CERAMIC INNOVATION AND INTERREGIONAL INTERACTION: A STUDY FROM FORMATIVE CAHAL PECH, BELIZE

A Thesis

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ABSTRACT

This thesis presents the results of the ceramic analysis of a sample of ceramics from the site of Cahal Pech, Belize, in an attempt to study the transition between the Cunil Ceramic complex and the Early Facet Jenney Creek/ Kanluk ceramic complex. The Cunil ceramics (1100-900 B.C.) are the earliest known ceramic complex discovered at Cahal Pech. This complex is immediately followed by the Early Facet Jenney Creek/Kanluk ceramic complex (c.a. 900-600 B.C.). Cunil ceramics served as mediums to display motifs considered to be Olmec-style or following a pan-Mesoamerican style (Brown 2007; Awe 1992; Cheetham 1998). These motifs held symbolic and ideological meaning, and the ceramics bearing these decorations were meant to be displayed while serving food or drink (Brown 2007:9). The use of these pan-Mesoamerican concepts decreases significantly after the Cunil phase (Brown 2007: 9,) at a time when social differentiation starts to emerge in the Maya Lowlands and it can first be identified in the archaeological record (Healy et al. 2004; Brown 2007). This decrease in the occurrence of Cunil symbols also coincides with the emergence of the Early Facet Jenney Creek/ Kanluk Complex. These ceramics differ from the Cunil ceramics in decoration, surface treatment, materials used for their manufacture, and form.

The presence of Olmec style motifs in Cahal Pech, without a doubt, indicates that the people of this site were involved in some type of regional interaction. The emergence of the Olmec civilization towards 1250 B.C. marks the first known development of a large-scale chiefdom or state polity in Mesoamerica (Cheetham

1998). Archaeological excavations at San Lorenzo, the seat of the Olmec civilization, produced information pointing to the existence of sustained trade networks with other regions of Mesoamerica. Findings of Olmec style motifs and ceramics also lend support to theories claiming the existence of extensive networks of exchange and interaction within the Maya region.

During the transition from Cunil to Jenney Creek/Kanluk, not only did the residents of Cahal Pech cease to use Olmec motifs on serving vessels, but also the ceramics used at Cahal Pech changed significantly. Some ceramic groups maintained some continuity, but new, previously unknown groups emerged. Transformation in the ceramics produced by the inhabitants of Cahal Pech can inform the social changes that occurred during the transition between these two ceramic complexes from Cahal Pech, Cunil and Early Facet Jenney Creek/Kanluk. The query this project pursues addresses the influence of internal means for change in ceramic production, and well as the effect that Cahal Pech's involvement in a regional network had on its ceramic assemblage. Some questions this project addresses when examining the ceramic sample presented include: What local factors may have contributed to the development of new ceramic groups? Did new ceramic decoration and production techniques did in effect develop at Cahal Pech, or were such innovations introduced from neighboring areas? How do changes in the ceramics of Cahal Pech reflect social changes? The possibility that foreign ceramics were introduced to the Belize Valley raises the question of where these materials came from and who was involved in regional and long distance interaction with Cahal Pech, since the wide distribution of Olmec style materials suggests that people sustained trade and exchange networks over

considerable distances. After detailing the findings from analysis of the ceramic sample, I consider how this ceramic sample points to the combination of internal and external catalysts for change in the production reflects in this ceramic sample. Engaging these issues might help to determine the role that Cahal Pech played at a local level, and furthermore on a regional level.

BIOGRAPHICAL SKETCH

Isabelle M. Martínez-Muñiz began her undergraduate studies in 2005 at the University of Puerto Rico, Río Piedras Campus. Her fields of study were Biology and Anthropology. During this time she completed archaeological fieldwork in Caguas, Puerto Rico at a 19th century sugar can plantation. Upon graduating from this the University of Puerto Rico in 2010, she began to pursue a Master's degree in Archaeology. In order to complete this degree, she traveled to Belize to conduct the fieldwork necessary to gather the data presented in this project.

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INTRODUCTION

This thesis presents the results of the ceramic analysis of a sample of ceramics from the site of Cahal Pech, Belize, in an attempt to study the transition between the Cunil Ceramic complex and the Early Facet Jenney Creek/ Kanluk ceramic complex. The Cunil ceramics (1100-900 B.C.) are the earliest known ceramic complex discovered at Cahal Pech. This complex is immediately followed by the Early Facet Jenney Creek/Kanluk ceramic complex (c.a. 900-600 B.C.).

Although the Cunil period ceramics are the earliest discovered at Cahal Pech, these ceramics are not experimental attempts at pottery production. Rather, they give the impression of being the result of a long tradition of ceramic manufacture. Other areas of the Maya region hold evidence of ceramic production predating Cunil times. Ceramic production along the Pacific Coast regions of Mexico, Guatemala, and El Salvador predates Cunil period ceramics. In these areas the ceramics from the Barra Phase (ca. 1550-1400), the first phase of the Early Formative, are the earliest known. The high quality of manufacture and the wide range of decorative techniques characterize the Barra Phase ceramics (Blake et al., 1995:167-168). Similarly, in the Highlands of Mexico archaeologists identified ceramics far earlier than Cunil ceramics (Clark and Gosser 1995). Also, the ceramic chronology established at Puerto Escondido, Honduras, produced ceramics that far predate the appearance of Cunil phase ceramics at Cahal Pech and the Belize Valley (Joyce and Henderson 2001). Therefore, it is a possibility that the earliest potters at Cahal Pech immigrated from these regions, that pottery making knowledge was adopted from a neighboring region, or that ceramics arrived at Cahal Pech as trade items.

The presence of Olmec style motifs in Cahal Pech, without a doubt indicates that the people of this site were involved in some type of regional interaction. These motifs, which reflect a pan-Mesoamerican style (Brown 2007; Awe 1992; Cheetham 1998), held symbolic and ideological meaning, and the ceramics bearing these decorations were meant to be displayed while serving food or drink (Brown 2007:9). Although the presence of Olmec style objects is not a common occurrence in the Maya Lowlands, the findings of symbols of Olmec influence in locations further removed from the Olmec heartland suggests one of two scenarios. It is possible that the Olmec ideas and style diffused from the Gulf Coast as a result of interaction through trade. Alternatively, it is possible that before the advent of complex civilization in the region, there were already broadly shared underlying beliefs which would account for similarities in iconography, style, and material culture between the Olmec and the Maya (Cheetham 1998).

The use of these pan-Mesoamerican concepts decreases significantly after the Cunil phase (Brown 2007: 9,) at a time when social differentiation starts to emerge in the Maya Lowlands and it can first be identified in the archaeological record (Healy et al. 2004; Brown 2007). This decrease in the occurrence of Cunil symbols also coincides with the emergence of the Early Facet Jenney Creek/ Kanluk Complex. These ceramics differ from the Cunil ceramics in decoration, surface treatment, materials used for their manufacture, and form.

The primary questions this project addresses involve the transition from Cunil to Jenney Creek/Kanluk. During the transition, not only did the residents of Cahal Pech cease to use Olmec motifs on serving vessels, but also the ceramics used at Cahal

Pech changed significantly. Some ceramic groups maintained some continuity, but new, previously unknown groups emerged. Transformation in the ceramics produced by the inhabitants of Cahal Pech can inform the social changes that occurred during the transition between these two ceramic complexes from Cahal Pech, Cunil and Early Facet Jenney Creek/Kanluk. The query this project pursues addresses the influence of internal means for change in ceramic production, and well as the effect that Cahal Pech's involvement in a regional network had on its ceramic assemblage. Some questions this project addresses when examining the ceramic sample presented include: What local factors may have contributed to the development of new ceramic groups? Did new ceramic decoration and production techniques did in effect develop at Cahal Pech, or were such innovations introduced from neighboring areas? How do changes in the ceramics of Cahal Pech reflect social changes? The possibility that foreign ceramics were introduced to the Belize Valley raises the question of where these materials came from and who was involved in regional and long distance interaction with Cahal Pech, since the wide distribution of Olmec style materials suggests that people sustained trade and exchange networks over considerable distances. After detailing the findings from analysis of the ceramic sample, I consider how this ceramic sample points to the combination of internal and external catalysts for change in the production reflects in this ceramic sample. Engaging these issues might help to determine the role that Cahal Pech played at a local level, and furthermore on a regional level.

