Sandstone Base			
Carbonized Ceramics (Wasters)			

Figure 1. Comparative model of ceramic production features and tools created by the author.

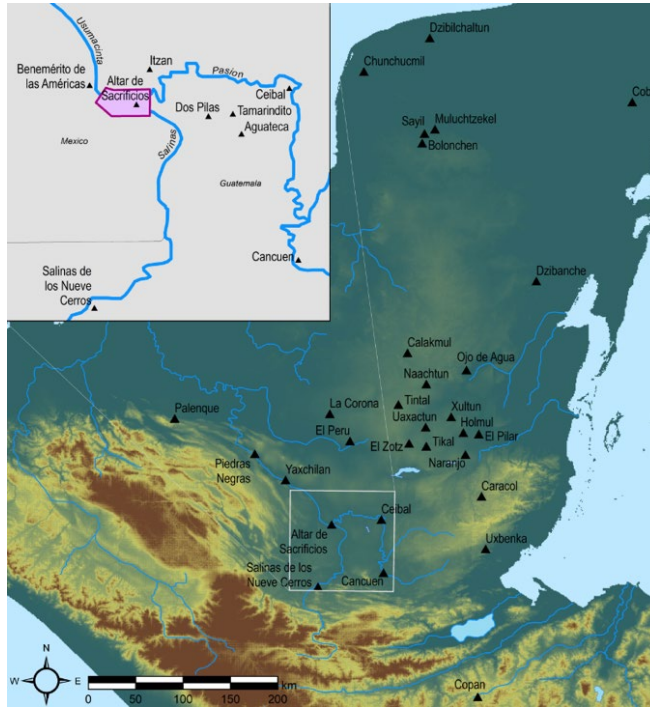


Figure 2. Two maps showing the west Maya lowlands (center) and where Altar de Sacrificios is located within them (upper left). Both maps created by Dr. Jessica Munson

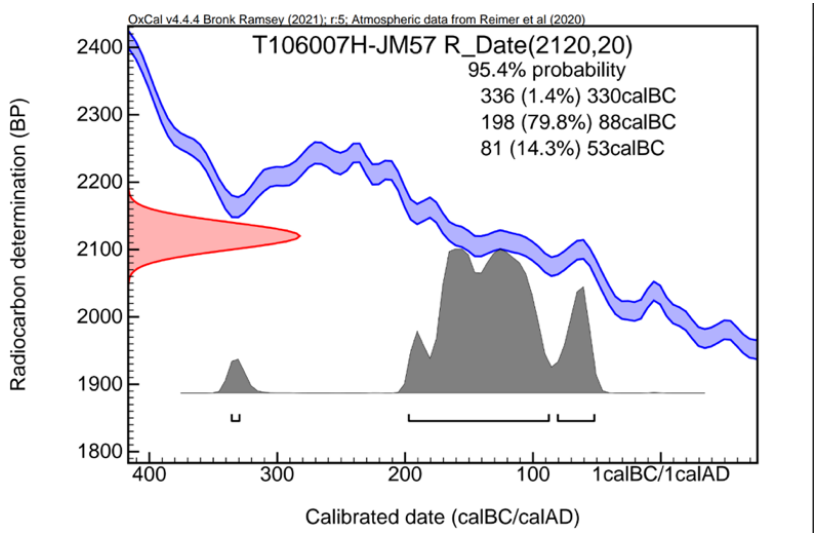


Figure 3. A graph showing the estimated age of the pit, 150-50BCE, based on radiocarbon dating. (Munson, Jessica. 2024. E-mail message to author, October 22).

