MODELING CULTURE WITH FIGURINES: A STUDY OF MATERIAL EMBODIMENT AT THE LATE CLASSIC MAYA SITE OF QUIRIGUA

A MASTERS THESIS

SUBMITTED ON THE DAY OF MAY 1st, 2023

TO THE DEPARTMENT OF ANTHROPOLOGY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

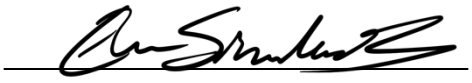
OF THE SCHOOL OF LIBERAL ARTS

OF TULANE UNIVERSITY

FOR THE DEGREE OF

MASTER OF ARTS

BY



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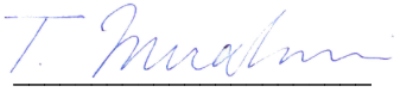

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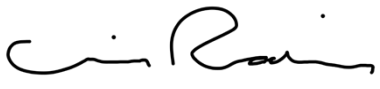

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AN ABSTRACT

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This thesis examines the way in which figurines were created and used to embody aspects of the culture and community at the Late Classic Maya site of Quirigua using a collection of figurines housed in the Middle American Research Institute (M.A.R.I.). By understanding Maya figurines as a whole - looking at their history and what distinguishes Late Classic figurines – and their different attributes (manufacturing techniques, function, iconography, and decoration) Maya figurines can be studied within their own contexts. Further study of the geographic region and the cultural/historical influences of the southeastern periphery region, as well as the settlement history, political and cultural relations, and figurine production/use at Quirigua itself provides a better background of the site from which this collection was found. The geochemical analysis (via neutron activation analysis) and macroscopic analysis of manufacturing techniques, function, iconography, and decoration, when considered within the previously discussed contexts, illustrates different elements of the people who lived at the site of Quirigua. Aspects of how their society was structured as well as the materialization of different important ideological themes ultimately come together to help us better understand the community of Quirigua itself. Figurines transcend the divides usually placed between people and between levels of society – namely between the household and political systems that govern them – and embody the connections and relationships that form across the entire community. This study shows us how materials, no matter how small, can provide answers to monumental questions and provides a great example of how to use legacy collections, even ones without provenience, in serious archaeological work by applying rigorous and thorough analytical methods, allowing us to better understand past communities, like the one found at Quirigua.

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Chapter 1: Introduction

We as archaeologists have tended to place artifacts within a hierarchy of informative value: the artifacts most valued for their information are large monuments, massive burials, and towering pyramids. Small artifacts do have the potential to answer questions normally reserved for the monumental artifacts of the elite and can add new insights that their larger counterparts overlook. A perfect example of such an object is the Late Classic period Maya figurine. In the Classic Maya world, figurines were widely accessible, used in a variety of ways and in a number of settings. They were integrated directly into multiple aspects of cultural practice and society, making them perfect vessels for studying ideology and world views of the entire culture, including the typically invisible lower class. By using a variety of analytical methodologies, even collections of looted materials can be given new life when archaeologists see the potential for such small objects to answer our big questions.

In the Late Classic Maya region, figurines connected multiple cultural and ethnic groups under one generally shared cosmology. Maya figurines were used in both smaller household ritual and larger state-sponsored ceremonies, and they were accessible to all levels of society. With the introduction of moldmaking technology, figurines were able to be produced faster and in much greater quantities, all while maintaining a relatively standardized series of forms. Their widespread trade across the region also connected people across many different sites. As much as they worked to draw the Maya together, however, they also kept them apart. Figurines, especially Maya figurines, represent the different ideals of society and provided clear guides for what was expected of different groups of people. Some imagery was also reserved for elite groups, such as deity images,

preventing the general populace from accessing such a divine source of power. Overall, Late Classic Maya figurines both connected and disconnected people: they brought them together in an intimate way, but they also reminded people of the positions they held and reinforced those boundaries regularly.

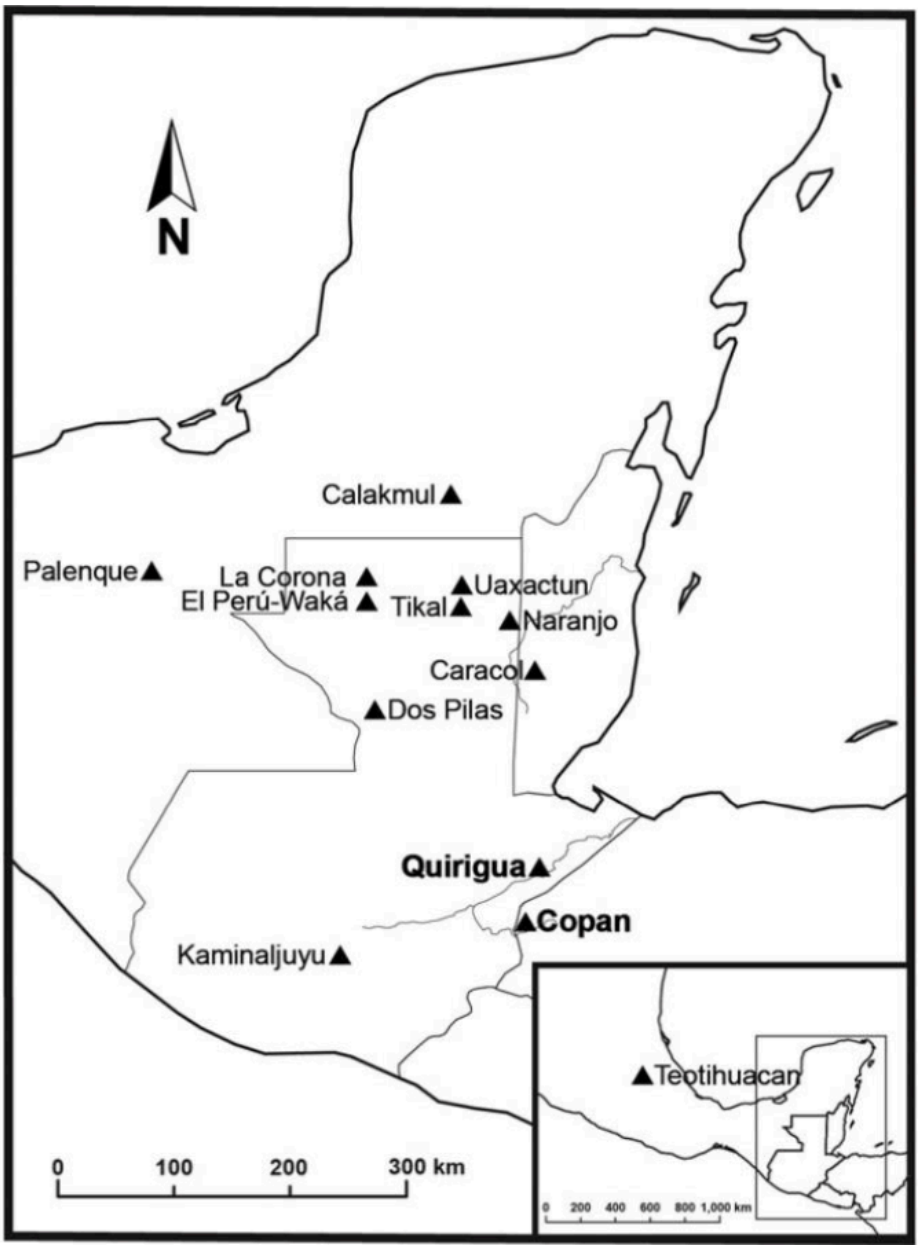


Figure 1.1: Regional map of the Maya area marking important Classic period sites and Teotihuacan (Ashmore 2015:214)

Maya figurines have only recently been researched in depth (Halperin 2014a, 2014b, 2017; Halperin et al. 2009; Hendon 2003; Horcajada et al. 2014; Kohout 2011; Marcus 2018; Triadan 2007), and their functions across all levels of society and within different social systems are not nearly as well understood as the monumental work restricted largely to elites. In part, this is because, given their small size and graphic nature, figurines are easily looted and often collected with little regard to provenience and have, therefore, been relegated only as objects for museum displays and not for research. This study, however, aims to demonstrate that the M.A.R.I. collection of thirty-eight figurines from Quirigua can be used to not only confirm hypotheses formed off monumental and settlement sources but can also provide a unique and more intimate look into the culture and community of Quirigua.

The Late Classic period site offers a unique chance to study figurines and their role as socializing tools and, ultimately, how those figurines reflect the way the people of Quirigua saw themselves and how they identified in comparison with other sites from the surrounding regions. At Quirigua, figurines illustrate an interesting cultural and historical atmosphere, one that deviates from the rest of the Maya world and reflects the tumultuous history of the small polity and its complex system of identities resulting from its location within a periphery region. The people of Quirigua seemed to center at least their sense of hegemony more closely with their religion than other Maya sites, likely as an attempt to integrate the adoption of elite Maya symbology with the primarily non-Maya populace. It is this sense of integration that appears to permeate throughout the small polity and to be vital to its maintenance as a community. The integration of family members within a household is followed by the integration of different household units which come

together with households all across the valley during large ceremonial events. Political systems insert themselves into households through imagery and ritual practices and therefore become integrated in the community's daily life. Differences of any kind can be bridged in at least some small way, ensuring that every type of person is made to be an integral part of the functioning whole. Households rely on the state systems just as much as these systems rely on the households.

Figurines ultimately embodied the social and cultural values of the people who used and produced them, allowing archaeologists to study those values even without proper context. By analyzing these figurines using a wide variety of methods - examining chemical sourcing data, manufacturing technique, function, decoration, and iconography - these embodied values are made visible. The important ideological values and how they were related to the role of ritual - at both household and state levels - along with the societal structures surrounding gender and the place that Quirigua held in the world helps us to better understand how people related to themselves and others. All of these parts go together to form the complex relationships held between the different types of people living at and interacting with the site, and how the formation and maintenance of community at Quirigua was materialized in their figurines.

Chapter 2: Maya Figurines

The role that figurines play within a given society is a unique one that requires examination beyond their immediate functionality by looking at what they might mean to the people using or creating them. When studying objects that have a connection to ritual and the divine, it becomes vital that we understand the nature of social systems' interactions with culture and cosmology. We understand ritual to be a fundamentally performative group proceeding critical to the formation, reproduction, or negotiation of social relationships (Looper 2003:21). It provides its participants with direct access to their cosmology and offers them varying degrees of control within it. Other cultural systems or social institutions can and have inserted themselves into rituals and performance, creating different forms of hierarchy within the religious system and utilizing belief to justify and reproduce other cultural values and practices. As a result, people create different tools to reinforce these beliefs and worldviews, while simultaneously dividing and incorporating the whole population within a unified cosmology. Visual art serves as one such tool, as it is used to communicate important ideas and ideals to the group - an especially useful tool when a majority of the population is non-literate - and it acts as a way to record and add to a group's collective memory. When combined with ritual objects - typically used to contain, store, and channel spiritual forces (Looper 2003:21-31) - these pieces of 'art' become powerful tools that can reflect and reshape the world they function within.

Through their display of religious motifs, general accessibility, and roles within different ritual settings, figurines have been used to provide people direct access to their cosmology and invite them to participate in larger, state sanctioned ceremonies which

they may have otherwise been more removed from. They have also been used to bridge the gaps between different groups within their culture - social status, age, gender, and geography - ultimately uniting the whole within their own greater cosmologies. Because of their visual nature, figurines also display and teach ideals of a culture to their users and creators. Acting as tools for socialization, they work to teach people how their world works and their place within it. When found in specific archaeological sites, those figurines can illustrate that particular site's cosmologies, showing what values are being reinforced, what groups are more or less emphasized, and what other polities this site may come in contact with.

When studied in the Maya region, the term 'figurine' can be applied to various figural objects with a wide range of uses and functions. Figurines are created by using modeling and/or molding techniques and fit within some type of visual/artistic program. These art objects are small, capable of being held in one hand (Halperin et al. 2009:458; Horcajada et al. 2014:275). While they can be made out of different materials, the vast majority of figurines - and the type being discussed in this paper - are ceramic.

History of Use

Figurines have had a longstanding position in cultures across Mesoamerica, extending both across great geographic and temporal distances. They first appear with fairly simplistic designs at early sites like Zohapilco in the Basin of Mexico around 2300 BC (Marcus 2018:2), although it is possible that figurines made from perishable materials were in use well before this date. By 1300-1100 BC, small solid figurines with more detailing had become widespread in areas being settled by emergent sedentary chiefdoms (Hendon 2003:28; Marcus 2018). Most figurines during this period were solid (although

animal figurines tended to take the shape of flutes and whistles) and most depicted female figures or people with no distinguishable gender and/or sex attributes. They tend to be found broken in special locations and deposited in caches or chultuns (Pugh 2021:577-578). During the Late Preclassic period (400 BC-AD 250), figurine production slowed to a halt as an individualized ruling class emerged and there was a shift away from communal/domestic ritual (Doyle 2020:53; Pugh 2021:578). In the Classic period (AD 250-900), figurines started to be produced again on an even wider scale across the entire Maya region with the innovation of a new form of production: moldmaking (Halperin et al. 2009; Halperin 2014b:31-43; Marcus 2018). During the transition between the Terminal (AD 830-950/1000) and Postclassic (AD 1000-1521) periods, figurines once again saw an abrupt shift in style, imagery, and use reflective of the shifting political climate at the time (Halperin 2017). Today, the Maya people still use figurines in their ritual and daily lives, including for ancestor worship (Marcus 2018:12), and they are made from a plethora of materials, such as clay, wood, corn (Hendon 2003:30), and paper (Marcus 2018).

While figurines have long been used in the Maya region, their style, iconography, frequency, and usage have undergone several major shifts, all of which coincides with shifts in political and social structures. The emergence of marked social differentiation and the rise of chiefdoms saw a change in figurine styles, going from simple designs to detailed figurines, possibly intended to emulate specific people or positions of power. During the end of the Preclassic period and the beginning of the Classic, the system of divine kingship (or the *k'uhul ajaw* complex) surfaced in major polities coinciding with the explosion of figurines found across the region. It was at this time that figurines

became primarily moldmade, turning into somewhat of a commodity that was produced at a frequency indicative of both the growing population and the increased reliance of elites on ritual activities to legitimize their newfound status (Halperin 2014b; Marcus 2018). Apparent changes in gender dynamics that occurred around the Preclassic period can also be seen in the shift of figurine styles. Figurines made by early village groups primarily depicted female-bodied/feminine human figures but, afterwards, masculine figures became the more frequently produced type of human figures (Hendon 2003:30; Marcus 2018:7). With the collapse of the *k'uhul ajaw* complex between the Terminal and Postclassic periods, figurine production dropped and started to be used more frequently in smaller rituals as opposed to larger, state-held ones. They also tended to depict different types of figures, or, more aptly, they ceased depicting figures that were or could be tied to the divine kings of the past (Halperin 2017).

Late Classic Figurines

The Classic period, defined by the wide usage of the Long Count calendar and the widespread system of clear divine rulership, is generally separated between its Early and Late periods. It is in the Late Classic period that many of the developments generally considered hallmarks of the Classic period really solidified (Coe and Houston 2015:124-173). While the continued effects of central Mexico's Teotihuacan intrusion into the Maya region during the Early Classic could still be felt, the Late Classic was politically dominated by the expansion of Kaanul at the expense of Tikal (Sharer and Traxler 2006:287-498). Late Classic sites had dynamic and often highly connected political histories and the system of divine rulership meant that ritual celebrations hosted by rulers became integral parts of Maya political communities.

As previously mentioned, figurines during the Late Classic period were a popular and integral commodity for the Maya people. Typically found in trash middens, figurines during this period are mostly associated with domestic structures, where they appear to have been used frequently, considering the sheer volume of figurines found and their high frequency of breakage (Halperin 2014a:119, 2014b:6, 2017; Halperin et al. 2009; Hendon 2003; Kohout 2011; Triadan 2007). They have also been associated with more elaborate, state sponsored ritual activity, due to the few caches of figurines found placed in deliberate scenes and buried for events like funerals, building dedications, and to celebrate visiting dignitaries (Marcus 2018:9-10). Highly accessible, figurines have been found at all settlement types, from large primary centers all the way to tertiary sites (Halperin et al. 2009:468) and, with the exception of a few cases (most notably that of Copan), they are associated with both elite and commoner households (Halperin 2014a:117-119, 2014b; Halperin et al. 2009; Kohout 2011; Marcus 2018). This widespread accessibility was made possible by the introduction of moldmade figurines. However, while figurines are found all across Mesoamerica, these molds have only been found at certain sites (Halperin et al. 2009; Marcus 2018): Aguateca, Altar de Sacrificios, Comalcalco, Copan (although they are very rare here), El Chal, Ixtonton, Lagartero, Lubaantun, Palenque, Tikal, Piedras Negras, Ceibal, Xunantunich, and Quirigua (Halperin et al. 2009:469). This suggests the production of figurines had centers of manufacturing and were then traded across the landscape, connecting the different polities economically and cosmologically.

Manufacturing Technique

Figurines can be manufactured by using a mold, hand modeling, or a combination of both (usually resulting in a molded base with hand modeled details). Hand modeled figurines/elements are typically further classified as finely or crudely made, a distinction which - despite being qualitative - is used to indicate the general level of effort and/or skill needed to produce the figurine. Finely hand modeled figurines are usually restricted objects, only associated with elite contexts, whereas the crudely hand modeled figurines were likely not deemed as prestigious and may have been given mostly to children (Halperin 2014b:152-167). Moldmade figurines were formed by pressing clay into ceramic molds to create their designs, although in the case of ocarinas and whistles, the back was most likely made by hand and then attached to the molded front (Triadan 2014:10). Moldmade figurines are the most common figurine form, with no visible restrictions on who could possess them during the Classic period, and they typically took the form of ocarinas (Halperin 2014b:153-155; Marcus 2018).

Function

The different functions determined for the figurines in this collection can be categorized as either music makers, incensario fragments, or undetermined. Of the undetermined figurines, those can be further classified as hollow, solid, or appliqued. Undetermined hollow figurines are more likely to have been ocarinas, but because the figurine was broken above any possible diagnostic features, this cannot be positively identified. Similarly, undetermined appliqued figurines may have been attached to incensarios, but this also cannot be determined for certain, so they remain in this category.

Music Makers

Music making figurines, particularly ocarinas and whistles, initially appeared in the Preclassic at sites like Chiapa de Corzo and Chalchuapa before rapidly expanding during the Classic period (Sharer n.d.) and expanding in use during the Late Classic period as the region's populations and urban centers grew and political institutions became increasingly competitive (Halperin 2014b). Their form was standardized: one resonating chamber, two holes on the back (allowing for multiple notes to be produced), and a tripod base formed by the mouthpiece and two front legs which allow them to stand on their own (Marcus 2018; Triadan 2007:274-275). They usually depict humans, animals, and, occasionally, supernaturals (Halperin 2014a, 2014b:44-142; Triadan 2007:275-279). Smaller and crudely hand-modeled ocarinas have also been found, usually depicting animals, especially birds, which are thought to have been mostly used by children, given their size and less elaborate forms (Halperin 2014b; Kohout 2011). Other intricate hand-modeled figurines have been found attached to flutes and were probably also used in some type of ritual event, however these are significantly less common than their smaller, whistle counterparts (Halperin 2014b:160-167).

Music makers were primarily used during large scale ceremonies (Halperin 2014a, 2014b:186-209), although they may have also been utilized in small, more private household rituals (Hendon 2003:30) and by children as toys (Kohout 2011). Music makers have also been found discarded in caves along with other artifacts indicative of ritual practice - likely in association with rain (Halperin 2014b:197-198) - performed by elite ritual specialists (such as priests) or local shamans.

Besides being associated with physical ritual spaces, music makers can be tied to religious activities by their very sound-making qualities, as many rituals performed by the Maya across time periods utilized the senses to produce spiritual experiences. Incensarios, discussed further below, utilized scents and sight to produce connections to the spirit world (Halperin 2014b) and it is possible that rituals performed in caves utilized sensory deprivation to produce a similar effect (Canby 1994:187-191). In that vein, music makers may have utilized the sense of sound to summon and interact with spirits during ritual events. Modern Maya shamans utilize their breath (by blowing, breathing, or spitting) to animate inanimate objects (Halperin 2014b:203-207). The Maya concept of the *ch'uel*, or a 'soul', is associated with music and scents (particularly from burning copal) and its essence lies within the breath (Sharer and Traxler 2006:733). The breath is also seen as analogous to smoke (smoke:fire::breath:humans) (Schele and Miller 1986:43), a substance which is deemed an ideal conduit for communicating with otherworldly beings. Taking all of that into consideration, it is likely that the act of blowing into ocarinas during the Late Classic period may have been seen as a way to bring the figurines to life (Halperin 2014b:203) and fill them with spiritual forces.

While ocarinas and small, figurine music makers are not recorded in state accounts (as opposed to more formalized performers with their own larger and more stylized instruments), these figurines likely were still an important/prominent part of public ceremonies. While not serving as official musicians for the ruler, the general populace could still be active participants in these larger rituals (Halperin 2014b; Triadan 2007), producing sounds, animating figures, and communicating with the spirits themselves. They also would have served to elevate the ecstatic atmosphere of such

monumental performances. Because of their availability and portability, these figurines could then be brought back into the home, carrying with them the memories and experiences of large events, but this time bringing it into a much more personal space.

Incensarios

Figurines are, similarly, often found appliqued onto incensarios (Halperin 2014a and 2014b; Triadan 2007). These vessels were used to burn incense (typically made from different plant resins and gums) and possibly blood (Looper 2003; Rice 1999; Sharer and Traxler 2006; Tedlock 1993) in various ritual activities, at a specific place or for a specific idol (Miller and Taube 1993; Rice 1999). They tend to be found most often associated with ceremonial or sacred spaces like temples and stela or buried alongside important figures like rulers. While incensarios take a number of different forms, when utilizing figurine imagery, they usually depict zoomorphic and anthropomorphic figures attached to the body, base, handles, flanges, or covers of the effigy incensarios (Rice 1999). Incensarios are usually fairly simple bowls, shallow plates, or narrow vases made from ceramics with elaborate features and decorations (Rice 1999). Incensarios are inherently ritual objects and would not have been used for any other purpose. Their primary function was to "define boundaries of ritual space and practice, mediate transitions between the sacred and profane, and invite the presence of the ancestors/gods" (Rice 1999:28). While they may have been a part of household rituals, incensarios primarily were utilized by ritual specialists - both state-sponsored and local (Looper 2003; Rice 1999).

There are two primary types of incensarios: image/effigy and non-image. While non-image incensarios have been found well before the Classic period, effigy incensarios

only appeared during the Late Preclassic/Early Classic periods and stopped being made with any frequency around the Terminal Classic (Rice 1999). The time that effigy incensarios were utilized most heavily was alongside the *k'uhul ajaw* complex, tying them directly to the systems surrounding divine rulership. Also during this period, incensarios started to be utilized in much more distinct ways, having been prescribed specialized roles for certain rituals (Rice 1999). Effigy incensarios are found mostly at major centers in association with major temples and with royal burials. Non-image spiked or ladle incensarios, on the other hand, are usually found buried in public places - alongside stelae and altars or associated with smaller structures - none of which were overly powerful areas connected directly to royalty and spaces of cosmic renewal (Ashmore 2007; Rice 1999).

Undeterminable Function

Many figurines lack clear diagnostic features and could have been utilized in a wide variety of ways: for rituals, entertainment, and/or play (Halperin 2014b). Some hollow head figures that were not appliqued to anything and are not part of ocarinas have been posited to have served as removable masks for larger figurines (Triadan 2007:275). Others with boring holes might have been worn as jewelry/decoration (Horcajada et al. 2014:275). Because of their small and portable nature, figurines can be brought into a multitude of different contexts and arranged/rearranged to fit new roles. Assuming that all figurines were used in the same way is problematic and would oversimplify a clearly complex material culture. Many spaces that figurines have been associated with blur the line between ritual and domestic - with some spaces seeming to be more domestic while

others are much more spiritual - but they are usually found associated with households or places where people frequent (Halperin 2014b).

The majority of figurines are found broken in trash middens, indicating that they were used often and were not intended to be cherished heirlooms. They could have also been purposefully broken as a way to ritually kill or destroy the figurine (Halperin 2014b). Figurines might have been used as stand-ins for dead family members and to communicate with their ancestors during household rituals (Hendon 2003; Marcus 2018), so breaking them would have been necessary to release these spirits once the ritual was completed. Such effigy figures have been found and used in the entire Mesoamerican region as far back as the Olmec and likely exists as a widespread and fundamental aspect of Mesoamerican cosmology. Maya today use small figures made from a variety of materials to communicate with ancestors and also ritually destroy them once their ritual is finished (Marcus 2018). Outside of ancestor worship, figurines are found associated with most bath houses, which are spaces associated with healing and rebirth. These figurines may have been utilized during certain curing rituals that took place within bathhouses (Halperin 2014b:190).

Figurines have also been found placed in caches or burials, set up in expressive scenes, recreating specific events or myths (Halperin 2014b:196-197; Marcus 2018), and are found in association with funerals, building dedications, or visitations from foreign dignitaries (Marcus 2018:10). Burying these caches turn these figurines into offerings, empowered by their placement within these scenes. Such scenes could have also been recreated in a far less formal and permanent manner, being used as sources of entertainment or play for members of the household. Recreating important cultural and

mythological scenes using figurines could have been essential to teaching and reinforcing the Maya worldview for children and the rest of the household.

Iconography

The concept of mimesis is essential for understanding the importance of imagery/iconography. Mimesis refers to an object representing or imitating something else (Halperin 2014b:31-43); in the case of figurine studies, mimesis is seen in the iconographic subjects that the figurine is representing. Essentially, the subject of the figurine is assumed to represent something real from the user's world or adjacent worlds that they were aware of or interacted with (Halperin 2014b). For the Late Classic period Maya, a widespread collection of ideologies is associated with a series of relatively standardized images and symbols (Looper 2003), making the iconography of figurines reflective of the world and people at large with which they would have or might have interacted. Other sources of imagery in this region are thought to contain the essence of the being represented inside of the them (Halperin 2014b). Stelae depicting rulers or effigies of deities have part of those beings held within them, and so they are alive and powerful. It is not unreasonable to extend that logic to figurines. That being the case, the iconography of figurines carries a great deal of weight and should be considered as part of a much larger system of meanings when being analyzed.

Anthropomorphic Figures

Anthropomorphic figures are the most frequent subject both for this collection and for most Late Classic Maya figurines (Halperin 2014b; Triadan 2007). Unlike stelae, figurines usually do not depict specific individuals. Rather, they depict general personae or ideal types of people, emphasizing the social and cosmological roles people were

expected to perform (Halperin 2014b; Hendon 2003; Kohout 2011; Looper 2003; Triadan 2007). Costuming and dress provide a good metric for differentiating many of these roles. In the same way that performers during festivals use costumes, masks, and body adornments to transform themselves into the beings they are impersonating (Looper 2003), so, too, do the iconographic elements of figurines utilize dress as a way to transform into these figures.

One principal figure seen among human figurines is the ruler. Classic period rulers were both the political and spiritual leaders, as the title *k'uhul ajaw* would suggest. Rulers were almost exclusively portrayed in attire for large, public rituals (Halperin 2014b:46-62) and never in everyday courtly dress as seen in paintings and polychrome pottery. They are often wearing abundant jewelry - thick beaded necklaces, ornamental bars, thick bracelets, and ear spools - and large headdresses, sometimes accompanied by masks, either on the ruler or on the headdress (Halperin 2014b). Masks and headdresses helped rulers manifest and transform into deities to communicate with and to receive direction (Looper 2003; Sharer and Traxler 2006:747-748). The majority of ruler headdresses have supernatural or zoomorphic masks with additional feathered sprays. Deities usually have wide, rounded eyes, commonly referred to as 'God-eyes'. They can also be seen wearing elaborate, fan-shaped or t-shaped headdresses and others are depicted resting in the center of large palanquins. The use of masks are good indicators of the ritual actors, as masks were and are important in most ritual activities. They allow the actor to transform themselves from their human form into the (often) supernatural figures they are embodying (Marcus 2018). Many of the royal elites depicted wear masks and elaborate costumes as the central figures of the major events. Ruler figurines are found in

a wide array of contexts, including primary and periphery sites, as well as across elite, middle status, and commoner households (Halperin 2014b).

Another set of ritual actors depicted by figurines are ballplayers and wrestlers, identifiable by their gear (such as yokes, elbow and knee padding, and helmets). While also found across the region, ballplayers and wrestlers are not as commonly depicted as ruler figurines (Halperin 2014b:62-64). Performers, also integral figures in state-sponsored festivals, are another common type of figurine. They can be masculine and/or feminine figures and are typically dancers or musicians. Performers, while not uncommon in figurine collections, are normally downplayed or absent from stelae and other state monuments. Typically, performers seem to have some kind of elaborate dress or hairstyle but are still distinctly less adorned as ruler figurines and contain no overt cosmological symbols. They are also often found carrying instruments or fans (Halperin 2014b:65-74). By depicting these different ritual actors, these images reconnected people to past ritual events (many of which likely involved the use of one type of figurine or another) and allowed households to bring public events into their own private spaces (Halperin et al. 2009; Triadan 2007).

Nonroyal elites and ritual specialists are also figures who are reduced in state-sponsored art but are often found depicted by figurines. These figures generally do not have very overt status signifiers, making a wide variety of roles difficult to differentiate from one another, but they are still distinct from commoner figurines. Priests, scribes, and other royal court officials generally wear either stiff or drooping headcloths. Priests have a somewhat distinctive appearance, more typically seen wearing tall, stiff headdresses

made from bark cloth, and scribes tend to wear a specific scribal headband (Halperin 2014b:78-84).

Finally, figures wearing broad brimmed hats are one of the most frequent figurine styles, paralleling ruler figurines in both frequency and distribution (Halperin 2014b:84-91). These figures likely represent market vendors, travelers, and commoners and they are most likely depicting women/feminine presenting individuals. Outside of broad brimmed hat figurines, domestic activities are rarely depicted (Halperin 2014b; Triadan 2007), with most of the attention given to elite figures. There are also virtually no clear representations of children (Triadan 2007).

Animal Figures

Animals are the next most common type of figurine found during the Late Classic period, depicting various birds, monkeys, jaguars, dogs, turtles, etc. (Hendon 2003; Triadan 2007). Animals represented in figurine and other Maya art are not simply depicting animals, rather supernatural figures. Whether spirits, specific mythological figures, or supernatural representations, animals in Maya cosmology tend to take on much more active roles as characters with agency similar to that displayed by humans. *Way* (*wayob* in the plural) spirits are "the spiritual co-essence of a person" (Looper 2003: 28) that are primarily depicted as animals (Grube and Nahm 1994; Halperin 2014b; Looper 2003; Miller and Taube 1993; Sharer and Traxler 2006; Triadan 2007). Many of the animals that are not directly referencing other supernatural figures are likely meant to be interpreted as *wayob*. *Wayob* are typically associated with sacrifice, death, the underworld, untamed wilderness, and excess (Grube and Nahm 1994; Halperin 2014b:96-99, 127), all concepts that bring someone to the edges of Maya 'civilization' and into

wild realms controlled by the spirits. Because of this, *way* spirits are powerful entities who can be summoned during certain rituals, both by state leaders and in household rituals associated with ancestor communication. Late Classic polychrome vases illustrate lords entering trances and summoning *wayob* (Halperin 2014b). *Way* spirits' power to help individuals perform transformations is typically associated with masculine figures (Halperin 2014b) and masculinity, which is in contrast to the feminine spiritual powers of bloodletting (Looper 2003) and ancestor communication.

Another context in which some animal figurines can be interpreted is in the role of a trickster. Tricksters in Maya cosmology, as in most cosmologies, contradict social norms, typically in a comical manner. They regularly choose self over society, are hypersexual, live on the edges of civilization, and are usually depicted in animal or nonhuman forms (Halperin 2014b:96-130). Ritual clowns have been used in Maya festivals from at least the Classic period and continue to function as commentary on society in modern festivals (Halperin 2014b:97; Miller and Taube 1993). By depicting clowns and tricksters as animals, their antithetical nature is highlighted and implies that their behavior is unhuman, insinuating that people rise above and control the urges tricksters are enslaved to (Halperin 2014b). Ritual clowns also embodied the chaotic power from before creation and are often seen participating in events associated with major shifts/changes in the universe (Miller and Taube 1993:63). One of the most common forms these animal tricksters take is that of the monkey, both in ancient and contemporary settings, and they are very common in figurine collections (Halperin 2014b; Triadan 2007).

Supernatural Figures

Grotesques and supernaturals are a rather diverse category (Halperin 2014b:94-142; Hendon 2003; Triadan 2007), typically made up of figures that do not comfortably fit into the other defined categories. Grotesques consist of a wide variety of unusual anthropomorphic figures, usually with exaggerated and/or zoomorphic features. Some also depict emaciated figures with sunken and wrinkled faces, grimaced open mouths, beards, and deformed heads all meant to invoke images of old age, pain, and death (Halperin 2014b:124-127). Grotesques are associated with masks (being figures that people would often impersonate during festivals), music, clowning, death, warfare, and sacrifice (Halperin 2014b). Much like tricksters and clowns, grotesques were likely used to criticize, parody, or mimic society and important state figures. Unsurprisingly, they are found at all levels of society (Halperin 2014b).

Dwarves are the most frequent Late Classic supernatural figure and are also associated with the trickster/ritual clown complex, having been a part of Mesoamerican cosmology since at least the Olmecs (Halperin 2014b:107-115). Dwarves are both supernatural and historical figures who are often depicted in paintings as members of the royal court. However, even when performing as courtiers, dwarves were considered supernatural and liminal beings associated with forests, caves, the underworld, and other liminal/temporal spaces (Halperin 2014b), along with Chacs (rain deities) and the Maize God (Miller and Taube 1993:82). Dwarves can generally be identified in figurines by their disproportionately large head, prominent forehead, sunken face, and drooping lower lip (Halperin 2014b; Marc Zender personal communication 2021).

The final type of supernaturals that figurines depict are formalized deities, particularly those associated with cosmic order. Deities are rather rare to find in figurine collections, making up only 0-7% of supernatural figures (and even less of total figurines) and are generally only found in restricted special contexts (Halperin 2014b:130). This is most likely because such imagery was strictly controlled by elites, whereas the other figurine types can be found among any and all social groups. If figurines really were considered to carry the essence of the figures they were depicting, it makes sense why such imagery would have been only allowed for royal elites. Rulers drew on specific patron deities as the source of their political and religious power (Halperin 2014b). While all levels of Maya society could communicate with generic spirits and their ancestors, only the highest level of elites could communicate with specific deities, a restriction which defines Classic period divine kingship and differentiates this period from Preclassic and Postclassic rulers. Deity figurines tend to be hand-modeled and of a higher quality. Deity figures tend to depict the Sun God (God G), K'awiil (God K), the Maize God (God E), God N, Goddess O, the Moon Goddess, and the Wind God (Ik' K'uh, God H) (Halperin 2014b:130-140).

Decoration

Unlike pottery, Maya figurines were never slipped, rather, they were either left plain or painted after firing (Halperin 2017). Typically, figurines were polychrome, painted with vivid colors to make the figures appear realistic. Certain colors were more commonly used, particularly blue, black, red, and white. Red was associated with cardinal east, the primary direction as it pointed toward the rising sun. Similarly, cardinal west, with the setting sun, was black, associated with death and the Underworld (Schele

and Miller 1986:42). White was an important color, typically associated with the cardinal direction north (Miller and Taube 1993:65-66) and the ancestral dead. The color yellow was associated with the south, the direction considered the right hand of the sun, although this color is not as typical for figurine decoration (Schele and Miller 1986). Maya blue was typically used to designate sacred or precious substances and objects (Rice 1999:28). People involved in sacrifice (both the sacrificed and the sacrificer) were usually painted primarily in blue, as well as objects that were sacrificed via breaking and/or burial (Sharer and Traxler 2006:751-752).

The Figurine's Role in Society

Figurines are widely accepted to have been ritual items used by most or all members of a family (Halperin 2014a, 2014b; Halperin et al. 2009; Hendon 2003). The rituals themselves range from smaller, household practices - particularly those surrounding ancestor worship (Hendon 2003; Marcus 2008; Pugh 2021) - to larger, state-sponsored events, all meant to solidify the group and reinforce identity (Halperin 2014a, 2014b; Halperin et al. 2009; Kohout 2011; Marcus 2018). These larger events also provided spaces for distributing figurines, with major ceremonial centers acting as aggregation sites for the wider, surrounding areas, and creating the perfect environment for temporary marketplaces to be established where figurines could be sold to a large audience (Halperin 2014a, 2014b; Halperin et al. 2009). It has also been theorized that figurines were toys, used primarily by children and produced by women (Kohout 2011; Triadan 2007), due to a number of reported child burials with figurines. This argument is diluted somewhat by the fact that figurines have also been found in juvenile, adult male, and adult female burials, as well as the fact that the majority of these burials are only

found at the site of Jaina (Halperin 2014b). Similarly, at the rapidly abandoned site of Aguateca, figurines were found in rooms interpreted as back/storerooms associated with items such as ceramics, cooking vessels, ground stones, and spindle whorls (Marcus 2018), all items generally relegated as tools for 'women's work'. When interpreted as toys, the figurines' iconography is thought to have been a way to teach children about the universe that they live in, illustrating social class, elite status, and supernatural beings (Kohout 2011; Triadan 2007).

The reality of figurine use, however, cannot and should not be simplified down to one single function. While it is common practice to see these two interpretations as opposing one another, a better viewpoint is that they are working simultaneously together and both perspectives are required to see the complex nature of these artifacts. Acknowledging figurines as ritual items does not stop some of them from having been relegated to children, who could have easily viewed them as toys in a sense. Similarly, just because a child might have used a figurine for play, does not mean it didn't have a role in creating the 'supernatural' world for them. Smaller, more crudely made figurines - which usually depict animals, especially birds, and were often ocarinas - were more likely to have been used by young children, whose propensity for breaking or losing items would have made such low quality, low energy objects appealing to their caretakers. The size of these figurines also would have been difficult for a grown adult to have used them, whereas the small hands of a child fit these figurines perfectly (Halperin 2014b; Kohout 2011). While children were not participants in larger, state-sponsored rituals, they still could have been active participants in the smaller, household ones. Even if they were not actively involved, they still would have likely witnessed rituals and

served as passive participants. Providing them with their own figurines, especially ones that depicted creatures they were visually more familiar with and could understand, would allow children to be taught from a young age the vital ritual and cosmological knowledge that they would need to navigate their world.