DESCRIPTION AND BACKGROUND OF CAHAL PECH

Cahal Pech is located in San Ignacio Town, specifically in the Upper Belize River Valley, Western Belize. The site core is situated at the top of a hill, overlooking the modern town of San Ignacio on the west bank of the Macal River, about 2 kilometers from where the Macal and Mopan Rivers converge. Cahal Pech is about 200 river kilometers away from the Caribbean Coast, and undoubtedly during the Formative the river system would have been an important means of transportation and communication.

Cahal Pech is positioned within two different environmental zones, the alluvial bottomlands and limestone hills. The alluvial zone extends into the north and northeast of the site, where a series of terraces provide some relief. Otherwise, this region has no relief, and the terraces were most likely formed by the meandering of streams during previous time periods. However, the terraces where pre-Hispanic settlements are located today are rarely flooded (Awe 1992), suggesting that during Maya times these would also have been safe from flooding, making them ideal locations for settlements.

The flora and fauna of the region seem to be well adapted to an alluvial plain. The river banks and terraces support several species of water-loving trees, such as cacao (*Theobroma cacao*), bribri (*Inga edulus*), and fig (*Ficus radula*). Fauna of this area include iguanas, fish, turtles, crocodiles, howler monkeys, and the tapir.

Meanwhile, the hilly region of Cahal Pech begins at the site core and extends to the southeast towards the Maya mountains. This area does not have permanent sources of water, but has a few seasonal rivers and creeks. The hills are composed of

limestone covered by a thin and fertile layer of soil (Awe 1992). The hills around Cahal Pech support an abundance of trees that also were exploited by the Maya, suggesting that their distribution in the site is a result of anthropogenic interference. These trees form a dense canopy that usually reaches 30-50 m high.

The Belize River Valley is an area that exhibits a high settlement density. Other major sites in the region include Blackman Eddy, Baking Pot, Pacbitun, Cahal Pech, El Pilar, Buena Vista, and Xunantunich. In general all of these sites have a similar size, with the exception of El Pilar, which is the largest in the area (Awe 1992). The distance among them ranges from 6-10 linear kilometers. The sites nearest to Cahal Pech are Buena Vista and Xunantunich, 6 and 10 kilometers away, respectively. In the case that communication among these sites relied on water transportation, then the distance between them would have been much greater. (Awe 1992)

The pre-ceramic occupation of Belize and the Maya Lowlands has been documented through the presence of lithic artifacts and through pollen and paleoenvironmental data. Lohse et al. (2006) present evidence for the presence of humans in Belize during the archaic period, and they rely primarily on the discovery of points. The most commonly encountered point is the Lowe point, while the second one is the Sawmill point. These are commonly found in surface contexts in Northern Belize, but also have been discovered in Western Belize. These findings indicate that the Late Archaic had a broader geographic scope than was once believed. Also, pollen date from Northern Belize indicates that by 3400 B.C. maize was widely cultivated and that at least by 2500 B.C. humans had significantly altered their environment by clearing the forest.

The site core of Cahal Pech exhibits some 34 buildings that originally held civic-ceremonial and residential purposes. During the Late Early Formative, the approximate size of Cahal Pech was .75 ha, with a population estimated between 75-150 people (Cheetham 1998). Excavations at Plaza B in Cahal Pech have uncovered a series of 14 construction phases under Structure B4. Of these phases the earliest has been dated to Cunil times. It is in construction phase 9-sub that the presence of Jenney Creek/ Kanluk ceramics is first observed; this stratum has an associated radiocarbon date of 770 ± 60 B.C. (Beta 40864) (Cheetham 1998).

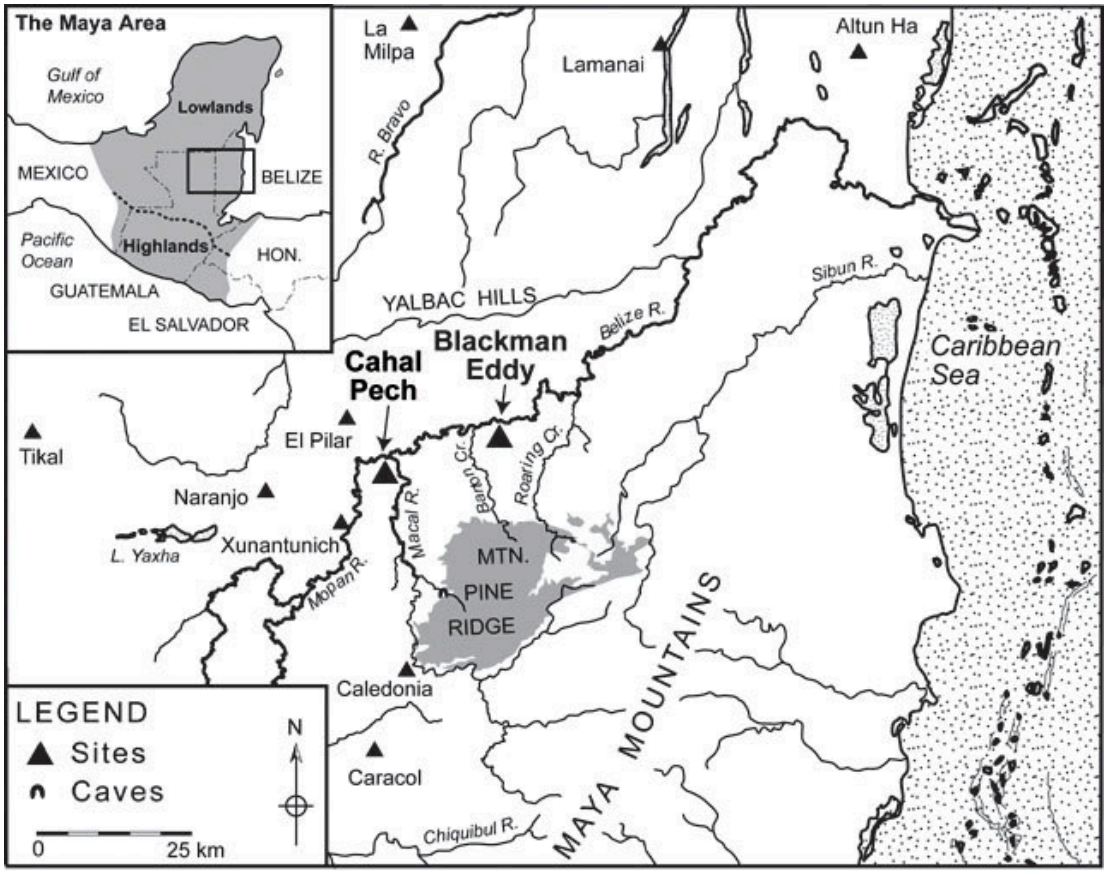

Figure 1: Map of the Belize River Valley (Brown 2007)

CLASSIFICATION OF CERAMICS FROM CAHAL PECH

Smith, Willey, and Gifford (1960) were among the first archaeologists who proposed adopting the type-variety concept as a basis for classifying Maya ceramics. Later, Gifford (1976) published a volume titled *Prehistoric Pottery Analysis and the Ceramics of Barton Ramie in the Belize River Valley*. In this work, he classified the ceramics of Barton Ramie employing the type-variety system of classification and emphasized that the categories on which the classification scheme was based were inherent to the ceramic assemblage. Gifford clearly states that the role of the analyst is simply to recognize these categories and from them, create analytical taxa. Furthermore, Gifford's (1976:6) use of the type-variety concept depends on the analysis of whole vessels and culturally meaningful segments of vessels to develop his typology. This methodology for classifying ceramics consists of three basic units: the type, variety, and mode. To Gifford, a type was a ceramic unit that aggregated certain visual characteristics (attributes) that are recognizably distinct and represent a category of pottery that was produced within a specific time interval within a specific region. A type could be comprised of its established varieties and related varieties. Similarly, a variety was a category that referred to a complete vessel, and will always be closely associated with a type. In contrast, a mode could represent a special segment of an artifact, such as a single attribute or a cluster of closely associated attributes, and did not require a complete vessel (Gifford 1976). Smith, Willey, and Gifford (1960) intended these three categories to be units of analysis that could subsequently be integrated into broader and more inclusive categories of study, for

example ware, horizon style, and pottery tradition, which had a greater scope, either temporally, spatially, or both.