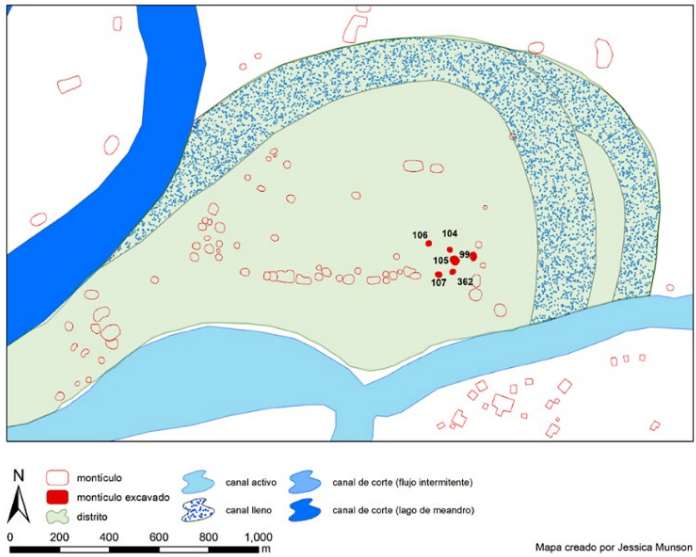


Figure 4. A map of the excavated mounds (colored in red) in El Trapiche district, in which T106 is located. The light green shading indicated the district. The light blue shading shows the modern canal, the medium blue shows the cut channel which flows intermittently, and the dark blue shows a meandering lake. The blue dots show a filled-in canal. The map was created by Dr. Jessica Munson in 2023. (Viñals and Munson 2023, 37. Text translated by the author).

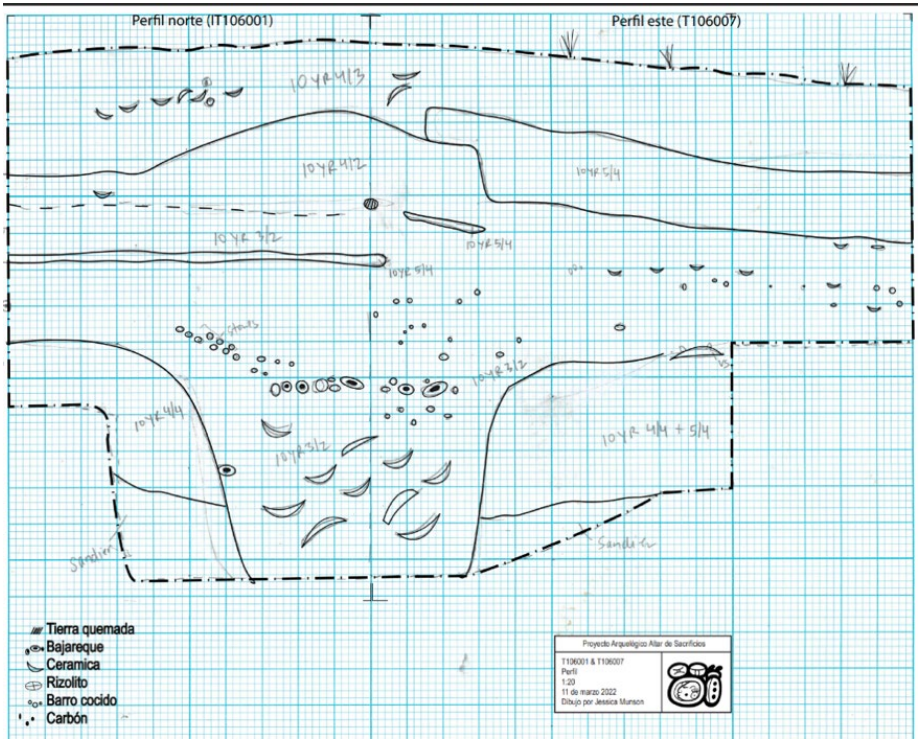


Figure 5. A profile drawing of the North (left) and east (right) walls of T106, showing the stratigraphy. The pit feature is in the center and extends further into the ground than any others. Drawn by Dr. Jessica Munson in her field notes on May 11, 2022; digitized by the author.