Just as figurines are thought to teach the Maya cosmology to children, they can also engrain these ideas and ideals into the older generations as well. Figurine iconography depicts the ideals of a society: what is expected and valued by the culture as a whole. As people of all ages interact with these images, they are provided models for behavior and appearance through these figurines (Halperin 2014b; Hendon 2003). Having them present within the household would have allowed for the state ideology and socio-cultural constructions to be continuously built, rebuilt, and reinforced as they were used and given meaning by their users (Halperin 2014a, 2014b). Such aesthetic and symbolic tools of popular culture allowed the ruling state to constantly reiterate their knowledge base and dynastic claims to legitimacy (Looper 2003). Outside of the state-controlled culture, however, figurines would have also served as a way to provide identity to people who were rarely or never represented on public monuments, where the imagery was strictly controlled by the elite/state (Halperin 2014b).

Summary

Figurines have a longstanding history of use in all of Mesoamerica, including the Maya region, spanning from the Preclassic period up into modern day. It is this long history in conjunction with their widespread accessibility that makes Maya figurines such important materials to study. Late Classic period figurines most likely served multiple purposes (but especially as ritual actors and toys used by children), all of which helped to

illustrate and pass along knowledge about the world that surrounded the people who used them. Just as figurines were able to communicate a number of concepts to a wide variety of people, they also took several different forms with various attributes that must be identified. The manufacturing technique – either moldmade, hand modeled, or both – speaks to how much attention each figurine might have been given or how prevalent that image and style may have been. Certain diagnostic features can identify the function of a figurine, particularly when they are music makes or censer fragments, although many uses of figurines do not require easily recognizable diagnostic features. The iconography of a figurine communicates certain ideals and associations that can showcase important ideological concepts, whether they be depicting anthropomorphic figures, animals, or supernaturals/grotesques. They can also depict different types of people and specialized dress associated with them. Any sign of decoration can communicate different meanings as well, given the importance that color plays in the Maya religion.

Chapter 3: The Southeastern Periphery

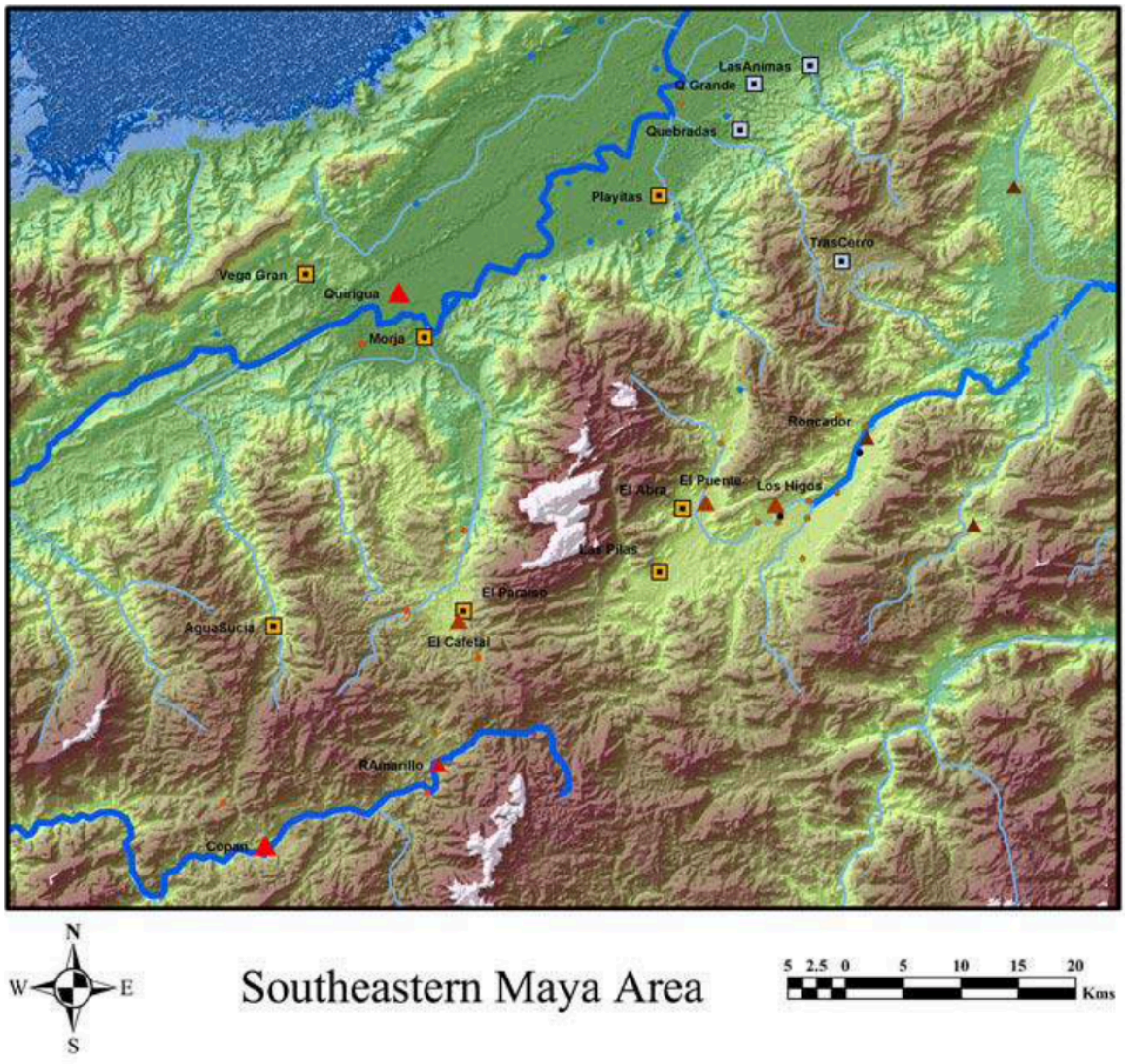


Figure 3.1: Map of the Southeastern Maya periphery region, including major sites from the Classic period (Marcello and Bell 2004:4)

Understanding figurines and their forms/functions requires us to understand the context in which they are living to begin with. This collection comes from a site in a distinctive and complex cultural region: the southeastern periphery (*Fig. 2*). This region consists of a number of different sites (of varying sizes) in parts of southeastern Guatemala, western Honduras, and El Salvador; stretching from the Caribbean below the

Peten down to the Pacific Coast (Ashmore 1986; Bishop et al. 1986; Canuto and Bell 2004, 2013; Inomata and Aoyama 1996; Schortman 1986; Schwerin 2010). Geologically, this region is characterized by a number of mountain ranges with settlements distributed at fairly regular intervals inside their lush river valleys. The valleys contain "a great variety of geological formations, mostly metamorphic (serpentine and schist/greiss with quartz, mica, and feldspars) and sedimentary (sandstones and, near the Caribbean, limestone) origins" (Bishop et al. 1986:147).

Culturally, the region is often considered to be the proverbial 'edge' of the Maya world. This Maya-centric view simplifies the periphery region. Peripheries, by nature, are loosely defined and transitional (Parker 2002), as they are made up of shades of gray, where the different cultures connected to each other begin to bleed over and into the people living there. This region is no exception. A complex mix of different cultural and/or ethnic identities can be seen co-existing in this area during the Late Classic period. While the nuances of identity are extremely difficult to parse out, especially for a region of this size and complexity, a general pattern can be discerned differentiating ethnographically identified Ch'olan Mayan speakers from the north and west (Guatemala and Belize) and people linked to the Lenca region to the south and east (central Honduras and eastern El Salvador) (Canuto and Bell 2013:1-2). Significant dynastic lowland Maya political and culture influence did not appear in this region until around AD 400, with the arrival of K'inich Yax K'uk Mo' and the establishment of Copan as a Maya settlement (Ashmore 2015; Coe and Houston 2015; Looper 1999, 2003; Sharer and Traxler 2006; Storey 2017). From there, Copan began to establish their own settlements or to significantly influence leadership at previously established sites. Because of this, various

ethnicities were coexisting in these valleys at the same time. Using architectural, sculptural, and pottery forms/styles, the overall ethnic connections of the various sites in the region are identifiable (Canuto and Bell 2004, 2013; Schwerin 2010; Storey 2017).

Mostly, however, these ethnic markers are more indicative of state affiliations and less of a discussion concerning individual interactions. Some of these 'Maya' and 'Honduran' sites were within eyesight of each other. A complex system of routes also connected the different sites and valleys to one another, some meant to carry goods/materials between them, but others seemingly meant to transport messengers back and forth; some of the routes connecting major centers are able to be traversed in a matter of hours (Canuto and Bell 2004:21-32). It is highly suggestive that different ethnic groups would have had regular interactions with one another (Canuto and Bell 2013; Inomata and Aoyama 1996; Schortman 1986; Schwerin 2010; Storey 2017) and some of the larger sites, like Copan (Storey 2017) and Quirigua (Looper 2003), would have had a population of both Maya and Honduran ethnicities (and sometimes a melding of both).

As a result of the complex cultural landscape visible in this peripheral region, elite strategies for communication took an interesting form, one which relied primarily on visible symbolism (Canuto and Bell 2004:4-6; Inomata and Aoyama 1996; Schortman 1986; Schwerin 2010). This expression of identity via a visible media system had a two-fold purpose. On one hand, it illustrated a form of control over its population, especially when Maya polities were trying to maintain control in an ethnically non-Maya area. Probably more effectively though, is the way in which it visibly connected elites from different sites/regions to one another. Many aspects of the Maya sculptural/artistic program may have not been well understood by anyone who was not also a member of

the Maya elite cultural and economic system (Ashmore 1986:45; Schortman 1986:126). Smaller sites who were under the hegemonic control of Copan, especially, had monumental cues that associated them directly with Copan, including showing evidence of hiring Copanec sculptors to create their stela/sculptural works. Even primarily Honduran sites contained some evidence of artistic connections to Maya styles, suggesting they were participants, at least to some degree, with the Maya elite economic networks.

Lower Motagua Valley

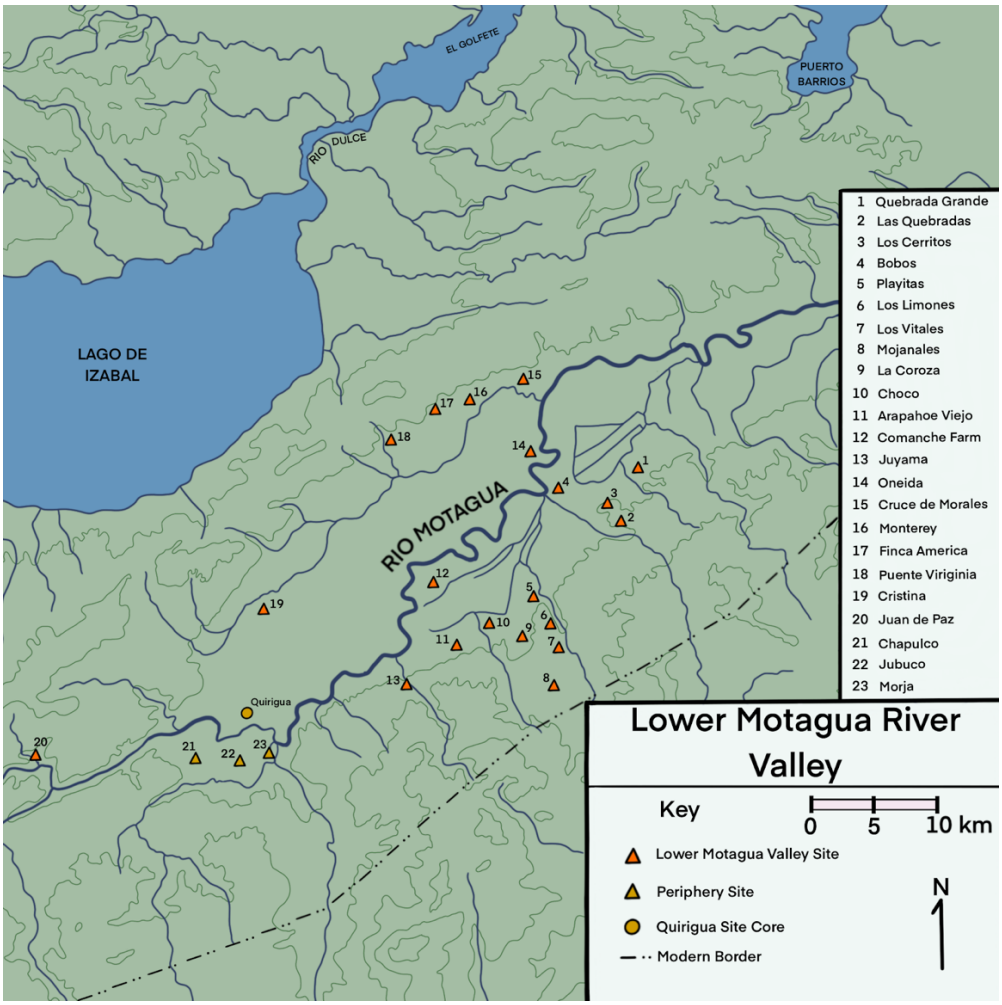


Figure 2.2: Map of the Lower Motagua River Valley, including Classic period sites (modified from Schortman 1993: Fig.1)

Quirigua itself is located in the lower Motagua valley (LMV), situated between the Maya Peten and the rest of the southeastern periphery (Canuto and Bell 2004; Schortman 1986). This section of the river valley is located within Guatemala's southern tropical lowlands near Lake Izabal and Puerto Barrios, close to the Caribbean coast. The valley itself is primarily a rich, broad, and flat river floodplain tucked between the Sierras de la Minas and Espiritu Santo mountain ranges to the northwest and southeast. The floodplain's suitability for agriculture rendered it advantageous for human settlement; in the Late Classic it was occupied by a number of sites, ranging in size and political/cultural affiliations (*Fig. 3*). Because of its generally flat topography, inter-site communication within the valley would have been fairly easy without any physical barriers. While the region was likely occupied on and off since at least the Preclassic period, monumentality only lasted during the Late Classic (Schortman 1986:115-125).

Sites in the LMV share a somewhat unique material pattern that distinguishes them from other cultural groups, including those within the wider southeastern periphery. The Quadrangle court/patio group is considered to be a local southeastern architectural pattern, often attributed to sites in the LMV (Ashmore 1986:38-40; Canuto and Bell 2004; Schortman 1986:121). Quadrangle courts are composed of four platforms forming a quadrangular court or patio space that is at least 15m wide. The corners of these courtyards are often sealed, restricting access and movement of peoples. The substructures of these groups are long (minimum of 20m) but fairly low (less than 3m high), with the northern structure usually being the tallest (Ashmore 1986). Quadrangle courts were only built and occupied from around AD 700-900 and they were likely used as residences and/or administrative centers for local aristocracy. Their presence in the

Motagua valley is only associated with a small number of larger sites distributed evenly across the valley, suggesting a separation or spreading of politico-administrative powers among them. Besides Quirigua, the sites that seem to have the most influence in the valley are Las Quebradas, Playitas, Quebrada Grande, and Choco (Schortman 1986).

A few sites in the LMV show Peten influence, especially with the presence of Triad/Temple architectural groups (Ashmore 1986:40), a primarily Peten form of architecture. These structures - placed in sites with prominent and controlling spaces and only appearing during the periods of Maya influence in the region - are indicative of the lowland Maya presence. The earliest temple groups "are located at river control points, adjacent to Motagua tributaries either where these emerge from the foothills or at their Motagua confluence" (Ashmore 1986:40) and later groups appear associated with both river locations and administrative centers. All of these areas would have been highly visible and traversed spaces and the layout of these assemblages ensures easy access to large groups. At Quirigua, the temple group consists of an elongated plaza with structures located to its west, north, and east, but with plenty of access points. As the case with the Quadrangle courts, the highest structure is also the northern one (Ashmore 1986:40).

The presence of both Peten and southeastern architectural styles in the valley suggests a complex mix of ethnic identities present. At the very least, there were multiple sources of political power/influence being utilized in the lower Motagua region. How interconnected these sites were and their relationalities to one another would require more excavations of the region in the future. For now, it appears the valley was composed of several centers of influence, all balancing with one another. Some of these centers, like

Quirigua, were influenced by outside Maya political structures, but all displayed southeastern/LMV cultural connections.

LMV Figurine Distribution

As mentioned, the limited excavations in the lower Motagua valley hampers our ability to understand the nature of figurine distribution in this region. However, a series of preliminary investigations were conducted by the University of Pennsylvania (Schortman 1993) which help establish baseline patterns. Surface collections at 20 other LMV sites and preliminary excavations at the larger sites of Playitas, Las Quebradas, and Choco provide data used here. All of these sites appear to have been settled by local culture groups adopting only some aspects of Maya cultural and economic.

Generally speaking, pottery at all of these sites was primarily produced at or around Quirigua, with some other examples of local pottery found alongside them. Copador ceramics (originating from Copan and found throughout much of the southeastern periphery) are virtually absent from the LMV, however (Bishop et al. 1986:165). Ceramics in the region, therefore, were locally produced and somewhat centralized around the Quirigua region. At the very least, potters at Quirigua were major producers/providers of ceramics. In terms of figurine distribution, the excavation sample is limited, so little definitive can be stated. The three sites that have the most figurines in the region are the only three sites that were excavated (*Fig. 4*; *Table 1*). They are the three largest non-Maya sites in the region, which might be significant.

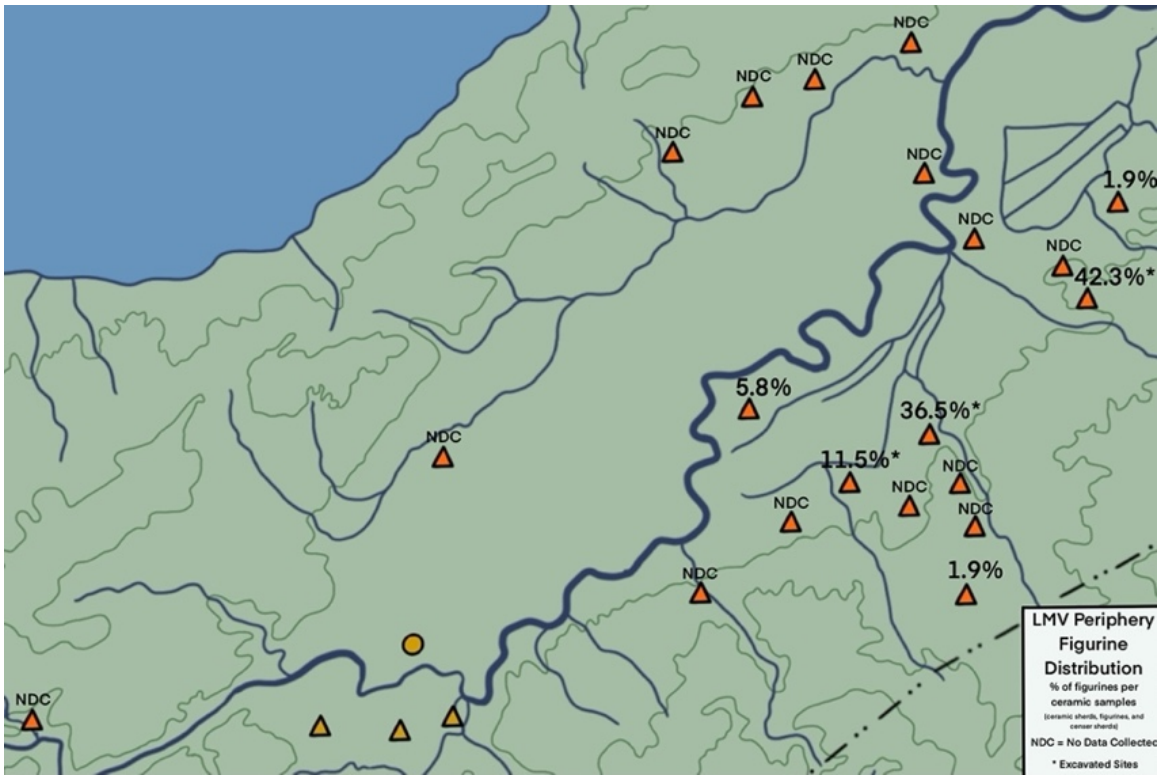


Figure 3.3: Map of LMV figurine distribution; based on data from Schortman 1993 (modified map from Schortman 1993: Fig. 1)

Table 3.1: LMV figurine distribution; based on data from Schortman 1993. Playitas, Las Quebradas, and Choco are the only sites that were excavated. Surface collections were the only method of investigation used at the other sites.

Site	Figurines	%
Playitas	19	36.54
Las Quebradas	22	42.31
Quebrada Grande	1	1.92
Choco	6	11.54
Comanche Farm	3	5.77
Juyama	-	0.00
Bobos	-	0.00
Mojanales	1	1.92
Arapahoe Viejo	-	0.00
Juan de Paz	-	0.00
Oneida	-	0.00
Cristina	-	0.00
Los Limones	-	0.00
Los Vitales	-	0.00
La Coroza	-	0.00
Los Cerritos	-	0.00
Cruce de Morales	-	0.00
Monterey	-	0.00
Finca America	-	0.00
Puente Virginia	-	0.00
Total	52	100

Summary

The southeastern periphery is a diverse region, with a number of different ethnic identities present and interacting with one another. Geographically, it connects people from the Peten and the Caribbean to the Pacific coast and those living further south in Honduras and the rest of Central America. The several sites located in this region vary in size as well as cultural and political affiliation, illustrating the region's great diversity. The use of specific visual symbols was employed as a way to identify political, economic, and individual associations with any number of ethnic groups. Such symbology was used to connect different polities, to illustrate subjugation, and to declare independence. Within the lower Motagua valley, an even more distinct and individual identity can be seen taking shape, with valley-specific architectural programs being employed even alongside Peten architecture in the larger monumental sites. While not much definitively can be said in reference to figurine production and distribution at the various sites in the valley, the lack of Copador pottery and the distribution of primarily Quirigua-produced ceramics suggests that production of figurines might have been centralized through Quirigua and outside interaction was intentionally avoided. As one of the largest sites in the valley, Quirigua clearly played an important role within the LMV itself as well as the rest of the periphery region and should, therefore, be examined more in depth.

Chapter 4: Quirigua

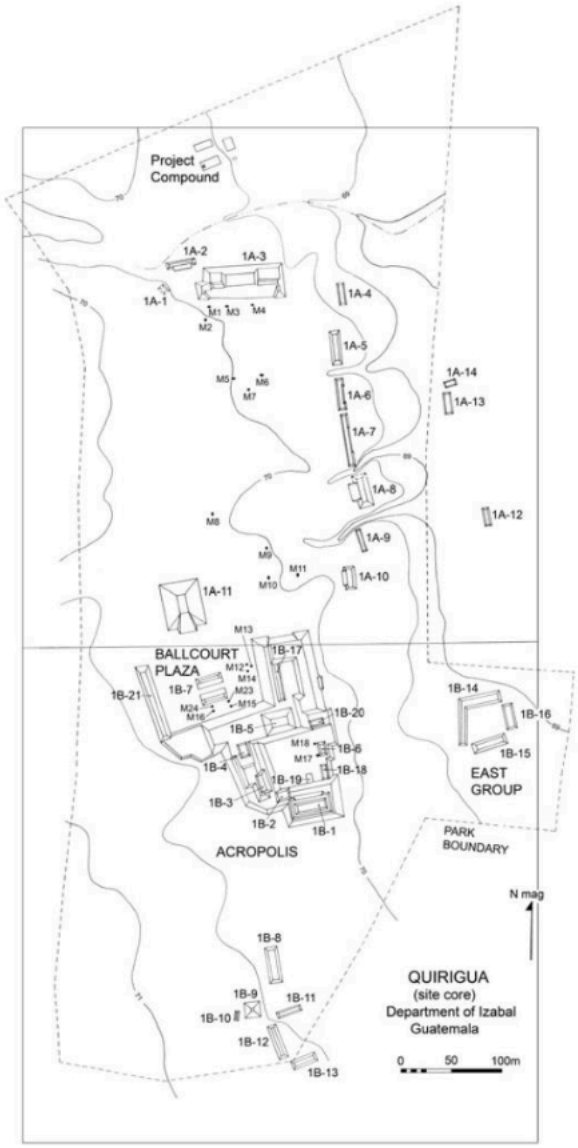


Figure 4.1: Map of Quirigua's site core (Ashmore 2007:8)

Quirigua is a Late Classic Period site located in the Motagua River Valley in southeastern Guatemala, close to the contemporaneous site of Copan on the edge of the Maya world (Ashmore 2015; Ashmore and Sharer 1978; Looper 1999 and 2003; Schortman and Ashmore 2012). The fertile nature of the LMV suggests that Quirigua was a highly productive agricultural center, growing not just individual gardens, but large plots of maize and cacao to be sent out to other sites in the region (Ashmore 1984:365-366, 2007, 2015; Ashmore and Sharer 1978; Schortman and Ashmore 2012). Being a floodplain, however, did mean that the people living at Quirigua had to become accustomed to both regular and flash flooding events (Ashmore 1984:377-378). Its position along the Motagua river also made it a strategically placed site as it was located along the major highland route that ran through the Guatemalan mountain range connecting the Gulf Coast and Pacific lowlands with the Peten (Ashmore 1984, 2015; Looper 1999, 2003; Schlesinger 2001; Schortman and Ashmore 2012). It was also the

largest site located at the northern junction of a number of southeastern trade and communication networks. It therefore likely served as the primary go-between for any contact between Honduras and the lowland Maya, as well as communication between the different valleys of the periphery area (Canuto and Bell 2004:21; Schortman 1986:124).

Settlement History

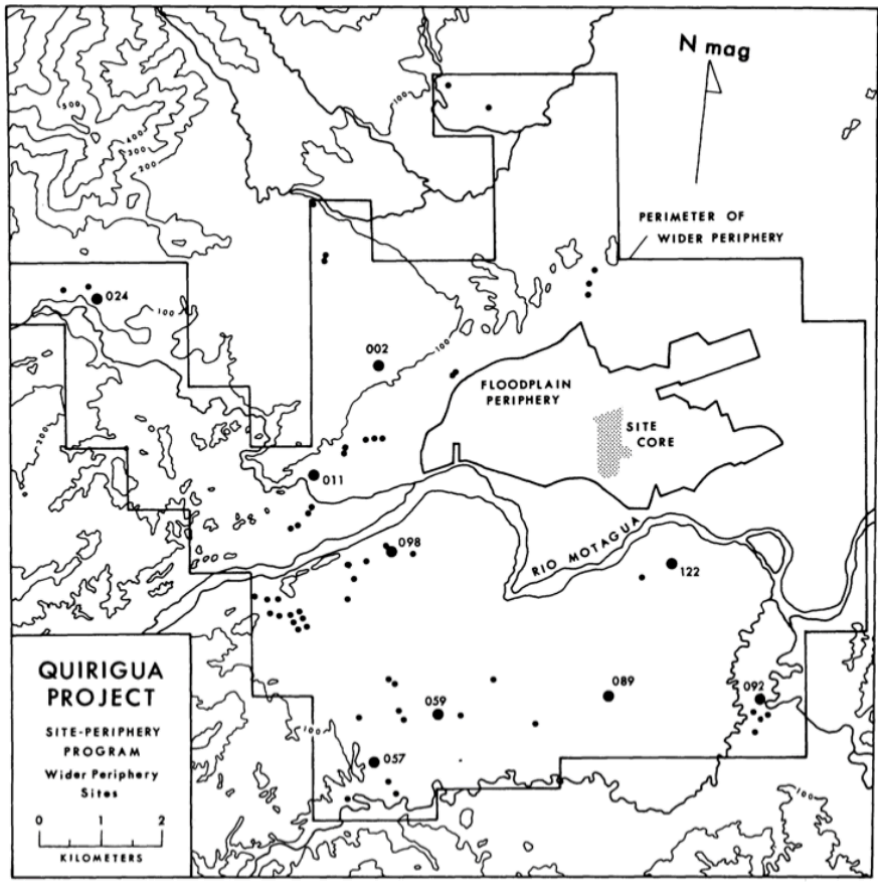


Figure 4.2: Quirigua site periphery map, including the site core, floodplain periphery, and wider periphery (Ashmore 1984:369)

While the area has been inhabited since at least the Preclassic Period (Ashmore 1984, 2007, 2015; Ashmore and Sharer 1978; Looper 2003), Quiruga was not established as a Maya polity until around AD 426, when K'inich Yax K'uk Mo', the first ruler of Copan, established the site as a colony (Ashmore 2015; Looper 1999, 2003) only a few days after he himself was placed on the throne (Ashmore 2015; Looper 2003). Both sites

were the first of a number of strategically placed Maya colonies in the Honduran region likely sponsored by the new Teotihuacano dynasty at Tikal. The region was particularly valuable to the larger Mesoamerican region as the source of highly valuable jade and obsidian (Ashmore 1984:366, 2007:10; Ashmore and Sharer 1978; Looper 2003:2); its numerous fertile valleys provided the ideal environment to grow valuable cacao pods (Ashmore 1984:366, 2007:10). Copan, a geographically isolated site, had to depend on their established colonies to facilitate the movement of these goods as well as their communications with any other site. Quirigua, because of its position along the intersection of a number of paths of movement, acted as a primary filter for Copan and most of its allies, both in the periphery and further north in the Peten, particularly its close ally, Tikal (Ashmore 1984, 2015; Looper 1999, 2003).

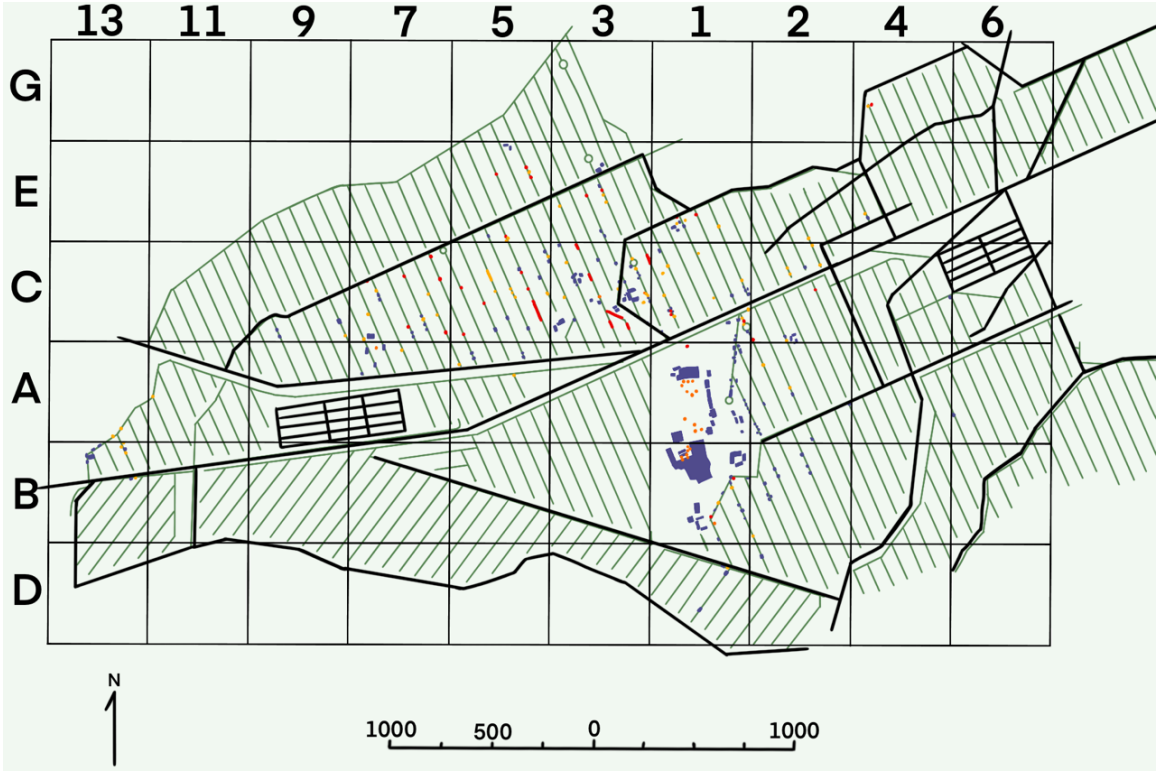


Figure 4.3: Quirigua Site core and floodplain periphery; labeling structures (purple), middens (red), monuments (orange), and disturbed features (yellow) (modified from Ashmore 2007:43)

Little is known about Quirigua like other, large sites of the time (Ashmore 2015; Looper 1999; Schortman and Ashmore 2012). Its monumental center was kept fairly small and unadorned, with little to no obvious mortuary structures for early rulers that citizens could continue to worship their divine ancestors at (Ashmore 1984, 2015; Ashmore and Sharer 1978), a popular practice seen at larger Maya sites. Only one possibly elite burial has been found from this earlier period (Burial 2, Str. 1B-6-2nd: Ashmore 1984:379, 2007, 2015:222-223; Ashmore and Sharer 1978; Looper 2003) but it contains no signs of reentry for continued worship and the structure itself was soon overshadowed by the construction of surrounding buildings and ultimately became irrelevant as the site continued to grow (Ashmore 2015:222-223). Similarly, only four rulers of Quirigua have ever been named at the site, and most of these were carved later in the site's history, since that was a practice generally restricted from Copan's subordinate sites (Looper 2003:vii). Overall, aside from the scant monuments and text from this period, Quirigua fulfilled its secondary role, only interacting with (in terms of exchange of physical materials) other sites in the LMV and parts of the other nearby periphery valleys.

This 'uneventful' history, however, is somewhat misleading, as small indications of strain begin to appear concerning Quirigua's relationship to Copan (Ashmore 2015; Halperin 2014; Schortman and Ashmore 2012). These underlying stressors began to cause visible cracks sometime in the early 8th c. AD when evidence of a particularly massive flood destroyed much of the structures in Quirigua's acropolis, periphery buildings, and, likely, their farmlands. The site was restored, and the acropolis built anew with the apparent aid of Copan's ruler, which would have made Quirigua significantly

indebted to its parent site (Ashmore 1984, 2007, 2015; Schortman and Ashmore 2012; Looper 2003). For a site which seemed to have been used to a degree of autonomy, this intrusion of Copan in its affairs may not have been as welcomed as one might assume. This major flood also happened to take place during a period of possibly unsustainable population growth and site expansion at Copan. As a result of this rapid growth, Copan began to lean more heavily on its subordinate sites by demanding more tribute (Ashmore 2015; Looper 2003; Shortman and Ashmore 2012). Such a demand, not long after a major destructive event, likely placed strain on not only the elite of Quirigua, but also the larger farming community, the ones who had to bear the brunt of the damage from the flood.

This pressure ultimately exploded in AD 738, when K'ak' Tiliw Chan Yo'at/Yo'pat - the 14th ruler of Quirigua - attacked Copan (Ashmore 2007, 2015; Canuto and Bell 2004, 2013; Looper 1999:268-271, 2003; Schortman and Ashmore 2012), most likely with the support of Calakmul (a massive site in Campeche that had a history of aiding the insubordination of smaller sites connected to its long-term enemy, Tikal) (Schortman and Ashmore 2012; Looper 2003). On May 3rd, K'ak' Tiliw publicly sacrificed Copan's ruler, Waxaklajun Ub'ah K'awil (Ashmore 2014; Looper 1999, 2003; Sanchez 2005; Sharer and Traxler 2006). He went on to rule as a divine ruler, making himself equivalent in status, power, and prestige to the rulers of larger, more powerful Maya sites. He legitimized his new self-ascribed status by continuing to go to war with nearby subordinate sites of Copan (Looper 1999:272-274) and through monument building and site expansion, which he accomplished at an unprecedented scale (Ashmore

1984, 2015; Ashmore and Sharer 1978; Looper 1999; Sanchez 2005; Schortman and Ashmore 2012).

After this monumental shift in its history, Quirigua had a dramatic change in material culture. On the monumental scale, Quirigua practically *exploded* with materials. K'ak' Tiliw started a building campaign that included the erection of eleven of the thirty total monuments erected at the site (Ashmore 1984:380-381). The structure of the site itself changed drastically with the implementation of new building styles site-wide, including the change of construction techniques and building materials used (Ashmore 1984, 2007; Ashmore and Sharer 1978). Older buildings, particularly ones that were connected to Copan, were ritually destroyed and buried so that new structures could be built on top of their remains (Ashmore and Sharer 1978), including a great plaza and platforms (Ashmore 2015; Ashmore and Sharer 1978) which provided more space for larger religious events. Changes in pottery styles are evident as previous imitations of Peten styles (Ashmore 2007:70-72; Lopper 1999) were abandoned in exchange for a new, unique, and isolated ceramic culture (Ashmore 1984; Halperin 2014a).

After K'ak' Tiliw, only two rulers are recorded at the site before it was ultimately vacated. The immediate successor was 'Sky Xul', whose rule can be characterized as following in his predecessor's footsteps with an emphasis on building and military campaigns, as well as a continued aggressive attitude towards Copan and its affiliates (Ashmore 2015; Looper 1999). He notably continued to use K'ak' Tiliw's legacy to legitimize his own somewhat tenuous claim to power. 'Jade Sky', the successor to Sky Xul, is the last recorded ruler of Quirigua (Ashmore 1984). Aware of the changing political environment across the rest of Mesoamerica, he tried to repair the relationship

with Copan by moving some of the monuments depicting more overt references to their previous altercation that were erected by his predecessors, erecting some of his own, honoring Copanec emissaries for a period ending event (Ashmore 2007, 2015; Looper 1999). Ultimately, though, it was the shifting of the centers of power in Mesoamerica that caused the end of Quirigua's occupation. Tikal and Calakmul had lost much of their former power and the controllers of trade were shifting to the west, towards Central Mexico. Trade routes began to change from primarily overland to coastal hopping using boasts, making Quirigua's mountain pass irrelevant (Ashmore 1984; Schlesinger 2001). Quirigua was ultimately vacated along with many of the other Classic period sites in both the Maya region and further into Honduras at the start of the Terminal Classic period.

Political and Cultural Relations

Beyond the general history we must also understand the larger political and cultural contexts informing and being informed by the events that took place at Quirigua. Even at its height, Quirigua was a fairly small site, with a population of about 2,000. Its center only measured about 4 square kilometers (Looper 2003:2), so it was not a site that held much sway or garnered the attention of most polities outside the periphery region.

The most obvious and well-studied relationship Quirigua had is obviously its connection to Copan. As discussed above, most of its history was spent as a political subordinate to Copan and this subordination showed clear impacts on the material record. The building style for most of Quirigua's history mimicked Peten and Copan styles (Ashmore 1984; Ashmore and Sharer 1978; Looper 2003) and the pottery produced at Quirigua would also sometimes mimic Peten styles during the years of its subordination (Ashmore 1984; Looper 1999, 2003). The few stelae from this period always note

someone from Copan, either an emissary or the ruler, presiding over the events being commemorated, including the accession of Quirigua's own rulers. Name glyphs on these stelae place the visitors from Copan in authoritative positions, even over the rulers of Quirigua themselves (Looper 1999, 2003).