For my analysis, I find it necessary to define certain classificatory categories that have proven to be useful in this project. First, the sum of all the modes and types/varieties that conform the full ceramic assemblage of a site during a specific period of time, in a limited geographic region defines a ceramic complex. Gifford (1976:11) goes on to say that " The ceramic complex, then, is a culturally meaningful unit composed of types, varieties and modes with special regard to a delineated interval of time and space". Willey, Culbert, and Adams (1967) originally established and defined the term ceramic sphere at a ceramics conference held in Guatemala City. They described this category to capture instances where there was a high content similarity between two or more ceramic complexes. A high degree of similarity at the ceramic complex level implies that there is extensive cultural contact and technological exchange (often around one aspect of technological development). A ware encompasses a group of ceramics that are technologically similar, especially in surface finish, paste, and method of manufacture. This category includes a large number of different types, and can be quite varied in the style of vessels included. For Gifford, the ware classificatory level is useful in identifying centers of ceramic production, especially those that have developed a specialized artisan group devoted completely to this end. Finally, Gifford (1976) understood a ceramic horizon to be a style that can be traced over a broad geographic range, but has a brief duration with strict upper and lower bounds in time.

Several of the shortcomings of the type-variety concept have been debated and examined extensively (Gifford devotes some time to this in his 1976 publication), but the type-variety classification scheme still presents great advantages for ceramic analysis. One of these is access to intersite comparisons, which are crucial to understanding interaction within the Maya lowlands. Smith, Willey, and Gifford (1960) present this point as one of the main advantages of using this classificatory method, as well as the flexibility that it allows the analyst during the process of classification. For my project, I frame the description of the ceramic sample in terms of the type-variety approach in order to more easily integrate information from previous publications, both from Cahal Pech and the Belize Valley, as well as other sites in the Maya Lowlands.

The two earliest ceramic complexes at Cahal Pech are the Cunil and Early Jenney Creek/Kanluk complexes. The Cunil ceramic complex now represents the earliest ceramics produced in the area. The Kanluk ceramic complex succeeded and replaced the Cunil ceramics, and is coeval with the Jenney Creek complex described at Barton Ramie. Early perspectives about the ceramic history of the Belize River Valley posited that the area did not have a pre-Mamom ceramic complex. The Xe ceramic sphere originally appeared as the earliest in the Maya Lowlands, but the discovery of the Cunil ceramics at Cahal Pech during the 1980s changed the perspective archaeologists had of the Belize River Valley (Awe 1992).

Cunil ceramics are typologically and stratigraphically a predecessor of the Jenney Creek/Kanluk ceramic complex. As with other pre-Mamom ceramics that have been identified elsewhere in the Maya Lowlands, Cunil ceramics appear in the earliest

occupation levels where early ceramics are identified. Various radiocarbon dates confirm the early appearance of Cunil ceramics at Cahal Pech, and archaeologists widely accept an initial date of 1100 B.C. for the development of Cunil ceramics. This ceramic complex represents a well established ceramic manufacture tradition, which does not correspond to an initial attempt at ceramic production. The Cunil complex shows ties to ceramic traditions from northern Belize, such as the Swasey Complex from Cuello, as well as to ceramic complexes from other areas of the Maya Lowlands. I develop a detailed comparison with other early ceramic complexes of the Maya Lowlands in a later section of this project (p. 31).

The Cunil complex is divided into two wares, the Belize Valley Dull Ware and the Belize Valley Coarse Ware. The Belize Valley Dull Ware contains the following ceramic groups: Uck Red, Cocoyol, and Chi. These ceramics exhibit some incising, often following what are generally considered pan-Mesoamerican style or "Olmec-style" motifs, such as, but not limited to, the kan cross, the lightning bolt, the avian serpent, and the flame brows (Cheetham 1998, Sullivan et al. 2009, Brown 2007). Uck ceramics are characterized by uniform slips in red and sometimes black over a soft ash-tempered paste, and a common form in this group is flat bottomed plates (Sullivan et al. 2009:163). Within the Uck ceramic group several varieties can be identified, several of which exhibit postslip grooved-incised lines. The Cocoyol Group is recognizable by a creamy white, pale brown or light grey slip (Cheetham and Awe 2002:16), usually in the form of bowls and dishes. Finally, the Chi Group is the smallest one within the Belize Valley Dull Ware sample. Sullivan and colleagues (2009:165) discuss that these sherds have a dull black slip, which is easily eroded.

These three groups have in common that the percentage of volcanic ash used for temper is very high; this characteristic carries over into the Early Facet Jenney Creek ceramics, making it very easy to confuse Uck Red sherds with Joventud Group sherds. Interpretations of use and function of the Belize Valley Dull Ware hold that it is an elite or ritual function ware (Awe 1992, Brown 2007), since the iconographic motifs that Cunil ceramics exhibited were ideologically charged. In addition, these decorated vessels functioned as containers in which to serve food or drink, presumably during ceremonial or ritual activities (Brown 2007:7).

At Cahal Pech The Sikiyá is the only ceramic group in the Belize Valley Coarse Ware, and two types are associated with the Sikiyá group. The paste of this group tends to be coarser than in the Belize Valley Dull wear. Usually these sherds are unslipped and the surfaces of vessels can be smoothed or burnished. The color of the paste varies greatly between dull orange, brown, grey or black, and fire clouding on external surfaces is commonly encountered (Sullivan et al. 2009). Sikiyá sherds display some minimal decoration techniques, such as filleting and geometric incising, are observed; these features are preserved into the Early Facet Jenney Creek/Kanluk phase.

The Early Facet Jenney Creek / Kanluk Ceramic Complex dates to the Early Middle Formative Period (850-650 B.C.). The ceramic groups within this period still show continuities with traditions from northern Belize. However, during the Early Middle Formative new ceramic traditions appear in Cahal Pech ceramics, as can be observed through the emergence of new groups, such as Jocote Orange-Brown (evolved from the Sikiyá group), as well as wares such as Mars Orange Ware

(represented by the Savana Group), and Flores Waxy Ware (comprised of the Joventud Groups). The presence in limited quantities of this last group indicates to some archaeologists that it represents trade items (Awe, personal communication 2011). Savana Group ceramics are characterized by a very smooth fine paste, usually in a bright orange color; inclusions if present are usually calcite and very small. On the other hand, Joventud Group has a medium textured paste in cream or light grey colors; temper is not readily visible. Many of the Joventud sherds had a bright orange to red waxy slip, which is often greatly eroded. The decoration during the Early Jenney Creek/Kanluk facet is restricted to pre-slip and post-slipped grooved/incised geometric patters, and impressed filleting, which also evolved from the Cunil ceramics. Towards the end of this facet the Savana and Jocote Groups become more dominant.

As these ceramic assemblages have increased in size through the course of new excavations, it becomes apparent that there is great continuity between Cunil and Jenney Creek complexes. These similarities led to problems in classification of the two complexes. The Sikiyá and Jocote Groups share a similar paste composition, surface treatment and decoration. Therefore it is easy to misidentify one as the other. Uck Red ceramics share similarities in paste composition with the later Joventud Group. Both of these groups have sherds that are predominantly ash tempered as well as a red slip that is easily eroded (Brown 2007). In many cases the two cannot be distinguished, so chronological assessments of terminal Cunil occupation should not be based solely on the presence or absence of any of the types that present such a challenge in their classification.