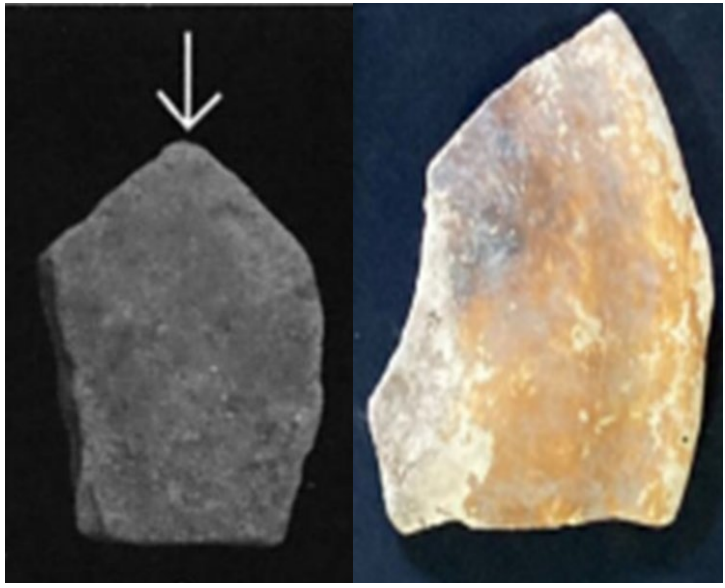
Material Class	Details	#	Weight (g)
Ceramic	Disk; slipped on one side	1	205
Earspools	1 jadeite, 1 blackstone	2	9.2
Faunals	Unidentified fragment	1	n/a
Figurines	Unslipped ceramic	1	15
Lithics	Chert	52	n/a
Lithics	Obsidian	11	17.3
Other Materials	Impressions	4	4785
Other Stone	Red sandstone	1	1360

Figure 6. Table of non-ceramic sherd materials excavated at T106007H at Altar de Sacrificios created by the author.

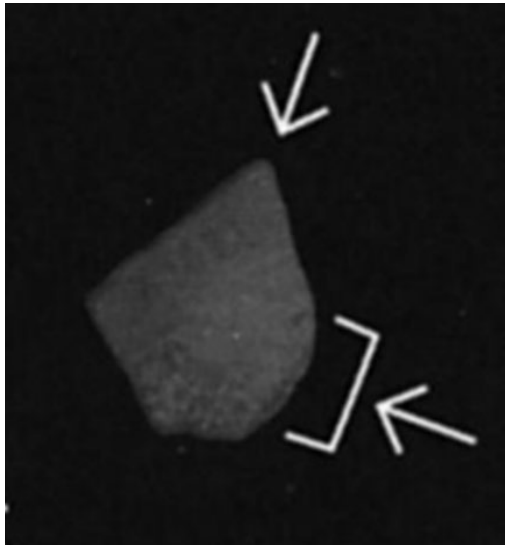
Figure 7. A photo of the pit, and the stratigraphy of T106, at Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.

Figure 8. A photo of a polishing stone from Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.

Figures 9 and 10. Sherds used for scraping. Left: Figure 9, from K'axob (Varela et al. 2001, 188). Right: Figure 10, from Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.



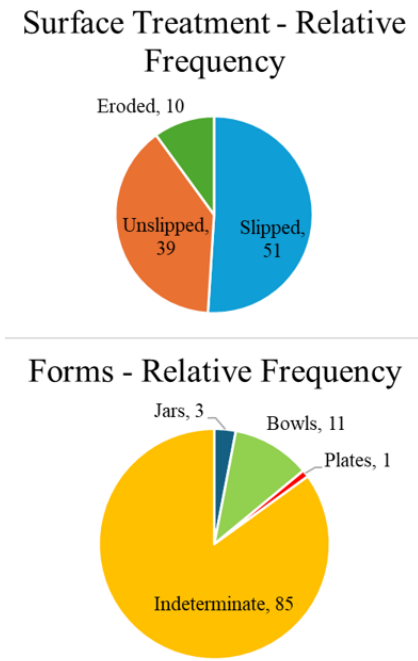
Figures 11 and 12. Sherds used for incising. Left: Figure 11, from K'axob (Jordan and Prufer 2017, 73). Right: Figure 12, from Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.