Nevertheless, Quirigua also shows signs of intentional rebellions against such a relationship with Copan, asserting its own autonomy and independence in a number of small but significant ways. It is one of the few subordinate polities to create its own emblem glyph, a practice usually reserved for large and influential Maya sites (Ashmore and Sharer 1978; Looper 2003), not for small ones like Quirigua. Similarly, for a center meant to control a major trade route, materials found at Quirigua are surprisingly local in manufacture. A majority of the nonperishable items, including pottery and obsidian, were produced at the site, even if they did mimic the styles of outside polities (Ashmore 1986, 2007; Ashmore and Sharer 1978; Looper 2003; Schortman 1986). Copador style pottery, which originated at Copan, was essentially absent from the site, just as it was rare to find in the wider LMV (Bishop et al. 1986; Canuto and Bell 2013; Vlcek and Flash 1986).

When it came to early monumental construction - while mimicking Copan in some ways - Quirigua's *art* displayed unique iconographic motifs, which illustrated a much more local interpretation of religious events, as well as different stylistic techniques (Looper 2003). Given Copan's tendency to use its own unique art style as a method of exerting and expressing its influence at other subordinate sites, this choice to emphasize its own style and trained artists is an interesting choice only seen in sites considered to be Honduran and not Maya (Canuto and Bell 2013; Schwerin 2010). K'ak' Tiliw really expanded upon this sentiment with his monumental architecture even before the attack on

Copan. He walked a fine line between connecting himself to Copan and proclaiming Quirigua as its own political power; he began to omit proclamations of subordination in certain texts and used the title 'south *kalomte*', which was an outdated term used by the early divine rulers of Copan (Looper 2003) and referencing titles used by high-ranking individuals from Teotihuacan.

After Quirigua's secession from Copan's sphere of control, K'ak' Tiliw retroactively applied the *k'uhul'* (divine) title to the emblem glyphs of past rulers (Looper 2003), further cementing its autonomy as its own political agent. Expressions of independence and displays of power became central to developments at the increasingly monumental site. The stelae erected focused on connecting K'ak' Tiliw and his deeds to major ideological themes from the Maya worldview. He recorded the capture of the deity figures from the sites he conquered, which were then recorded as being brought out during major events, including his own funeral (Looper 1999). Whenever the defeat of Waxaklajun Ub'ah K'awil was depicted (which happened often), it was contextualized as a sacrifice mimicking the mythical sacrifice of the Hero Twins recorded in the *Popul Vuh*, a myth that was ritually reenacted through the Ball Game during important religious events (Ashmore 1984; Looper 1999). Likely due to the fact that all of the rulers of Quirigua, including K'ak' Tiliw, had previously only legitimized their right to rule through their appointment by the Copan ruler, K'ak' Tiliw had to reinvent his base of power. With no important ancestors to point back to and the new, self-appointed title of *k'uhul ajaw*, he relied primarily on religious ideology, expressed through iconography, to illustrate his divine right to rule (Ashmore 2015; Looper 1999, 2003; Shortman and Ashmore 2012).

This monumental form of legitimizing power, however, would have only really been targeted at other members of the elite class at other sites. It has been suggested that the Maya elite class should be considered as its own ethnic group entirely (Canuto and Bell 2004:6; Schortman 1986; Schwerin 2010; Storey 2017) as they would have been dealing with an entirely separate complex of materials, images, and interpretations that would have been more or less indecipherable to the majority of the population. Something like the site layout or emblem glyphs or *k'uhul'* titles would only be interpreted by any visiting elites and would have meant less to everyone else living at or near Quirigua (Schortman 1986).

It was suggested by Schortman (1986) that Quirigua's use of Maya symbology was a strategy to control and assert its position as the primary trade stop in the LMV: "[i]f Late Classic commerce in the southern Maya lowlands were elite controlled it may have been crucial to Quirigua's economic position to maintain the symbols and, hence, membership in that elite group. If these symbols and the knowledge of their use were allowed to spread throughout the valley then other centers might have been in a better position to compete with Quirigua for control of that trade" (134). Instead of considering Quirigua as a helpless pawn in the economic machinations of Copan and Tikal, this perspective places some more agency in the hands of the Quirigua elite. It also lends to the interpretation of the aspects of Maya influence at the site as being more of a tool taken advantage of by local elites rather than a clear expression of group identity.

Because of its participation in this sociopolitical system, the Maya-style attributes of Quirigua are typically focused on more than its more unique/local traits, but it was still very much a LMV site. Architecture styles already noted as being particular to the LMV,

specifically the quadrangle patio group, are found at Quirigua alongside the more Maya triad/temple group. The site also emphasized different aspects of group ritual activity. Constructing a number of temples and the depositing numerous caches was de-emphasized (Schortman 1986:137) in exchange for wide open plaza spaces filled with easily accessible stelae and lower buildings. These feature, as well as the development of its own artistic style, creates a Quirigua-specific ritual and built environment.

Just as we see at Copan (Storey 2017) and other periphery sites (Canuto and Bell 2004, 2013; Schwerin 2010), material expressions of culture at Quirigua are a mix of Maya, Honduran, and LMV traits, reflecting the complex webs of influence acting on the people of the region. Ultimately, Quirigua had to reflect the needs of the people living there. As one of the largest sites in the Motagua valley, it acted as the major ceremonial and market center for the relatively spread-out rural community (Looper 2003). Monumental art and architecture, as fascinating as it is, mostly just covers the elite perspective of the site. Accessing the perspective of the wider community is essential to understanding this vital aspect of what defines Quirigua in the minds of the people inhabiting the region.

Figurines at Quirigua

As previously mentioned, Quirigua is one of the select sites that produced their own figurines rather than importing them. Evidence that figurines were being made at Quirigua begins as early as the Late Preclassic period (Looper 2003) and continued until the decline of the polity, although most date to sometime during the Classic period (Sharer n.d.). Molds have been found across the site - from the site core to the floodplain periphery (Ashmore 2007; Halperin 2014b:151) - and in the houses of both elites and

commoners (Halperin 2009, 2014b), suggesting the knowledge and skill required for figurine production was accessible, or at least access was not clearly limited by class/social position. Interestingly, none have been found in the wider periphery of the site, although that does not mean they were not produced there, simply that none have been found.

The actual figurines themselves have been found in elite and commoner domestic contexts (in the elite core, the floodplain periphery, and the wider periphery of villages and farmsteads). Most figurines were found in the floodplain and wider peripheries (Halperin 2014b; Sharer n.d.), likely because that is where most of the people at Quirigua would have resided. The presence of figurines in both elite and commoner contexts is the opposite to their distribution at Copan, where figurines seem to have been a prestige item, found associated only with elite households (Hendon 2003). Ceramics made at Quirigua, in general, rarely left the site, with a distribution sphere of about 15 km^2 (Ashmore 2007), so most production of figurines likely remained local and did not travel to other sites, including Copan. If figurines were distributed as were ceramics, Quirigua may have been the primary source for figurines in the lower Motagua valley as well (see Chapter 3).

Data were collected from the excavations of the University of Pennsylvania's Quirigua Project (Ashmore 2007; Sharer n.d.) and, although there were discrepancies in the numbers of figurines found between the different archaeologists' records, there is still a relatively consistent distribution pattern (see *Fig. 8* and *Fig. 9*; and Appendix C). The majority of figurines center around a settlement cluster north of the site core, particularly at the center in Grid 3C. The bulk of the remaining figurines were found either in the site

core or the rest of the settlement cluster (Grids 2C, 1A, 1B, 7C, 5C, and 1C). This general pattern was maintained even when examined based on function, manufacturing technique, or imagery, as well as looking at the number of figurines in relation to the number of structures present. While the site core does tend to have more figurines than other areas, this area has been excavated far more and far longer than any other region of the site and is the only space protected from looting and faming disturbances. Given this context, the site core is fairly devoid of figurines in comparison to the far less studied or protected areas. The grids that had the highest proportion of figurines to buildings (Grids 2C and 3C; see *Fig. 9*), under closer inspection, show that certain structures or features had clusters of figurines higher than most of the other features within their respective grids (Appendices J.1 and J.2), suggesting that figurines may have been used in or associated with some spaces more than others. Without further excavations, however, not much more can be said about this distribution pattern. Most of the excavations outside of the core were on privately owned farms and thus severely limited. A certain degree of sampling bias, therefore, should be considered when examining these data.

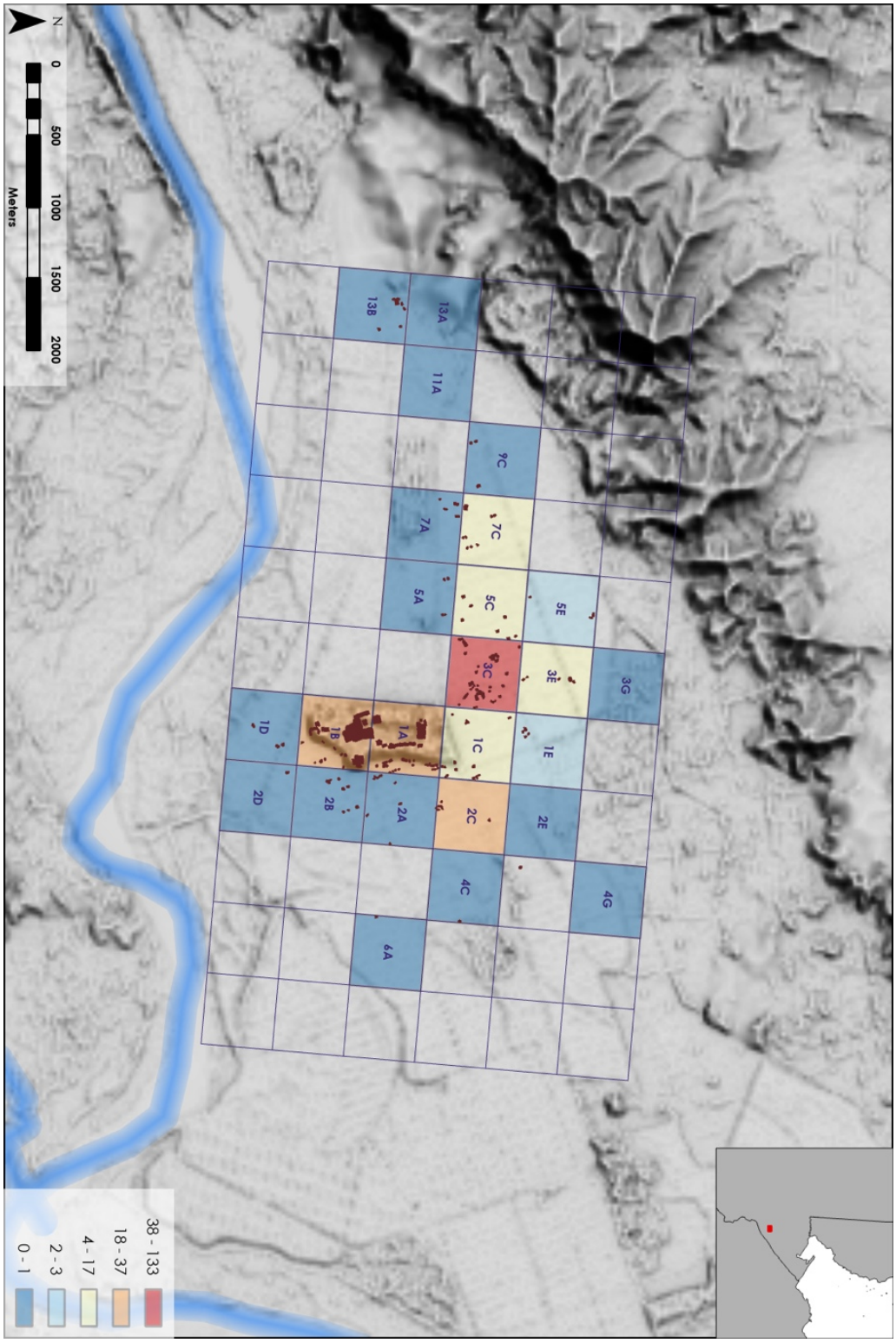


Figure 4.4: Distribution of figurines by grid, using a natural breaks distribution (data from Sharer n.d.)

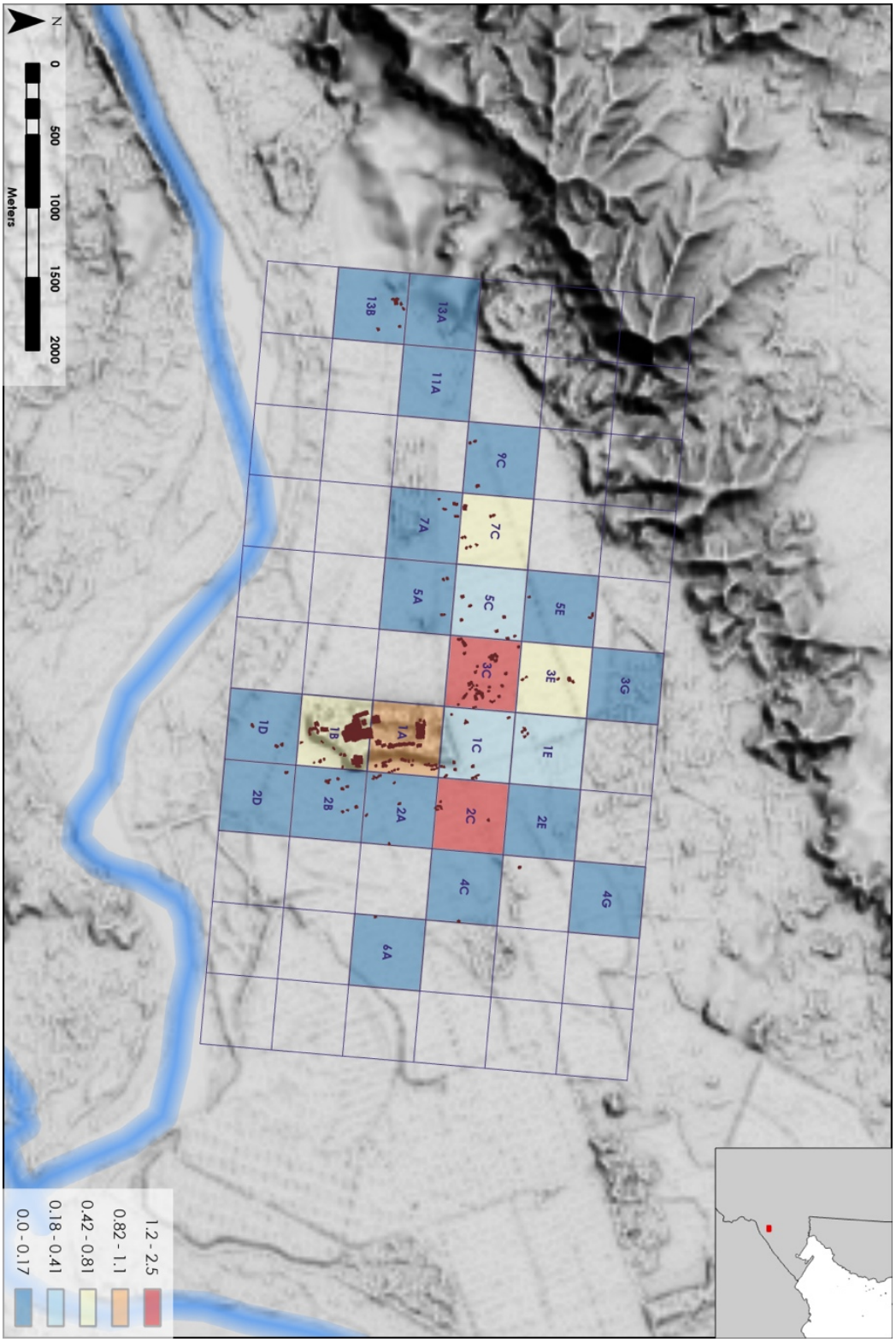


Figure 4.5: Distribution of figurines per buildings by grid, using natural breaks distribution (data from Sharer n.d.)

Figurine style at Quirigua tends to focus on the physical construction of the figure, with highly detailed and expressive modeling, but with more simplistic monochrome painting (Ashmore 2007; Ashmore and Sharer 1978; Halperin 2014b; Looper 2003), typically red or white (Ashmore 2007). This is the opposite of what is typical of Classic Maya figurine styles, where it is more common to see figurines without highly detailed molding but with very intricate painting that utilizes a wide variety of colors. The clay recipes for the vast majority of the figurines found at the site closely resemble that of Tipon ceramics, with paste colors ranging from a fine buff to fine orange. Hand-modeled or Preclassic figurines can be best compared to styles from the nearby Maya highlands and the southern periphery, especially at the site of Chalchuapa. Moldmade or Classic period figurines are more analogous to the Classic lowland Maya figurine tradition (Sharer n.d.).

Summary

Originally founded during the Late Classic period as a Copan subsidiary, Quirigua was a polity meant to mediate trade between Maya, periphery, and Central American sites. However, Quirigua as a polity still valued its autonomy and independence, as seen through a number of small but significant rebellious acts. The Maya-centered political system it employed was likely in place primarily as a way for the elite to manage their position managing trade and communication between the Maya and non-Maya groups. In reality, the majority of the population living at and around Quirigua likely were not ethnically Maya. When Copan eventually became too involved and demanding of the people at the smaller site, the underlying tensions between the two finally snapped with a military campaign resulting in the sacrifice of the Copan ruler. Rulers at Quirigua began

to rely heavily on religious iconography and activities to illustrate and maintain their positions of power after the revolt. All of these different parts of the site's history help to better contextualize important aspects of figurine use and production. Quirigua's unique figurine and ceramic style (detailed modeling with monochrome paint) displays its independent nature that rejected influence from outside areas. Their distribution across the site, which opposes the tightly controlled distribution seen at Copan, contrasts the way that the community of Quirigua influenced their political system/leaders with those of the larger site. Given the religious nature of figurines, it also hints at ritual and festival activities happening at the site.

Chapter 5: Collection Analysis Results

Five primary attributes were analyzed to better understand the collection: source of material, manufacturing technique, function, iconography, and decoration. Most of these attributes were studied macroscopically (manufacturing technique, function, and iconography), but a combination of microscopic and macroscopic analysis was used to identify traces of decorative paint and geochemical analysis (NAA) was used to identify the possible geographic sources of the figurines. A full inventory of the entire collection can be found in the appendices (Appendix A), with an individual analysis of each figurine on its own, including more detailed discussions on possible meanings, uses, and interpretations (*Table 2*).

History of the Collection

This study centers around a collection of figurines housed in the M.A.R.I. collections, originally donated by Mr. and Mrs. Floyd Avery of the United Fruit Company in 1940. The collection is made up of 38 figurines and figurine fragments all from Quirigua, although more specific site provenience was not provided when the collection was donated; it is most likely that they came from the plantation area and drainage ditches the UFC dug in the 1930s (Ashmore 2007). One of the figurines, as previously stated, has been determined to be a modern fake and, therefore, will not be included in any further analysis, bringing the total to 37 figurines.

Table 5.1: Figurine collection inventory overview

Appendix Number	Artifact Number	ANID Number	Manufacturing Technique	Function	Subject	Decoration	Source
A.1	G_02_002 31-2276	QRG015	Moldmade	Ocarina	Ruler	None	Local (A2)
A.2	G_02_002 31-2280	QRG021	Moldmade	Unknown Hollow	Ruler	None	Local (A1)
A.3	G_02_002 31-2272	QRG012	Moldmade	Unknown Solid	Ruler	Blue Paint	Local (A1)
A.4	G_02_002 31-2277	QRG019	Moldmade	Unknown Hollow	Ruler	Blue Paint	Local (A)
A.5	G_02_002 31-2275	QRG025	Hand-modelled	Ocarina	Ruler	Blue Paint	Local (B)
A.6	G_02_002 31-2297	QRG006	Moldmade	Unknown Hollow	Elite (N/A)	Blue Paint	Local (B)
A.7	G_02_002 31-2279	QRG028	Hand-Modelled	Unknown Solid	Elite (Masc.)	None	Local (A2)
A.8	G_02_002 31-2298	QRG033	and Crudely Hanc	Ocarina	Elite (Masc.)	None	Local (Unassigned)
A.9	G_02_002 31-2311	QRG020	Moldmade	Ocarina	Performer (Masc.)	Blue Paint	Local (A2)
A.10	G_02_002 31-2342	QRG001	Moldmade	Unknown Solid	Elite (Masc.)	None	Non-local (Veracruz)
A.11	G_02_002 31-2319	QRG018	Moldmade	Unknown Hollow	Performer (Fem.)	None	Local (B)
A.12	G_02_002 40-3649	QRG037	Hand-modelled	Unknown Applique	Elite (Fem.)	None	Local (A2)
A.13	G_02_002 31-2302	QRG026	Moldmade	Ocarina	Performer (Fem.)	None	Local (B)
A.14	G_02_002 31-2307	QRG038	Moldmade	Ocarina	Elite (Fem.)	Blue Paint	Local (A)
A.15	G_02_002 31-2303	QRG010	Moldmade	Ocarina	Elite (Fem.)	None	Local (A1)
A.16	G_02_002 31-2339	QRG035	Moldmade	Unknown Hollow	Unknown Person	None	Local (A)
A.17	G_02_002 35-7795	QRG002	Hand-modelled	Censer	Unknown Person	None	Non-local (Veracruz)
A.18	G_02_002 31-2333	QRG024	Hand-modelled	Unknown Solid	Unknown Person	None	Non-local (Honduras)
A.19	G_02_002 31-2270	QRG036	Hand-modelled	Ocarina	Unknown Person	None	Local (A)
A.20	G_02_002 31-2281	QRG034	Moldmade	Ocarina	Bird	None	Local (Unassigned)
A.21	G_02_002 31-2320	QRG027	Moldmade	Ocarina	Bird	None	Local (A1)
A.22	G_02_002 31-2305	QRG031	Moldmade	Ocarina	Bird	None	Local (A1)
A.23	G_02_002 31-2330	QRG029	Moldmade	Ocarina	Bird	None	Local (C)
A.24	G_02_002 31-2331	QRG005	Hand-modelled	Censer	Bird	None	Local (Unassigned)
A.25	G_02_002 31-2332	QRG011	Hand-modelled	Censer	Bird	None	Local (A1)
A.26	G_02_002 40-3650	QRG016	Hand-modelled	Unknown Applique	Bird	None	Local (A2)
A.27	G_02_002 31-2315	QRG004	Moldmade	Rattle	Bird	None	Local (A2)
A.28	G_02_002 31-2322	QRG009	Moldmade	Ocarina	Monkey	White Paint	Local (A1)
A.29	G_02_002 31-2314	QRG022	Moldmade	Ocarina	Monkey	None	Local (A)
A.30	G_02_002 31-2310	QRG030	Hand-modelled	Unknown Hollow	Dog	None	Local (C)
A.31	G_02_002 31-2274	QRG007	Moldmade	Unknown Hollow	Jaguar	Blue Paint	Local (A1)
A.32	G_02_002 31-2341	QRG013	Moldmade	Ocarina	Turtle	None	Local (C)
A.33	G_02_002 31-2312	QRG003	Hand-modelled	Censer	Dwarf	Red Paint	Local (A1)
A.34	G_02_002 31-2278	QRG023	Hand-modelled	Unknown Hollow	Dwarf	Blue Paint	Local (A1)
A.35	G_02_002 31-2273	QRG017	Hand-modelled	Censer	Deity	None	Local (A)
A.36	G_02_002 31-2326	QRG008	Hand-modelled	Censer	Grotesque	White Paint	Local (A2)
A.37	G_02_002 31-2317	QRG032	Hand-modelled	Censer	None	None	Non-local (Basin of Mexico)

Analysis Results

A number of different methods can be used to analyze figurine collections. The best analyses generally come from the application of as many of these methodologies as possible - especially when it comes to smaller and/or unprovenienced collections - although time, money, and the destructive nature of the analysis all have to be taken into consideration before moving forward. For this study, the collection of figurines were sourced using neutron activation analysis (NAA) performed with the help of the University of Missouri research reactor (MURR). Further macroscopic analysis was used to determine different diagnostic features for the identification of manufacturing

techniques, figurine function, iconography, and decoration. Combining all of these methods paints a clearer picture of where each one was made, how they were created, what they were used for, and how they might have been understood by the people interacting with them.

Source Results

NAA measures the elemental concentrations of an entire sample (in this case, a ceramic sample) which can be used to determine the geographic origins of the artifact when compared to other known elemental concentrations in a given area. Determining the geographical source of the clays and tempers used in figurine production - assuming they were produced in the same general area the materials were acquired - can inform us of each figurine's place of origin. A significantly more detailed explanation of the methods and results of this analysis can be found in the lab's written report (Goodwin et al. 2022), which is also provided here in the appendix (Appendix B).

Samples are taken following the MURR standard for drilling with a diamond-point or similar bit. All material and surfaces are sterilized after each use and approximately 150 mg of powder per sample are collected from each sample. At the lab, each sample is divided in two and tested separately for different irradiation lengths in order to get measurements for 33 different elements (aluminum (Al), barium (Ba), calcium (Ca), dysprosium (Dy), potassium (k), manganese (Mn), sodium (Na), titanium (Ti), vanadium (V), arsenic (As), lanthanum (La), lutetium (Lu), neodymium (Nd), samarium (Sm), uranium (U), ytterbium (Yb), cerium (Ce), cobalt (Co), chromium (Cr), cesium (Cs), europium (Eu), iron (Fe), hafnium (Hf), nickel (Ni), rubidium (Rb), antimony (Sb), scandium (Sc), strontium (Sr), tantalum (Ta), terbium (Tb), thorium (Th),

zinc (Zn), and zirconium (Zr)). When the samples are placed in the nuclear reactor, the neutrons from the irradiated elements' nuclei release gamma rays that are then measured. The specific half-life of the radioactive isotopes allows analysts to determine the type of atoms present within the sample and the rate at which the gamma rays are emitted is determined by the amount of atoms/concentration of the various elements (Glascock 1998; Minc and Sterba 2016).

For this study, the MURR labs provided the NAA results and, with assistance from Whitney Goodwin, the data was analyzed, groups were created using quantitative analysis, and the figurines' sources were determined (see Appendix B for more detailed explanations: Goodwin et al. 2022). The data from each sample were placed in multivariate space by comparing the first six principal components (PCs) as well as PCs for each individual element to determine clustering (Appendices D and E). The use of principal component analysis (PCA) was especially important in the case of this collection due to the small sample size. After comparing a number of PCAs, seven repeating clusters were identified via visual analysis and confirmed using mahalanobis group memberships. The groups were labeled as Groups A, A1, A2, B, C, unassigned, and outliers (*Table 3*). These groups were also verified using mahalanobis distance (Appendix H) and then compared to the extensive MURR ceramic database using euclidean distances to determine their geographic origins.

Table 5.2: NAA group distributions

Local						**Foreign/Outliers**			**Total**
Group A	Group A1	Group A2	Group B	Group C	Unassigned	Basin of Mexico	Veracruz	Honduras	
5	10	7	4	4	4	1	2	1	38
13.16%	26.32%	18.42%	10.53%	10.53%	10.53%	2.63%	5.26%	2.63%	100.00%

Groups A, A1, and A2 grouped closely to one another, often overlapping in multivariate space. They have been differentiated as three separate groups, however,

because of slight but noticeable deviations in most of their elemental compositions, especially amongst the rare earth elements, that takes the form of a spectrum (Appendix I.1). Group A has the highest relative abundances of these elements, A1 the lowest, and A2 hovers in between. Group A1, however, is more enriched in uranium, thorium, and tantalum (followed by Group A2, then Group A). The euclidean distances for all the samples in these three groups (Appendices K.1, K.2, and K.3) matched significantly closer to one another and other samples in this collection rather than any of the numerous foreign samples. This pattern suggests that these samples were locally produced.

Groups B and C form their own, much more distinctive clusters in multivariate space in comparison to the three A groups. Both groups are depleted in several elements - most notably chromium, cobalt, and rare earth elements - compared to the rest of the collection, but they both have high levels of tantalum, cesium, and aluminum (Appendix I.2). Group C deviated further from the rest of the collection (almost never overlapping with the other samples) with a further depletion in cerium and vanadium. Groups B and C also match significantly closer to materials from this collection before foreign materials, indicating that, while different, they were also locally produced (Appendices K.4 and K.5).

The samples labeled as unassigned did not fit well into any of the other groups noted here (Appendix K.6), but they did remain close to the other local samples in multivariate space and did not match significantly with foreign samples from the database, indicating they were also locally produced. Their lack of group assignment might be due to the small sample size; it is possible that with more materials to compare to, they may have matched to other local groups not represented in this collection. The

unassigned samples did greatly vary between one another. One of the samples - QRG014 - was unique given higher levels of a number of elements, especially zinc, while calcium levels were below detection level. Although it did match closest to Groups A1 and B, these matches were too distant to be significant. When visually examined, this figurine's style is likely a modern replica, which this distinctive chemical signature supports. Its connection to local materials suggests it was produced in the vicinity of Quirigua and was likely sold to the collector while at the site.

The outliers in this collection are the only figurines that appear to have been imported to the site. None of the four samples matched to other samples from the collection and when placed in multivariate space with foreign samples from the MURR database, they all grouped with different foreign sites (Appendix J). QRG024 matched consistently with samples from the Ulua valley in Honduras, particularly the sites of Las Canoas and Travesía, even if those matches are not as close as they could be. QRG032 consistently matched to samples from the Basin of Mexico (Appendix K.7). In multivariate space, it falls in the same group with samples made in the Teotihuacan periphery region (as opposed to within the site itself).

Two of the outlier samples - QRG001 and QRG002 - show some signs of contamination with high levels of chromium, cobalt, and vanadium. These samples were analyzed with and without these problematic elements. QRG001, before the removal of elements, primarily matched to samples from the Tuxtla Mountains and Catemaco Valley (the sites of Teotepec and La Joya), but the matches were very distant. After the potential contaminants were removed, it matched to sites in Northern Veracruz - particularly the site of Pavon - and those matches were much closer. In multivariate space, QRG001 plots

close to QRG024 (from northern Honduras) (*Fig. 10*), but the style and course temper do not match figurines from this region, so this pattern appeared not significant. QRG002 matched somewhat closely to sites in southern Veracruz (San Lorenzo) and the Tuxtla Mountains (La Joya), Oaxaca (Etlatongo), and the Teotihuacan Valley (Altica) both before and after the problematic elements were removed. In multivariate space, QRG002 plots closely to figurines from Oaxaca. Despite its specific characterization of either figurine, they likely originate from outside of the Maya region: QRG001 from the Veracruz region and QRG002 from the highlands of southern Mexico.

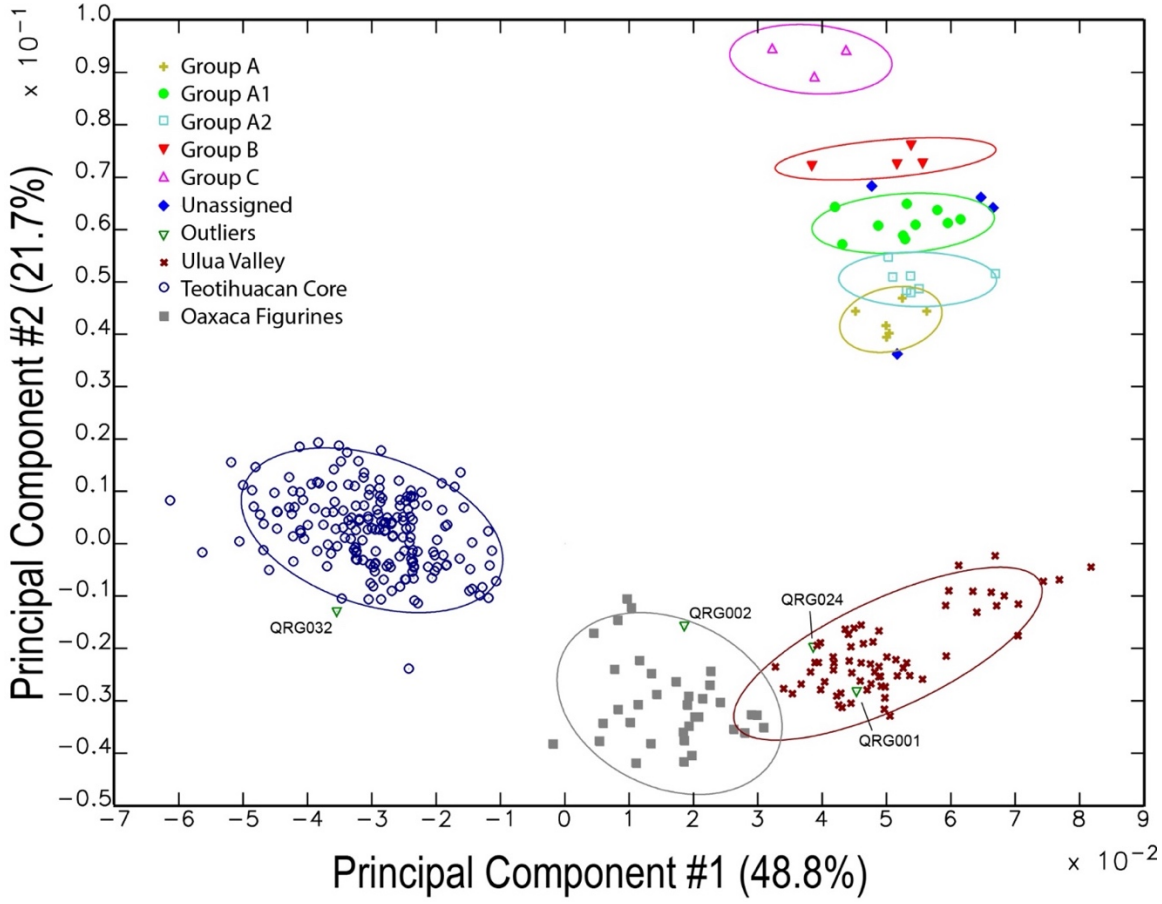


Figure 5.1: NAA comparative cluster analysis with Honduran, Basin of Mexico, and Oaxaca samples. Principal components calculated for comparative materials and current groups and unassigned specimens. Ellipses represent 90% confidence interval of group membership.

A great majority of this collection was locally made with only a few being imports from non-Maya sites. Groups A, A1, and A2 likely come from a similar series of ceramic production techniques, such as similar clay courses or same/similar temper choices, suggesting that this particular ceramic tradition derived from potters in the same kin or social groups. Groups B and C, and the unassigned group show a number of distinct production traditions, likely pointing to at least some of their sources being from the wider periphery areas. While not much else is known about figurine production practices at Quirigua (Ashmore 2007), the results of this study suggests that figurine production at Quirigua, while still a specialized craft, might not have been an entirely *centralized* one. So many different chemical groups, some of which are vastly different from one another, suggests that figurine makers were independent from one another. Stylistic elements of the locally produced figures are similar and do follow more Maya styles, but that may be more indicative of the wider cultural and religious attributes of Mesoamerica. The similarities within the collection point to a shared stylistic culture - which may have been highly influenced by the elite art styles displayed in monumental forms - but are not the result of centralized production under the strict control of elite producers. Rather, production seems to have been available to anyone who could access the knowledge and materials to produce them.

When considering the nature of the imported figurines a clear and interesting pattern emerges. None of these samples came from within the Maya region; in fact, most of them (n=3) came from a significant distance away. Quirigua does, however, have a history of interaction with all of the geographic regions illustrated in these outlier figurines. Its participation in the periphery or Honduran interaction sphere has already

been discussed, but it is worth noting that the site of Travesía does have a history of trading and interacting with Maya sites to the north somewhat regularly and Travesían figurines have been found in Copan (Hendon et al. 2014). Moving into the Basin of Mexico, Teotihuacan was considered by *several* Maya and non-Maya sites to be a powerful political entity and elites would often use Teotihuacano imagery as a display of power and prestige, a practice especially utilized at Copan (Looper 2003). Teotihuacan, during the Classic period, was also a trade giant, so material from the site making its way along its own system of trade routes is not overly surprising. Similarly, the southeast periphery has shown evidence of being connected by this same trade route to the Olmec region during the Preclassic period (Henderson and Hudson 2012), a connection that clearly continued on into the Late Classic based on QRG001 and QRG002 being from around the Veracruz and Oaxaca regions respectively. The upper Motagua valley itself was connected to most of Mesoamerica from the Preclassic period because of its status as a valuable jade source.

Manufacturing Technique Results

Most figurines were moldmade (n=20), although this was not significantly more than the hand modeled specimen (n=16). One figurine (n=1) was moldmade with significant (crudely) hand modeled details. While some of the moldmade figurines did include some hand modeled elements, this figurine (QRG033; Appendix A.8) stood out enough to differentiate it from the others.

Function Results

Of the music makers, almost all are ocarinas (n=15), however there is one rattle present. The majority of this collection with a determinable function is made up of music

makers (n=16) followed by censer fragments (n=7). Of the undeterminable fragments, hollow figurines make up the majority (n=9) followed by solid (n=4) and appliqued (n=2) figurines (*Table 4*). Many of the unknown hollow figurines are likely to have been whistles, they simply don't have any clear diagnostic features. At least one hollow figurine appears to have been a detachable piece of a larger ensemble (QRG030; Appendix A.30), likely a hat.

Table 5.3: Different functions within the collection

Music Maker		**Censer**	**Undeterminable**			**Total**
Ocarina	Rattle		Hollow	Solid	Appliqued	
15	1	7	8	4	2	37
40.54%	2.70%	18.92%	21.62%	10.81%	5.41%	100.00%

Iconography Results

Because of the well-preserved nature of this collection, the vast majority of figurines can be placed in recognizable iconographic categories in order to determine intended subject portrayals (*Table 5*).

Table 5.4: Iconography of the collection

Human							**Undeterminable**
Ruler	Elite			Performer		Unknown	Handle
	Masculine	Feminine	N/A	Masculine	Feminine		
5	3	3	1	1	2	4	1
Animal					**Supernatural**		
Bird	Monkey	Dog	Jaguar	Turtle	Dwarf	Deity	Grotesque
8	2	1	1	1	2	1	1

The different subjects present are animals (n=13), humans (n=19), supernaturals (n=4), or undeterminable (n=1). The different animals depicted are further classified as birds (n=8), monkeys (n=2), a dog, a jaguar, and a turtle. The different human figures display characteristics that identify them as rulers (n=5), elites (n=7: 3 masculine, 3 feminine, and 1 without a clear gender expression), performers (n=3: 1 masculine and 2 feminine

gender expressions), and unknown status (n=4: all without a clear gender expression). Of the different supernaturals, the collection contains dwarves (n=2), a deity, and a grotesque. One figurine, while containing some detailing, doesn't display any recognizable designs.