METHODS

The sample analyzed in this project was recovered during the 2002, 2006, and 2007 field seasons at Cahal Pech. Their provenience is Structure B4 Excavation Unit 7, levels 9 and 8b, and Excavation Unit 9, levels 9 and 8. These levels are the ones that immediately supersede those that contain Cunil material exclusively (Awe, personal communication 2011). This ceramic sample is currently located in San Ignacio, Cayo District, Belize, in facilities operated by the Belize Valley Archaeological Reconnaissance Project (BVAR).

The ceramic analysis presented here was conducted over a period of four weeks. To complete this project, scheduling air and land transportation to and within Belize was necessary. The analysis of the materials themselves was cost-efficient, since few tools assisted in the completion of the project. Therefore, the budget for the project was straightforward.

The universe of the ceramic samples available for this project consisted of approximately 7,500 sherds. The distribution and size of each ceramic group represented in the sample is shown in detail in a series of tables, where each group is further described in terms of diagnostic and non-diagnostic sherds. The ceramics from this sample were analyzed following the type-variety concept. The ceramics were first classified according to ceramic groups, which have been previously defined at Barton Ramie and at Cahal Pech. Using ceramic groups was more practical for the purposes of this project since most of the sherds analyzed were of a very small size or preservation was poor, therefore making difficult the process of assigning the sherd to

a more specific classificatory unit. Later, they were separated on the basis of the part of the vessel they represented (the rims were separated from body sherds), and furthermore according to whether or not the sherd had some sort of decoration. At this point the decorated body sherds were separated from the undecorated ones. Also, a separate category was created for handles, spouts, and other pieces that were uncommon.

However, following this analytical technique brings a series of problems that must be considered. Gifford's classificatory system is based solely on style, and does not incorporate stratigraphic contextual information. The ceramics from Cahal Pech, Structure B4 do have sound stratigraphic provenience. Also a series of radiocarbon dates associated with these levels can also be correlated with the ceramic analysis. As a result, the dating of ceramics in the Cahal Pech sequence may be earlier than those dates proposed by Gifford.

ANALYSIS

The ceramic groups found at Cahal Pech during the transition from the Late Early Formative to the Early Middle Formative occurred in varying frequencies within the ceramic sample that I analyzed. In all of the ceramic samples analyzed, the most frequent ceramic group was Jocote, followed by Savana. In all the units and levels analyzed, Jocote Group made up between 65% and 79% of the total sample for the unit and level. Savana Group represented between 14% and 31% of the total sample for the unit and level. Several less frequently occurring groups are also represented in the remainder of the sample. Some of these are Uck Red, Sikiyá, Joventud, and Sayab Daub.

One problem encountered when analyzing ceramics is that some ceramic groups have great longevity, and because of this it is not an easy task to assign a specific date to designate the ending of one group and the beginning of another (Brown 2007; Sullivan et al. 2009). One well-documented example is the difficulty in differentiating between Uck Red and Joventud sherds. Ash was used as temper for Uck Red ceramics, which makes the paste in these ceramics very distinctive. However, some later Joventud pieces also show a high percentage of ash temper, which makes differentiating between the two groups challenging. Some types that were included in this ceramic assemblage cannot be incorporated within either the Cunil or Jenney Creek complex, and I have labeled them as "Indeterminate" (Tables 1, 3, and 4). These might represent transitional types that emerged between two given complexes, where there exists some continuity between their ceramics. The

"Indeterminate" sherds also document the longevity and continuity of some ceramic groups. Sikiyá is another group that exhibits a prolonged presence in the archaeological record. Some archaeologists (Sullivan et al. 2009) consider it to be a precursor to Jocote Group. Many of these intermediary sherds have attributes that belong to both the Sikiyá and the Jocote Groups. In addition, the presence of ceramics which I have designated "Pre-Savana" signals an alteration in the production techniques and raw materials employed in the creation of pottery included within the Cunil Complex (Table 4). "Pre-Savana" ceramics have a color, both in paste and surface, similar to that of Savana proper sherds. However, contrary to Savana Group attributes, these "Pre-Savana" sherds have larger inclusions than those found in Savana (Figure 2). Also, their paste is very porous on the surface but has a consistency similar to that of Uck Red Group. These sherds signal the possibility of encountering a transition between the Cunil and Jenney Creek/Kanluk Complexes.

Image 1: Savana precursor

Table 1: Ceramic groups represented in Unit 7, Level 9, 2002

Group	Number of total sherds	Rim sherds	Body sherds	Body sherds with decoration	Handles/ Spouts/ Other
Jocote	922 (66%)	33	847	34	8
Savana	264 (19%)	40	223	-	1
Uck Red	61 (4.4%)	4	57	-	-
Indeterminate	60 (4.3%)	4	55	1	-
Joventud	17 (1.2%)	4	13	-	-
Sikiyá	2 (.12%)	1	1	-	-
Sayab Daub	9 (.60%)	-	9		-

Table 2: Ceramic groups represented in Unit 7, Level 8b, 2002

Group	Number of total sherds	Rim sherds	Body sherds	Body sherds with decoration	Handles/ Spouts/ Other
Jocote	623 (72%)	37	560	25	5
Savana	222 (26%)	40	166	15	1
Uck Red	15 (1.7%)	2	13	-	-
Blackware	4 (.40%)	1	3	-	-

Table 3: Ceramic groups represented in Unit 7, Level 9, 2006

Group	Number of total sherds	Rim sherds	Body sherds	Body sherds with decoration	Handles/ Spouts/ Other
Jocote	687 (79%)	25	627	39	6
Savana	120 (14%)	23	94	-	3
Uck Red	28 (3.3%)	8	20	-	-
Joventud	26 (3.0%)	6	20	-	-
Indeterminate	11 (1.3%)	1	10	-	-

Table 4: Ceramic groups represented in Unit 9, Level 9, 2007

Group	Number of total sherds	Rim sherds	Body sherds	Body sherds with decoration	Handles/ Spouts/ Other
Jocote	1219 (66%)	71	1076	54	18
Savana	503 (27%)	112	363	26	2
"Pre-Savana"	76 (4.1%)	70	6	-	-
Uck Red	23 (1.2%)	1	22	-	-
Joventud	19 (1.0%)	2	17	-	-
Indeterminate	13 (.75%)	2	10	-	2
Sikiyá	4 (.2%)	-	4	-	-
Sayab Daub	2 (.1%)	-	1	-	-

Table 5: Ceramic groups represented in Unit 9, Level 8, 2007

Group	Number of total sherds	Rim sherds	Body sherds	Body sherds with decoration	Handles/ Spouts/ Other
Jocote	1629 (65%)	133	1381	82	23
Savana	780 (31%)	216	534	29	-
"Pre-Savana"	3 (.10%)	-	3	-	-
Uck Red	48 (2.0%)	1	47	-	-
Joventud	19 (0.7%)	2	17	-	-
Indeterminate	24 (.90%)	-	20	1	3
Sikiyá	15 (.60%)	-	4	-	-

Some general conclusions can be drawn from the data presented. The earlier levels analyzed (Level 9 in both Units 7 and 9) show more diversity within the sample, meaning that a larger number of ceramic groups could be confidently established, and this number decreases in Level 8 of both units. This observation is more prominent in Unit 7, since in Unit 9 the number of ceramic groups identified decreases by one from Level 9 to level 8.