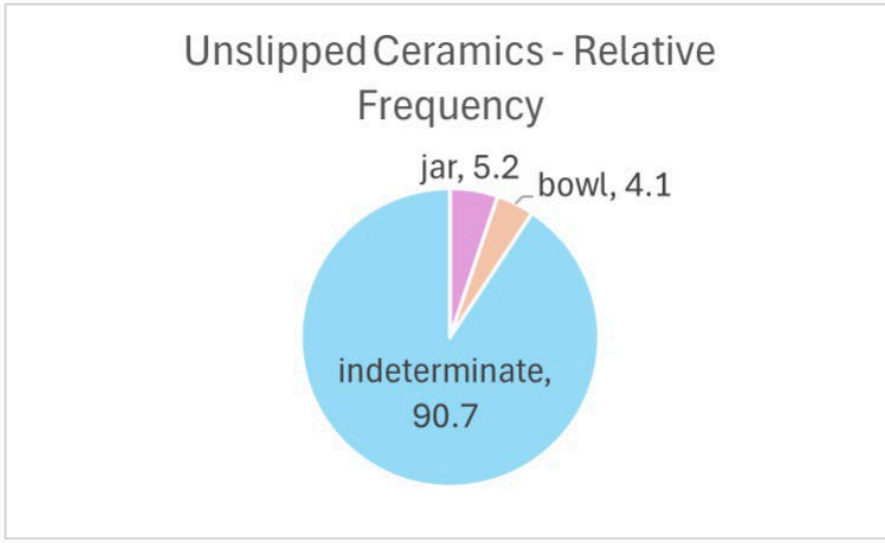
Figures 13 and 14. Sherds used for both scraping and incising. Top: Figure 13, from K'axob (Jordan and Prufer 2017, 73). Bottom: Figure 14, from Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.

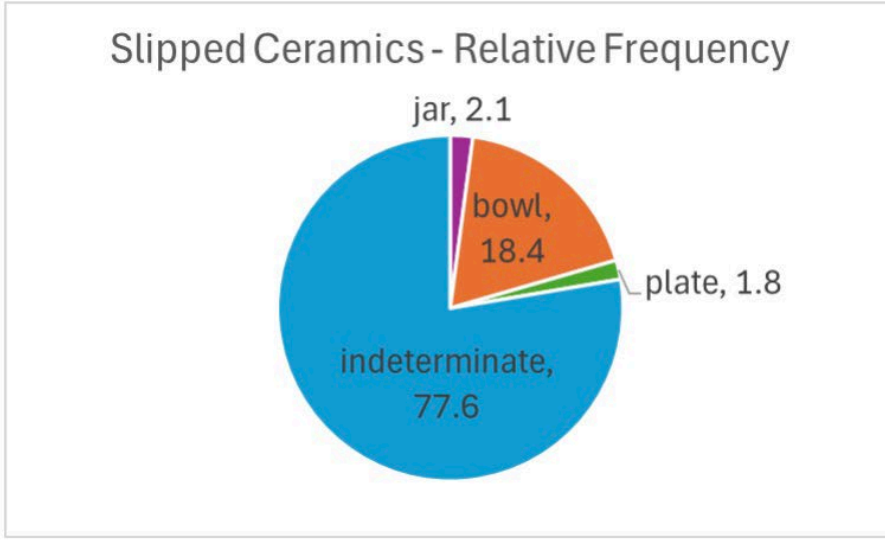
Figures 15, 16, and 17. *Kabal* (left, figure 15) and *molde* (right, figure 16) being used by Maya potters in Mexico in the 1950s; photos courtesy of Antonin Brejnik (Foster 1959a, 55). Bottom: Figure 17, the ceramic disk and sandstone pedestal from Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.

Figure 18. A sample of carbonized sherds from Altar de Sacrificios. Photo courtesy of Dr. Jessica Munson.



Figures 19 and 20. Graphs of the relative frequency of the surface treatment (top, figure 19) and forms (bottom, figure 20) of all the sherds from Altar de Sacrificios created by the author.





Figures 21 and 22. Graphs of the relative frequency of vessel forms among unslipped (top, figure 21) and slipped (bottom, figure 22) sherds recovered at Altar de Sacrificios created by the author.

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