Decoration Results

Besides their molded or modeled designs, most of the figurines in this collection do not display any other visible traces of decoration (n=26), although this does not mean that they were not once painted and the pigments had simply been eroded away over time. Of the figurines that do contain visible traces of pigments (n=11), some have traces of white paint/wash (n=2) or blue paint (n=8). One figurine (QRG003, Appendix A.33) shows traces of red paint. Any figurine with pigment in this collection only showed one color which does not appear to be localized, rather painted across the entire figure.

Chapter 6: Discussion

Studying figurines does more than simply provide a database of attributes and frequencies for these artifacts. When understood within the wider contexts of political, historical, and cultural influences, the roles and impacts that figurines have on multiple aspects of a community are made visible. Because of how they interact with so many systems and connect people and things despite so many differences, figurines are representative of nearly all parts of a community. Through them we can see how society was structured; understanding gender dynamics and how people conceptualized themselves within the larger world around them. Ideology becomes materialized in their uses and imagery, highlighting the central role of ritual in society as well as the importance of themes such as warfare, death, sacrifice, and the ever-present cycle of rebirth and renewal. Ultimately, all of these concepts come together to weave the tapestry of community. Figurines exist on multiple levels, operating within the household and interacting with individuals on a small-scale while also being influenced by large-scale political systems. Particularly salient, however, is how figurines mediated these different levels within the community, connecting them via threads that are typically difficult to see and embodying the push-and-pull nature of the state and household interactions.

Structuring Society

Dynamics of Gender

While the finer points of gender dynamics are difficult to accurately discuss under the most ideal of circumstances, the subject is still worth commenting on in relation to this collection. There were several depictions of humanoid feminine figures/women (~26.3%) and a similar percentage of feminine associated figurines (~29.7%). These

numbers, however, are still less than the number of masculine individuals/men (~47.4%) and masculine associated figures (~35.1%). Even within the small sample size, the general pattern noted by Halperin (2014b), that Classic Period figurines consisted of more masculine figures than feminine ones, seems to hold.

Despite the differences in numbers, it is worth noting that there are several allusions to feminine figures tied to positions of power. The most notable being QRG004 (Appendix A.27), a rattle depicting a vulture - a symbol analogous to rulers and rulership - wearing the necklace and earrings typically seen worn by feminine figures. QRG038 (Appendix A.14) also shows a clearly elite feminine individual standing and holding a bundle in their arms. Kneeling is typically a signal of subordination or a lowering of oneself to elevate another person. That this figure is standing and not kneeling at least suggests that they could be in a position of authority.

It should be noted that some of the gender expression assignments made here were done based on common assumptions about gender and must therefore by assumed to be preliminary observations that will require further revision. For this purpose, the method adopted here follows less presumptive conventions, flawed though they may be. In all cases of gender discussed, it is also important to note that these are only *expressions* of gender, rather than an assignment of personal identity. Figurines, particularly in the case of Maya figurines, show types of beings, not actual people, so the application of more than a description of their thematic elements would be highly speculative for such a context.

Placing Quirigua in the Wider World

One of the most interesting and unique aspects of Quirigua is the way it organized its interaction sphere. It is easy to just consider it as a site under the Copan hegemony, a Maya outlet and nothing more than that, but there is so much more running as an undercurrent which we can see in this collection. Despite being populated primarily by a non-Maya ethnic group, Quirigua was still participating with the Maya cultural sphere, albeit more loosely than other sites. The imagery found in this collection follows the Classic Period Maya stylistic conventions. Costuming worn by people match closely to costumes seen in other Maya figurines, stelae, and paintings. The animals and supernatural figures generally tie directly to stories and ideological images typical of the cultural area. The imported figurines are some of the most stylistically divergent from the collection, reflecting the different conventions from their areas of origin. Many of the religious images/elements can, however, be seen repeating, in one form or another, across the different Mesoamerican cultures. The reliance on pan-Mesoamerican motifs may have been intended to easily translate the different (albeit similar) set of cultural conventions of the periphery region to a more Maya-based elite structure. The addition to and maintenance of Quirigua in the Maya cultural sphere may have been more reliant, then, on the shared religious elements seen in the figurines and other visual media, despite their different methods for expression and style.

That being said, all of the imports from the collection are interestingly not from Maya sites. In fact, they all come from places well outside of the Yucatan. The closest this collection gets to a direct connection to a ‘Maya’ site is the possible allusion to Copan in the bat headdress of QRG019 (Appendix A.4). Most of the foreign connections

are geared towards central Mexico. QRG032 (Appendix A.37) was imported from the Teotihuacan region and is an incensario fragment of a style (ladle censer) particular to the Basin of Mexico. Similarly, QRG021 (Appendix A.2) shows a t-shaped headdress that originates from Teotihuacan and central Mexico (rulers at Copan also wore the headdress, likely as a way to reference power from the Basin). Two other imported figurines - QRG001 (Appendix A.10) and QRG002 (Appendix A.17) - likely come from the Veracruz region, although QRG002 could also possibly be from Oaxaca. Both the Veracruz and Oaxaca region were part of the Teotihuacan trade network (Marcello Canuto personal communication 2023). Figurines picked up from those regions might have very well made their way to Quirigua as merchants moved throughout the region. Outside of Mexico, QRG024 (Appendix A.18) is originally from Honduras, around the Ulua valley, and is a figurine style particular to that region. The more decentralized production of figurines at Quirigua is also more reminiscent of Honduran figurine production practices, where the highly decentralized household production resulted in a different NAA group present for each household (Halperin et al. 2009).

Quirigua maintained a great deal of cultural autonomy despite its connections to the Maya and non-Maya worlds. While they clearly had access to goods from as far north as the Basin of Mexico and Veracruz and to the south in Honduras, the site still preferred to produce their own figurines, with 33 of the 37 figurines having been locally produced. Even when considering style, Quirigua still maintained their own unique take on the Maya style, with their deep modeling and monochrome painting. Few if any examples of Quirigua figurines have been found outside of the general site periphery as well. With little to no evidence of exportation, almost all the figurine production happening at the

site, then, was likely intended to remain in the Quirigua sphere. This appears to be a deliberate choice to maintain a degree of self-isolation and remain self-sufficient. It suggests a community that emphasized independence and detachment from outside influence, even if the ruling class continued to use Maya cultural cues as the backbone of their power. Even that, however, could speak more towards the extent of the pan-Mesoamerican ideological system.

Materializing Ideology

Classic Maya ideology is usually interpreted by archaeologists through monumental architecture and art, hieroglyphic texts, murals, and polychrome ceramics in conjunction with the few Postclassic writings to survive today (ethnohistoric texts) and ethnographic studies. While the larger contemporary sources do act as vital lines of evidence for understanding the ideologies from this time, they heavily bias the elite perspective. Figurines, on the other hand, can provide insight to the community's ideology on a far broader level. The proliferation of figurines across the cultural and physical landscape of Quirigua means that the images and ideas they embody are, in many ways, reflecting the worldviews and ideologies of the community as a whole.

The Centrality of Ritual

Large scale and public ritual clearly played a vital role in the creation and maintenance of identity, community, and structure at Quirigua, given the number of figurines depicting important actors in these events. Several rulers were depicted in clearly ceremonial garb, wearing elaborate god-masks and headdresses - QRG021 (Appendix A.2), QRG019 (Appendix A.4), and QRG025 (Appendix A.5) - or dressed in elaborate ballplayer gear - QRG015 (Appendix A.1) - ready to participate in the public

(or semi-public) reenactment of important mythological and/or historical events. Other figurines depict musicians/performers as seen in some painting of these large state-sponsored ceremonies - QRG020 (Appendix A.9), QRG018 (Appendix A.11), and QRG026 (Appendix A.13) - and at least one depicts a ritual specialist, likely a priest but also possibly a shaman - QRG033 (Appendix A.8). Other figurines depict mythological figures often shown as part of religious festivals, either impersonated by actors (as is the case of the clown/trickster character of the spider monkey seen on QRG009 (Appendix A.28)) or as actual individuals, like the two dwarf figurines of QRG003 (Appendix A.33) and QRG023 (Appendix A.34). Of course, as already noted, the number of incensarios (n=7) and music makers (n=14) in this collection are also easily interpretable as being active participants in ritual activities, including those sponsored by the state.

Clearly, these ceremonies/events were an important aspect of life at Quirigua. For the Quirigua elites, the use of large and publicly inclusive ritual events was an essential part of how they maintained their power and justified their positions. Rulers, to motivate the public into participating in labor projects or to obtain and control access to valuable materials, had to appease and placate the wider public, a population that they were dependent on. The population's small size and limited scope of influence limited the rulers' access to such needs even further, so they had to put in different efforts to achieve their desired levels of grandeur than rulers at larger and more powerful sites.

A cornerstone of Maya theology is the importance of maintaining cosmic order through shamanic ritual and the appeasement of otherworldly beings (whether that be spirits, ancestors, and/or deities, etc.). Different rituals of different scales were necessary to maintain this balance. The ruler and elite class based themselves and their positions -

either directly or indirectly - to their roles of maintaining the cosmos on a larger scale, so their continuation of public ritual would, therefore, be necessary, not just in their eyes but in the eyes of the surrounding public. The royal elite's persona is one that is built on performance; they must embody their position, particularly when being viewed by the public, and that embodiment is typically credited to portraiture, especially stelae (Looper 2003). Figurines, however, also embody these actors and events in their imagery and often by being part of the state-sponsored events. They also come with the additional bonus of being *significantly* more accessible than monumental portraiture. Memories of ritual events can, therefore, be embodied in figurines which can then be brought outside of the site core and into a person's house, where they continue to enforce the memories of ritual events sponsored by the ruling and elite class.

Warfare, Death, and Sacrifice

Warfare and sacrifice are also important themes in Quirigua's art, writings, and history, as well as the figurines being studied here. Many of the motifs and figures within the collection are linked to warfare and sacrifice, whether directly or indirectly. While most figurines are not as obvious to us as allusions of warfare as that of QRG025 (Appendix A.5) depicting a warrior in full armor or QRG003 (Appendix A.33) depicting a dwarf impersonating a warrior, many others have direct associations with the concepts. The Feathered Serpent of QRG021 (Appendix A.2) is often considered to be a deity associated with war and sacrifice across Mesoamerica, as is the Jaguar God of the Underworld (QRG017; Appendix A.35). Some animals are also often thought to be embodiments of warfare and sacrifice, especially the jaguar (QRG007; Appendix A.31) and the owl (QRG029; Appendix A.23). The turtle shell of QRG013 (Appendix A.32)

may have also been meant to represent a type of shield often used by Maya warriors. The ballgame (and subsequently the players of the game (QRG015; Appendix A.1)) is often thought to be a reenactment of war and the story of the Hero Twins and their famous ballgame against the Lords of Xibalba (the Maya underworld), which involved multiple instances of human sacrifice. Real world sacrifices are often meant to emulate this major event tied to the creation of the mankind.

Warfare and sacrifice often overlap or are dually associated with the larger concept of death and Xibalba. Many of these figurines (the ballplayer, the owl, and the jaguar) can be interpreted in both contexts. In the case of the ballplayer, this cross-association stems from the prevalence of all themes in its one major story - the Hero Twins' trip to and from Xibalba - but the owl and jaguar are frequent characters in a number of other myths and stories, making their capability for meaning somewhat fluid and dependent on context. Other figurines in this collection are more directly/prevalently associated with the concept of death. The dog portrayed by QRG030 (Appendix A.30) is often shown as a spirit guide that helps transport the dead to the underworld. Similarly, bats, like the one portrayed on the headdress of QRG019 (Appendix A.4), are creatures of Xibalba, both noted in stories of the realm and associated with caves (entrances to Xibalba) and the dark/night. The depiction of the Jaguar God of the Underworld in QRG017 (Appendix A.35) is associated with the underworld as the name suggests: it is the form of a larger collection of Jaguar deities that takes shape when the Jaguar/sun deity dies and enters Xibalba during the night before it is reborn in the morning. Less obvious but nonetheless still potent is the % sign on the huipil of QRG010 (Appendix A.15), which is always meant to allude to death, Xibalba, the night, and everything else

diagnostic of these themes (Schele and Miller 1986; Marc Zender personal communication 2022).

Allusions to death, war, and sacrifice are not uncommon at Maya sites, but are particularly prominent in the artistic program of Quirigua. K'ak' Tiliw used martial power and imagery to depict such themes throughout his reign, but especially after the decapitation of Waxaklajun Ub'ah K'awil. The war with and sacrifice/death of the Copan ruler became a very meaningful event in K'ak' Tiliw's reign and in his justification of power. The presence of these particular motifs, then, becomes even more meaningful. Serving both as a way to highlight the importance of these themes in Maya cosmology and as a possible way to religiously justify violent actions taken by rulers, the continuation of these themes into the houses and lives of the population in many ways helped to illustrate how the elite of Quirigua may have wanted themselves to be thought of and, possibly, what concepts were powerful enough to justify their right to rule to the wider community.

Creation and Renewal

The last ideological theme that has a prominent role in this collection is the concept of creation and renewal. In Maya ideology, renewal goes hand in hand with death and sacrifice, it is what makes those two concepts truly meaningful. Hence why all the figurines that represent renewal were also already mentioned in some capacity above. The creation of the universe started with the Maker, Modeler, often conceptualized as the Feathered Serpent (QRG021) and involved the placement of the three stones/thrones of creation, one of which was the jaguar (QRG007). The creation of human beings starts with the decent of the Hero Twins into Xibalba to play their deadly game (QRG015). By

winning the ballgame against the Xibalbans, the twins were able to resurrect their father who was reborn as the Maize God. All iterations of the rebirth of the Maize have them being born from a creature representing the earth. That creature is often depicted as a turtle, with the deity rising from a crack in its shell (QRG013). Just like the Maize God is reborn as a part of the cycle of life, so, too, is the Sun God killed and reborn. The Jaguar God of the Underworld (QRG017) is an essential form of this process; without this transitional period the sun can't rise again the next day and give life to the earth below.

The very act of creating figurines, something which is suggested to have been available to multiple workshops instead of a very select few, might have been a powerful act of creation as well. As recorded in the *Popol Vuh*, one of the Maker, Modeler's first attempts at creating humans was by using mud or clay. Ultimately, the earth didn't have enough life in it and was too fragile, melting when touched by water (Tedlock 1996; Schlesinger 2001), but it was the beginning of creating life. Perhaps figurines are such ideal tools for interacting with spirits because they mimic this first, very basic form of life, providing a temporary house for the spirits to reside until the ritual has ended and the figurine is (possibly) broken. A similar idea occurs in the wooden deity effigies recorded at sites (including Quirigua). Wood, just like clay, was another material the Maker, Modeler tried to create humans out of. The wooden vessels were much closer to humans but were still not perfect and, so, they were destroyed (except for those that became monkeys) (Tedlock 1996). Wood is another material thought to be alive and statues made out of it were used to hold the spirits of deities they depicted.

Mesoamerican belief systems see the world in terms of cycles; there is no real end, just the beginning of something different. Creating/renewing something is the whole

point of maintaining balance and performing most of the larger ceremonies. Most of the events are meant to mark transitional periods of time - period ending events - when one cycle ends and a new one begins. Even small-scale ritual activities and events would have been meant to keep the process of renewal going. By participating in these events or performing the rituals meant to maintain the cycle of death and renewal - or by creating figurines (to then later be used in these rituals) - individuals were taking an active role in the maintenance of their universe that goes beyond simply existing as a part of that universe. At a site that regularly had to contend with the annual flooding of the Motagua river, which was both necessary for maintaining the fertility of the soils but also highly destructive, emphasizing the cycle of death and rebirth might have been something very personal and vital to the residents of the river valley.

Creating Community

Figurines in the Household

Most of the religious ceremonies and rituals that would have been conducted would have occurred at the smaller, household level involving primarily the family units within a shared house (Sharer and Traxler 2006). Because of their small size and portability, as well as the ease in which they could be replicated and replaced, figurines are ideal tools for these localized events/rituals. Modern Maya have both public and private shrines for venerating various spirits, saints, and/or entities. These shrines often center physical objects with anthropomorphic traits where the being lives that allows them to communicate (Tedlock 1993). These modern practices easily translate to ancient household shrines housing (possibly) figurines meant to facilitate communication with the spirits and other worlds. Maya religion has roots in the practice of ancestor worship,

spiritual practices that function on a very local and intimate level. The religion's later development into divine rulership did not erase the importance of small-scale household practices, and access to the spirits and the cosmos at large remained open (at least to some extent) to all people. The small, household rituals involving figurines allowed non-specialists and non-elites to participate with their religion, to have a part and to have a say in the way the spirits were being mitigated with on their behalf. It allowed individuals to have space and agency. Elite and commoner households alike all had to function within the same cosmos, they all had to play their roles and maintain the order by conducting rituals, many of which involved figurines within the household.

Outside of their obvious roles within ritual activity, figurines also serve another, vital function within the household: their role as integrators. Within a family unit, they integrated the different members together into a close-knit group. Differences in responsibilities - whether that be based on age, gender, relation, job, etc. - were all meant to function as different and equally important cogs within the greater household system. Larger scale ceremonies may not have allowed direct participation of all members of the group, particularly in the case of age, but household ritual could at least be easily witnessed by children, if they didn't have their own rituals. The presence of especially small and/or crudely made figurines suggests the participation of children alongside adults within these small-scale ritual activities. The inclusion of all members within ritual spaces and activities at this more intimate level ensured that the differences between members remained as a tool for integration and not for separation. The different roles and abilities of people who varied in age, kin-relation, gender, sex, etc. ultimately came

together to fulfill different needs. Difference, therefore, does not necessarily have to mean separation.

Figurines and the Political System

By restricting access to certain images - deity images like the jaguar god of the underworld effigy incensario (Appendix A.35) - the ruling elite could establish a sense of divine separation; a division between the royalty who had access to such a powerful deity and everyone else. Especially when compared to other incensario fragments within the collection, the theological gap between the deity image and the image of, say, a bird is large enough to see the lines being drawn between groups of people, backed by religion, and solidified in these ceramics. The widespread access to images of rulers - especially rulers in the act of showcasing their primary claim to status - would act as a regular reminder of the different positions between a wider population and those 'in power'. That being said, at Quirigua displays of social differentiation were not as pronounced as sites like Copan, with less competitive displays of grandeur in the construction of buildings likely due to a greater difficulty in controlling access to labor and materials (Ashmore 2007). Figurines that further supported the institution of divine rulership and reinforced the power of rulers could have helped the elite to establish their authority without needing the flashy architecture of larger sites.

Whether it be through depictions of elite authorities, state religion, or state sponsored functions, figurines brought crucial aspects of state power into the homes of most of the population. Portraits and stelae cannot be moved and are not widely available to the public. Even when placed in such open settings as the stelae of Quirigua, only people who were in the plaza could view them; most people going about their day to day

lives were not guaranteed to come face to face with these pieces of royal embodiment. Figurines on the other hand, are portable and easily accessible. They could have been seen or handled by people if not every day, then at least more often than any monumental structure. The ways in which people respond emotionally to objects and/or events produce actions that can result in regular practices (Halperin 2014b). Those practices in turn impact the state and the various systems it relies on to function. It would therefore be beneficial for the state to interfere with and mediate the emotional responses taking place at the small scale, hence their emphasis and interactions with objects like figurines: small scale objects with large scale implications.

The Ties that Bind

Figurines were fluid actors within the community of Quirigua. Their portable nature and ability to be used in a wide variety of possible contexts, along with their accessibility, meant that they were present in nearly every aspect of life at the site. Lines that might otherwise separate different types of people could be crossed by figurines. In this way, figurines, by their very nature, were tools that bound the site together. It no longer becomes a question of household versus the state systems, but a question of how they all fit together.

The importance of the public ceremonies to the whole population, not just members of the ruling elite, is a notion worth further discussion. At Quirigua they were clearly prevalent parts of everyday life, between the actual events themselves, the availability and close proximity of the plaza spaces, and the wide distribution of ritual imagery throughout the valley via figurines. The ideological significance and importance of these events was not lost on the population of Quirigua, and the repetition of such

large events would have not only been demanded by their theology but likely by the people themselves. Such a demand would need to be taken seriously by those trying to maintain their positions of power.

Large group festivals would have benefited the larger community beyond just the ideological reasons, too. Quirigua was the only site of its size and monumentality in the Lower Motagua Valley, so it likely acted as a central place for the wider valley population to congregate at for major celebrations. The size of the plaza was large enough to hold more than just the immediate population (Inomata 2006) and the plaza's placement right along the river (at the time) would allow visitors to come to the site and have direct access to the ritual space. The aggregation of so many people who may not have had many interactions outside of such events in one space would have provided an ideal environment for establishing temporary markets. Goods of all kinds - including figurines meant to be used during the ceremonial events - could be exchanged and relationships formed in the festival market spaces that would ultimately become invaluable for the elite and non-elite populations alike. These large, state-held ceremonies provided a wide-spread community the space and opportunity to come together and forge social and economic links that could be maintained even over a distance with the consistent repetition of such events.

At Quirigua, the creation and integration of a wider community was vital for sustaining the site as a whole. As mentioned previously, its location right along the Motagua River meant the people living at Quirigua had to contend with regular flooding events. Ashmore (2007) posits that these floods likely caused damage to family homes and fields. Because of the site's small size, Ashmore theorizes that the family groups at

Quirigua had to develop an interconnected support system not typical of the Maya area (although how prevalent this practice was in the periphery region cannot be attested to at this time), where individuals with ties to one another - whether those ties be familial, economic, etc. - would provide each other with economic aid and labor to repair damaged property. This system of support resulted in a physical restructuring of space and the placement of structures, but it would have also required social and ritual activities to be altered in order to create and maintain a culture that facilitated such a community support system.

The development of a distinct social identity at Quirigua would have helped to create this integrated culture. The widespread distribution of figurines across the site, as opposed to the restrictive access seen at Copan, suggests, at least in part, this need for cooperation over competition. Wide access to figurines (and the abundant local production of them) would make it easy for every house to be able to maintain the amount of ritual activity required of them to maintain and appease spiritual beings so that the community could prevent the destruction of their houses and fields. Regular state ceremonies/rituals performed by the royal house would help intercede on the community's behalf to the much greater powers and deities that the average person didn't have access to. Celebrations held for the site and surrounding region, involving the abundant number of whistles and incensarios found, would have continued to reassure the populace of the state's efforts to protect the site and created the all-important sense of community, stretching from the ruler of Quirigua down to the most low-status individual.

Figurines were optimal tools for forming connections between the state and household levels. Art and its associated meanings are heavily dependent on the context in

which it is consumed (Halperin 2014b) and, as already discussed, figurines operated within both state and household contexts. By bringing objects and images with ties to the state and its systems into an individual's household, the two worlds, which are often studied separately or independently of one another, are tied together. To only pay attention to how the elite separated themselves from the population would be looking at only one side of the relationship. The likelihood that the culture of Quirigua tended towards community and reciprocity rather than overt stratification and separation meant the ruling elite had to find ways to connect themselves with the common population. It was only the elite who had to reaffirm their place in the community on a regular basis. While we might interpret the need to assert elite imagery via figurines inside the household as an attempt to make themselves separate, we could also easily see it as a way in which they sought to integrate their presence within those households.

Just as was the case with the integration of different groups at the household level, figurines might have integrated the more distant figures of the state with the wider population, reminding people that while they may serve a different purpose, they were still contributing to the maintenance of the whole community. By emphasizing imagery of ritual celebration, they were also reminding them of the events they held *for* the community, events which aided them economically, socially, and spiritually: events that were displays (or proof) of the elites performing their vital roles in keeping the cosmic balance and protecting the homes and lives of the people living there. The memories of these events and what they meant could be maintained, communicated, and taught to all members of a household, no matter how far away from the site core and the rulers they were. In this way, even as people separated, they were still always interconnected, woven

together in a vast web that stretched from all levels of society and to all types of people. In this way, the community of Quirigua was upheld.

Chapter 7: Conclusion

Communities are created, experienced, and shaped by and with the world that surrounds them. That world, simultaneously, is made up of objects that communities created, experienced, and shaped. Understanding one requires us to at least try and understand the other, which is an essential part of archaeology: to study people by studying the materials they leave behind. All materials, no matter their size or status as legacy collections, play an important role in helping to better understand the past. When collections like the one used in this study are overlooked because they do not come with an ideal set of circumstances, it denies us the chance to study a culture from all perspectives.

As fascinating as monumentality can be, monuments are inherently 'separate' objects; what provides them power and meaning is how they stand apart from the greater world around them. And this perspective can only get us so far when trying to understand *all* types of people. In order to understand a community, we, again, must study materials that represent that whole community. For the Maya and Mesoamerican regions, figurines can typically offer that connected viewpoint, as they were prevalent throughout households of every size and status, could be used and seen by all members of the family, and could be brought in and out of spaces and scenarios ranging from large and monumental state ceremonies to small, everyday household shrines. And while it is true that many figurine collections, including this one, come often without provenience, they still hold an inherent sense of value with them. Analysis can still be conducted and made meaningful for these materials by using a thorough and diverse series of analytical

methods and considering them all in context with each other and with the known history of the people who used and created them.

The importance of studying legacy collections, however, goes beyond simply the acknowledgement of what is possible. Archaeology is an inherently destructive process; once something is dug up it can't ever be put back in place again. Over the years, museum and institution collections around the world have been filled with boxes and shelves of materials, sometimes still in their artifact bags and sometimes just lost, which have yet to be studied. Past attitudes in archaeology considered the only viable and legitimate research to come in the form of fieldwork, which has continued to have ramifications within the discipline. It was my goal here, as a disabled archaeologist, to prove that this old view is not rooted in any truth, that collections, even as small as this one and with no provenience, can still say something worthwhile.

This collection offers an ideal case study for this very point. Quirigua is a site that has been studied enough and with enough of a written record that its history is one that is relatively knowable to us. That being said, it has not been studied in excess and there are still many parts of the culture and community of Quirigua that have yet to be explored in full. Its tendency towards self-isolation and relatively contained settlement timeline means that outside influence was easier to spot and note than if dealing with a larger and more involved site like Tikal. By using geochemical analysis (in the form of NAA) and visual analysis (determining manufacturing techniques, imagery and ideological associations, intended function, and presence of decoration) the figurines from this collection could be situated and understood in the wider cultural context of the community of Quirigua.

Several interconnected ideologies were at play in the lives of the people living at the site. Concepts of warfare, sacrifice, and death were paired with themes of creation and renewal, all within the clearly vital space of ritual; both on the larger, monumental scale held by the state and on the smaller, individual scale of the household. Societal structure like gender and external relations were also apparent, particularly Quirigua's tendency to turn inward and avoid interaction and dependency on outside sites. Its relation to the rest of the Maya world only going so far, with figurines mimicking Maya styles but still remaining unique and with no noted cased of importation or exportation evident with polities in the Yucatan. All of these factors – ideological, social, and economic - show a community building around itself. The need to create and maintain a degree of interconnectedness would have been essential for continuation in an environment that, due to regular flooding events, may have been threatened by instability. They found support with one another. The ruling class also seems to have relied on figurine and artistic persuasion as their method for maintaining their level of power and status. With Quirigua being smaller, ethnically diverse, and under foreign hegemony, the rulers found a way to assert their position but also prove themselves as a part of the larger whole. These figurines showcase an intricate part of the push and pull, of the separation and integration of all members of the community. The differences in an individual's status (whether it be via age, kin relations, sex or gender variations, hierarchical status, etc.) were illustrated by these figurines, but the religious and cultural practices that they were a part of transcended those divisions and showed how all of these different roles came together to serve the community. Gaps that were formed between people could be bridged through connections that were facilitated by these figurines.

Understanding how those connections were built and continued on is essential to our ability to understand the people of Quirigua as a wider culture. These connections help us understand them by showing us how they understood themselves. The small size of the site, just like the small size of these artifacts, does not mean that complex systems don't run under its surface. A closer look shows us a complex series of cultural, religious, political, and social systems working with and around each other to structure a community, where people separated and united themselves under different ideologies and practices. It is that community that situated itself in the wider world, navigating the different interaction spheres that operated around them. Understanding Quirigua means contextualizing it in all of these different interaction spheres, from the Basin of Mexico to the Yucatan all the way down to the Ulua valley. In many ways it also goes to painting a better picture of the complex ways that identity was formed in the southeastern periphery region; how multiple ethnic groups with different cultural practices related to, differentiated from, and worked alongside each other. Instead of thinking of Quirigua as part of the Maya monolith, these figurines show us ways to think of it on its own terms, as something more complex than the black and white cultural boundaries often drawn onto maps. If we can do that - if we can understand even the smallest thing from where it stands, in its own context rather than ours - then we can better know the larger universe that it lives within.

Appendices

Appendix A: Inventory

The collection inventory consists of entries for all the figurines in this collection, save for QRG014 (the modern fake). Each entry includes an image of the figurine, a summarized list of each of the figurines' traits (source, manufacturing technique, function, imagery, and decoration), and an in-depth analysis of any possible associations or meanings that may be associated with the traits and, therefore, the figurine. Each entry also names the figurine's ANID number (ex. QRG001), which was assigned by MURR during their analysis, and its artifact number (ex. G_02_002 31-2314), which was assigned by the M.A.R.I. collections.

Appendix A.1: QRG015 (G_02_002 31-2276)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Ruler (masculine, ballplayer)

Decoration: None visible

Source: Local (Group A2)

This figurine is a local moldmade ocarina with no paint. It depicts a masculine figure (as denoted by the loincloth) in elaborate attire emulating ballplayer paraphernalia within a ritual context. Ballplayers are figures heavily associated with public and political events, ritual sacrifice, and calendrical/cosmic renewal events (Ashmore 2007; Halperin 2014b; Sharer and Traxler 2006) and while the arm band ties, belt, and thigh padding are common attributes of recreational ballplayer attire, the rope necklace, large headdress, and possible cape/cloak are more indicative of royal costumes for ritual activities/events, given they would have been unfunctional and cumbersome for actual ballplaying. The

ritual act of the ballgame was intended to reenact the game played by the Hero Twins - Hunahpuh and Xblanque - as chronicled in the *Popul Vuh* and that is representative of warfare and agricultural renewal/the rebirth of the maize god (Looper 2003; Sharer and Traxler 2006). Since this reenactment was emulating god figures, this role was reserved solely for the ruler or another member of the royal family. Rulers often wore heavy belts in their costumes in order to emulate ballplayer yokes (Looper 2003). The belt also contains a twisted braid pattern that resembles the mat sign's personified form, a sign used to signify rulers (Schele and Miller 1986). The use of ball-player imagery here indicates that this figure is likely depicting a ruler reenacting the sacred ballgame. Interestingly, the figure has a larger body size, which could be meant to suggest physical weight or excessive padding. If it is indicative of a larger body mass, it may be intended as a form of satire for nonelite groups. However, various depictions of ballplayers appear to have a similar silhouette to this figurine (see Plate 96 and Plate 104, Schele and Miller 1986), so it seems likely that this is an actual depiction of a ballplayer and not a form of satire.

Appendix A.2: QRG021 (G_02_002 31-2280)

Manufacturing Technique: Moldmade

Function: Unknown Hollow

Subject: Ruler

Decoration: None

Source: Local (Group A1)

This is a local moldmade hollow figurine with an unknown function. Broken at the neck, this figurine fragment depicts a head decorated in an elaborate, T-shaped turban headdress with triple-stacked earplugs. The headdress is diagnostic of ruler headdresses found at Copan, while the T-shape is also associated with Teotihuacan and Central Mexico. Teotihuacan imagery was very important and complexly interwoven into Copan's material culture, which is likely how it was introduced to Quirigua. Aside from Quirigua and Copan, the only other site known for such headdress imagery is Nim Li Punit, a nearby site also under Copan's hegemony (Looper 2003).

Appendix A.3: QRG012 (G_02_002 31-2272)

Manufacturing Technique: Moldmade

Function: Unknown Solid

Subject: Ruler (Deity mask, Feathered Serpent)

Decoration: Blue Paint

Source: Local (Group A1)

This is a local moldmade solid figurine of unknown usage and traces of blue paint. It has been broken at the neck and depicts the face of a person wearing a large god-mask headdress and two earspools, marking this individual as a ruler. The mask, situated on top of the figure's head, depicts the Feathered Serpent (also wearing earspools) with a large, feathered fringe wrapping around the whole outer edge. The Feathered Serpent is a major figure found in royal masks and is usually associated with the highest-ranking royal titles such as *k'inich* and *k'uhul ajaw* (Halperin 2014b) and it is also associated with themes of warfare and martial power (Halperin 2014b; Looper 2003). In the *Popol Vuh*, the Feathered Serpent is one of the great deities - the Modelers, Makers - who form the cosmos out of an empty sky and sea (Schlesinger 2001; Tedlock 1996). Impersonating such a powerful and important deity illustrates the ruler's role within Maya society and cosmology; a role of power, influence, and order.

Appendix A.4: QRG019 (G_02_002 31-2277)

Manufacturing Technique: Moldmade

Function: Unknown Hollow

Subject: Ruler (Deity mask)

Decoration: Blue Paint

Source: Local (Group A)

This is a local moldmade hollow figurine of unknown usage with traces of blue paint. It depicts a ruler wearing a large god-mask headdress, two ear spools, and a square pectoral piece. The god-mask appears to be depicting a bat, based on the flatness and shape of the nose and the ears on the side of the face. It should be noted, however, there are few depictions of bats on headdresses. A large disk is placed above the head. The outer edge of the headdress is broken off, indicating that this was a stacked headdress,

and a different god-mask was placed on top - possibly the Feathered Serpent based on the curve of the broken edges, which corresponds to the curved mouth of the deity (see Appendix A.3). Bats are often associated with the night and power. One of the eighteen months in the Maya calendar is called *zotz*, the Maya word for bat (Schlesinger 2001). They are also associated with death, decapitation, and sacrifice (Miller and Taube 1993), and were responsible for the decapitation of the Hero Twin Hunahpu in the *Popol Vuh* (Miller and Taube 1993; Tedlock 1996). One of the main signs in Copan's emblem glyph was the bat sign (Looper 2003; Schlesinger 2001; Tedlock 1993), so this headdress may be meant to allude to Copan's rulership. In fact, the bat emblem glyph was the beginning syllable used in the title for the Copan ruler (Tedlock 1993). Co-opting symbols of rulership from Copan is not unusual at Quirigua, especially during the reign of K'ak' Tiliw, where these symbols were used to empower and embolden the smaller site (Looper 2003). Simultaneously, it could be meant to depict a ruler *from* Copan itself, which would speak to the site's influence over Quirigua.

Appendix A.5: QRG025 (G_02_002 31-2275)

Manufacturing Technique: Hand-Modeled

Function: Ocarina

Subject: Ruler (Masculine, Warrior, Deity mask)

Decoration: Blue Paint

Source: Local (Group B)

This is a locally made, finely hand-modelled ocarina figurine with traces of blue paint. This figurine is depicting a warrior during a ritual celebration or a ruler emulating a warrior in their dress (also for a ritual celebration). Warriors in ritual celebrations, whether rulers or otherwise, were acting in a performative role, emulating warfare through performance, such as ritual battles (Triadan 2007). This figure is wearing quilted armor and holding a circular shield with tassels, typical of a warrior, but they are also wearing a large headdress with a mask covering their face. The mask is not typical in that it depicts a type of mammal with a muzzle and slightly pointed ears. It is not immediately recognizable, but it could possibly be a jaguar.

Appendix A.6: QRG006 (G_02_002 31-2297)

Manufacturing Technique: Moldmade

Function: Unknown Hollow

Subject: Elite (N/A)

Decoration: Blue Paint

Source: Local (Group B)

This is a local, hollow, moldmade head of unknown use and traces of blue paint, although, due to the figurine's structure, it is unlikely to have been an ocarina. The head, broken off at the neck, displays idealized facial features, particularly a long, sloping forehead. The protrusion on the top of the head indicates that this figurine was originally

decorated with additional, removable decorations, made of either more ceramic or from a perishable material like cloth/feathers. Similar head shapes are seen on figurines with removable headdresses (see Plate 3, Schele and Miller 1986). Traces of blue paint are found across their entire face. The beauty being portrayed by the figure, as well as the presence of some kind of head decorations, indicates that this may be depicting an individual of some importance, although exactly how important is impossible to tell. However, it is unlikely that this would be depicting a commoner or anyone below a lower elite status.

Appendix A.7: QRG028 (G_02_002 31-2279)

Manufacturing Technique: Hand-Modeled

Function: Unknown Solid

Subject: Elite (Masc.)

Decoration: None

Source: Local (Group A2)

This is a local hand-modelled solid figurine head with an unknown use that's been broken at the neck, whether intentionally (to ritually kill the figure) or unintentionally

(the neck being one of the most fragile parts of a figurine). The figure is not lavishly adorned, but it does have ear plugs and a cloth headwrap with a high, stiff back, marking it as an individual of some importance, likely some lower status elite, priestly figure, or scribe.

Appendix A.8: QRG033 (G_02_002 31-2298)

Manufacturing Technique: Moldmade with Crude Hand-modelling

Function: Ocarina

Subject: Elite (Masc.)

Decoration: None

Source: Local (Unassigned)

This is a local moldmade ocarina with several crudely hand-modelled and appliqued decorative elements, although it is not as finely detailed as most of the other ocarinas in this collection. The figurine portrays an individual dressed in a loincloth (making the figure masculine), with ear plugs and a necklace. They also wear a stiff headboard with a long cloth draping behind their head. One of the arms is angled outwards and a piece is broken off from the hand. The headboard and cloth are diagnostic features of a priest or state ritual specialist. Most likely, the object that had been held in their hand was a staff or a different ritual object.

Appendix A.9: QRG020 (G_02_002 31-2311)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Performer (Masc.)

Decoration: Blue Paint

Source: Local (A2)

This is a local moldmade ocarina figurine that is missing its head and has traces of Maya blue paint. The figure wears a loincloth and a tied belt, along with a pectoral necklace. Something drapes over both shoulders, either long hair or a shoulder cape, and they hold two objects - one in each hand - that appear to be rattles. If the objects being held are truly rattles, that would make this individual a masculine performer (see Halperin 2014b: Figure 3.2d), given that they are wearing a loincloth, a masculine article of clothing. They could also be a religious practitioner, as rattles are noted to be used by shamans and priests in ceremonies both in the past and the present (Grube and Nahm 1994).

Appendix A.10: QRG001 (G_02_002 31-2342)

Manufacturing Technique: Moldmade

Function: Unknown Solid

Subject: Elite (Masc.)