Several other patterns are salient. Level 9 of Unit 7 has a larger percentage of Cunil ceramics than the following level (Level 8). Since level 9 physically and chronologically follows levels that have been established as containing exclusively Cunil ceramics, one would expect to find a larger percentage of Cunil ceramics (out of the total sample) in Level 9 of both units. Since Level 9 temporally and stratigraphically precedes Level 8, and assuming that there was a gradual decline in use of Cunil ceramics over time, the findings from Unit 7 support the expected trend of decreasing Cunil ceramics. However, in Unit 9, the percentage of Cunil ceramics (out of the total sample) increases from Level 9 to Level 8; such a finding contradicts the results which were expected. Also, in levels 8 and 8b there is a decrease in the incidence and in the frequency of sherds that cannot be easily classified into any ceramic group. I have labeled these pieces as "Indeterminate" and consider them to be transitional; these often show a combination of materials, production techniques and decoration from different ceramic groups and complexes. These combinations of attributes represent a blurring of the temporal distinctions and of the categories that other researchers have established. This is not to say that the taxa established to classify Cahal Pech ceramics are poorly defined; I find no way to re-define these

categories in a way that accommodates these indeterminate sherds. Rather, the higher number of ceramic groups in earlier levels and also of ceramics that do not clearly conform to the parameters established to define these groups calls for closer attention in order to identify the possible causes for such an unexpected shift in practices of production and use of ceramics at Cahal Pech.

Table 6: Indeterminate sherds, from Unit 7, Level 9, 2002

Sherd (body or rim)	Total number	Description
a) Rim sherd	1	Similar in paste and temper composition to Jocote group; has red-orange slip with post-slip crosshatching
b) Body sherds	39	Miscellaneous types, mostly Jocote Orange-Brown but too small to classify further
c) Rim sherd	1	Possibly Sikiyá or related to Chitam incised
d) Body sherd	1	Not uniformly fired, ¾ of body wall is dark grey while ¼ is orange
e) Body sherds	2	Not uniformly fired, similar to d), but orange section of cream
f) Body sherd	1	Possible related to Chitam incised
g) Rim sherd	1	Possibly related to Chacchinic Red on Orange
e) Rim sherd	1	Possible Baki Red Incised
f) Body sherds	2	Savana Orange, possible represent a new type. Paste is extremely fine, no visible temper. One sherd (Figure 3) probably was a small globular vessel with incisions; two parallel incisions run around the upper half of the body of the vessel, and towards the center concentric circles complete the decoration. The second sherd exhibits the same type of fabric, but has no decoration.
g) Body sherds	6	Sikiyá, possibly related to Chitam incised
h) Body sherds	5	Possibly related to an early form of Joventud (Guitarra Incised)
i) Rim sherd	1	Similar to Cowpen (Cuello)
j) Rim sherd	1	Cream paste
k) Body sherds	3	Cream paste
l) Rim sherds	2	Cream paste pottery; possibly a new type that may have evolved from Cocoyol Cream type, but with a Red-Orange slip (Figure 4).
m) Body sherds	16	Cream paste pottery; possibly a new type that may have evolved from Cocoyol Cream type, but with a Red-Orange slip

Image 2: Savana Orange body sherd with incisions

Image 3: Creamware, possibly new type evolved from Cocoyol Cream (Awe 2011: personal communication)

Table 7: Indeterminate sherds from Unit 7, Level 9, 2006

Sherd (Body or rim)	Total number	Description
a) Body sherd	1	Post-slip crosshatching, several parallel lines above the section with the crosshatching. Paste is similar to Joventud, in hardness, and to Savana, because of the lack of visible tempering material. Paste is very fine, and seems uniformly oxidized (dull orange).
b) Rim sherd	1	Paste is very fine and small calcite inclusions are visible. Paste texture resembles that of Savana sherds, but color is not bright orange, but brown instead (Figure 5). There is no visible slip.
c) Body sherd	1	Paste is similar to Joventud in hardness but is a dull orange color/ There are no visible inclusions. Sherd with two horizontal incised lines, which are closely spaced. Underneath this area are five visible, diagonal parallel lines. These seem to have been made before the slip was applied.
d) Body sherd	1	Cream paste resembles that of Joventud sherds in texture. Color is more similar to the earlier Uck Red Group. Small calcite inclusions.
e) Body sherds	3	Resemble Sikiyá Group, but have post firing incising. Paste is medium textured, with calcite inclusions. Possibly related to Chitam Incised
f) Rim sherd	1	Paste is pinkish and has a medium texture, without any visible inclusions. Surface color is mottled (grey, dull orange, brown)
g) Body sherds	3	Cream paste with brown slip

Image 4: Fine pasted rim sherd, similar to Savana in texture.

Table 8: Indeterminate sherds from Unit 9, Level 9, 2007

Sherds (Body or Rim)	Total number	Description
a) Body sherd	1	Cream paste, medium texture, well smoothed. No visible inclusions
b) Body sherd	1	Thick sherd, paste resembles Joventud. No visible slip.
c) Body sherd	1	Brown slip, post-slip incising. Similar to piece in Level 9, 2006.
d) Body sherd	1	Brown slip with incising, cream paste.
e) Body sherds	4	Dull brown surface. Paste resembles Jocote, has a dull orange color and has very small calcite inclusions.
f) Rim sherd	1	Black slip. Possibly Jocote, similar to sherds from Level 9, 2006.

Table 9: Indeterminate sherds from Unit 9, Level 8, 2007

Sherds (Body or Rim)	Total number	Description
a) Body sherds	3	Very thin walled sherds, similar to Jocote Group, surface color is dull brown to gray. Paste has medium texture and is mostly orange.
b) Body sherds	9	Sherds with thick wall. Paste is similar to Savana in texture, with calcite inclusions, and has dull orange color. Surface color resembles typical Jocote sherds (brown to grey)
c) Body sherd	1	Large sherd, possibly Jocote, but most likely Sikiyá because of incisions.
d) Body sherd	1	Very small and thin-walled piece, with what appear to be a series of circular impressions, possibly done while the paste was still plastic.
e) Body sherds	3	These sherds have what appears to be a black slip (Figure 6).
f) Body sherds	2	Have what appear to be painted stripes (Figure 7).
g) Body sherd	1	Paste is similar to that of Jocote Group; the sherd has some sort of nodule.

Image 5: Sherd with black slip

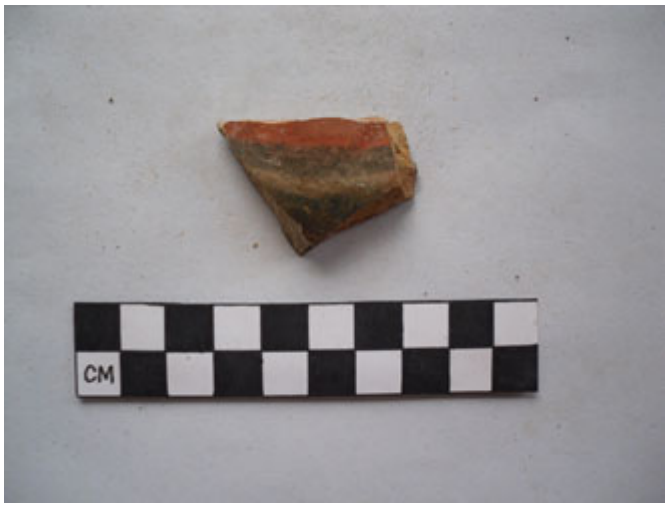

Image 6: Savana with black paint.

CHANGES IN CERAMIC PRODUCTION AND THEIR IMPLICATION FOR CHANGES IN SOCIAL ORGANIZATION

The succession of local ceramic groups and the introduction of new, uncommon ceramic types may indicate the presence of connections with other regions of the Maya lowlands and Mesoamerica. The simultaneity of these two phenomena led some archaeologists to suggest that they represent an increase in social complexity (Brown 2007). Also, various scholars have considered the possibility of pan-Mesoamerican interaction as a source for innovation in ceramic production within Cahal Pech (Cheetham 1998, 2005). Before these possibilities are taken into consideration, internal catalysts for social change that could also help explain the appearance of new ceramic types must be assessed.