Decoration: None

Source: Non-local (Veracruz)

This is an imported solid, moldmade head of unknown use, possibly originating from the Veracruz region. Given the solid nature of the figurine, the thickness of the neck, and the clean break line makes it likely that this head was separated from the rest of the figurine on purpose. This individual wears a large, round headdress/turban and large

earplugs and has a tall, slightly sloping forehead. They are most likely depicting a lower status elite individual whose role did not have diagnostic apparel.

Appendix A.11: QRG018 (G_02_002 31-2319)

Manufacturing Technique: Moldmade

Function: Unknown Hollow

Subject: Performer (Fem.)

Decoration: None

Source: Local (Group B)

This is a locally made head of a hollow moldmade figurine with an unknown use, although it is possible it could be the top of an ocarina. The individual wears earplugs and a highly decorative beaded headdress, similar to the headdress worn by QRG026 and those worn by women/feminine presenting performers. Performers usually are depicted wearing fan-shaped feather headdresses with ornamental headbands and wind deities who are considered musicians wear the same or similar headdress (see Halperin 2014b: Figure 3.18). The stepped/multilayered cropped hairstyle paired with the headdress indicates that this figure is a woman or feminine presenting person, most likely a performer for ritual and royal events.

Appendix A.12: QRG037 (G_02_002 40-3649)

Manufacturing Technique: Hand-modeled

Function: Unknown Applique

Subject: Elite (Fem.)

Decoration: None

Source: Local (Group A2)

This is a locally made, solid, hand-modelled figurine which had been appliqued to another ceramic piece, either a larger object, such as an incensario, or had a smaller figurine decoration appliqued to the figure's front. They wear a hat/head covering, ear plugs, and a beaded necklace. The beaded necklace is typically seen being worn by women/feminine figures, indicating that the individual being portrayed here is a woman or feminine figure of a lower/nonroyal elite status.

Appendix A.13: QRG026 (G_02_002 31-2302)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Performer (Fem.)

Decoration: None

Source: Local (Group B)

This is a local moldmade ocarina figurine depicting a kneeling person. They are wearing a long skirt with a banded design down the side, no top, and visible breasts, making the individual biologically female. They also wear a similar beaded headdress and cropped hair as QRG018, and are holding an object in one hand, possibly a rattle. Kneeling is a feminine pose and, as discussed with QRG018, the hair and headdress are typically feminine attire. While short skirts are masculine, long skirts are feminine, so pairing all these features with the possible rattle, this figurine is most likely portraying a female performer, either a woman or a feminine presenting individual.

Appendix A.14: QRG038 (G_02_002 31-2307)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Elite (Fem.)

Decoration: Blue Paint

Source: Local (Group A)

This is a local moldmade ocarina with traces of blue paint. This individual is a female - with visible breasts - and a cropped hair style, a 4-bead necklace, earplugs, rayed cuffs, and a two-layered long skirt. They also are holding an object in front of them,

possibly a box, although a box of what is uncertain. Royal women/feminine figures were often depicted in murals and stelae holding baskets of ritual items, particularly items for bloodletting, which was a more feminine coded activity. However, bloodletting activities were generally not depicted as a part of popular media and were relegated more to elite spaces. This woman or feminine presenting person is likely someone of a higher/elite social status, given their adornments. They are also depicted standing rather than kneeling, the more typical pose for feminine figures to take (see QRG018), although women/feminine figures are depicted standing enough to make this more of an interesting side note than a major revelation.

Appendix A.15: QRG010 (G_02_002 31-2303)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Elite (Fem.)

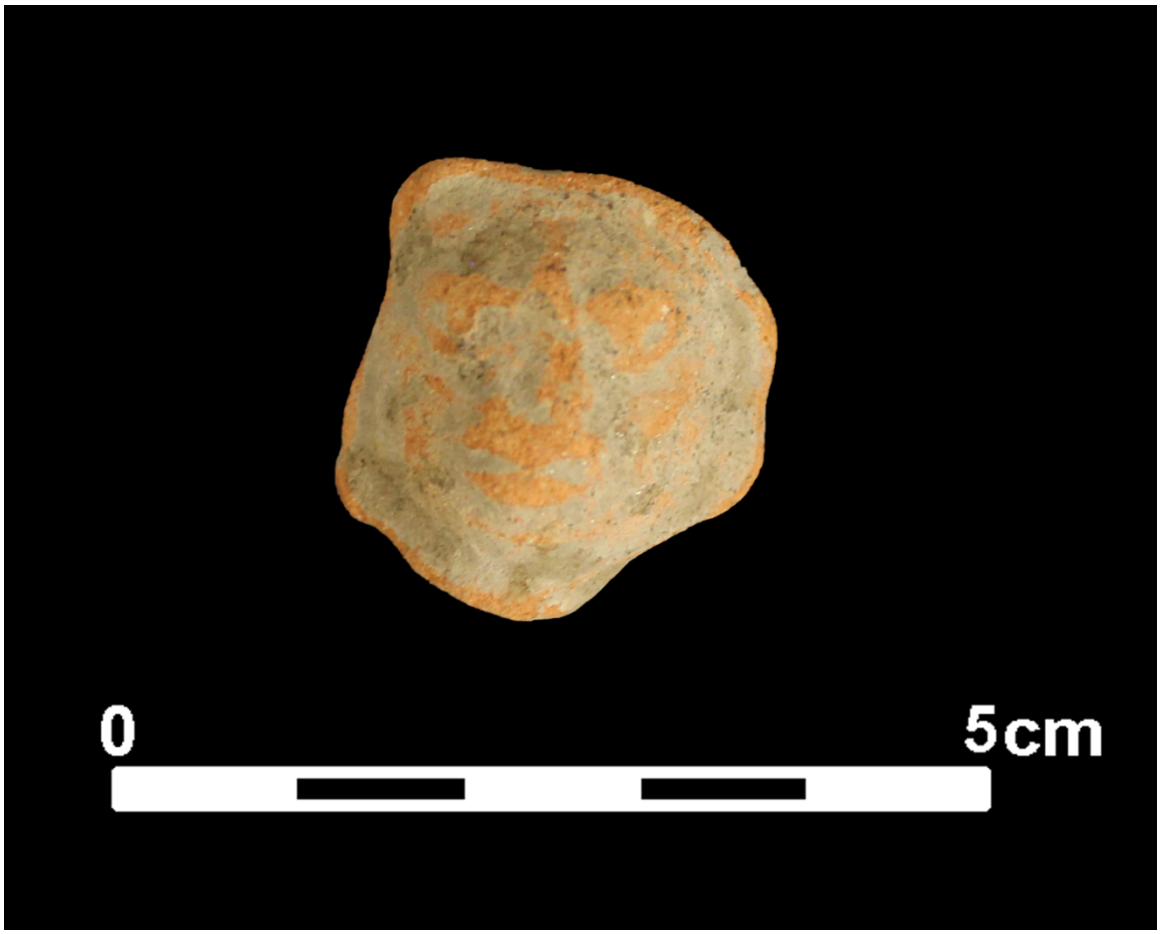
Decoration: None

Source: Local (Group A1)

This is a local moldmade ocarina (identified by the whistle holes visible in the back). This figurine portrays a person wearing a large rope-like headdress, with cropped hair seen coming out from under it, and earplugs. They are also wearing a huipil, a feminine piece of clothing that's primarily worn by women, with tau/ik signs lining the border and % designs on the garment. The colloquially termed 'percentage signs' often are found on figures associated with caves, the night (or darkness in general), and the

underworld (Schele and Miller 1986). Often, they are found on images of bats, jaguars, and nocturnal insects like fireflies, likely due to these creatures' associations with the dark/underworld. They are also found on deities and 'demons' of the underworld (Marc Zender, personal communication 2022). Such motifs are found also at other sites, but they are especially prominent at Quirigua. Imagery associating the main plaza (built by K'ak' Tiliw) with the underworld was heavily utilized, including the use of percentage signs on the face of the figure on QRG Stela E (Looper 2003). The space was commemorated as the "Black Hole" or "Black Lake" after the sacrifice of Waxaklajun Ub'ah K'awil, titles that mark it as a portal to the underworld, much like a cave (Ashmore 2007; Looper 2003). It is also a place connected to the Jaguar Sun God of the Underworld. The huipil and the hair style indicate that this figurine is portraying an elite woman or feminine presenting person.

Appendix A.16: QRG035 (G_02_002 31-2339)



Manufacturing Technique: Moldmade

Function: Unknown Hollow

Subject: Unknown Person

Decoration: None

Source: Local (Group A)

This is a face from a hollow figurine, possibly that of ocarina, and was locally made. Very few distinguishing features can be seen due to the figurine fragment's poor state of preservation and size.

Appendix A.17: QRG002 (G_02_002 35-7795)

Manufacturing Technique: Hand-modeled

Function: Incensario

Subject: Unknown Person

Decoration: None

Source: Non-local (Veracruz)

This is a hand-modelled fragment of an effigy incensario imported from the Southern Veracruz/Oaxaca region, most likely from the Tuxtla Mountains. This fragment is depicting a head with abnormal, pinched facial features, including asymmetric closed eyes, and two perforations is each ear, which likely allowed for perishable decorations to be attached. The figurine fragment is hollow with holes at the top and bottom of the head, where smoke from the incensario could escape. The base of the head and neck has a

tenon joint that is unbroken, meaning this head had been connected to a larger piece and then removed, possibly intentionally. The asymmetric and pinched features could be indicative of unspecialized/poor craftsmanship, however, given the presence of a well-articulated mortise and tenon joint, it seems more likely instead that these features were intentional, meant to portray something, possibly a genetic mutation/disease. Physical deformities were not an uncommon subject found across Mesoamerica; in Postclassic Central Mexico, extreme physical deformities were seen as a supernatural punishment for immoral behavior (Miller and Taube 1993).

Appendix A.18: QRG024 (G_02_002 31-2333)

Manufacturing Technique: Hand-modeled

Function: Unknown Solid

Subject: Unknown Person

Decoration: None

Source: Non-local (Honduras)

This is a hand-modelled hollow figurine fragment of unknown use, imported from northern Honduras, most likely from the Ulua Valley. The fragment depicts a broad face with one ear pendant remaining (the other likely was broken off) and almond shaped eyes and mouth. Diagnostic features indicating gender, status, or subject are normally located in the headdress of such a figure but, given that the headdress was broken off, nothing further can be inferred about the individual being depicted. The styling of this fragment is reminiscent of Preclassic imagery, although that does not necessarily mean it is, in fact, from the Preclassic. The style is highly reflective of typical figurines from the Ulua Valley region. Based on figurines from that area, this one was likely wearing a large turban or headwrap, a necklace and other jewelry, and was attached to a full-bodied figure. There is also a possibility that it was attached to another figure, as human figurines like this one often depicted embracing figures (Hendon et al. 2014). Chemical analysis of the figurine matches closest with other ceramic samples from the site of Travesía, where the paired human figurines were incredibly abundant. Important families in Travesía have been noted to trade and interact with other groups, including the Maya, to the north, far more than most other Honduran sites. Especially in the southeastern periphery region, Travesía and other Honduran communities were likely connected to each other via trade and kinship ties (Hendon et al. 2014). Figurines from Honduras have been found in Copan (Halperin 2014b; Hendon et al. 2014) and jadeite from the Motagua River Valley has been found in Travesía (Hendon et al. 2014). The likelihood that Honduran sites like Travesía had economic and/or familial ties to Qurigua is not unwarranted and the presence of this figurine certainly suggests the possibility.

Appendix A.19: QRG036 (G_02_002 31-2270)

Manufacturing Technique: Hand-modeled

Function: Ocarina

Subject: Unknown Person

Decoration: None

Source: Local (Group A)

This is a locally made hand-modelled ocarina figure. It is very small in size, so it was likely meant to be used by children, especially small children, since adults would have a difficult time manipulating the instrument. The figure is fairly simplistic, with no visible designs, but it is likely that it was depicting a person who's head had been broken off, either accidently or purposefully. If this truly was an ocarina for small children to use, the lack of details would make sense, since the figurine was likely to be broken or lost and this design would have required very minimal effort to create.

Appendix A.20: QRG034 (G_02_002 31-2281)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Bird

Decoration: None

Source: Local (Unassigned)

This is a local moldmade ocarina depicting a type of raptor bird. It has a sharp beak and expressive, aggressive eyes. This figurine is similar to QRG027 as they both portray nearly identical birds that are somewhat squatter and rounder in comparison to

QRG031. Birds are usually associated with women and femininity, and they also often act as messengers between the earthly and divine realms (Halperin 2014b; Tedlock 1996).

Appendix A.21: QRG027 (G_02_002 31-2320)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Bird

Decoration: None

Source: Local (Group A1)

This is a local moldmade ocarina depicting a type of raptor bird. It has a sharp beak and expressive, aggressive eyes. This figurine is nearly identical to QRG034 depicted above.

Appendix A.22: QRG031 (G_02_002 31-2305)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Bird

Decoration: None

Source: Local (Group A1)

This is a local moldmade ocarina depicting a type of raptor bird. It has a sharp beak and expressive, aggressive eyes. This figurine is slightly taller and thinner than QRG034 and QRG027. Despite these differences, it is most likely portraying the same kind of bird as the other two.

Appendix A.23: QRG029 (G_02_002 31-2330)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Bird (Owl)

Decoration: None

Source: Local (Group C)

This is a local moldmade ocarina depicting a bird with a sharp, curved beak, V markings on top of the forehead and on the chest, as well as two circular protrusions on either side of the head, suggesting that this bird is an owl, possibly a screech owl. Owls served as the primary messengers for the Lords of Xibalba in the *Popol Vuh* (Tedlock 1996; Triadan 2007) and aided the mother of the Hero Twins (usually interpreted as the Moon Goddess) in her escape from Xibalba (Tedlock 1996). They are associated with the night and the underworld, as well as fertility and death (Miller and Taube 1993). Owls are also associated with warfare across Mesoamerica, especially in Central Mexico at Teotihuacan (Halperin 2014b). The screech owl (or *muan* owl) was an important iconographic figure for the Maya, with a month named after it, and is usually associated with rain, maize, and the underworld as well as the rain deity Chac and the merchant deity of the underworld, God L (Miller and Taube 1993; Schele and Miller 1986).

Appendix A.24: QRG005 (G_02_002 31-2331)

Manufacturing Technique: Hand-modeled

Function: Incensario

Subject: Bird

Decoration: None

Source: Local (Unassigned)

This is a locally made, hollow, hand-modelled incensario fragment. This fragment depicts the round face of a bird that had once been appliqued, most likely, to the side of its effigy incensario. Its features are fairly simple, with round, circular eyes likely carved with a reed, and a protruding, curved beak. Because of its simple design, it is difficult to determine what type of bird this fragment is meant to portray. It could possibly be the same kind of bird represented by QRG034, QRG027, and QRG031 or QRG029 but it is more likely portraying another bird species native to the Maya region, such as a parrot or macaw. The arrogant Sevan Macaw is a prominent figure in the story of the Hero Twins in the *Popol Vuh* (Tedlock 1996) and, interestingly, some additional toponyms for Copan referenced birds, including the name M'o Witz or "Macaw Mountain" (Looper 2003).

Appendix A.25: QRG011 (G_02_002 31-2332)

Manufacturing Technique: Hand-modeled

Function: Incensario

Subject: Bird

Decoration: None

Source: Local (Group A1)

This is a locally made hand-modelled solid effigy incensario handle. This handle depicts a fairly distinct and abnormal bird, not normally depicted in Maya art. It bears some resemblance to QRG016, with its long beak and circular eyes. It shows some similar characteristics to depictions of turkeys, although it does not contain the tell-tale piece of skin (the snood) hanging over the top of the beak. Turkeys were possibly raised as domesticated birds by the Maya as a source of food, feathers, and as offerings to deities (Schlesinger 2001).

Appendix A.26: QRG016 (G_02_002 40-3650)

Manufacturing Technique: Hand-modeled

Function: Unknown Applique

Subject: Bird

Decoration: None

Source: Local (Group A2)

This is a locally made hand-modelled figurine of unknown use. Its long beak, neck, and round eyes are reminiscent of QRG011. Like QRG011, this figurine had also been appliqued onto something, although what it was is difficult to determine, due to the figurine's small size and simplistic design

Appendix A.27: QRG004 (G_02_002 31-2315)

Manufacturing Technique: Moldmade

Function: Rattle

Subject: Bird (Vulture)

Decoration: None

Source: Local (Group A2)

This is a local moldmade rattle depicting the head of a vulture. The head is hollow and still contains some of the elements that create the rattle sound. The vulture has very anthropomorphic features, including very human eyes and eyebrows ridges, as well as wearing two ear plugs and a circular beaded necklace. Vultures in Maya cosmology are symbols of rulership (Miller and Taube 1993), and the circular beaded necklace is a feminine adornment, as seen on QRG037. Likely, this rattle was meant to relate an image of supernatural or divine feminine rulership, such as queenship or as rulership that co-opted feminine powers. The Principle Bird Deity is also sometimes seen as a vulture in the Maya world and among the nearby Zapotecs (Miller and Taube 1993).

Appendix A.28: QRG009 (G_02_002 31-2322)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Monkey (Spider)

Decoration: White Paint

Source: Local (Group A1)

This is a local moldmade ocarina that depicts a monkey with traces of white paint. The monkey has anthropomorphic features and dangles hanging from the ears, an erect penis, and is holding an object in their left hand. Marks on the back of the ocarina suggests that a curled, appliqued tail had once been attached but has since broken off. Monkeys have two different positions in the Maya worldview. Howler monkeys are seen as supernatural artisans, illustrated by One Monkey and One Artisan in the *Popol Vuh* (Schlesinger 2001; Schele and Miller 1986; Tedlock 1996) and are the respected patrons of scribes and artists (Halperin 2014b; Schele and Miller 1986; Schlesinger 2001;

Tedlock 1996; Triadan 2007). Spider-monkeys, on the other hand, are viewed as mischievous troublemakers, often stealing cacao pods from farmers, and are usually portrayed as clowns and hypersexual (Miller and Taube 1993). This comical figure is also portrayed and discussed in the *Popol Vuh*; when humans who do not follow the social and moral norms of society are then transformed into monkeys and mocked (Tedlock 1996). The erect penis and long curling tail is typical of spider-monkey clowns. The object being held by this figurine looks very much like a cacao pod, which is typical behavior of spider monkeys. Even today they are known for harassing farmers by stealing their crops (Zender, personal communication 2021).

Appendix A.29: QRG022 (G_02_002 31-2314)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Monkey (Howler)

Decoration: None

Source: Local (Group A)

This is a locally made hand-modelled hollow figurine of unknown function since it was cut off at the neck, although it is possible it could have been an ocarina. The face of the figurine has both anthropomorphic and nonhuman features, and it wears a head covering or headband. The curved features around the mouth suggest that this figurine is depicting a howler monkey. As mentioned above, howler monkeys are seen as artists and scribes and are often viewed as more respectable than their spider monkey counterparts. They are also often depicted wearing clothing, including a scribe's headband. While this figure does not seem to be wearing that particular headband, the fact that it is wearing a head covering helps to further identify them as a howler monkey rather than a spider-

monkey, even without the rest of the body. This less comical and more respected iteration of the monkey can also be interpreted as a spirit companion that represents ancestral human lives along with the typical social alterity and deviance (Halperin 2014b).

Appendix A.30: QRG030 (G_02_002 31-2310)

Manufacturing Technique: Hand-modeled

Function: Unknown Hollow

Subject: Dog

Decoration: None

Source: Local (Group C)

This is a locally made hand-modelled hollow figurine of unknown use. While it is possible it was appliqued to another object, the rim bears no marks typically seen on broken off appliqued items. Rather, in conjunction with the modelling inside the figurine, it seems more likely that this was intended to be a hat worn by another figurine (Marc Zender, personal communication 2021), which would have had a head shaped similarly to

QRG006. This figurine depicts the face of a dog wearing a collar. Dogs, in Maya cosmology, are often connected to the underworld and scenes of death. On some painted scenes, dogs have been interpreted as escorting the souls of deceased rulers to the afterlife (Hendon et al. 2014; Miller and Taube 1993). They were also often eaten in various rituals spreading from Peru up to Central Mexico (Hendon et al. 2014).

Appendix A.31: QRG007 (G_02_002 31-2274)

Manufacturing Technique: Moldmade

Function: Unknown Hollow

Subject: Jaguar

Decoration: Blue Paint

Source: Local (Group A1)

This is a local moldmade hollow figurine of unknown usage and traces of blue paint. This figurine fragment depicts the head of a jaguar with an open, snarling mouth, a characteristic common for depictions of this animal (Grube and Nahm 1994). Jaguars are important figures in the Maya world, as illustrated by their appearance several times in various capacities in the *Popol Vuh* (Tedlock 1996). They are not uncommon *way* spirits, associated with the underworld, ritual, and transformations (Grube and Nahm 1994; Miller and Taube 1993) and are connected to several different deities such as the Jaguar War God/Jaguar God of the Underworld (Halperin 2014b; Looper 2003; Miller and Taube 1993), the Water Lily Jaguar, Jaguar Baby, and Jaguar Paddler (Miller and Taube

1993). One of the hero twins from the *Popol Vuh* - Xbalanque - is also usually shown with jaguar attributes (Sharer and Traxler 2006). Jaguars symbolized courage and strength and were meant to protect Maya rulers, who would often use parts of the jaguar or images of them to communicate their strength and power (Miller and Taube 1993; Schlesinger 2001). They were very important sacrifices for major events and were typically beheaded (Miller and Taube 1993). Jaguars are also a part of the creation of the cosmos. Multiple accounts of the event, including several at Quirigua itself, recount the establishment of the three stones of Creation, seen repeated in triple monument groupings (the cross group at Palenque, the A-B-C program at Quirigua, etc.) (Looper 2003; Sharer and Traxler 2006). The first of these stone/platforms/thrones to be placed is the 'jaguar platform' (noted at Quirigua on Stela C that it was placed by the Paddler deity 'First Five Sky'), followed by the 'snake platform' and the 'water platform'. The jaguar platform - and, subsequently, the jaguar itself - is representative of masculine power and warfare, which is balanced by the feminine powers of the snake and its association with autosacrifice and ancestor communication (Looper 2003). The image and essence of the jaguar was used by hunters and warriors to give them strength and stealth in their work (Schlesinger 2001) since they were the ultimate predator in the area (Miller and Taube 1993).

Appendix A.32: QRG013 (G_02_002 31-2341)

Manufacturing Technique: Moldmade

Function: Ocarina

Subject: Turtle

Decoration: None

Source: Local (Group C)

This is a local moldmade ocarina fragment depicting a turtle shell. Turtles and their shells often conveyed ideas of defense. They are often depicted either as shields, representing shields, or are painted on to shields. As an example, QRG003 wears a shield with a turtle shell pattern carved onto it. They are also associated with water - due to their typical habitat - and possibly music - as their shells were also used as instruments - along with thunder (Miller and Taube 1993). They are also connected to cosmic renewal, as it was out of the crack of the cosmic turtle shell that maize deities are reborn (Looper 2003; Miller and Taube 1993; Sharer and Traxler 2006). The turtle was also an important constellation and was an important symbol mentioned in some stela created by K'ak' Tiliw (Looper 2003).

Appendix A.33: QRG003 (G_02_002 31-2312)

Manufacturing Technique: Moldmade

Function: Ocarina

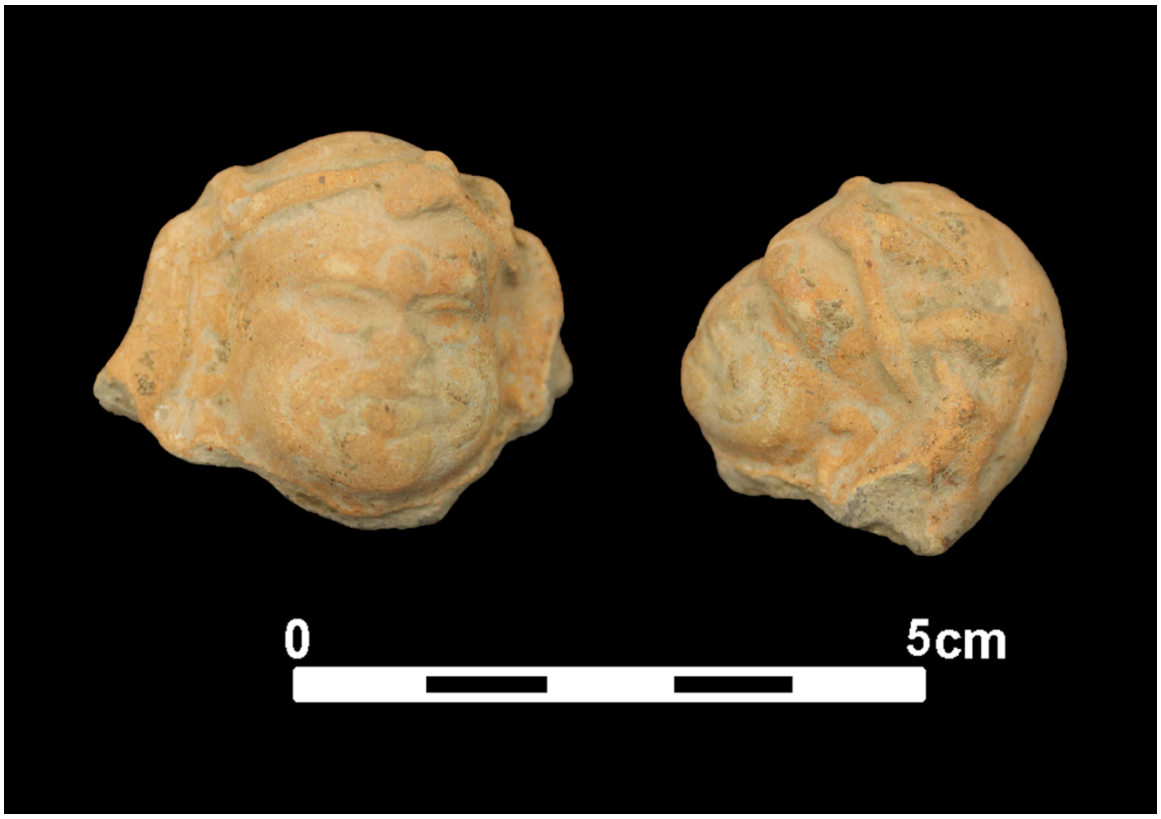
Subject: Turtle

Decoration: None

Source: Local (Group C)

This is a locally made hand-modelled effigy incensario fragment, depicting the head and torso of a humanoid figure. The proportions of the head to the body, as well as the facial/eyebrow features indicates that this figurine is portraying a dwarf. The dwarf wears a hat/head covering, double ear pendants, and a twisted cord pectoral and necklace. A hole and grooved section of the figurine's left shoulder suggests a moveable limb had been attached, although the same cannot be said for the right shoulder/arm. Strapped to their back is a back shield with carved patterns resembling a turtle's shell. As noted with QRG013, turtle shells symbolize defense, making it a fitting design for the dwarf's shield. Given dwarves' supernatural status, their regular depictions in royal courts, and this figure's smiling face the role this figurine is most likely portraying is that of a court jester/entertainer. Dwarves in a ruler's court were often dressed as other royal courtiers or figures such as ballplayers, boxers, and ritual specialists, but solely as a parody of and for the court (Halperin 2014b). Dwarves are associated with both rulership and liminality and, while they are found in both elite and commoner households, they are usually found as a part of caches (including burials), depicting scenes of performing entourages or mythical reenactments (Halperin 204b).

Appendix A.34: QRG023 (G_02_002 31-2278)



Manufacturing Technique: Hand-modeled

Function: Unknown Hollow

Subject: Dwarf

Decoration: Blue Paint

Source: Local (Group A1)

This is a locally made hand-modelled hollow figurine head of unknown use and with traces of blue paint. The rounded facial features and markings above the eyebrows resemble those of QRG003, making this most likely the head of a dwarf. They wear a draping headcloth with a chorded headband, which resembles those worn by QRG028. As mentioned previously, dwarves in royal courts often dressed as official court members, but they were considered as separate entities to the other courtiers. While

dwarves were meant to parody the other court members, many dwarves did act as assistants to rulers (Miller and Taube 1993). The headcloth and headband, which could resemble the scribal reed headband, could signify this individual as acting less as an entertainer and more of an affiliate of the ruler.

Appendix A. 35: QRG017 (G_02_002 31-2273)

Manufacturing Technique: Hand-modeled

Function: Unknown Hollow

Subject: Dwarf

Decoration: Blue Paint

Source: Local (Group A1)

This is a locally made hand-modelled effigy incensario, with holes on the top, bottom, and back of the head for smoke to travel through. This incensario is depicting the head of the Jaguar Sun God (*Ajaw K'in* or *K'inich*), specifically the underworld manifestation of the deity (the Jaguar God of the Underworld) who is related to decapitation, fire, jaguars, and the sun (Halperin 20114b; Miller and Taube 1993; Sharer and Traxler 2006). The twisted crullers going between and under the eyes and the ring going around the mouth are diagnostic features of this deity, as well as the curled lips and tongue sticking out (Halperin 2014b; Miller and Taube 1993; Rice 1999; Sharer and Traxler 2006; Schele and Miller 1986). This deity is usually associated, symbolically, with flowers, the sky, and the solar day, and it is stylistically portrayed with large god eyes, a large nose, and T-shaped front incisors (Halperin 2014b; Schele and Miller 1986). This manifestation of the deity is the embodiment of the sun as it travels through the underworld at night before it is reincarnated during the day (Halperin 2014b; Miller and Taube 1993; Rice 1999; Sharer and Traxler 2006). It is also the primary image used on shield and is considered to be a patron deity of warfare (Schele and Miller 1986) The Jaguar God of the Underworld is used solely by royal elites, who associate themselves directly to this deity, and is usually portrayed in effigy incensarios as parts of divine ruler cults and are found in large ceremonial contexts (Halperin 2014b) and funerals (Rice 1999). Interestingly, though, many of these incensarios don't show any smoke blackening on them, characteristic of burning incense, so they were more likely used as primarily deity images. This deity specifically appears very frequently at Tikal and was possibly the site's patron deity (Miller and Taube 1993). It is directly connected to the *k'uhul ajaw*

complex and once that system collapsed around the Terminal Classic period, the use of these types of incensarios disappeared from the archaeological record (Rice 1999).

Appendix A.36: QRG008 (G_02_002 31-2326)

Manufacturing Technique: Hand-modeled

Function: Incensario

Subject: Grotesque

Decoration: White Paint

Source: Local (Group A2)

This is a locally made hand modelled solid effigy incensario fragment with traces of white paint. This large figurine fragment depicts the face of an individual with deeply modelled facial features. The cheeks and eye sockets are sunken in, the mouth is open and agape, the eyes are squinting, and the eyebrows are furrowed, all features depicting great pain or sorrow. While the sunken features and expression of pain in this context usually portray an individual in old age (Rice 1999), this figurine does not contain an overbite that is typically diagnostic of older figures. In that sense, this figurine fragment is a somewhat unique design. The *Popol Vuh* contains scenes of individuals crying and

lamenting in a very visceral way, notably when the first four motherfathers wept continually on top of the mountain while they waited for the first sunrise (Tedlock 1993 and 1996). Intense expressions of sorrow/grief, while not the type of ideal reminiscent of the beautiful sloping faces seen in other figurines, do repeatedly illustrate an ideal form of devotion, similar to the pain and release of bodily fluids displayed during bloodletting.

Appendix A.37: QRG032 (G_02_002 31-2317)

Manufacturing Technique: Hand-modeled

Function: Incensario

Subject: None

Decoration: None

Source: Non-local (Basin of Mexico)

This is a hand-modelled incensario fragment imported from the Basin of Mexico, specifically the handle from a ladle incensario. A small hole runs through the incensario handle and a broken hole can be seen along the side (similar to the holes of a flute). This is the end of the handle; the bowl would be located at the other end and smoke would travel through the handle and escape through these several holes. There are some hand-carved patterns on the handle, primarily of lines (long, short, and wavy). Unfortunately, not enough of the handle is present to make clear what these patterns may be illustrating. Most likely, however, it didn't contain any specific imagery, as ladle incensarios usually are not accompanied by elaborate figurines and are, instead, decorated by geometric designs (Rice 1999), such as those displayed here. The possibility that this particular handle was a part of a larger image, however, cannot be entirely discounted.

Appendix B: MURR Lab Report

Archaeometry Laboratory

NEUTRON ACTIVATION ANALYSIS OF CLASSIC PERIOD FIGURINES FROM QUIRIGUA, GUATEMALA

(ANIDS: QRG001-038)

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1 Introduction

This report describes the results and interpretations of neutron activation analysis (NAA) of a collection of 38 figurine samples (QRG001-QRG038) collected at the Late Classic Maya site of Quirigua, currently housed in the Middle American Research Institute (M.A.R.I.). The collection is comprised of figurines displaying a variety of forms and functions.

The goal of the study is to determine the nature of the local figurine production economy as well as the breadth of the Quirigua interaction sphere and its place in larger Mesoamerican trade networks (Simulcik 2021). Accordingly, comparative materials from were pulled from other figurine samples in MURR's Mesoamerican database, as well as other areas with known production of figurines, as discussed in detail below.

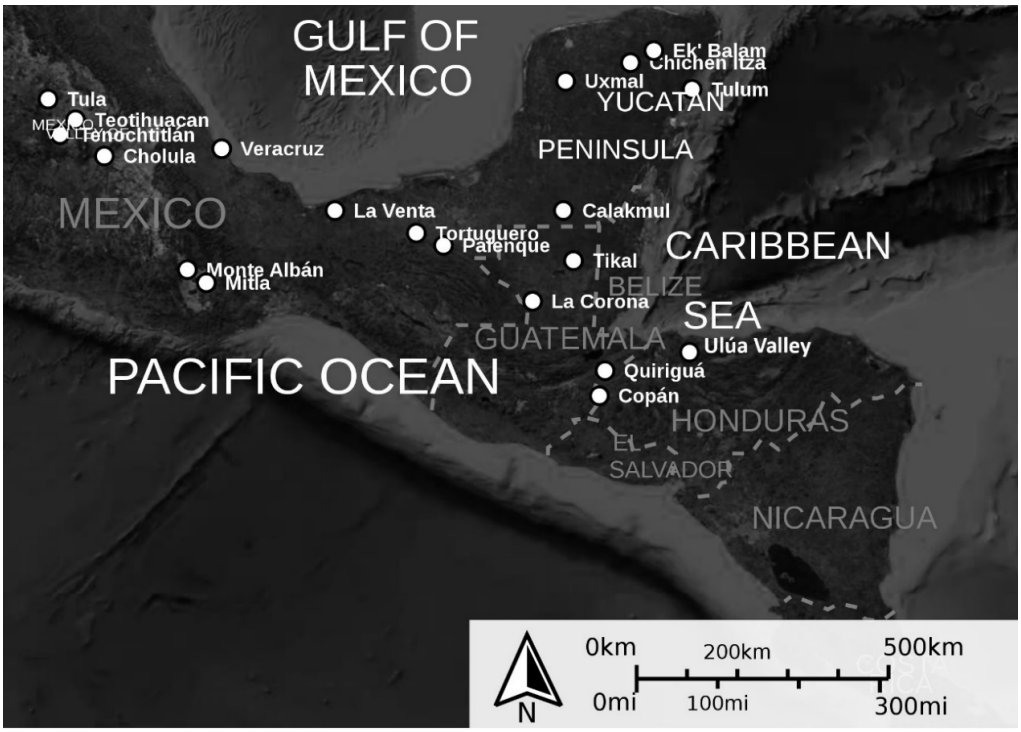

Figure 1. Map of the study region and the origin of comparative datasets.

Table 1. Count of current specimens by form and production technique.

	HAND-MODELLED	MOLDMADE	BOTH	TOTAL
CENSER	7			7
OCARINA	2	12	1	15
RATTLE		1		1
UNK. APPLIQUE	2			2
UNK. HOLLOW	3	6		9
UNK. SOLID	1	2		3
OTHER				1
TOTAL	15	21	1	38

1 Sample Preparation

Specimens were prepared for NAA following MURR standards for drilling, using a diamond-point bit (see Boulanger et al. 2013). Due to the nature of the figurines being sampled, drilling was the only viable option for obtaining samples. Materials and surfaces were regularly sterilized after every use. Approximately 150 mg of powder was collected form each specimen.

Two analytical samples were prepared from each specimen. Archival samples were retained from each sherd (when possible) for future research. Portions of approximately 150 mg of powder were weighed into clean high-density polyethylene vials used for short irradiations at MURR. At the same time, 200 mg of each sample was weighed into clean high-purity quartz vials used for long irradiations. Individual sample weights were recorded to the nearest 0.01 mg using an analytical balance. Both vials were sealed prior to irradiation. When samples were too small to perform both analyses concurrently, the existing samples were transferred from the short to the long irradiation vials after short irradiations were completed.

Along with the unknown samples, standards made from National Institute of Standards and Technology (NIST) certified standard reference materials of SRM-1633b (coal fly ash) and SRM-688 (basalt rock) were similarly prepared, as were quality control samples (i.e., standards treated as unknowns) of SRM-278 (obsidian rock) and New Ohio Red Clay (a standard developed for in-house applications).

2 Irradiation and Gamma-Ray Spectroscopy

Neutron activation analysis of ceramics at MURR, which consists of two irradiations and a total of three gamma counts, constitutes a superset of the procedures used at most other NAA laboratories (Glascock 1992; Neff 1992, 2000). As discussed in detail by Glascock (1992), a short irradiation is carried out through the pneumatic tube irradiation system. Samples in the polyvials are sequentially irradiated, two at a time, for five seconds by a neutron flux of 8×10^{13} n cm^{-2} s^{-1} The 720-second count yields gamma spectra containing peaks for nine short-lived elements aluminum (Al), barium (Ba), calcium (Ca), dysprosium (Dy), potassium (K), manganese (Mn), sodium (Na), titanium (Ti), and vanadium (V). The samples are encapsulated in quartz vials and are subjected to a 24–hour irradiation at a neutron flux of 5×10^{13} n cm^{-2} s^{-1}. This long irradiation is analogous to the single irradiation utilized at most other laboratories. After the long irradiation, samples decay for seven days, and then are counted for 1,800 seconds (the “middle count”) on a high-resolution germanium detector coupled to an automatic sample changer. The middle count yields determinations of seven medium half-life elements, namely arsenic (As), lanthanum (La), lutetium (Lu), neodymium (Nd), samarium (Sm), uranium (U), and ytterbium (Yb). After an additional three- or four-week decay, a final count of 8,500 seconds is carried out on each sample. The latter measurement yields the following 17 long half-life elements: cerium (Ce), cobalt (Co), chromium (Cr), cesium (Cs), europium (Eu), iron (Fe), hafnium (Hf), nickel (Ni), rubidium (Rb), antimony (Sb), scandium (Sc), strontium (Sr), tantalum (Ta), terbium (Tb), thorium (Th), zinc (Zn), and zirconium (Zr). The element concentration data from the three measurements are tabulated in parts per million.

Contextual and descriptive data for the specimens are appended to the concentration spreadsheet to facilitate organizing, sorting, and extracting sample information. The combined descriptive, contextual, and compositional database for samples analyzed as part of this study is included here in limited form as Appendix A, as well as in its complete form in a digital file accompanying this report. Additional copies of these data are available upon request to the Archaeometry Laboratory. Following the Archaeometry Laboratory's Data Management and Sharing Plan (Boulanger and Stoner 2012), these data will be incorporated into the MURR database, retained for future comparative purposes, and made publicly available via the laboratory's website following publication or a period of no less than two years.

1 Interpreting Chemical Data

The analyses at MURR, described above, produce elemental concentration values for 33 elements in most analyzed samples. Statistical analysis was carried out on base-10 logarithms of concentrations of these elements. Use of log concentrations rather than raw data compensates for differences in magnitude between the major elements, such as calcium, on one hand and trace elements, such as the rare earth or lanthanide elements (REEs). Transformation to base-10 logarithms also yields a more normal distribution for many trace elements.

The interpretation of compositional data obtained from the analysis of archaeological materials is discussed in detail elsewhere (e.g., Baxter and Buck 2000; Bieber et al. 1976; Bishop and Neff 1989; Glascock 1992; Harbottle 1976; Neff 2000) and will only be summarized here. The main goal of data analysis is to identify distinct and relatively homogeneous groups within the analytical database. Based on the provenance postulate of Weigand et al. (1977), different chemical groups may be assumed to represent geographically restricted sources. With pottery, however, chemical composition additionally varies according to the paste recipes that potters employ. Given the additive nature of ceramic production, a paste recipe reflects the cumulative steps from the selection of raw materials, preparation of those materials, the mixing of temper and clay, and even the firing of the pottery, all of which can affect the final compositional profile. Additionally, elemental chemistry can be altered through use and diagenesis, which should be investigated and eliminated as possible sources of variation when possible.

For lithic materials such as obsidian, basalt, and cryptocrystalline silicates (e.g., chert, flint, or jasper), raw material samples are frequently collected from known outcrops or secondary deposits and the compositional data obtained on the samples is used to define the source localities or boundaries. With ceramics, the locations of sources can also be inferred by comparing unknown specimens (i.e., ceramic artifacts) to knowns (i.e., clay samples) or by indirect methods such as the "criterion of abundance" (Bishop et al. 1982) or by arguments based on geological and sedimentological characteristics (e.g., Steponaitis et al. 1996). The ubiquity of ceramic raw materials usually makes it impossible to sample all potential "sources" intensively enough to create groups of knowns to which unknowns can be compared. This is in contrast to lithic sources, which tend to be more localized, as is the case for many cherts, and compositionally homogeneous, as in the case of obsidian.

Compositional groups can be viewed as “centers of mass” in the compositional hyperspace described by the measured elemental data. Groups are characterized by the locations of their centroids and the unique relationships (i.e., correlations) between the elements. Decisions about whether to assign a specimen to a particular compositional group are based on the overall probability that the measured concentrations for the specimen could have been obtained from that group.

Initial hypotheses about source-related subgroups in the compositional data can be derived from non-compositional information (e.g., archaeological context, decorative attributes, etc.) or from application of various pattern-recognition techniques to the multivariate chemical data. Some of the pattern recognition techniques that have been used to investigate archaeological data sets are cluster analysis (CA), principal components analysis (PCA), and discriminant analysis (DA). Each of the techniques has its own advantages and disadvantages which may depend upon the types and quantity of data available for interpretation.

4.1 Principal Components Analysis

The variables (measured elements) in archaeological and geological data sets are often correlated and frequently large in number. This makes handling and interpreting patterns within the data difficult. Therefore, it is often useful to transform the original variables into a smaller set of uncorrelated variables in order to make data interpretation easier. Of the above-mentioned pattern recognition techniques, PCA is a technique that transforms the data from the original correlated variables into uncorrelated variables most easily.

PCA creates a new set of reference axes arranged in decreasing order of variance subsumed. The individual PCs are linear combinations of the original variables. The data can be displayed on combinations of the new axes, just as they can be displayed on the original elemental concentration axes. PCA can be used in a pure pattern-recognition mode, i.e., to search for subgroups in an undifferentiated data set, or in a more evaluative mode, i.e., to assess the coherence of hypothetical groups suggested by other criteria. Generally, compositional differences between specimens can be expected to be larger for specimens in different groups than for specimens in the same group, and this implies that groups should be detectable as distinct areas of high point density on plots of the first few components. It is well known that PCA of chemical data is scale dependent (Mardia et al. 1979), and analyses tend to be dominated by those elements or isotopes for which the concentrations are relatively large. This is yet another reason for the log transformation of the data.

One frequently exploited strength of PCA, discussed by Baxter (1992), Baxter and Buck (2000), and Neff (1994, 2002), is that it can be applied as a simultaneous R- and Q-mode technique, with both variables (elements) and objects (individual analyzed samples) displayed on the same set of principal component reference axes. A plot using the first two principal components as axes is usually the best possible two-dimensional representation of the correlation or variance-covariance structure within the data set. Small angles between the vectors from the origin to variable coordinates indicate strong positive correlation; angles at 90 degrees indicate no correlation; and angles close to 180 degrees indicate strong negative correlation. Likewise, a plot of sample coordinates on these same axes will be the best two-dimensional representation of Euclidean relations among the samples in log-concentration space (if the PCA was based on the variance-

covariance matrix) or standardized log-concentration space (if the PCA was based on the correlation matrix). Displaying both objects and variables on the same plot makes it possible to observe the contributions of specific elements to group separation and to the distinctive shapes of the various groups. Such a plot is commonly referred to as a "biplot" in reference to the simultaneous plotting of objects and variables. The variable inter-relationships inferred from a biplot can be verified directly by inspecting elemental concentration scatterplots.

1.1 Canonical Discriminant Analysis

Canonical discriminant analysis (CDA) is another dimension-reducing method that transforms multiple independent variables into a linear combination of those variables (one fewer than the total number of groups), which describe decreasing amounts of separation between compositional groups. These are referred to as the canonical discriminant function (i.e. CDA-1, CDA-2, etc.), and are expressed as a percentage of the magnitude of separation. Additionally, the influence on the separation of groups of each independent variable (i.e. element) is calculated by the CDA.. Bivariate plots of discriminant functions are a typical visual output showing group separation. CDA differs from PCA in that it extracts a new set of variables that maximize the differences between two or more groups rather than maximizing the variance of the total data set, and is more advantageous in circumstances when known sources can be treated as groups.

1.2 Mahalanobis Distance and Group Membership Probabilities

Whether a group can be discriminated easily from other groups can be evaluated visually in two dimensions or statistically in multiple dimensions. A metric known as the Mahalanobis distance (or generalized distance) makes it possible to describe the separation between groups or between individual samples and groups on multiple dimensions. The Mahalanobis distance of a specimen from a group centroid (Bieber et al. 1976, Bishop and Neff 1989) is defined by:

$$D^2_{y,X} = [y - \overline{X}]^t I_x [y - \overline{X}]$$

where y is the 1 x m array of logged elemental concentrations for the specimen of interest, X is the n x m data matrix of logged concentrations for the group to which the point is being compared with $\overline{X}$ being it 1 x m centroid, and I_x is the inverse of the m x m variance-covariance matrix of group X. Because Mahalanobis distance takes into account variances and covariances in the multivariate group it is analogous to expressing distance from a univariate mean in standard deviation units. Like standard deviation units, Mahalanobis distances can be converted into probabilities of group membership for individual specimens. For relatively small sample sizes, it is appropriate to base probabilities on Hotelling's T^2, which is the multivariate extension of the univariate Student's t.

When group sizes are small, Mahalanobis distance-based probabilities can fluctuate dramatically depending upon whether or not each specimen is assumed to be a member of the group to which it is being compared. Harbottle (1976) calls this phenomenon "stretchability" in reference to the tendency of an included specimen to stretch the group in the direction of its own location in elemental concentration space. This problem can be circumvented by cross-validation, that is, by removing each specimen from its presumed group before calculating its own probability of

membership (Baxter 1994; Leese and Main 1994). This is a conservative approach to group evaluation that may sometimes exclude true group members.

Small sample and group sizes place further constraints on the use of Mahalanobis distance: with more elements than samples, the group variance-covariance matrix is singular thus rendering calculation of I_x (and D^2 itself) impossible. Therefore, the dimensionality of the groups must somehow be reduced. One approach would be to eliminate elements considered irrelevant or redundant. The problem with this approach is that the investigator's preconceptions about which elements should be discriminate may not be valid. It also squanders the main advantage of multielement analysis, namely the capability to measure a large number of elements. An alternative approach is to calculate Mahalanobis distances with the scores on principal components extracted from the variance-covariance or correlation matrix for the complete data set. This approach entails only the assumption, entirely reasonable in light of the above discussion of PCA, that most group-separating differences should be visible on the first several PCs. Unless a data set is extremely complex, containing numerous distinct groups, using enough components to subsume at least 90% of the total variance in the data can be generally assumed to yield Mahalanobis distances that approximate Mahalanobis distances in full elemental concentration space.

Lastly, Mahalanobis distance calculations are also quite useful for handling missing data (Sayre 1975). When many specimens are analyzed for a large number of elements, it is almost certain that a few element concentrations will be missed for some of the specimens. This occurs most frequently when the concentration for an element is near the detection limit. Rather than eliminate the specimen or the element from consideration, it is possible to substitute a missing value by replacing it with a value that minimizes the Mahalanobis distance for the specimen from the group centroid. Thus, those few specimens which are missing a single concentration value can still be used in group calculations.

1 Results

1.1 General Structure of the Dataset

The general structure of the sample was assessed first by examining the raw elemental data. Three specimens (roughly 8% of the sample) returned nickel concentrations below the limits of detection. This is a common issue in most Mesoamerican datasets and, following standard protocols, nickel was removed from subsequent analyses. Additionally, eight specimens (around 21% of the sample) had concentrations below the limits of detection for strontium. This was taken into consideration in analyses.

Concentrations of cobalt, chromium, and vanadium were found to be abnormally high for QRG001, both relative to the rest of the current dataset (Table 2), and to the regional database. These high concentrations are believed to be the result of contamination from drilling during sample collection (see Boulanger et al. 2013). Accordingly, this specimen was treated as an outlier in this and following sections of the report. Other elemental concentrations for this specimen were not outside the range of variation present within the remainder of the sample. Its relationship to the rest of the sample is considered in more detail below.

Table 2. Descriptive statistics for the overall dataset compared to elemental concentrations for QRG001. Bolded elements represent abnormal results.

	Average	*St. Dev.*	*%RSD*	***QRG001***
As	13.2	4.3	32.3	8.7
La	17.7	3.5	19.4	23.9
Lu	0.3	0.1	20.3	0.3
Nd	15.2	4.5	30.0	26.1
Sm	3.3	0.9	28.5	4.9
U	3.2	0.7	22.6	2.2
Yb	1.9	0.4	21.7	2.3
Ce	34.4	7.8	22.6	51.9
Co	**12.5**	**22.3**	**177.7**	**141.6**
Cr	**192.4**	**201.4**	**104.7**	**1340.5**
Cs	4.9	1.0	20.4	5.3
Eu	0.6	0.2	37.5	1.2
Fe	34036.4	8571.4	25.2	66413.0
Hf	5.9	0.6	10.2	5.2
Ni	89.1	50.3	56.4	0.0
Rb	68.8	10.3	15.0	92.5
Sb	1.6	0.5	29.4	1.2
Sc	9.9	3.4	34.2	14.4
Sr	69.5	54.6	78.5	141.1
Ta	1.0	0.2	17.9	1.0
Tb	0.4	0.2	38.5	1.0
Th	11.1	2.4	21.8	6.6
Zn	113.0	87.1	77.1	121.2
Zr	155.0	26.5	17.1	154.7
Al	92913.1	10346.3	11.1	78655.0
Ba	892.5	259.7	29.1	552.7
Ca	8807.6	7536.7	85.6	40247.0
Dy	3.0	1.0	33.4	3.8
K	14806.7	2985.6	20.2	21097.0
Mn	505.7	275.6	54.5	844.7
Na	8513.5	2188.5	25.7	7325.7
Ti	3708.3	811.4	21.9	4412.7
V	**83.4**	**95.1**	**114.0**	**623.6**

A principal components analysis (PCA) was used to understand the most significant elements driving variation within the sample (Figure 2; Table 3). On PC1, the metalloids arsenic and antimony are positively loaded and driving a large portion of the variation. Chromium, uranium, thorium, barium and cesium are all also positively loaded. Negatively loaded elements include cobalt, manganese, vanadium, calcium, strontium, and the rare earth elements (REEs), among others. QRG001 was excluded from the PCA presented here, however, while significant elements differed among plots, removing this specimen and problematic elements (Co, Cr, V and even Sr) from PCA plots did not drastically alter the spread of the data in multivariate space. It is also notable that the high amount of calcium may indicate that this specimen included carbonate temper, which was rare or absent for most of the sample. This suggests that this specimen was not produced locally.

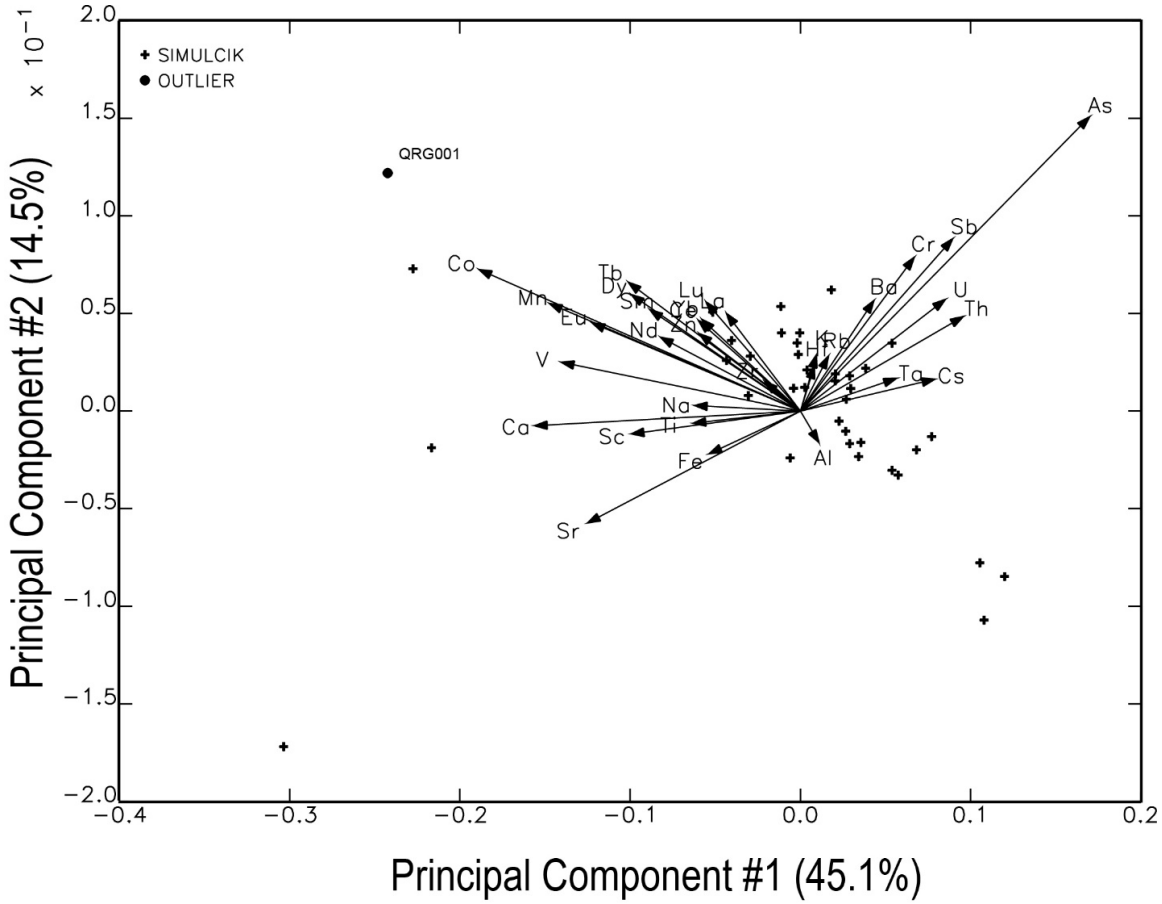

Figure 2. Biplot of the first two principal components calculated for the dataset (without QRG001) with labeled vectors demonstrating the loading of individual elements. The first two PCs capture 59.6% of the variation in the dataset.

Table 3. Elemental loadings for principal component axes 1-8 for the dataset based on the variance-covariance matrix. Values in bold explain the greatest amount of variation within each component. Over 90% of the cumulative variance in the dataset is explained by the first 8 PCs.

Variable	*Average*	*PC1*	*PC2*	*PC3*	*PC4*	*PC5*	*PC6*	*PC7*	*PC8*
Na	8298.7	-0.119	0.010	-0.069	-0.238	-0.102	-0.213	-0.102	0.054
Al	92751.2	0.021	-0.054	0.070	-0.048	0.029	0.068	-0.191	0.078
K	14361.3	0.018	0.098	-0.047	-0.173	0.019	-0.070	**0.423**	-0.11
Ca	7370.2	-0.299	-0.025	0.148	-0.095	0.185	0.248	0.343	**0.377**
Sc	9.4	-0.190	-0.039	-0.066	0.194	0.070	-0.104	-0.086	-0.12
Ti	3614.5	-0.121	-0.021	-0.019	0.174	0.066	-0.010	-0.175	0.056
V	63.7	-0.269	0.085	-0.110	0.236	-0.076	0.071	-0.059	-0.21
Cr	149.5	0.128	0.266	-0.164	**0.450**	0.268	-0.333	0.205	-0.28
Mn	435.8	-0.282	0.186	0.228	**-0.509**	**-0.193**	**-0.455**	-0.105	-0.14
Fe	32608.8	-0.103	-0.074	0.065	0.072	0.033	-0.027	-0.129	-0.08
Co	7.8	**-0.361**	0.245	0.367	0.016	-0.148	**0.333**	0.056	**-0.30**
Zn	97.9	-0.114	0.134	**0.647**	0.328	0.274	-0.214	-0.097	0.170
As	12.1	**0.325**	**0.510**	-0.083	-0.185	0.038	0.107	**-0.375**	-0.05
Rb	67.4	0.032	0.096	-0.027	-0.069	0.016	-0.071	0.261	-0.26
Sr	75.0	-0.239	**-0.194**	-0.162	-0.289	**0.739**	0.164	-0.245	-0.27
Zr	152.9	-0.040	0.052	-0.029	0.105	-0.074	-0.135	-0.132	0.218
Sb	1.5	0.171	0.298	0.198	0.002	0.051	0.209	-0.200	-0.05
Cs	4.8	0.152	0.056	0.154	-0.112	0.053	0.144	0.287	-0.29
Ba	867.3	0.083	0.192	-0.044	-0.169	0.328	-0.290	0.121	0.369
La	17.3	-0.083	0.169	-0.040	-0.004	0.084	0.011	0.139	0.123
Ce	33.2	-0.115	0.157	0.002	-0.045	0.107	-0.044	0.077	0.019
Nd	14.3	-0.157	0.128	-0.157	0.030	0.060	-0.088	0.106	0.048
Sm	3.1	-0.169	0.176	-0.137	0.000	-0.009	0.022	0.050	0.083
Eu	0.6	-0.234	0.153	-0.181	0.025	-0.044	0.030	0.069	0.055
Tb	0.4	-0.194	0.224	**-0.210**	0.027	-0.083	0.270	-0.014	0.214
Dy	2.8	-0.190	0.202	-0.174	0.045	-0.078	-0.053	-0.084	0.065
Yb	1.9	-0.111	0.159	-0.169	0.062	0.000	0.123	-0.066	0.040
Lu	0.3	-0.106	0.189	-0.154	0.053	0.002	-0.079	-0.075	-0.04
Hf	5.9	0.016	0.079	0.017	0.055	-0.030	0.007	-0.090	-0.00
Ta	1.0	0.108	0.057	0.024	0.018	0.064	0.191	-0.022	0.162
Th	10.9	0.183	0.164	0.093	-0.098	0.152	0.065	0.013	0.077
U	3.2	0.163	0.194	0.012	-0.047	0.024	0.181	0.201	0.030
% Variation		45.1	14.5	10.4	8.3	4.7	4.1	2.7	2.1
Cumulative %		45.1	59.6	70.0	78.4	83.1	87.2	89.9	92.0
Eigenvalues:		0.2730	0.0876	0.0630	0.0505	0.0287	0.0248	0.0162	0.012

1.1 Group Assignments

This figurine collection was split into five primary groups – Group A, Group A1, Group A2, Group B, and Group C – and unassigned specimens and outliers (Table 4). Individual specimen assignments are provided in Appendix A and in the digital excel file that accompanies this report. Appendix B provides summary statistics for each group and for the unassigned and outlier specimens.

Table 4. Specimen count by compositional group

GROUP	COUNT
GROUP A	6
GROUP A1	10
GROUP A2	7
GROUP B	4
GROUP C	3
UNASSIGNED	4
OUTLIERS	4
TOTAL	38

The groups were primarily created using principal component plots (Figure 3). PCA plots were initially helpful in identifying three additional outliers (QRG002, QRG024, QRG032, in addition to QRG001 discussed above) all with enriched levels of calcium, cobalt, calcium, and strontium and depleted levels of arsenic relative to the rest of the dataset (see specimens on the left portion of the plot in Figures 2-3; Appendix B:Table B.2). Removing problematic elements and projecting the figures onto the current groups did not produce any overlap, indicating that these outliers differ on numerous elements (e.g., calcium), not only those associated with contamination from drilling, suggesting they may differ from the remainder of the dataset in various ways. It is telling that the outliers include the only two specimens QRG001 and QRG032 that are coarse tempered in the sample. QRG024 also represents the only Preclassic period specimen from the dataset. These differences are discussed further below.

Once the additional outliers were identified, a new PCA was created for the remaining specimens (Figure 4; Table 5), to help increase the resolution of the variation within the remainder of the dataset. Given the small numbers of specimens in each group, this PCA was used to determine group membership probabilities for specimens into groups, which are provided in Appendix C. Euclidean distance searches, provided in Appendix D, were also used to test similarities among specimens by group relative to both internal groups and to other specimens in the database, as discussed in the following section.

Within the current dataset, Groups A, A1, and A2 are fairly similar to one another, and tend to overlap in multivariate space. They differ slightly in abundances of most elements, particularly REEs, but exist on a spectrum rather than demonstrating clear clusters, with Group A having the highest relative abundances, followed by A2 and then A1. Conversely, Group A1 is more enriched in uranium, thorium, and tantalum relative to the Group A2, which is enriched in these elements compared to Group A.

Group B and Group C each have distinct clusters on several principal component plots and rarely overlap with any other group, particularly Group C. Both groups B and C are depleted in most elements relative to the rest of the dataset, particularly meaningful are chromium, cobalt, and REEs (e.g., terbium, dysprosium; see Figure 5). On the other hand, both groups have slightly elevated averages of tantalum, cesium, and aluminum. Group C is depleted in cerium and vanadium relative to all other groups and contains two specimens (of eight total), that returned strontium levels below the limits of detection.

Four samples, representing only about 10% of the dataset, remain unassigned as they do not fit well within any of the other groups. Three of these specimens (QRG005, QRG033, QRG034), however, do seem to be related to the internal groups identified within the dataset and likely belong within these groups but fall either slightly outside the range of variation for some elements or are too similar to more than one group and cannot be confidently placed in one over the other. QRG014, however, is unique in its high levels of a subset of elements relative to the rest of the sample, particularly zinc, and in having returned calcium levels below the limits of detection. This specimen was visually identified as a possible modern fake. It is further discussed below.

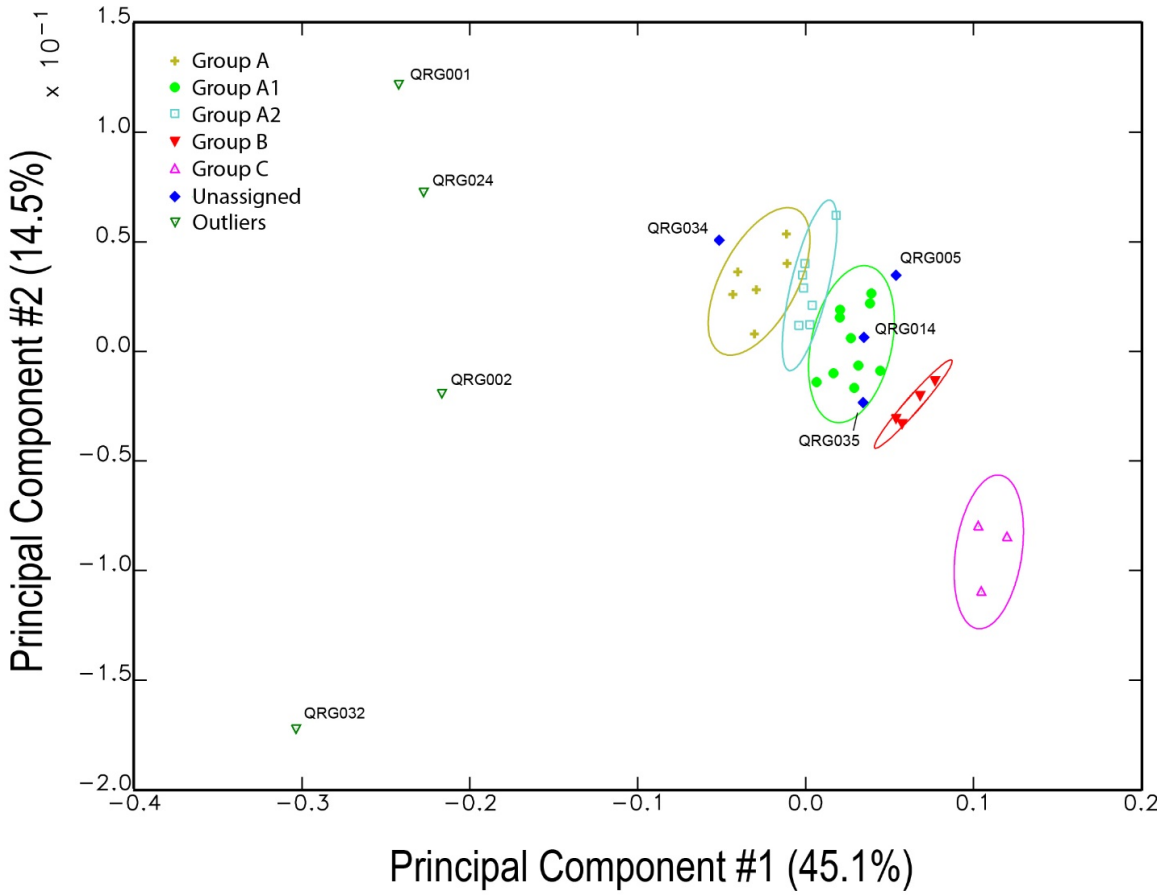

Figure 3. Scatterplot of the first two principal components calculated for the dataset (without QRG001) with internal groups plotted. Unassigned specimens and outliers are labeled individually. Ellipses represent 90% confidence interval of group membership.

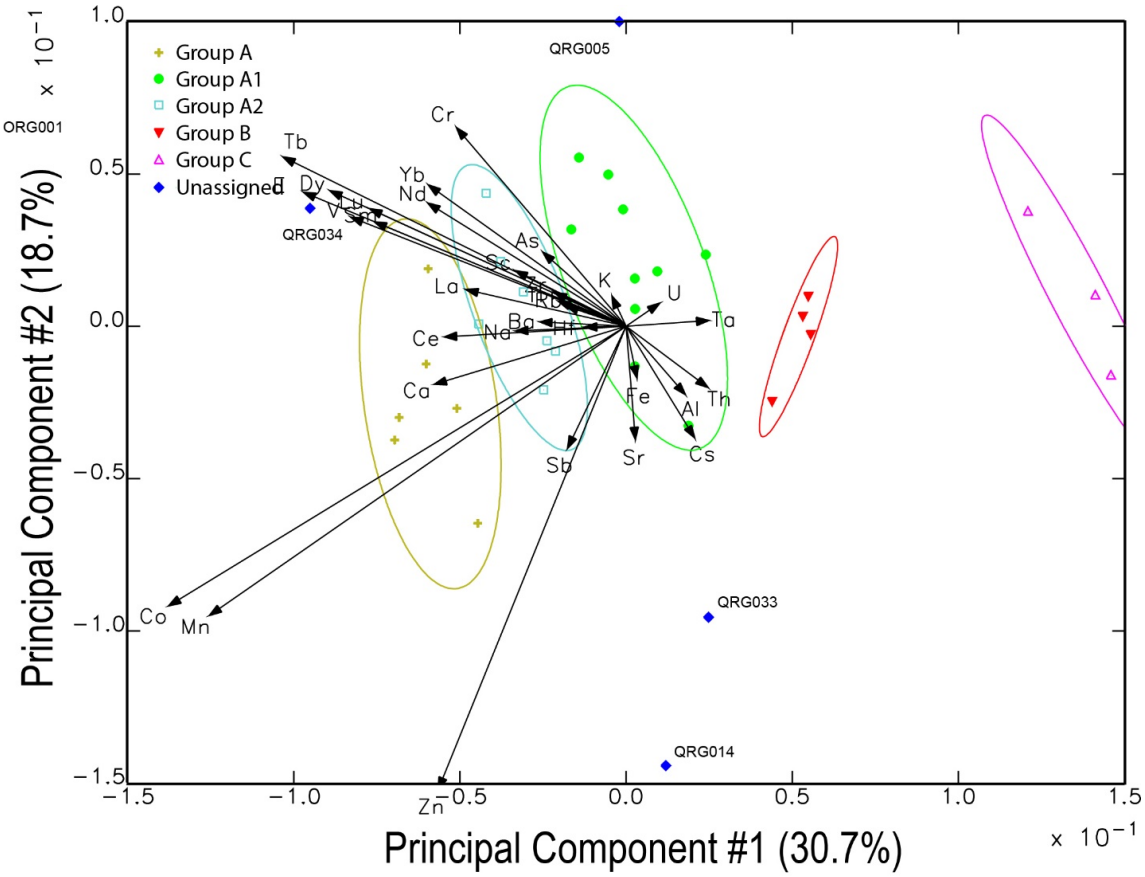

Figure 4. Biplot of the first two principal components calculated for the dataset without outliers, with labeled vectors demonstrating the loading of individual elements. The first two PCs capture 52.8% of the variation in the dataset. Unassigned specimens are labeled individually. Ellipses represent 90% confidence interval of group membership.

Table 5. Elemental loadings for principal component axes 1-9 for the dataset based on the variance-covariance matrix. Values in bold explain the greatest amount of variation within each component. Over 90% of the cumulative variance in the dataset is explained by the first 9 PCs.

Variable	*Average*	*PC1*	*PC2*	*PC3*	*PC4*	*PC5*	*PC6*	*PC7*	*PC8*	*PC9*
Na	8025.4	-0.100	-0.006	0.253	-0.075	-0.154	0.016	0.110	-0.148	**-0.322**
Al	93198.0	0.054	-0.087	0.029	0.059	0.129	-0.031	0.069	-0.012	0.021
K	14396.7	-0.013	0.039	0.163	-0.070	-0.195	0.174	-0.070	0.144	**-0.330**
Ca	6550.5	-0.174	-0.074	0.153	-0.141	0.260	0.103	-0.307	-0.178	-0.105
Sc	8.8	-0.101	0.071	-0.166	-0.177	-0.044	-0.187	0.137	0.021	0.011
Ti	3473.5	-0.062	0.032	-0.160	-0.067	0.083	-0.062	0.104	-0.101	0.181
V	58.7	-0.250	0.138	-0.197	0.036	-0.056	-0.235	0.202	**-0.362**	0.184
Cr	159.3	-0.154	**0.252**	-0.380	**-0.367**	0.004	0.066	0.188	**0.409**	-0.231
Mn	407.3	**-0.378**	-0.367	**0.432**	-0.092	**-0.400**	0.070	0.250	0.129	**0.348**
Fe	31340.2	0.010	-0.066	-0.090	-0.059	-0.040	-0.148	0.060	0.089	0.026
Co	7.0	**-0.415**	-0.355	-0.119	**0.357**	-0.007	-0.251	-0.197	**0.358**	**-0.320**
Zn	95.6	-0.170	**-0.588**	**-0.470**	-0.210	0.156	0.248	0.002	-0.111	0.125
As	13.7	-0.076	0.094	0.184	**0.314**	0.229	0.063	0.166	0.094	0.102
Rb	68.5	-0.055	0.026	0.060	-0.048	-0.171	0.016	0.021	-0.109	-0.215

Sr	*67.1*	*0.009*	*-0.144*	*0.351*	*-0.378*	***0.556***	***-0.491***	*0.201*	*0.077*	*-0.096*
Zr	151.5	-0.065	0.043	-0.078	-0.046	-0.028	0.068	-0.091	-0.064	-0.075
Sb	1.6	-0.053	-0.155	-0.066	0.292	0.204	0.059	0.224	**-0.408**	-0.272
Cs	5.0	0.062	-0.142	0.049	0.106	-0.033	-0.002	0.053	-0.158	-0.104
Ba	901.6	-0.078	0.005	0.178	**-0.345**	0.180	**0.410**	**-0.293**	-0.017	0.151
La	16.9	-0.145	0.047	0.015	-0.040	0.083	0.163	-0.001	-0.045	-0.180
Ce	32.2	-0.165	-0.013	0.037	-0.076	0.036	0.100	0.071	-0.070	-0.149
Nd	13.7	-0.180	0.156	0.008	-0.101	-0.025	0.207	**0.347**	-0.228	-0.260
Sm	3.0	-0.228	0.133	0.039	0.005	0.045	0.047	0.020	-0.012	-0.040
Eu	0.6	-0.293	0.170	0.032	-0.009	0.031	-0.047	-0.052	-0.036	0.089
Tb	0.4	-0.311	0.215	0.035	0.235	0.237	0.068	**-0.341**	-0.010	0.056
Dy	2.7	-0.269	0.172	0.006	0.009	-0.036	-0.007	0.067	-0.116	0.200
Yb	1.8	-0.179	0.180	-0.014	0.091	0.139	-0.019	0.025	0.152	0.093
Lu	0.3	-0.233	0.149	-0.006	-0.044	0.011	-0.070	0.006	0.065	0.092
Hf	5.9	-0.038	-0.001	-0.056	0.062	0.023	0.013	0.060	0.162	-0.019
Ta	1.0	**0.075**	0.008	-0.028	0.147	0.219	0.201	0.178	0.102	0.194
Th	11.5	**0.074**	-0.078	0.060	0.062	0.178	0.239	0.215	0.162	-0.071
U	3.3	0.031	0.030	0.035	0.194	0.142	0.308	**0.354**	0.253	0.038
% Variation		30.7	18.7	16.2	8.3	6.5	4.0	2.5	2.1	1.8
Cumulative %		30.7	49.4	65.6	73.9	80.4	84.5	87.0	89.1	90.9
Eigenvalues:		0.1103	0.0670	0.0582	0.0297	0.0233	0.0145	0.0090	0.0076	0.0065

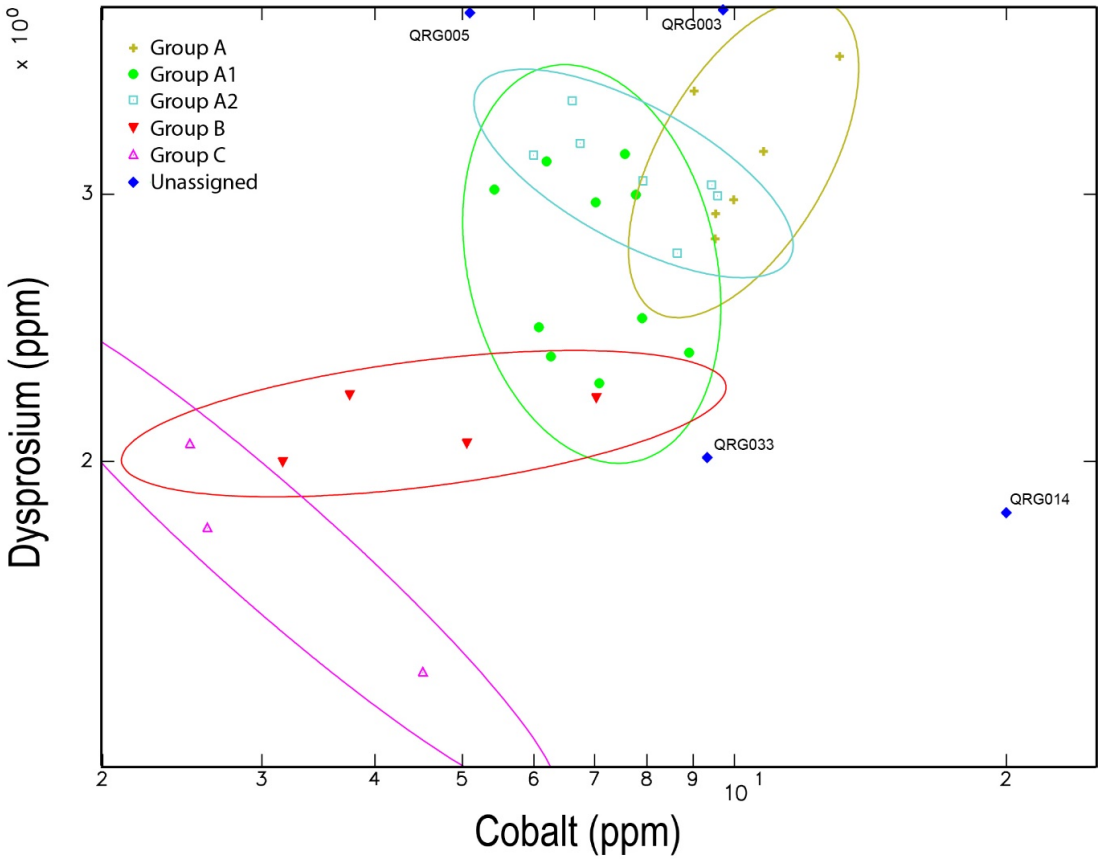

Figure 5. Bivariate plot of cobalt and dysprosium concentrations with the internal groups plotted. Unassigned specimens are labeled individually. Ellipses represent 90% confidence interval of group membership.