The analysis of the ceramics has revealed certain trends, some of which were contrary to the expectations held at the outset of the project. First, the greater diversity of ceramic groups in Level 9 of Unit 7 primarily, provides some insight into the processes that were in progress at this time in Cahal Pech. The occurrence of a greater variety of ceramics may represent the potters' experimentation with new production techniques, raw materials, and decorative motifs. For example, in Unit 9, Level 9, one can observe the emergence of a pre-Savana type of ceramic, where there was still use of ash temper but, at the same time, the fabric exhibits traces of the orange color that characterizes the Savana Group. Also, there is great difficulty in distinguishing between Uck Red and Joventud, as well as between Sikiyá and Jocote. These transitional types could help explain some shifts at Cahal Pech, in production of ceramics. In the following level (8), there is a clear reduction in the number of ceramic

groups represented, and also in their variability. I see this change as evidence of the consolidation of ceramic production, where a smaller group of individuals had control over the production of ceramics, leading to a regularization of the process. This would lead to a reduction in variability of ceramics (Costin and Hagstrum 1995). The unexpected increase of the percentage of Cunil ceramics in Unit 9, Level 8 (2.0%), from the preceding Level 9 (1.2%), suggests that other activities are influencing the discard of ceramics, and that the frequency in circulation of these ceramics is not necessarily determining their frequency once they are discarded. Most of the ceramics encountered here are of local production (their higher frequency in the sample indicates they were produced locally). However, a small minority, which occurs less often, seems to have been imported (such as Joventud).

Other evidence indicates that Cahal Pech was embedded in regional networks of interaction, which supplied the settlement with a diversity of ideas. The presence of ceramic sherds that occur in small numbers documents this interaction. At the same time, the archaeological record displays intentional and repeated attempts at developing novel ceramics within Cahal Pech. Archaeologists working at the site have encountered such a transitional period, not only in the ceramics, but also in architectural features. For example, excavations conducted by Awe (1992:106-143) Structure B4 (which is located in Plaza B) and Cheetham (1996) in Plaza B revealed the development of Cahal Pech during the transition from the Late Early Formative to the Early Middle Formative. During the Cunil phase, Structure B4 began as a platform (13-sub) built from packed marl, earth and ashy loam (Healy et al. 2004:107) and reached a height of 0.48m. Structure B4 underwent 4 additional construction events,

during which it was raised and expanded. Platform 12-sub measured 0.84m high, and was built from the same materials as the earlier platform. Two small steps and four postholes also appeared in this construction stage. A radiocarbon date (Beta-77207, 2930 ± 50 b.p, calibrated to B.C. 1200-1020 (Healy et al., 2004)), is associated with platform 12-sub. Platform 11-sub continued to increase the height of the structure. Structure B4/10-sub contains four lime –plastered platforms, which continued the trend of elaborating and elevating the structure. One of these platforms (10c-sub) held the most ornate residential superstructure from Cunil phase in the sequence, which was painted along the exterior walls (Healy et al., 2004). After the Cunil phase, the function of the structures in Plaza B changed. Structure B4 was no longer used for residential purposes, but during the Early Middle Formative several temples were built over the Cunil phase constructions. Also, residents of Cahal Pech appeared to use Plaza B as a residential area during the Cunil Phase; eight residential units were located there (Cheetham 1995). At the end of the phase, however, this area was elevated and leveled to form a single floor of tamped marl (Healy et al., 2004:108). This new space served ceremonial purposes, and seems to have functioned as a base for the later construction of temples and ritual areas. Other areas underwent similar transformations, and some speculate that they served as residential areas for a growing elite (Healy et al. 2004:109). The transformation of Cahal Pech ceramics in tandem with changes in architecture and construction then, seems to reflect a changing reality for the inhabitants of Formative Cahal Pech.

The other potential source of variability within the Cahal Pech ceramic sample comes from interactions with other parts of the Belize Valley and furthermore, with

the rest of the Maya Lowlands. A comparative analysis of the sample analyzed in this work with other sites shows that there are significant similarities in the ceramic assemblages of all these sites. Still, a small percentage of sherds from Cahal Pech are examples of ceramics in a foreign style, which presumably originated in other parts of the Maya Lowlands.

COMPARATIVE ANALYSIS

Pre-Mamom ceramics have been documented at other sites along the Belize Valley, including Xunantunich and Blackman Eddy (Strelow and LeCount 2001; LeCount and Yaeger 2008; Garber et al. 2004). Comparisons of the early ceramics from these sites with the Cunil and Early Jenney Creek/Kanluk ceramics from Cahal Pech may clarify the factors that contributed to the transformation of the ceramics used in the Belize valley between 1100 and 900 B.C. towards those that are classified as Early Facet Jenney Creek.

Ceramics from Blackman Eddy follow ceramic phases similar to those from Cahal Pech. The ceramic complexes described at this site come from a problematic deposit in Structure B1, which was uncovered by illegal bulldozing activity. The damage to Structure B1 provided an opportunity to study the transition of architecture at the site and helped establish a more reliable chronology. The Kanocha Phase ceramics described at Blackman Eddy, and these are coeval with the Cunil ceramic phase at Cahal Pech. Kanocha ceramics were recovered under 13 superimposed architectural layers of Structure B1, and in association with postholes and bedrock features such as chultuns. Similarly to Cunil material, Kanocha phase ceramics have been dated to 1100- 900 B.C.; these dates are supported by radiometric dating methods. These ceramics are also divided in two wares, one more utilitarian with quartzite and calcite temper and the other a dull slipped ware characterized by ash temper. These two wares show strong ties to their successors, Jocote types and Mars Orange Ware (Garber et al. 2004). Similarly to the Cunil phase ceramics, the Kanocha Phase does not appear to be an initial attempt to produce ceramics, but rather seems to

be part of an earlier tradition of ceramic production. However, there is little or no evidence of earlier attempts to produce ceramics at Blackman Eddy.

During the Early Jenney Creek phase (900-700 B.C.) at Blackman Eddy, the social transformation of the site is apparent. Garber et al. (2004) point to the development of public architecture, the implementation of block masonry and the use of lime plaster. The appearance of new ceramic types also is an indication of social changes at this time. The ceramics here closely resemble those from Barton Ramie (as described by Gifford (1976)), and the most common pottery types came to be Jocote Orange-Brown and Mars Orange, which evolved from the earlier Kanocha ceramics. In addition, there was a proliferation of new vessel forms and decoration techniques (Garber et al., 2004, Brown 2007).

These developments in the ceramic sequence of Blackman Eddy have parallels in the ceramics from Cahal Pech. Brown (2007) points to the fact that the Cunil and Kanocha phase ceramics bear close resemblance to later ceramic groups such as the Joventud group. These ash-tempered redwares are not easily distinguished, which has led to the overrepresentation of Cunil ceramics since both groups (Uck and Joventud) contain a large amount of volcanic ash and also exhibit a similar type of reddish slip, which in many cases is partially or completely eroded. As a result some Joventud sherds are classified as Uck. Also, the Sikiyá group from Cahal Pech is very similar to Jocote ceramics, which makes their differentiation difficult. At both sites the predominant types during the Early Jenney Creek phase, Jocote Orange Brown and Savana Orange, have precursors in earlier phases. Therefore, the two ceramic complexes share similarities in temper and decoration.

At Xunantunich Cunil ceramics have also been recovered. All of the Cunil ceramics recovered from Xunantunich some from Tunnel 196, which was dug under El Castillo, the largest structure at the site. The tunnel extended 26 meters into the base of the structure, and had two side branches which added up to a total tunnel length of 40.4 m. The excavation in these tunnels followed stratigraphic layers. Under these tunnels excavators found limestone bedrock, and above them a Late Formative plaster floor. LeCount and Yaeger (2008) report that the ceramic sample from this excavation was very similar to the one from Cahal Pech. At Xunantunich 29% of the sample belonged to the Belize Valley Dull Ware and 67% to the Belize Valley Coarse Ware (LeCount and Yaeger 2008).