1 Comparative datasets

The chemical signatures of samples in this collection were compared to MURR's Mesoamerican database, which is made up of around 30,000 ceramic samples from across the region. Unfortunately, there are no existing samples from the site of Quirigua and little to no samples from the site's general vicinity with which to compare them. Accordingly, the criterion of abundance (Bishop et al.1982) was used to assess the likelihood of local production.

The five identified internal compositional groups (Group A, Group A1, Group A2, Group B, and Group C) are likely locally made. The signatures of these groups were found to be unlike others in the Mesoamerican database (Figure 6; Appendix D). Comparative datasets included the entirety of the database but focused on likely source zones – like Teotihuacan (Ashmore, 2015; Halperin, 2014; Looper: 1999, 2003) and the Ulua Valley (Hendon et al., 2014) – as well as other Mesoamerican figurine samples from MURR's database.

Using Euclidean distances (see Appendix D), all five groups matched closest to samples from their own group and the other groups in the collection. Unsurprisingly, Groups A, A1, and A2 tended to have closer matches to one another than any other group as their chemical compositions were fairly similar to one another (although distinct enough to justify three separate groups). Group B samples tended to match the closest to Group A1 samples. Group C only matched closely to itself, having a more unique chemical composition than the other locally made groups. Any other matches to the samples of Group C, whether local or foreign, were far too distant to suggest that they were actually imports.

The Unassigned group has a significant amount of internal variation, requiring analysis at the individual sample level. Using the Euclidean distances, QRG005 appears to be a locally made, albeit uniquely made, sample. Its closest matches were all to Group A1 specimens with the exception of one match to a specimen in group A2 and one to a sample from San Isidro (in Chiapas). However, all of these matches were too distant to indicate that QRG005 belongs in the same group as any of them.

QRG014 similarly matched closest to samples from Group A1 and Group B, along with samples from the sites of El Baul in the Pacific Coast Highlands and Nixtun-Chi'ich' by Lake Peten. As was the case with QRG005, all of these matches were too distant to indicate any real connection to this sample. QRG033 only matched to a variety of samples from the collection, including samples from Group A, Group A1, Group A2, and Group B, although all of these matches were also too distant and too varied to also belong to any of these samples. Finally, QRG034 had closer matches to samples from Group A and Group A2, as well as some samples from San Isidro in Chiapas. These matches were closer, though they were not close enough nor were they consistent enough to consider this sample to belong to any of these groups.

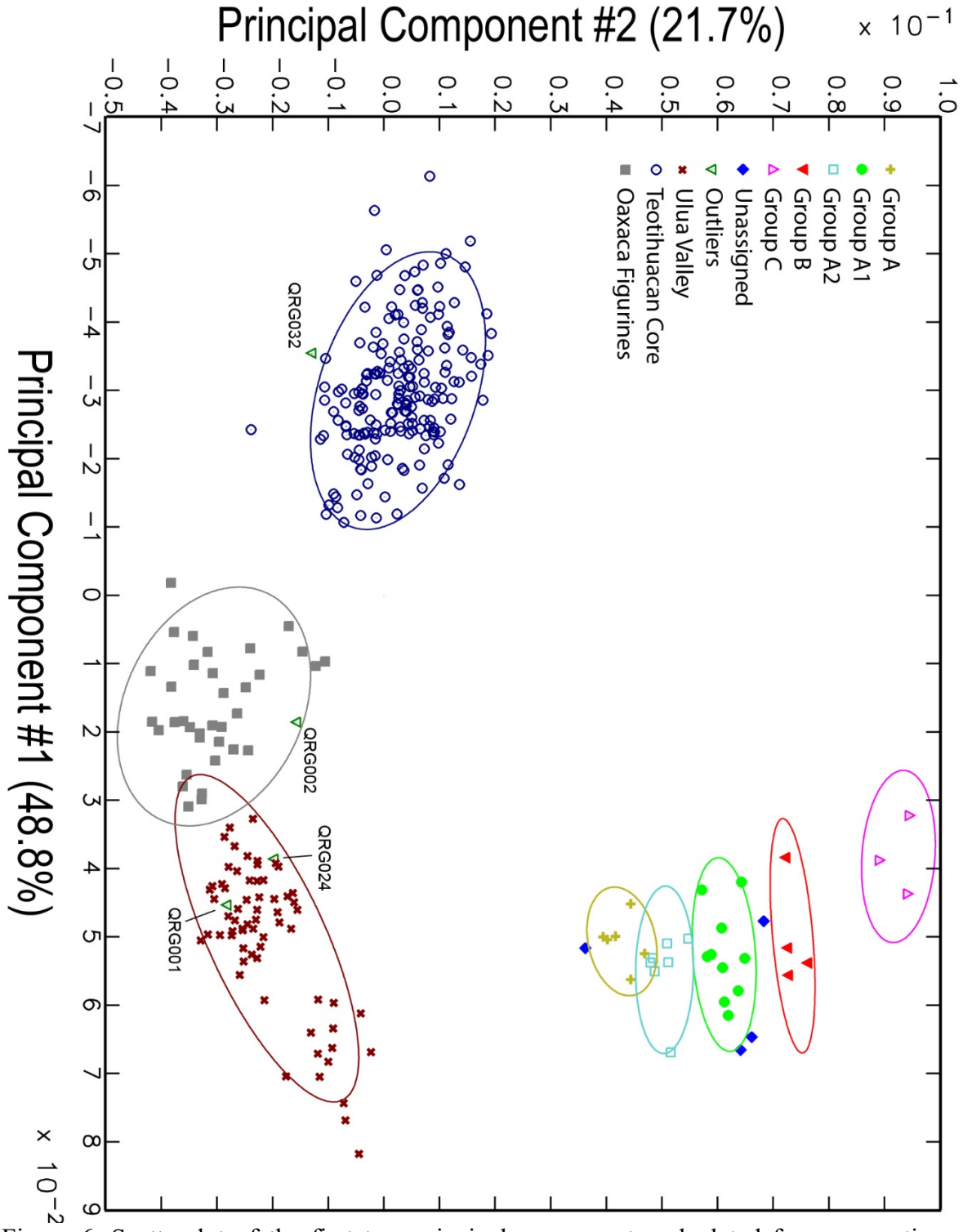

Figure 6. Scatterplot of the first two principal components calculated for comparative materials and current groups and unassigned specimens. Ellipses represent 90% confidence interval of group membership

The Outlier group shows an interesting mix of possibly imported material (see Figure 6 above; Table 6). QRG024 matches to none of the samples within the collection, but it does consistently match to samples from Honduras, primarily the Ulua Valley (Lopiparo 2003, 2004; Speakman and Glascock 2003) , which is a known production area for figurines. The two sites it most closely and consistently matches to are Las Canoas and Travesía, although the matches are not overly close to one another. QRG032 matches more frequently with samples from the Basin of Mexico.

QRG001 and QRG002 pose a difficult problem. They contain unusually high levels of chromium, cobalt, and vanadium, suggesting that these two samples were contaminated. However, some possible conclusions about their points of origin may be able to be made after removing these elements from consideration when comparing them to the MURR database.

QRG001 does not match to any of the local samples before and after removing the problematic elements, making it highly unlikely that it is a local sample. Before removing the elements, it was primarily matching to samples in the Tuxtla Mountains/Catemaco Valley (primarily the sites of Teotepec and La Joya), although they were very distant matches. After removing the problematic elements, QRG001 matched much closer to samples from Northern Veracruz, particularly the site of Pavon. QRG002, before the problematic elements were removed, matched somewhat closely to sites in Veracruz (San Lorenzo) and the Tuxtla Mountains (La Joya), Oaxaca (Etlatongo), and the Teotihuacan Valley (Altica). In multivariate space, it tends to plot closest to QRG024, suggesting a possible, but unlikely, connection with northern Honduras. In any case, the presence of coarse temper supports the likelihood that this specimen was produced outside of Quirigua, but a confident conclusion about the exact area QRG001 was from is difficult to ascertain.

After taking the contamination of QRG002 into consideration, this sample could also possibly be from Mexico. QRG002 matched fairly closely to samples from Veracruz - one from San Lorenzo and two from the Tuxtla Mountains - as well as two from Etlatongo in Oaxaca. Since its matches were primarily in either Southern Veracruz or Oaxaca, QRG002 was most likely from somewhere in Southern Mexico, probably in or near the highlands, but certainly outside of the Maya area. While the closest match for QRG002 - San Lorenzo - is an unlikely source for the figurine given that Quirigua was not founded as a Maya site until well after the abandonment of San Lorenzo, the other sites of Apomponapan and La Joya were occupied at the same time as Quirigua was and are likely candidates for where the figurine originated from. In multivariate space, QRG002 plots closely with other figurines from Oaxaca, which also points towards a nonlocal origin for this specimen.

Table 6. Outlier specimens, identifying features, and their relationships to comparative materials.

Outlier	Feature	Possible source zone	Notes
QRG001	Coarse temper	Unknown	Possibly contaminated
QRG002		Oaxaca	Possibly contaminated
QRG024	Preclassic period	Ulua Valley	
QRG032	Coarse temper, censer	Teotihuacan	

Several specimens from the local groups do match to a few samples from outside areas, most notably San Isidro in Chiapas, but, given that the majority of matches are from this collection and that many of the foreign samples that match recur throughout the sample, suggests that the foreign sample is actually the outlier and not the sample from Quirigua. While the similarities with these San Isidro samples could be due to similar paste/tempers being used, given that the matches are only with a select few San Isidro samples, this suggests that those may have actually been Motagua Valley exports.

1 Discussion

The majority of this collection are most likely locally made, given that they match closest and most often with each other rather than with samples from other locations. Since Groups A, A1, and A2 do overlap frequently, these three likely represent similar pottery production techniques, particularly sourcing their clay and tempers from similar geological areas. Group A1 may reflect similarities related to moldmade production, given the majority of specimens were made using that technique. Group A2, conversely, has a slightly higher than expected number of hand-modelled specimens for this group size.

Group B, which also overlaps on occasion with the A groups, probably shared some aspects of pottery production in comparison to the aforementioned groups. This could be the use of similar tempers or clays or possibly different production techniques but in a similar geographic area. Group C is more distinct from the other groups, but still related more closely to the current sample than to others from the database. Although it is too small a sample to make any definitive conclusions, two of the three specimens are ocarinas. In any case, the cause of the chemical variation remains unknown and would likely require petrographic analysis or other (not bulk) compositional analysis to determine if these are caused by differences in clays and/or tempers.

Table 7. Specimens in chemical groups by production technique and function.

Technique	*Function*	*A*	*A1*	*A2*	*B*	*C*	*Unas*	*Out*	*Total*
Hand-modelled		**2**	**3**	**4**	**1**	**1**	**1**	**3**	**15**
	Censer	1	2	1			1	2	7
	Ocarina	1			1				2
	Unknown Applique			2					2
	Unknown Hollow		1			1		1	3
	Unknown Solid			1					1
Moldmade		**3**	**7**	**4**	**3**	**2**	**1**	**1**	**21**
	Ocarina	1	4	3	1	2	1		12
	Rattle			1					1
	Unknown Hollow	2	2		2				6
	Unknown Solid		1					1	2
Both							**1**		**1**
	Ocarina						1		1
Total		5	10	8	4	3	3	4	37

The unassigned specimens are most likely also locally produced within the Motagua River Valley, since they do primarily match to the other samples from the collection. But, since the matches are too distant to be too meaningful, they still were being produced differently from the others. Unfortunately, given the small nature of the samples from the region, how unique these samples are in comparison to the other Quirigua groups cannot be determined. One unassigned specimen, QRG014, had already been determined by visual analysis to be a modern fake. Since it did match to other samples from the collection, it probably was produced somewhere in the area, but it was distinct enough to be excluded from the internal groups presented here and should not be considered in further analysis of the collection.

The outliers, unlike the other groups, are almost definitely imported from various regions. Quirigua's position on the Classic Period trade route connecting the Pacific Coast to the Lowlands increases the likelihood that imported objects would be found at an otherwise isolated site.
QRG024 appears to have been produced somewhere in (northern) Honduras. The iconographic elements of the figurine supports this claim, with a very unique form that matches figurines found in the area. Travesía is a likely source of this figurine, as it is one of the closest matches and it is a known production location for figurines matching the style of QRG024 (Hendon et al., 2014). Travesía also traded with Maya groups, particularly with inhabitants of the settlement of Copan (Halperin, 2014; Hendon et al., 2014), which had close connections to Quirigua (Ashmore: 1984, 2007, 2015; Ashmore and Sharer, 1978; Looper: 1999, 2003; Schortman and Ashmore, 2012). Similarly, QRG032 was most likely produced somewhere in the Basin of Mexico, possibly Teotihuacan or a Teotihuacan-affiliated site. Teotihuacan is also a known production center for Classic period figurines and had political and trade connections to Quirigua and Copan (Ashmore, 2015; Halperin, 2014; Looper: 1999, 2003).

1 Conclusions

This study confirms previous arguments that the majority of ceramics and other non-perishable goods found at Quirigua were locally made, even when mimicking the styles of foreign polities (Ashmore and Sharer, 1978; Looper, 2003). Additionally, it illustrates Quirigua's involvement in pan-Mesoamerican trade networks and its connections both to non-Maya groups to the south in Honduras and to the north in Mexico. The presence of several distinct local groups suggests a fairly active and widespread figurine production network. Further analysis of materials from the area can help to narrow down the range of this production area and provide clarity as to the nature of the ceramic workshops at the site and the surrounding region.

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Appendix C: Figurine Distribution Total (combining Sharer n.d. and Ashmore 2007 data)

	13	11	9	7	5	3	1	2	4	6
G						0			0	
E					3	9	3	0		
C			0	21	14	133	13	42	0	
A	0	0		0	2		37	0		0
B	0						29	0		
D							0	0		

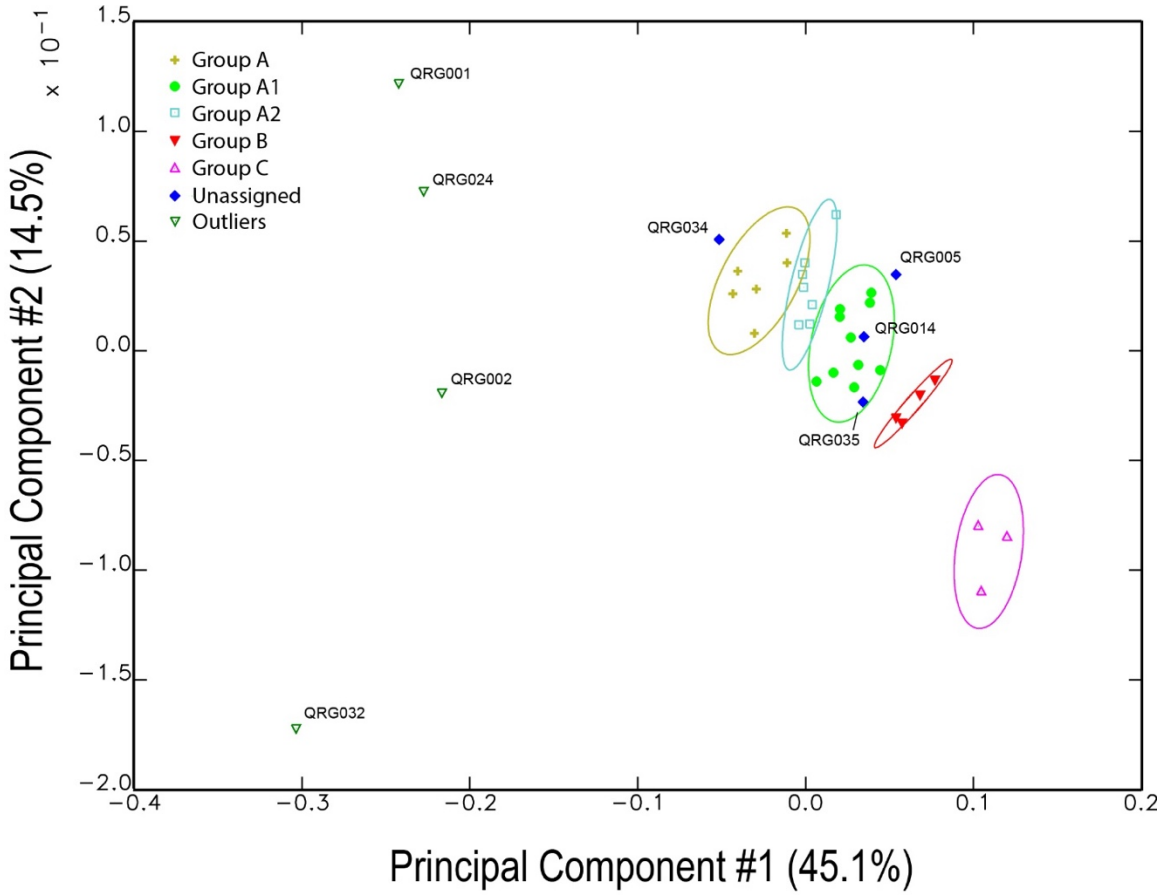
Appendix D: Elemental Loadings for PCAs 1-8

Elemental loadings for principal component axes 1-8 for the dataset based on the variance-covariance matrix. Over 90% of the cumulative variance in the dataset is explained by the first 8 PCs.

Variable	Average	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8
Na	8025.35006	-0.0999846	0.01629151	0.26134639	-0.1142223	-0.1161812	-0.0004536	0.08791902	-0.1627407
Al	93198.0084	0.05089104	-0.0876453	0.03326817	0.06131812	0.12489552	-0.0270822	0.07234484	-0.0175589
K	14396.7054	-0.0110999	0.05053569	0.17521985	-0.110561	-0.1474321	0.12717297	-0.063651	0.15077503
Ca	6604.38749	-0.1760551	-0.1118907	0.10413124	-0.102805	0.28043005	0.1520255	-0.3130909	-0.1605624
Sc	8.84910055	-0.0993477	0.06290717	-0.1922591	-0.1567158	-0.0533125	-0.1771166	0.13176951	0.01503532
Ti	3473.51112	-0.0615754	0.02324242	-0.179239	-0.0372718	0.05047658	-0.0350227	0.0957418	-0.1131981
V	58.7266973	-0.245586	0.13479761	-0.213908	0.06647734	-0.0861184	-0.21649	0.2043688	-0.3523169
Cr	159.253213	-0.1488546	0.22923772	-0.4388351	-0.3151509	-0.032741	0.0934361	0.17807428	0.4110267
Mn	407.286087	-0.3828745	-0.314622	0.4883388	-0.165927	-0.3573879	0.01984127	0.26795539	0.1344041
Fe	31340.184	0.00855924	-0.0711412	-0.0924672	-0.0469631	-0.0493499	-0.1398375	0.06046289	0.08849341
Co	7.01083432	-0.421464	-0.3427252	-0.0727854	0.37845421	-0.0534406	-0.2378058	-0.20275	0.35898947
Zn	95.6050521	-0.1836407	-0.60916	-0.455522	-0.1389269	0.06063685	0.28680267	0.0100083	-0.1054349
As	13.7454924	-0.0742019	0.10656165	0.19290547	0.30090871	0.23269924	0.05197689	0.18808481	0.1021154
Rb	68.5041061	-0.0530681	0.03322632	0.06649291	-0.0689647	-0.1459134	-0.0135111	0.03244889	-0.0951223
Sr	68.9973896	-0.0430222	-0.1492175	0.16411044	-0.3691232	0.64138496	-0.5039077	0.18864083	0.05113187
Zr	151.516531	-0.0640799	0.04118084	-0.0851213	-0.0326916	-0.0473828	0.08828411	-0.121652	-0.0889843
Sb	1.6182037	-0.0569455	-0.1578031	-0.0449918	0.31378016	0.16597409	0.07353018	0.22097775	-0.4093368
Cs	5.00718809	0.06000907	-0.1377468	0.07017756	0.10193029	-0.0418284	-0.0009254	0.05883704	-0.146012
Ba	901.554913	-0.0792101	0.01498972	0.1562575	-0.3652798	0.20279756	0.39895968	-0.2591235	-0.001911
La	16.9203402	-0.1447847	0.05118078	0.00634611	-0.0365072	0.07384478	0.17222311	-0.0086915	-0.0490738
Ce	32.2325497	-0.1654061	-0.0056693	0.03316677	-0.0802965	0.03667743	0.09565284	0.07268724	-0.0725963
Nd	13.6823782	-0.1761779	0.16213501	-0.0076805	-0.1030407	-0.0238141	0.20172997	0.34046868	-0.2292722
Sm	2.97476127	-0.2256673	0.14170068	0.02798597	0.00490926	0.0426898	0.05578833	0.00707392	-0.0214883
Eu	0.55044564	-0.2890764	0.18061656	0.01499373	-0.0076851	0.0301039	-0.0331833	-0.0698849	-0.0520172
Tb	0.37573808	-0.3067739	0.22401013	0.02409408	0.24707624	0.21532775	0.08844743	-0.3312224	0.0028258
Dy	2.67869137	-0.2643922	0.18128509	-0.0053399	0.00912149	-0.0378234	-0.0023682	0.05684411	-0.125154
Yb	1.82429228	-0.1763339	0.18091329	-0.0291648	0.09513529	0.14214241	-0.024938	0.03536792	0.151438
Lu	0.2874971	-0.229529	0.15576668	-0.0238243	-0.0413619	0.01105434	-0.0656956	-0.0013863	0.05373636
Hf	5.9014927	-0.0374345	-0.0022426	-0.0548612	0.07399735	0.00360635	0.02188315	0.05497224	0.15601859
Ta	1.01865322	0.07462745	0.0019214	-0.0272969	0.16397886	0.18810394	0.21648633	0.1822152	0.09983017
Th	11.5036824	0.07181386	-0.0778095	0.06726497	0.05868512	0.17392183	0.22909604	0.23029966	0.16585385
U	3.3420062	0.03120357	0.0302298	0.0459201	0.19330292	0.12887005	0.29586837	0.36382829	0.259018
%Variation									
%Variation Cum.									
Eigenvalues:		0.11040438	0.06783196	0.05380153	0.02892835	0.02446572	0.01492262	0.0090631	0.00757503

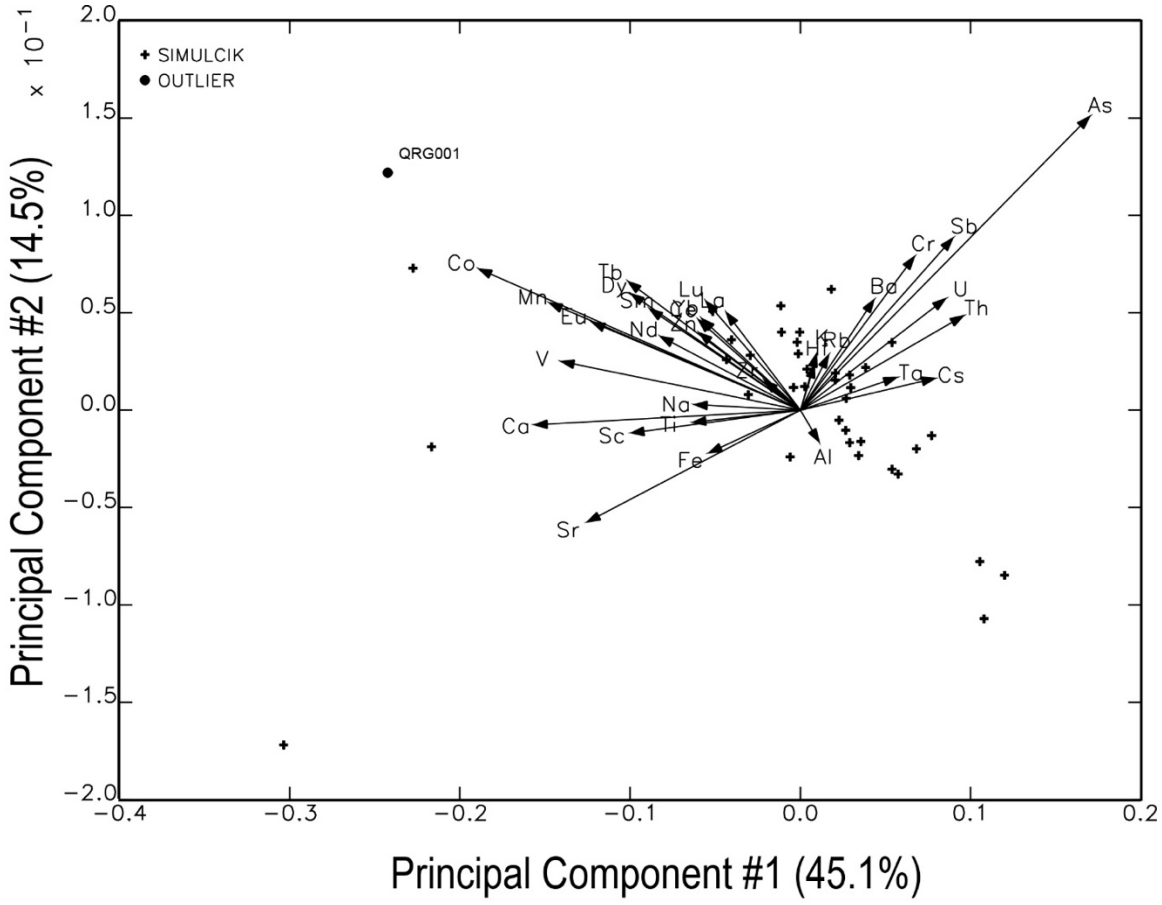
Appendix E: PCA Group Membership

Scatterplot of principal components 1 and 2 calculated (excluding QRG001) with the internal groups plotted (unassigned and outlier specimens are labeled individually). The ellipses represent 90% confidence interval of group membership.



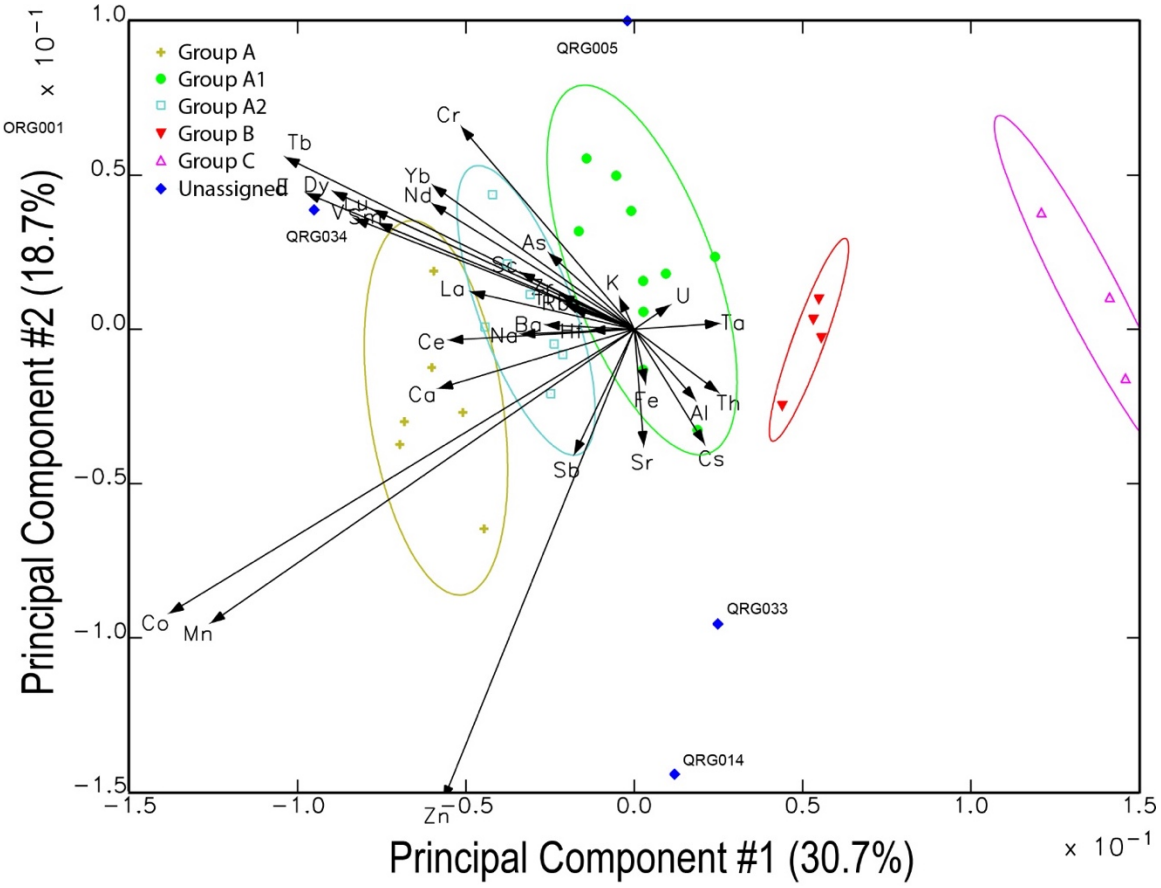
Appendix F: PCA Biplot with Elemental Loading Vectors

Biplot of principal components 1 and 2 calculated (excluding QRG001) with vectors of the individual element loadings. PCs 1 and 2 capture 59.6% of the dataset's variation.



Appendix G: PCA Biplot with Elemental Loading Vectors without Outliers

Biplot of the first two principal components calculated without outliers. Labeled vectors demonstrate the individual elemental loadings. The first two PCs capture 52.8% of the variation, unassigned specimen are labeled individually, and ellipses represent 90% confidence interval of group membership.



Appendix H: Mahalanobis Group Membership Probabilities of Groups A, A1, and A2

Group classification using Mahalanobis group membership based on PCs 1-4 for Groups A, A1, and A2. The first 4 PCs explain 73.3% of the variance. The best group is based on the highest membership probability (>0.001%).

Membership Probabilities (%): Group A
Probabilities calculated after removing each sample from group.

ANID	Group A	Group A1	Group A2	Best Group
QRG017	82.864	0.371	5.176	Group A
QRG019	85.634	0.54	6.974	Group A
QRG022	96.126	0.197	5.29	Group A
QRG035	85.54	0.112	2.047	Group A
QRG036	84.817	0.039	1.511	Group A
QRG038	85.506	0.146	3.856	Group A

Membership Probabilities (%): Group A1
Probabilities calculated after removing each sample from group.

ANID	Group A	Group A1	Group A2	Best Group
QRG003	4.764	72.991	7.216	Group A1
QRG007	3.696	74.761	2.473	Group A1
QRG009	3.215	54.458	0.89	Group A1
QRG010	4.664	88.835	4.886	Group A1
QRG011	13.394	42.866	6.16	Group A1
QRG012	15.661	73.021	5.678	Group A1
QRG021	7.726	58.808	1.598	Group A1
QRG023	8.339	99.231	4.001	Group A1
QRG027	23.933	75.911	12.113	Group A1
QRG031	17.722	78.471	3.542	Group A1

Membership Probabilities (%): Group A2				
Probabilities calculated after removing each sample from group.				
ANID	**Group A**	**Group A1**	**Group A2**	**Best Group**
QRG004	15.622	11.877	73.101	Group A2
QRG008	45.111	12.253	78.065	Group A2
QRG015	9.28	2.019	76.773	Group A2
QRG016	18.636	7.222	94.118	Group A2
QRG020	13.15	9.794	77.243	Group A2
QRG028	33.181	5.28	86.976	Group A2
QRG037	38.004	15.872	85.985	Group A2

Appendix I: Descriptive Statistics of Elemental Concentrations

Descriptive statistics of the different elemental concentrations for the NAA group, including the average, standard deviation, and %RSD for each group.

Appendix I.1: Descriptive Statistics for Elemental Concentrations of Groups A, A1, and A2

	Group A			Group A1			Group A2			All Samples		
	Average	SD	%RSD	Average	SD	%RSD	Average	SD	%RSD	Average	SD	%RSD
As	13.746	2.331	0.170	13.141	2.809	0.214	17.681	3.580	0.203	13.192	4.200	0.318
La	18.679	1.315	0.070	16.821	1.602	0.095	18.540	1.114	0.060	17.744	3.405	0.192
Lu	0.339	0.028	0.081	0.298	0.021	0.072	0.313	0.027	0.085	0.300	0.060	0.200
Nd	14.919	1.990	0.133	14.104	2.824	0.200	15.462	2.255	0.146	15.163	4.482	0.296
Sm	3.458	0.232	0.067	2.987	0.314	0.105	3.393	0.310	0.091	3.265	0.917	0.281
U	3.280	0.489	0.149	3.197	0.391	0.122	3.613	0.439	0.122	3.249	0.735	0.226
Yb	1.962	0.224	0.114	1.918	0.165	0.086	2.074	0.324	0.156	1.932	0.419	0.217
Ce	37.315	2.110	0.057	31.909	2.645	0.083	34.809	2.727	0.078	34.380	7.773	0.226
Co	10.313	1.345	0.130	7.021	0.996	0.142	7.844	1.326	0.169	12.544	22.297	1.777
Cr	185.472	68.743	0.371	195.289	57.930	0.297	135.057	21.328	0.158	192.359	201.371	1.047
Cs	5.006	0.388	0.077	4.737	0.605	0.128	5.203	0.555	0.107	4.910	1.000	0.204
Eu	0.670	0.054	0.080	0.558	0.082	0.146	0.654	0.081	0.123	0.635	0.238	0.375
Fe	32112.500	2181.077	0.068	31933.800	3148.892	0.099	30274.857	4509.539	0.149	34036.421	8571.386	0.252
Hf	5.964	0.368	0.062	6.129	0.412	0.067	5.822	0.648	0.111	5.863	0.599	0.102
Ni	102.532	43.689	0.426	96.993	41.540	0.428	100.624	46.516	0.462	89.114	50.285	0.564
Rb	73.598	8.585	0.117	70.218	4.016	0.057	69.558	7.266	0.104	68.799	10.309	0.150
Sb	1.569	0.114	0.072	1.585	0.419	0.264	1.822	0.331	0.182	1.581	0.465	0.294
Sc	9.981	1.420	0.142	9.641	1.820	0.189	8.537	0.709	0.083	9.930	3.395	0.342
Sr	86.969	12.010	0.138	29.399	32.498	1.105	81.694	19.922	0.244	69.549	54.585	0.785
Ta	0.924	0.097	0.105	0.989	0.135	0.137	1.043	0.104	0.100	1.006	0.180	0.179
Tb	0.403	0.077	0.191	0.399	0.050	0.126	0.502	0.088	0.175	0.433	0.167	0.385
Th	11.218	1.673	0.149	11.101	1.564	0.141	11.773	0.958	0.081	11.067	2.416	0.218
Zn	139.566	57.176	0.410	93.071	22.524	0.242	84.612	17.457	0.206	112.962	87.098	0.771
Zr	146.825	21.757	0.148	169.487	27.300	0.161	152.486	11.670	0.077	155.033	26.459	0.171
Al	91005.167	7021.995	0.077	89127.900	8680.091	0.097	94354.857	5343.899	0.057	92913.132	10346.274	0.111
Ba	1033.918	206.474	0.200	905.580	222.698	0.246	972.773	118.057	0.121	892.478	259.738	0.291
Ca	8176.967	1081.797	0.132	6174.320	975.912	0.158	7698.043	1136.610	0.148	8807.624	7536.667	0.856
Dy	3.182	0.324	0.102	2.721	0.353	0.130	3.102	0.206	0.066	2.968	0.990	0.334
K	14828.167	2113.217	0.143	15004.300	2247.756	0.150	14276.571	1802.662	0.126	14806.734	2985.606	0.202
Mn	724.435	256.058	0.353	335.141	97.893	0.292	510.066	60.644	0.119	505.732	275.634	0.545
Na	9268.050	1096.773	0.118	7407.860	1125.231	0.152	9265.443	1004.535	0.108	8513.500	2188.470	0.257
Ti	3656.417	525.465	0.144	3631.740	379.171	0.104	3443.214	276.275	0.080	3708.305	811.380	0.219
V	70.151	10.986	0.157	62.340	12.484	0.200	64.009	6.896	0.108	83.426	95.111	1.140

Appendix I.2: Descriptive Statistics for Elemental Concentrations of Groups B and C

	Group B			Group C			All Samples		
	Average	SD	%RSD	Average	SD	%RSD	Average	SD	%RSD
As	12.935	1.916	0.148	12.572	0.476	0.038	13.192	4.200	0.318
La	16.631	2.606	0.157	12.866	0.336	0.026	17.744	3.405	0.192
Lu	0.241	0.018	0.074	0.196	0.037	0.190	0.300	0.060	0.200
Nd	13.098	1.717	0.131	10.180	2.155	0.212	15.163	4.482	0.296
Sm	2.549	0.147	0.058	2.092	0.211	0.101	3.265	0.917	0.281
U	3.462	0.418	0.121	3.454	0.569	0.165	3.249	0.735	0.226
Yb	1.518	0.172	0.114	1.364	0.182	0.133	1.932	0.419	0.217
Ce	31.631	3.294	0.104	23.174	0.038	0.002	34.380	7.773	0.226
Co	4.749	1.484	0.313	3.209	0.928	0.289	12.544	22.297	1.777
Cr	157.625	39.607	0.251	111.357	32.623	0.293	192.359	201.371	1.047
Cs	5.355	0.636	0.119	5.611	0.393	0.070	4.910	1.000	0.204
Eu	0.415	0.020	0.048	0.369	0.056	0.151	0.635	0.238	0.375
Fe	30806.250	3248.268	0.105	32226.333	2989.236	0.093	34036.421	8571.386	0.252
Hf	5.870	0.719	0.123	5.261	0.402	0.076	5.863	0.599	0.102
Ni	87.362	34.554	0.396	37.732	26.961	0.715	89.114	50.285	0.564
Rb	67.807	7.811	0.115	62.062	4.883	0.079	68.799	10.309	0.150
Sb	1.596	0.234	0.146	1.382	0.110	0.080	1.581	0.465	0.294
Sc	7.902	0.587	0.074	7.444	0.910	0.122	9.930	3.395	0.342
Sr	70.189	28.733	0.409	29.512	41.737	1.414	69.549	54.585	0.785
Ta	1.082	0.118	0.109	1.130	0.140	0.124	1.006	0.180	0.179
Tb	0.295	0.007	0.023	0.207	0.038	0.182	0.433	0.167	0.385
Th	13.082	1.556	0.119	12.478	1.332	0.107	11.067	2.416	0.218
Zn	96.720	16.714	0.173	53.296	11.611	0.218	112.962	87.098	0.771
Zr	136.645	16.113	0.118	135.910	23.204	0.171	155.033	26.459	0.171
Al	99040.250	6505.403	0.066	104476.667	5031.675	0.048	92913.132	10346.274	0.111
Ba	1079.495	386.767	0.358	749.847	23.063	0.031	892.478	259.738	0.291
Ca	6154.350	1571.710	0.255	5121.400	855.048	0.167	8807.624	7536.667	0.856
Dy	2.120	0.093	0.044	1.771	0.247	0.139	2.968	0.990	0.334
K	15326.000	2763.731	0.180	14006.000	2346.061	0.168	14806.734	2985.606	0.202
Mn	346.863	83.382	0.240	221.973	23.042	0.104	505.732	275.634	0.545
Na	7794.600	1867.981	0.240	7611.867	937.625	0.123	8513.500	2188.470	0.257
Ti	3224.875	502.417	0.156	3131.333	644.331	0.206	3708.305	811.380	0.219
V	56.310	15.547	0.276	35.339	5.112	0.145	83.426	95.111	1.140