A comparison of Cunil ceramics with contemporary ceramic phases from other parts of the Maya Lowlands shows that pottery was being produced locally, but that similar styles were followed within a broad area. The earliest pre-Mamon ceramic complex identified in the Maya lowlands is the Eb Complex from Tikal, Central Petén (Culbert 2003, 1977). These ceramics were recovered from deposits where the excellent preservation of stratigraphy made it possible to determine the relative placement in time of the ceramics. The Early Eb ceramics were defined on the basis of excavation of deposits at the north Acropolis and the Chultun 5G-15. Meanwhile, the majority of the Late Eb ceramic sample was recovered from a tunnel excavated into Structure 5C-54, the great pyramid in the Mundo Perdido Complex (Culbert 2003). This last group of ceramics continues to show traits observed in the Early Eb, but also shows affinities to the Mamom ceramics. Culbert (2003) concludes that these ceramics represent a transition between the Eb and Tzek complexes. Cheetham et al. (2003)

compare Eb ceramics from Tikal and Cunil ceramics from Cahal Pech. The Eb complex has been dated to 800-600 B.C., while the Cunil phase is earlier (1100- 900 B.C.). Both ceramic complexes are similar in their slips and surface treatment, but differ greatly in paste composition, which proved to be from local sources. This difference shows that ceramics were being produced locally.

The ceramics from Seibal, Guatemala have also been used as a reference for contextualizing the Cunil ceramics on a regional level. Here the ceramic sequence has been established though stratigraphy of deposits, architectural superposition, Maya calendrical dates from monuments at the site, and cross-dating comparisons with other sites in the Maya lowlands (reference is made to Altar de Sacrificios and Uaxactun). The earliest ceramics known from Seibal are those belonging to the Réal Xe complex, dating to the Middle Formative (800-600 B.C.). The Réal Xe ceramics were recovered from beneath the A Group Plaza, and they were consistently found beneath the succeeding Escoba Mamom Complex. Willey (1970) infers that these ceramics probably represent the debris of the earliest inhabitants of Seibal. The Cunil Complex is dated to roughly the same time period as the Réal Xe from Seibal, and the ceramics from both sites are very similar. Although these are the earliest ceramics from this site, they are still later than the Cunil ceramics, with which the Réal Xe ceramics are comparable. The available description of the latter indicates that although the clay and temper used were not the same, the two complexes share similarities in form. In both the dominant forms were bowls with outflaring sides and jars with low necks. The more common temper in the Réal Xe ceramics was calcite, while the use of ash temper was relatively widespread at Cahal Pech.

Similarly, The Xe Compex from Altar de Sacrificios , established on the basis of certain excavation units that proved to have sound stratigraphic integrity (Adams 1971), are comparable to the Cunil ceramics from Cahal Pech. The succeeding complex at Altar de Sacrificios, the San Felix Complex, offers an opportunity to compare the Jenney Creek Ceramics from Cahal Pech. There seems to be some overlap among the Xe, Jenney Creek, and San Felix complexes, although Jenney Creek seems to be more similar to Xe than to San Felix, mainly in groups like Jocote (equivalent to Achiotes Unslipped).

Finally, Northern Belize also should be considered in a comparison with ceramics from the Maya Lowlands. Early ceramics were first described in Norther Belize by Pring (1977) at the site of Cuello. At the time, the only other early ceramic complexes known in the Maya lowlands were the Xe and Réal Xe; such a dearth of comparative sources made more challenging the task of describing and dating these ceramics. However, initial radiocarbon dating of these ceramics placed them in the Early Formative. Subsequently, Andrews and Hammond (1990) reevaluated the proposed dates for the placement of this ceramic complex within the Early Formative. They determined through new radiocarbon dates that the original ones were too early. As a result, the Swasey ceramic complex was related to the Late Early Formative. Although there is still considerable debate surrounding the dates assigned to the Swasey Ceramic Complex, what remains clear is that this complex is the earliest in the ceramic sequence of Cuello.

Originally the Swasey complex (1200-900 B.C.) and its stratigraphic successor, the Bladen complex (900-600 B.C.), were placed in the Xe ceramic sphere

because of modal similarities such as fine-line incising and straight-sided bowls in monochrome blacks and reds. (Kosakowsky and Pring 1998) However, differences in surface finish and color prompted the establishment of the Swasey ceramic sphere despite its contemporaneity with the Xe sphere. Both the Swasey and Bladen complexes are included in the Swasey ceramic sphere. The decision to establish this sphere is further validated upon comparison of ceramics from other sites in Northern Belize, such as Colha, Nohmul, San Estevan, Pulltrouser Swamp, and Santa Rita Corozal.

Glossy, non-waxy, monochrome slips characterize Swasey ceramics. Other modes of decoration include incising, pattern burnishing, modeling and punctation, although the most common are groove incising and dichrome slips. The most common forms in this complex are bowls and jars with squared rims. The Bladen Ceramics Complex is made up of 9 ceramic groups, all of which show monochrome slips. In this complex, bowl and jar forms predominate, and decoration includes groove incising, punctation, gouge incising, modeling, black line smudging and resist. These are also common decoration techniques among the Early Facet Jenney Creek-Kaluk ceramics in the sample from Cahal Pech. Kosakowsky and Pring (1998) establish that the Bladen complex is directly related and stratigraphically later when compared to the Swasey complex. A similar situation arises at Cahal Pech, where there is a gradual transition from the earlier ceramic complex to the later one.

The Bolay complex is the earliest from Colha, Belize, and is dated to 900-600 B.C. (Valdez 1994). Although this ceramic complex does show affinities with the Xe ceramic sphere, the Bolay complex is classified into the Swasey sphere since it holds

stronger similarities with coeval complexes from other sites in Northern Belize. Still, Bolay holds modal similarities with the Pasión region of Guatemala. The Chiwa ceramic complex follows the Bolay ceramics, and it belongs to the Mamom ceramic sphere. This complex is dominated by Joventud ceramics. In contrast, the Cahal Pech Early Jenney Creek is dominated by Jocote Group ceramics, although the number of Joventud sherds increases significantly in this phase. At Colha there is also an increase in the presence of "chocolate pots", or spouted jars, a change which is observed at Cahal Pech also through the presence of the spouts from the chocolate pots.

Figure 2: Early Ceramic Complexes in the Maya Lowlands

<table>
<tr><th></th><th>Cahal Pech</th><th>Blackman Eddy</th><th>Xunantunich</th><th>Cuello</th><th>Colha</th><th>Altar de Sacrificios</th><th>Seibal</th><th>Tikal</th></tr>
<tr><td>550-400 B.C.</td><td rowspan="2">Jenney Creek LF</td><td rowspan="2">Jenney Creek LF</td><td></td><td rowspan="2">Lopez</td><td rowspan="2">Chiwa</td><td>Plancha</td><td></td><td>Tzek</td></tr>
<tr><td rowspan="2">800-550 B.C.</td><td></td><td rowspan="3">Xe</td><td rowspan="3">Réal Xe</td><td rowspan="2">Eb</td></tr>
<tr><td>Jenney Creek EF Kanluk</td><td>Jenney Creek -EF</td><td></td><td>Bladen</td><td rowspan="2">Bolay</td></tr>
<tr><td>1000-800 B.C.</td><td rowspan="2">Cunil</td><td rowspan="2">Kanocha</td><td rowspan="2">Cunil</td><td rowspan="3">Swasey</td><td></td><td></td><td></td><td></td></tr>
<tr><td>1200-1000 B.C</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

CONCLUSIONS

When this evidence is considered, there are several possibilities to explain the absence of pre-Cunil ceramics. It is unlikely that these ceramics were developed locally, given the lack of earlier ceramic evidence. Therefore, it is possible that ceramic production was initially introduced into the Belize Valley by foreign groups, which ethnically would not necessarily have been Maya. This scenario suggests that the Belize Valley was populated around 1100 B.C. by peoples who came from other regions of the Maya Lowlands and already had a well-established ceramic tradition (Garber et al. 2004). Other theories formulated to explain the sudden appearance of relatively sophisticated pottery, which have been applied in regions other than the Belize Valley, include the possibility of traded objects reaching a new destination, local production of ceramics by itinerant craftspersons, and the diffusion on ideas (Clark and Gosser 1995:213). Cheetham (2005) on the other hand, discards the idea that the early inhabitants of the Belize Valley were descended from foreigners who settled in the area. Rather, he proposes that influences for ceramic innovation had several origins. Still, evidence for interregional interaction through long distance trade is acknowledged starting around 900 B.C.