Appendix I.3: Descriptive Statistics for Elemental Concentrations of Unassigned Group

	Unassigned							All Samples		
	AVG	SD	%RSD	QRG005	QRG014	QRG033	QRG034	Average	SD	%RSD
As	12.939	2.342	0.181	16.700	10.405	11.769	12.881	13.192	4.200	0.318
La	16.460	2.716	0.165	16.285	16.459	12.710	20.386	17.744	3.405	0.192
Lu	0.305	0.093	0.303	0.374	0.201	0.229	0.418	0.300	0.060	0.200
Nd	13.588	3.684	0.271	14.006	9.632	11.345	19.371	15.163	4.482	0.296
Sm	3.048	0.872	0.286	3.471	2.351	2.103	4.266	3.265	0.917	0.281
U	3.550	1.056	0.297	4.948	4.091	2.988	2.174	3.249	0.735	0.226
Yb	1.894	0.513	0.271	2.435	1.428	1.338	2.376	1.932	0.419	0.217
Ce	31.268	4.686	0.150	26.598	30.030	29.371	39.071	34.380	7.773	0.226
Co	11.027	5.475	0.497	5.095	19.977	9.328	9.708	12.544	22.297	1.777
Cr	190.773	67.485	0.354	262.510	133.510	113.940	253.130	192.359	201.371	1.047
Cs	4.980	1.250	0.251	3.642	6.088	6.363	3.829	4.910	1.000	0.204
Eu	0.590	0.214	0.362	0.682	0.391	0.392	0.898	0.635	0.238	0.375
Fe	32110.500	3554.966	0.111	26268.0	35872.0	32925.0	33377.0	34036.421	8571.386	0.252
Hf	6.110	0.294	0.048	6.373	6.387	5.675	6.006	5.863	0.599	0.102
Ni	117.848	53.802	0.457	93.01	48.43	135.81	194.14	89.114	50.285	0.564
Rb	64.274	11.337	0.176	55.32	51.48	79.25	71.05	68.799	10.309	0.150
Sb	1.965	0.654	0.333	1.382	3.075	1.688	1.716	1.581	0.465	0.294
Sc	8.789	1.195	0.136	9.304	7.771	7.578	10.505	9.930	3.395	0.342
Sr	38.824	26.809	0.691	27.75	0.00	63.60	63.95	69.549	54.585	0.785
Ta	1.143	0.257	0.225	1.507	1.261	0.937	0.869	1.006	0.180	0.179
Tb	0.420	0.171	0.408	0.574	0.281	0.220	0.604	0.433	0.167	0.385
Th	11.189	2.204	0.197	10.543	14.408	11.535	8.269	11.067	2.416	0.218
Zn	216.472	211.532	0.977	64.40	580.13	135.43	85.93	112.962	87.098	0.771
Zr	155.213	24.907	0.160	153.13	160.86	118.51	188.35	155.033	26.459	0.171
Al	94482.250	15009.785	0.159	75512.0	116990.0	96485.0	88942.0	92913.132	10346.274	0.111
Ba	735.420	140.143	0.191	675.0	557.3	768.9	940.5	892.478	259.738	0.291
Ca	4496.450	2852.602	0.634	4658.8	0.0	5456.7	7870.3	8807.624	7536.667	0.856
Dy	2.945	1.016	0.345	3.949	1.850	2.012	3.968	2.968	0.990	0.334
K	13364.500	2280.599	0.171	12310.0	10559.0	16773.0	13816.0	14806.734	2985.606	0.202
Mn	539.710	336.331	0.623	216.3	310.1	1082.9	549.6	505.732	275.634	0.545
Na	7361.925	1668.873	0.227	5911.4	5501.4	9233.6	8801.3	8513.500	2188.470	0.257
Ti	3653.575	421.207	0.115	4172.1	3623.4	3009.0	3809.8	3708.305	811.380	0.219
V	61.236	20.465	0.334	77.8	47.5	35.2	84.4	83.426	95.111	1.140

Appendix I.4: Descriptive Statistics for Elemental Concentrations of Outliers

	Outliers							All Samples		
	AVG	SD	%RSD	QRG001	QRG002	QRG024	QRG032	Average	SD	%RSD
As	5.612	3.787	0.675	8.743	2.928	9.876	0.901	13.192	4.200	0.318
La	23.308	5.335	0.229	23.886	25.015	29.514	14.818	17.744	3.405	0.192
Lu	0.355	0.061	0.171	0.315	0.329	0.460	0.317	0.300	0.060	0.200
Nd	25.028	3.218	0.129	26.103	23.754	29.521	20.732	15.163	4.482	0.296
Sm	5.264	0.903	0.171	4.922	5.201	6.702	4.230	3.265	0.917	0.281
U	2.026	0.691	0.341	2.190	2.836	2.153	0.926	3.249	0.735	0.226
Yb	2.550	0.385	0.151	2.281	2.460	3.203	2.255	1.932	0.419	0.217
Ce	49.672	10.728	0.216	51.937	51.319	62.629	32.801	34.380	7.773	0.226
Co	54.237	50.679	0.934	141.590	30.953	27.117	17.289	12.544	22.297	1.777
Cr	392.719	547.524	1.394	1340.500	89.627	94.484	46.264	192.359	201.371	1.047
Cs	3.645	1.754	0.481	5.255	5.527	2.093	1.705	4.910	1.000	0.204
Eu	1.203	0.022	0.018	1.193	1.229	1.217	1.172	0.635	0.238	0.375
Fe	55275.250	8551.471	0.155	66413.0	42474.0	57373.0	54841.0	34036.421	8571.386	0.252
Hf	5.316	0.638	0.120	5.181	4.981	6.383	4.718	5.863	0.599	0.102
Ni	40.703	44.525	1.094	0.00	55.88	106.93	0.00	89.114	50.285	0.564
Rb	67.292	20.834	0.310	92.48	81.56	55.30	39.82	68.799	10.309	0.150
Sb	0.919	0.374	0.406	1.224	0.852	1.266	0.335	1.581	0.465	0.294
Sc	18.051	3.522	0.195	14.376	14.809	20.593	22.426	9.930	3.395	0.342
Sr	182.655	38.413	0.210	141.10	207.49	149.67	232.36	69.549	54.585	0.785
Ta	0.802	0.184	0.230	1.043	0.877	0.751	0.538	1.006	0.180	0.179
Tb	0.760	0.142	0.187	0.997	0.627	0.742	0.674	0.433	0.167	0.385
Th	6.328	2.126	0.336	6.574	7.178	8.668	2.891	11.067	2.416	0.218
Zn	129.875	30.782	0.237	121.19	114.66	181.81	101.84	112.962	87.098	0.771
Zr	168.223	30.967	0.184	154.66	127.92	212.14	178.17	155.033	26.459	0.171
Al	86346.250	12764.702	0.148	78655.0	72493.0	87937.0	106300.0	92913.132	10346.274	0.111
Ba	584.058	174.197	0.298	552.7	583.3	845.0	355.3	892.478	259.738	0.291
Ca	28007.750	9127.451	0.326	40247.0	32230.0	15896.0	23658.0	8807.624	7536.667	0.856
Dy	4.801	1.425	0.297	3.782	4.053	7.260	4.110	2.968	0.990	0.334
K	16731.975	5774.262	0.345	21097.0	22468.0	15580.0	7782.9	14806.734	2985.606	0.202
Mn	934.280	196.411	0.210	844.7	687.3	1222.3	982.8	505.732	275.634	0.545
Na	11376.575	3883.685	0.341	7325.7	7672.6	14995.0	15513.0	8513.500	2188.470	0.257
Ti	5412.350	953.637	0.176	4412.7	4529.0	6147.4	6560.3	3708.305	811.380	0.219
V	275.403	201.219	0.731	623.6	145.4	168.3	164.3	83.426	95.111	1.140

Appendix J: Figurine Distribution by Structure

Appendix J.1: Figurine distribution by structure – Grid 2C

Data derived from Ashmore 2007 and Sharer n.d.

Grid 2C	
Structures	*Figurines*
Str. 2C-1	**20**
Str. 2C-2	0
Str. 2C-3	**21**
Str. 2C-4	0
Str. 2C-5	0
Str. 2C-6	0
Pvmt. 2C-1	0
Pvmt. 2C-2	0
Mdn. 2C-1	0
Mdn. 2C-2	0
D.F. 2C-1	0
D.F. 2C-2	0
D.F. 2C-3	0

Appendix J.2: Figurine distribution by structure – Grid 3C

Data derived from Ashmore 2007 and Sharer n.d.

Grid 3C	
Structures	*Figurines*
Str. 3C-1	3
Str. 3C-2	0
Pvmt. 3C-2	1
Str. 3C-4	0
Str. 3C-5	**34**
Str. 3C-6	0
D.F. 3C-1	0
Str. 3C-7	5
Str. 3C-12	1
Str. 3C-9	0
Str. 3C-10	0
Str. 3C-27	0
Str. 3C-28	0
Str. 3C-29	0
Str. 3C-20	0
Str. 3C-21	0
Str. 3C-22	0
Str. 3C-13	0
Str. 3C-14/Pl. 3C-1	6
Str. 3C-17	0
Str. 3C-18	0
Pl. 3C-2	0
Str. 3C-15	0
Str. 3C-16	2
Str. 3C-11	**34**
Pvmt. 3C-4	0
Well 3C-1	6
Str. 3C-32	1
Str. 3C-33	0
Str. 3C-34	0
D.F. 3C-4	0
Str. 3C-26	0
Pvmt. 3C-5	0
D.F. 3C-3	0

Str. 3C-8	0
Str. 3C-31	1
Str. 3C-3	0
Str. 3C-19	0
Str. 3C-23	0
Str. 3C-24	3
Str. 3C-25	0
Str. 3C-30	0
Str. 3C-35	0
Str. 3C-36	0
Str. 3C-37	0
Pvmt. 3C-1	0
Pvmt. 3C-3	0
Mdn. 3C-1	13
Mdn. 3C-2	0
Mdn. 3C-3	1
Mdn. 3C-4	0
Mdn. 3C-5	15
Mdn. 3C-6	0
D.F. 3C-2	0
D.F. 3C-5	0
D.F. 3C-6	0

Appendix K: Euclidian Distances for Figurine Collection

Appendix K.1: Group A Euclidean Distances

Group A Comparative Euclidean Distances

Results are based on the following variables:
Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce
Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG017

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG017	Motagua River Valley	Quirigua	0	A
QRG016	Motagua River Valley	Quirigua	0.0151	A2
QRG008	Motagua River Valley	Quirigua	0.0157	A2
QRG031	Motagua River Valley	Quirigua	0.0158	A1
SLN0797	Mazatan	San Isidro	0.0159	MURR Data
QRG037	Motagua River Valley	Quirigua	0.016	A2
QRG028	Motagua River Valley	Quirigua	0.0166	A2
QRG023	Motagua River Valley	Quirigua	0.0168	A1
QRG034	Motagua River Valley	Quirigua	0.0169	Unassigned
SLN0810	Mazatan	San Isidro	0.0173	MURR Data

QRG019

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG019	Motagua River Valley	Quirigua	0	A
QRG037	Motagua River Valley	Quirigua	0.0131	A2
QRG015	Motagua River Valley	Quirigua	0.0143	A2
QRG016	Motagua River Valley	Quirigua	0.0158	A2
QRG008	Motagua River Valley	Quirigua	0.0163	A2
QRG035	Motagua River Valley	Quirigua	0.0166	A
QRG028	Motagua River Valley	Quirigua	0.0187	A2
QRG020	Motagua River Valley	Quirigua	0.0189	A2
QRG003	Motagua River Valley	Quirigua	0.0189	A1
QRG004	Motagua River Valley	Quirigua	0.019	A2

QRG022

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG022	Motagua River Valley	Quirigua	0	A
QRG036	Motagua River Valley	Quirigua	0.014	A
QRG037	Motagua River Valley	Quirigua	0.014	A2
QRG020	Motagua River Valley	Quirigua	0.0151	A2
QRG038	Motagua River Valley	Quirigua	0.0161	A
QRG028	Motagua River Valley	Quirigua	0.0164	A2
QRG011	Motagua River Valley	Quirigua	0.0165	A1
QRG004	Motagua River Valley	Quirigua	0.0184	A2

QRG026	Motagua River Valley	Quirigua	0.0186	B
QRG016	Motagua River Valley	Quirigua	0.0191	A2

QRG035

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG035	Motagua River Valley	Quirigua	0	A
QRG037	Motagua River Valley	Quirigua	0.0156	A2
QRG019	Motagua River Valley	Quirigua	0.0166	A
QRG038	Motagua River Valley	Quirigua	0.0191	A
QRG016	Motagua River Valley	Quirigua	0.0191	A2
QRG020	Motagua River Valley	Quirigua	0.0196	A2
QRG028	Motagua River Valley	Quirigua	0.02	A2
QRG017	Motagua River Valley	Quirigua	0.0202	A
QRG022	Motagua River Valley	Quirigua	0.0204	A
QRG003	Motagua River Valley	Quirigua	0.0205	A1

QRG036

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG036	Motagua River Valley	Quirigua	0	A
QRG022	Motagua River Valley	Quirigua	0.014	A
QRG038	Motagua River Valley	Quirigua	0.0152	A
QRG028	Motagua River Valley	Quirigua	0.0174	A2
QRG034	Motagua River Valley	Quirigua	0.0189	Unassigned
QRG017	Motagua River Valley	Quirigua	0.0191	A
QRG020	Motagua River Valley	Quirigua	0.0196	A2
QRG037	Motagua River Valley	Quirigua	0.0198	A2
QRG023	Motagua River Valley	Quirigua	0.0211	A1
DCC228	Soconusco	Canton Corallito	0.0216	MURR Data

QRG038

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG038	Motagua River Valley	Quirigua	0	A
QRG036	Motagua River Valley	Quirigua	0.0152	A
QRG022	Motagua River Valley	Quirigua	0.0161	A
QRG028	Motagua River Valley	Quirigua	0.0168	A2
QRG037	Motagua River Valley	Quirigua	0.0174	A2
QRG017	Motagua River Valley	Quirigua	0.0188	A
QRG035	Motagua River Valley	Quirigua	0.0191	A
QRG011	Motagua River Valley	Quirigua	0.0194	A1
QRG033	Motagua River Valley	Quirigua	0.0202	Unassigned
QRG020	Motagua River Valley	Quirigua	0.0203	A2

Appendix K.2: Group A1 Euclidean Distances

Group A1 Comparative Euclidean Distances

Results are based on the following variables:

Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG003

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG003	Motagua River Valley	Quirigua	0	A1
QRG010	Motagua River Valley	Quirigua	0.011	A1
QRG020	Motagua River Valley	Quirigua	0.0126	A2
QRG016	Motagua River Valley	Quirigua	0.0131	A2
QRG018	Motagua River Valley	Quirigua	0.0132	B
QRG023	Motagua River Valley	Quirigua	0.0148	A1
QRG037	Motagua River Valley	Quirigua	0.0149	A2
QRG011	Motagua River Valley	Quirigua	0.0156	A1
QRG028	Motagua River Valley	Quirigua	0.0165	A2
QRG015	Motagua River Valley	Quirigua	0.0166	A2

QRG007

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG007	Motagua River Valley	Quirigua	0	A1
QRG010	Motagua River Valley	Quirigua	0.0136	A1
QRG012	Motagua River Valley	Quirigua	0.0155	A1
QRG016	Motagua River Valley	Quirigua	0.0163	A2
QRG003	Motagua River Valley	Quirigua	0.0172	A1
QRG020	Motagua River Valley	Quirigua	0.0178	A2
QRG004	Motagua River Valley	Quirigua	0.0185	A2
QRG015	Motagua River Valley	Quirigua	0.0187	A2
QRG023	Motagua River Valley	Quirigua	0.0187	A1
SLN0786	Mazatan	San Isidro	0.0188	MURR Data

QRG009

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG009	Motagua River Valley	Quirigua	0	A1
QRG021	Motagua River Valley	Quirigua	0.0144	A1
QRG023	Motagua River Valley	Quirigua	0.0157	A1
SLN0787	Mazatan	San Isidro	0.0171	MURR Data
QRG010	Motagua River Valley	Quirigua	0.0174	A1

QRG025	Motagua River Valley	Quirigua	0.0175	B
QRG031	Motagua River Valley	Quirigua	0.0181	A1
QRG003	Motagua River Valley	Quirigua	0.0192	A1
QRG007	Motagua River Valley	Quirigua	0.0193	A1
QRG006	Motagua River Valley	Quirigua	0.0196	B

QRG010

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG010	Motagua River Valley	Quirigua	0	A1
QRG0003	Motagua River Valley	Quirigua	0.011	A1
QRG016	Motagua River Valley	Quirigua	0.0129	A2
QRG020	Motagua River Valley	Quirigua	0.0133	A2
QRG007	Motagua River Valley	Quirigua	0.0136	A1
QRG004	Motagua River Valley	Quirigua	0.0163	A2
QRG037	Motagua River Valley	Quirigua	0.0164	A2
QRG023	Motagua River Valley	Quirigua	0.0164	A1
QRG025	Motagua River Valley	Quirigua	0.0167	B
QRG009	Motagua River Valley	Quirigua	0.0174	A1

QRG011

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG011	Motagua River Valley	Quirigua	0	A1
QRG026	Motagua River Valley	Quirigua	0.0146	B
QRG003	Motagua River Valley	Quirigua	0.0156	A1
QRG022	Motagua River Valley	Quirigua	0.0165	A
QRG037	Motagua River Valley	Quirigua	0.0171	A2
QRG018	Motagua River Valley	Quirigua	0.0178	B
QRG023	Motagua River Valley	Quirigua	0.018	A1
QRG020	Motagua River Valley	Quirigua	0.0184	A2
QRG028	Motagua River Valley	Quirigua	0.0185	A2
QRG038	Motagua River Valley	Quirigua	0.0194	A

QRG012

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG012	Motagua River Valley	Quirigua	0	A1
QRG031	Motagua River Valley	Quirigua	0.0152	A1
QRG007	Motagua River Valley	Quirigua	0.0155	A1
QRG027	Motagua River Valley	Quirigua	0.0158	A1
SLN0794	Mazatan	San Isidro	0.0159	MURR Data

QRG023	Motagua River Valley	Quirigua	0.016	A1
QRG016	Motagua River Valley	Quirigua	0.0163	A2
SLN0801	Mazatan	San Isidro	0.0165	MURR Data
SLN0806	Mazatan	San Isidro	0.0168	MURR Data
SLN0826	Mazatan	San Isidro	0.0169	MURR Data

QRG021

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG021	Motagua River Valley	Quirigua	0	A1
QRG023	Motagua River Valley	Quirigua	0.0118	A1
QRG009	Motagua River Valley	Quirigua	0.0144	A1
QRG031	Motagua River Valley	Quirigua	0.015	A1
QRG025	Motagua River Valley	Quirigua	0.0179	B
QRG010	Motagua River Valley	Quirigua	0.0189	A1
QRG003	Motagua River Valley	Quirigua	0.0194	A1
QRG006	Motagua River Valley	Quirigua	0.0194	B
QRG017	Motagua River Valley	Quirigua	0.0209	A
SLN0826	Mazatan	San Isidro	0.021	MURR Data

QRG023

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG023	Motagua River Valley	Quirigua	0	A1
QRG031	Motagua River Valley	Quirigua	0.0116	A1
QRG021	Motagua River Valley	Quirigua	0.0118	A1
QRG003	Motagua River Valley	Quirigua	0.0148	A1
QRG009	Motagua River Valley	Quirigua	0.0157	A1
QRG012	Motagua River Valley	Quirigua	0.016	A1
QRG010	Motagua River Valley	Quirigua	0.0164	A1
QRG017	Motagua River Valley	Quirigua	0.0168	A
QRG027	Motagua River Valley	Quirigua	0.0172	A1
QRG020	Motagua River Valley	Quirigua	0.0178	A2

QRG027

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG027	Motagua River Valley	Quirigua	0	A1
QRG012	Motagua River Valley	Quirigua	0.0158	A1
QRG023	Motagua River Valley	Quirigua	0.0172	A1
QRG031	Motagua River Valley	Quirigua	0.018	A1

QRG003	Motagua River Valley	Quirigua	0.0202	A1
AMO208	Three Rivers Region (Northwestern Belize)	Rio Bravo Conservation Area	0.0203	MURR Data
QRG037	Motagua River Valley	Quirigua	0.0204	A2
SLN0801	Mazatan	San Isidro	0.0204	MURR Data
QRG027	Motagua River Valley	Quirigua	0.0205	A2
QRG020	Motagua River Valley	Quirigua	0.0206	A2

QRG031

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG031	Motagua River Valley	Quirigua	0	A1
QRG023	Motagua River Valley	Quirigua	0.0116	A1
QRG021	Motagua River Valley	Quirigua	0.015	A1
QRG012	Motagua River Valley	Quirigua	0.0152	A1
QRG017	Motagua River Valley	Quirigua	0.0158	A
QRG027	Motagua River Valley	Quirigua	0.018	A1
SLN0786	Mazatan	San Isidro	0.018	MURR Data
QRG009	Motagua River Valley	Quirigua	0.0181	A1
SLN0789	Mazatan	San Isidro	0.0183	MURR Data
SLN0862	Mazatan	San Isidro	0.0191	MURR Data

Appendix K.3: Group A2 Euclidean Distances

Group A2 Comparative Euclidean Distances

Results are based on the following variables:
Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce
Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG004

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG004	Motagua River Valley	Quirigua	0	A2
QRG008	Motagua River Valley	Quirigua	0.0113	A2
QRG016	Motagua River Valley	Quirigua	0.0123	A2
QRG020	Motagua River Valley	Quirigua	0.0146	A2
QRG010	Motagua River Valley	Quirigua	0.0163	A1
QRG003	Motagua River Valley	Quirigua	0.0179	A1
QRG015	Motagua River Valley	Quirigua	0.0181	A2
QRG037	Motagua River Valley	Quirigua	0.0184	A2
QRG022	Motagua River Valley	Quirigua	0.0184	A
QRG007	Motagua River Valley	Quirigua	0.0185	A1

QRG008

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG008	Motagua River Valley	Quirigua	0	A2
QRG016	Motagua River Valley	Quirigua	0.0109	A2
QRG004	Motagua River Valley	Quirigua	0.0113	A2
QRG017	Motagua River Valley	Quirigua	0.0157	A
QRG019	Motagua River Valley	Quirigua	0.0163	A
QRG037	Motagua River Valley	Quirigua	0.0168	A2
QRG015	Motagua River Valley	Quirigua	0.0168	A2
QRG020	Motagua River Valley	Quirigua	0.0177	A2
QRG010	Motagua River Valley	Quirigua	0.0182	A1
QRG003	Motagua River Valley	Quirigua	0.0184	A1

QRG015

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG015	Motagua River Valley	Quirigua	0	A2
QRG019	Motagua River Valley	Quirigua	0.0143	A
QRG016	Motagua River Valley	Quirigua	0.0153	A2
QRG003	Motagua River Valley	Quirigua	0.0166	A1
QRG008	Motagua River Valley	Quirigua	0.0168	A2
SLN0790	Mazatan	San Isidro	0.0172	MURR Data
QRG037	Motagua River Valley	Quirigua	0.0176	A2
QRG020	Motagua River Valley	Quirigua	0.018	A2
QRG012	Motagua River Valley	Quirigua	0.0181	A1
QRG004	Motagua River Valley	Quirigua	0.0181	A2

QRG016

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG016	Motagua River Valley	Quirigua	0	A2
QRG008	Motagua River Valley	Quirigua	0.0109	A2
QRG004	Motagua River Valley	Quirigua	0.0123	A2

QRG010	Motagua River Valley	Quirigua	0.0129	A1
QRG020	Motagua River Valley	Quirigua	0.0131	A2
QRG003	Motagua River Valley	Quirigua	0.0131	A1
QRG037	Motagua River Valley	Quirigua	0.0138	A2
QRG017	Motagua River Valley	Quirigua	0.0151	A
QRG015	Motagua River Valley	Quirigua	0.0153	A2
QRG019	Motagua River Valley	Quirigua	0.0158	A2

QRG020

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG020	Motagua River Valley	Quirigua	0	A2
QRG003	Motagua River Valley	Quirigua	0.0126	A1
QRG016	Motagua River Valley	Quirigua	0.0131	A2
QRG010	Motagua River Valley	Quirigua	0.0133	A1
QRG004	Motagua River Valley	Quirigua	0.0146	A2
QRG037	Motagua River Valley	Quirigua	0.0148	A2
QRG022	Motagua River Valley	Quirigua	0.0151	A
QRG028	Motagua River Valley	Quirigua	0.0153	A2
QRG017	Motagua River Valley	Quirigua	0.0175	A
QRG008	Motagua River Valley	Quirigua	0.0177	A2

QRG028

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG028	Motagua River Valley	Quirigua	0	A2
QRG037	Motagua River Valley	Quirigua	0.0145	A2
QRG020	Motagua River Valley	Quirigua	0.0153	A2
QRG022	Motagua River Valley	Quirigua	0.0164	A
QRG003	Motagua River Valley	Quirigua	0.0165	A1
QRG017	Motagua River Valley	Quirigua	0.0166	A
QRG038	Motagua River Valley	Quirigua	0.0168	A
QRG036	Motagua River Valley	Quirigua	0.0174	A
QRG010	Motagua River Valley	Quirigua	0.0181	A1
QRG015	Motagua River Valley	Quirigua	0.0184	A2

QRG037

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG037	Motagua River Valley	Quirigua	0	A2
QRG019	Motagua River Valley	Quirigua	0.0131	A
QRG016	Motagua River Valley	Quirigua	0.0138	A2
QRG022	Motagua River Valley	Quirigua	0.014	A
QRG028	Motagua River Valley	Quirigua	0.0145	A2
QRG020	Motagua River Valley	Quirigua	0.0148	A2
QRG003	Motagua River Valley	Quirigua	0.0149	A1
QRG035	Motagua River Valley	Quirigua	0.0156	A
QRG017	Motagua River Valley	Quirigua	0.016	A
QRG010	Motagua River Valley	Quirigua	0.0164	A1

Appendix K.4: Group B Euclidian Distances

Group B Comparative Euclidean Distances

Results are based on the following variables:

Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG006

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG006	Motagua River Valley	Quirigua	0	B
QRG003	Motagua River Valley	Quirigua	0.018	A1
QRG021	Motagua River Valley	Quirigua	0.0194	A1
QRG009	Motagua River Valley	Quirigua	0.0196	A1
QRG023	Motagua River Valley	Quirigua	0.0201	A1
QRG033	Motagua River Valley	Quirigua	0.0211	Unassigned
SLN0800	Mazatan	San Isidro	0.0217	MURR Data
QRG018	Motagua River Valley	Quirigua	0.022	B
QRG010	Motagua River Valley	Quirigua	0.0234	A1
QRG025	Motagua River Valley	Quirigua	0.0236	B

QRG018

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG018	Motagua River Valley	Quirigua	0	B
QRG003	Motagua River Valley	Quirigua	0.0132	A1
QRG011	Motagua River Valley	Quirigua	0.0178	A1
QRG010	Motagua River Valley	Quirigua	0.0178	A1
QRG012	Motagua River Valley	Quirigua	0.0187	A1
QRG029	Motagua River Valley	Quirigua	0.0193	C
QRG015	Motagua River Valley	Quirigua	0.0193	A2
QRG037	Motagua River Valley	Quirigua	0.0194	A2
QRG016	Motagua River Valley	Quirigua	0.0197	A2
QRG023	Motagua River Valley	Quirigua	0.0202	A1

QRG025

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG025	Motagua River Valley	Quirigua	0	B
QRG010	Motagua River Valley	Quirigua	0.0167	A1

QRG026	Motagua River Valley	Quirigua	0.0174	B
QRG009	Motagua River Valley	Quirigua	0.0175	A1
QRG021	Motagua River Valley	Quirigua	0.0179	A1
QRG003	Motagua River Valley	Quirigua	0.0194	A1
QRG023	Motagua River Valley	Quirigua	0.0201	A1
QRG011	Motagua River Valley	Quirigua	0.0205	A1
QRG030	Motagua River Valley	Quirigua	0.0207	C
QRG007	Motagua River Valley	Quirigua	0.021	A1

QRG026

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG026	Motagua River Valley	Quirigua	0	B
QRG011	Motagua River Valley	Quirigua	0.0146	A1
SLN0823	Mazatan	San Isidro	0.0167	MURR Data
QRG025	Motagua River Valley	Quirigua	0.0174	B
QRG037	Motagua River Valley	Quirigua	0.0181	A2
QRG022	Motagua River Valley	Quirigua	0.0186	A
SLN0785	Mazatan	San Isidro	0.0187	MURR Data
QRG020	Motagua River Valley	Quirigua	0.0198	A2
QRG003	Motagua River Valley	Quirigua	0.0206	A1
QRG018	Motagua River Valley	Quirigua	0.0207	B

Appendix K.5: Group C Euclidean Distances

Group C Comparative Euclidean Distances

Results are based on the following variables:

Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG013

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG013	Motagua River Valley	Quirigua	0	C
QRG030	Motagua River Valley	Quirigua	0.0185	C
QRG029	Motagua River Valley	Quirigua	0.019	C
SLN0804	Mazatan	San Isidro	0.0238	MURR Data
CPT036	Western Zone	Zunil	0.0246	MURR Data
QRG018	Motagua River Valley	Quirigua	0.0248	B
HTN187	Peten	Holtun	0.027	MURR Data
QRG026	Motagua River Valley	Quirigua	0.0271	B
QRG006	Motagua River Valley	Quirigua	0.0274	B
KSP038	Lake Peten Itza Shore	Nixtun-Ch'ich'	0.0278	MURR Data

QRG029

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG029	Motagua River Valley	Quirigua	0	C
QRG030	Motagua River Valley	Quirigua	0.0174	C
QRG013	Motagua River Valley	Quirigua	0.019	C
QRG018	Motagua River Valley	Quirigua	0.0193	B
SLN0804	Mazatan	San Isidro	0.0205	MURR Data
QRG003	Motagua River Valley	Quirigua	0.0206	A1
QRG025	Motagua River Valley	Quirigua	0.0217	B
QRG023	Motagua River Valley	Quirigua	0.0227	A1
SLN0806	Mazatan	San Isidro	0.0229	MURR Data
QRG010	Motagua River Valley	Quirigua	0.0232	A1

QRG030

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG030	Motagua River Valley	Quirigua	0	C
QRG029	Motagua River Valley	Quirigua	0.0174	C
QRG013	Motagua River Valley	Quirigua	0.0185	C
QRG025	Motagua River Valley	Quirigua	0.0207	B

CPE036	Southeast Guatemala	Cantarrana	0.0249	MURR Data
QRG026	Motagua River Valley	Quirigua	0.025	B
QRG009	Motagua River Valley	Quirigua	0.025	A1
QRG018	Motagua River Valley	Quirigua	0.0251	B
QRG006	Motagua River Valley	Quirigua	0.0252	B
QRG003	Motagua River Valley	Quirigua	0.0262	A1

Appendix K.6: Unassigned Euclidian Distances

Unassigned Comparative Euclidean Distances

Results are based on the following variables:

Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG005

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG005	Motagua River Valley	Quirigua	0	Unassigned
QRG007	Motagua River Valley	Quirigua	0.0204	A1
QRG012	Motagua River Valley	Quirigua	0.0211	A1
QRG023	Motagua River Valley	Quirigua	0.0227	A1
QRG009	Motagua River Valley	Quirigua	0.0237	A1
QRG031	Motagua River Valley	Quirigua	0.0242	A1
QRG010	Motagua River Valley	Quirigua	0.0251	A1
SLN0801	Mazatan	San Isidro	0.0254	MURR Data
QRG016	Motagua River Valley	Quirigua	0.0257	A2
QRG003	Motagua River Valley	Quirigua	0.0263	A1

QRG014

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG014	Motagua River Valley	Quirigua	0	Unassigned
QRG021	Motagua River Valley	Quirigua	0.0313	A1
QRG006	Motagua River Valley	Quirigua	0.0315	B
QRG025	Motagua River Valley	Quirigua	0.0315	B
CPA1496	Motagua River Valley	Quirigua	0.0321	MURR Data
QRG009	Motagua River Valley	Quirigua	0.0331	A1
PMR090	Motagua River Valley	Quirigua	0.0337	MURR Data
MMM271	Motagua River Valley	Quirigua	0.0352	MURR Data
QRG033	Motagua River Valley	Quirigua	0.0352	Unassigned
QRG010	Motagua River Valley	Quirigua	0.0352	A1

QRG033

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG033	Motagua River Valley	Quirigua	0	Unassigned
QRG038	Motagua River Valley	Quirigua	0.0202	A

QRG006	Motagua River Valley	Quirigua	0.0211	B
QRG003	Motagua River Valley	Quirigua	0.0215	A1
QRG011	Motagua River Valley	Quirigua	0.0222	A1
QRG018	Motagua River Valley	Quirigua	0.0223	B
QRG028	Motagua River Valley	Quirigua	0.0244	A2
QRG035	Motagua River Valley	Quirigua	0.0247	A
QRG037	Motagua River Valley	Quirigua	0.0247	A2
QRG020	Motagua River Valley	Quirigua	0.026	A2

QRG034

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG034	Motagua River Valley	Quirigua	0	Unassigned
QRG017	Motagua River Valley	Quirigua	0.0169	A
SLN0818	Mazatan	San Isidro	0.0172	MURR Data
QRG016	Motagua River Valley	Quirigua	0.0175	A2
QRG008	Motagua River Valley	Quirigua	0.0186	A2
SLN0812	Mazatan	San Isidro	0.0188	MURR Data
QRG036	Motagua River Valley	Quirigua	0.0189	A
QRG031	Motagua River Valley	Quirigua	0.0194	A1
QRG020	Motagua River Valley	Quirigua	0.0196	A2
QRG028	Motagua River Valley	Quirigua	0.0196	A2

Appendix K.7: Outlier Euclidean Distances

Outlier Comparative Euclidean Distances

Results are based on the following variables:
Na Al K Ca Sc Ti Mn Fe Zn As Rb Sr Zr Sb Cs Ba La Ce
Nd Sm Eu Tb Dy Yb Lu Hf Ta Th U

QRG001

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG001	Motagua River Valley	Quirigua	0	Outliers
FPN009	Panuco	Pavon	0.0161	MURR Data
ERI348	Panuco	Pavon	0.0171	MURR Data
UVH005	Maya Highlands	CR035	0.0174	MURR Data
SLN0385	San Lorenzo Region	San Lorenzo	0.018	MURR Data
FPN016	Panuco	Pavon	0.0185	MURR Data
ERI351	Panuco	Pavon	0.0188	MURR Data
ERI345	Panuco	Pavon	0.0189	MURR Data
ERI353	Panuco	Pavon	0.0189	MURR Data
ERI346	Panuco	Pavon	0.019	MURR Data

QRG002

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG002	Motagua River Valley	Quirigua	0	Outliers
SLN0360	San Lorenzo Region	San Lorenzo	0.0108	MURR Data
PK224	Tuxtla Mountains	Apomponapan	0.0134	MURR Data
PJA133	Tuxtla Mountains/Catemaco Valley	La Joya	0.0137	MURR Data
BLM072	Mixteca Alta	Etlatongo	0.0152	MURR Data
SLN0271	Oaxaca and Pacific Coast	Etlatongo	0.0157	MURR Data
AZC1459	Texcoco	-	0.0158	MURR Data
FPN005	Panuco	Pavon	0.0161	MURR Data
GLC024	Basin of Mexico	Teotihuacan	0.0162	MURR Data

MLV064	Tuxtla Mountains	Matacanela	0.0162	MURR Data

QRG024

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG024	Motagua River Valley	Quirigua	0	Outliers
ESP398	Honduras	Las Canoas	0.0216	MURR Data
UVH022	Maya Highlands	CR080	0.0218	MURR Data
UVH068	Maya Highlands	CR132	0.0222	MURR Data
UVH011	Maya Highlands	CR069	0.0223	MURR Data
ESP325	Honduras	Las Canoas	0.0224	MURR Data
ESP081	Honduras	La Sierra	0.0224	MURR Data
ESP406	Honduras	Las Canoas	0.0226	MURR Data
ESP099	Honduras	La Sierra	0.0228	MURR Data
UVH067	Maya Highlands	CR132	0.0229	MURR Data

QRG032

ANID	*Region*	*Site*	*Distance*	*Chem Group*
QRG032	Motagua River Valley	Quirigua	0	Outliers
CPA1439	Lower Acome River	Manatial	0.0208	MURR Data
AZC0659	Texcoco Region	Cerro Portezuelo	0.0209	MURR Data
AZC0870	Texcoco Region	Cerro Portezuelo	0.0209	MURR Data
AZC1184	Texcoco Region	-	0.0213	MURR Data
AZC0662	Texcoco Region	Cerro Portezuelo	0.0215	MURR Data
CPG376	Texcoco Region	Cerro Portezuelo	0.022	MURR Data
CPG458	Teotihucan Valley	-	0.0222	MURR Data
YSH022	Yautepec Valley	Itzamatitlan	0.0224	MURR Data
TGC001	Mexico	-	0.0226	MURR Data

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Biography

Eva Simulcik is a graduate student at Tulane University, receiving their Master of Arts. They also received their Bachelor of Arts degree at Tulane University, graduating summa cum laude with honors and receiving the Rober Wauchope Award for Excellence in Anthropology. They have been awarded the Tulane CELT summer research grant as well as the Kenneth J. Opat grant twice. Eva's research has focused primarily on the Maya region during the Preclassic and Classic periods and usually involves questions that are at the intersection of cosmology, identity, and social structure. They are also interested in the archaeology of gender and the application of queer and indigenous theory to better study gender queer expressions in the archaeological record.