To explain the emergence of new ceramic groups at Cahal Pech, it is also useful to consider agency within the archaeological record. Agency has been indentified as a source of change and evolution, since collective actions and structures can be seen as the result of individual actions, and in instances the dominant structure induces a response from an individual or group of individuals (Bell 1992). Sassaman (2001) proposes that actions directed to building consensus or norms are likewise

agential because they derive from efforts to create rules or traditions in opposition to existing structures. Therefore, he sees normative structures as long-term derivatives of agency, and thus the dominant social institutions become products of what were once actions of agency. In their discussion of innovations in Mimbres pottery, Hegmon and Kulow (2005:317) say that:

> "As the potter builds a pot and paints the design, and especially when the finished vessel becomes part of the overall corpus, the pottery becomes part of the structure. The potter may reproduce the rules, or may (intentionally or not) introduce novel forms. And some artists- perhaps those with special skills or status- may be more likely than others to introduce new forms that are accepted (i.e. innovations) and thus that affect and change the structure."

These observations support the notion that agency is in fact a source of innovation in ceramic production, and that over time, these innovations can become established in the institution.

In archaeology, the application of practice theory and the identification of agency have been proposed as fundamental issues that need to be addressed. In addition, analytical and interpretive strategies that can be used in the study of agency in archaeology have been the object of numerous discussions. In general, most theories either exclude any type of human agency, take into consideration the individual, willful elements of humans, or they consider spiritual and experiential orientations (Bell 1992). The attempt to incorporate thoughts and decisions of individuals into archaeological theory seeks to establish that these elements produce collective actions and shared institutions. When facing the archaeological record, one must assume from the beginning that everyone has agency (Ortner 2001), and thus it

may be encountered at any point in the archaeological record. In this way, agency is present in the continuity or discontinuity of social and cultural structures.

Assigning agency to an individual or even a group of individuals can be quite problematic in archaeology, especially in pre-historic contexts, where often the material remains archaeologists deal with often are minimal. Archaeological artifacts do tell us much about the origin, the method of manufacture, and the use of an object. What is more difficult to ascertain is the purpose and intention behind its creation and the application given to it. The physical findings the archaeologist recovers must then be translated into thoughts, actions, and intentions; in this context, the identification of agency is somewhat elusive. Therefore, the representation of agency should not be the focus of analysis in archaeology, because agency is not directly represented. Instead, agency should be deduced from the temporal and spatial elements in which it exists (Barrett 2001). The manners in which material remains are discovered by the archaeologist provide clues to the actions of the agent in producing a certain object. In other words, actions correspond directly to agency. In ceramic analysis, for example, Dietler and Herbich (1998: 239) state that ceramics and their style reflect the "activities that actually create the material manifestations of those structures".

To return to the conclusions drawn on the ceramic analysis performed for this project, agency can be observed in the changes over time in the ceramic sample presented. The increase in variability of ceramic groups in Level 9 of Unit 7 is interpreted as indicating a time when potters experimented with new materials for the production of ceramics, therefore breaking with pre-established systems of social reproduction. In this case, potters seem to moving away from production techniques

that had been reproduced throughout several preceding centuries. The appearance of ceramics such as “Pre-Savana” (Image 1), which appear to mix the temper used in Cunil ceramics with the characteristic clay of true Savana sherds, is one example. These sherds appear in Level 9, Unit 9; and here represented 4.1% of the sherds I this level. In Level 8 of the same unit, this percentage had dropped to 0.10%. One can imagine a potter who encounters a new clay source with a bright orange color, but still chooses to use ash as a tempering material. After several attempts, and some unsuccessful results, this pottery might have turned to calcite as a tempering agent, leading to the production of Savana ceramics. At the same time these ceramic innovations are happening, a reorganization appears to be taking place within the *milieu* of Cahal Pech society. Examination of the ceramics from Level 8 shows that fewer ceramic groups are present, and therefore indicating possibly regularization of the ceramic production process (Costin and Hagstrum 1995). This change coincides with a shift in the type and purpose of architecture at Cahal Pech, where areas that had once been for residential purposes were now rebuilt and used as public areas. The materials used at Cahal Pech to convey public messages also changed, when ceramics ceased to be used for these purposes. Throughout the Cunil phase, the Cunil ceramics had served as mediums to represent Olmec-style motifs, such as the Kan cross, lightning motif, the brackets, and the monster maw. However, once the Cunil complex begins to disappear, the subsequent ceramic complex no longer conveyed these motifs, which held symbolic and ideological meanings (Brown 2007). Instead, other media, such as stelae, gradually appeared as bearers of these types of statements (Awe et al. 2009:182).

The proliferation of trade and long distance interaction between the Belize Valley, specifically Cahal Pech, and other regions of the Maya Lowlands during the transition between the Cunil phase and the Jenney Creek complex helps explain the abundance of new groups. Contact with other areas would foster the incorporation of new manufacturing techniques, modes of decoration, and paste composition. Such an increase in the ceramic diversity of Cahal Pech is observed in the pottery sample analyzed for this project. In the sample from Level 9 of Unit 7, there is a marked increase in the percentage of sherds that cannot be classified into one ceramic group following the canonical description proposed for such a group. Also there is a larger percentage of Cunil Uck Red ceramics (as discussed earlier) than in the following Level 8 of the same unit. Unfortunately, in Levels 8 and 9 of Unit 9 these patterns cannot be observed as clearly as in Unit 7. It would be useful to undertake an examination of a larger ceramic sample in order to determine whether this is simply an anomaly limited to Unit 9.

Some of these transitional sherds are similar to an established group, but possess enough variation to prevent the analyst from confidently classifying it. For example Table 6 lists some cases where a cream paste pottery resembles Cocoyol Cream Type, but may be a new type related to it. What differentiates these sherds from true Cocoyol sherds is the hardness and finish of the paste. Cocoyol sherds are ash tempered and very soft, but these cream pasted sherds had a harder paste. Level 8 of Unit 7 shows a decrease in the number of groups present, as well as a decrease in the total number of indeterminate sherds. Since this level is temporally more recent than Level 9, one can conclude that over time, Cahal Pech potters adopted some techniques

and styles instead of continuing to incorporate new ideas. As noted in the comparative discussion, other sites within the Maya lowlands experienced similar changes in their ceramic assemblage during this transitional time. Considering the similarities which are evident among the ceramics of the region after the Late Early Formative, it seems likely that these similarities are due to exchange of manufacturing techniques or trade of ceramics, which potters at individual sites incorporated. One example of trade is exemplified by the ceramics labeled as Blackware in Level 8b, Unit 7 (Table 2). These are present in small quantities (0.4% out of total sample in the level), pointing to the possibility that they were brought in as trade itemps from other parts of the Maya Lowlands. The time between the Late Early Formative and the Early Middle Formative has proven to be one of adjustment throughout the region, one that was shared by various sites. Especially at Cahal Pech, the change in ceramics coincides with other sweeping events happening at that time. It is plausible that the interconnectedness of the Maya Lowlands influenced to some degree these transformations.

Hypothetically, if this analysis, or a similar one, were to be undertaken again in the future, there are several elements that would be added. First, a longer time frame is required to effectively complete a thorough analysis of a ceramic sample. This analysis focused mainly on style, namely decoration and surface treatment. For future investigations, it would be ideal to look more closely at another aspect of style, the form of vessels, or what Dietler and Herbich (1998:236) call the style of action. Effectively documenting form would help to better understand not only the function that these ceramics held for their consumers (Hendrickson and MacDonald 1983), but also the existing relationships among sites in the Maya Lowlands. This type of

research question would require a longer period of time for its completion, ideally eight weeks. Also, in the future I would like to conduct petrographic and INAA testing on some of the sherds involved in this project. Since one of the questions explored here is whether Cahal Pech was involved in regional networks of exchange, comparing the mineralogical and composition of some sherds determined to be imports to the site would be crucial to understanding this aspect of the research questions.

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