Preliminary Report of the 2006 Field Season at Lamanai, Belize: The Maya Archaeometallurgy Project

by
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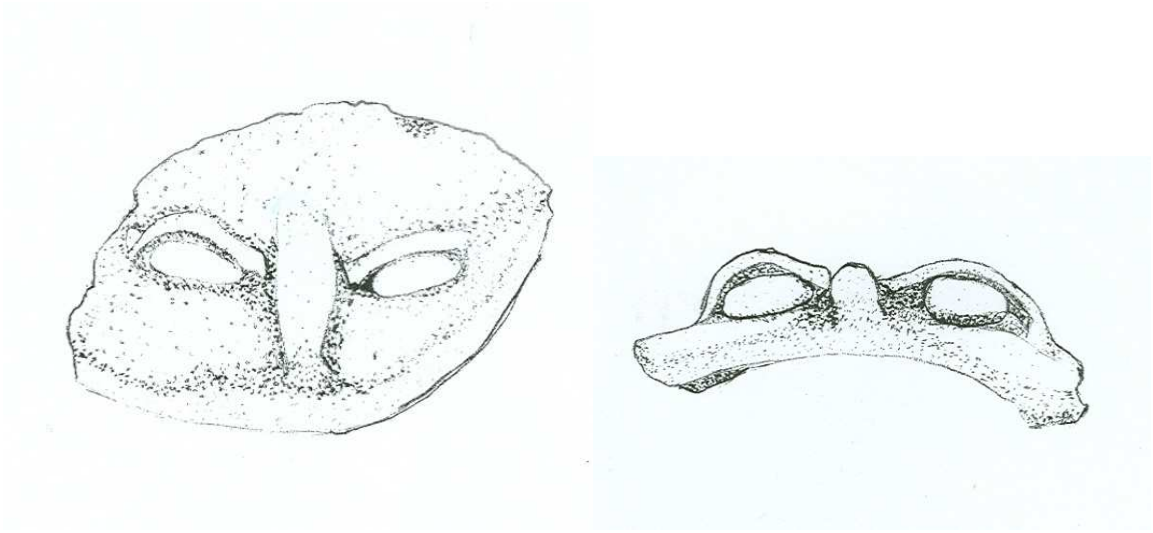

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Abstract

The following is a preliminary report of the 2006 field season at Lamanai, Belize by the Maya Archaeometallurgy Project and Lamanai Archaeological Project Field School. The theoretical background of the Maya Archaeometallurgy Project (MAP) is presented in summary form, along with a more detailed discussion of the methods and results of archaeological investigations in the Terminal Postclassic-Spanish Colonial Period occupation zone at Lamanai. Archaeological research on the nature of Maya metallurgy was conducted as part of a continuing program aimed at educating college students in archaeological field methods at the site of Lamanai. This report summarizes the findings from archaeological excavations in Operation 06-02, an area located immediately east of the Spanish churches (Structures N12-11 and N12-13) at Lamanai. This particular area, in the heart of the Spanish Church Zone, was utilized intensively by Lamanai's contact period residents. Archaeological investigations in this area of the site were aimed at identifying the remains of contact period residential and other special use structures and features. The remains of what are likely several contact period residential structures were identified during the 2006 field season.

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Introduction

This report presents the results of archaeological research in 2006 at the Maya site of Lamanai, located in the Orange Walk District of Belize (Figure 1). This field season comprises the fifth season of the Maya Archaeometallurgy Project (MAP), a research program aimed principally at illuminating the organizational structure and technological nature of Maya metallurgy as well as the roles metalworking played in Late Postclassic and Spanish Colonial Period Maya economies.

The 2006 field season operated under permit number IA/H/2/1/06 (05) issued by the Belize Institute of Archaeology, National Institute of Culture and History (NICH) to Scott E. Simmons. The 2006 archaeology program lasted a total of just over seven weeks and was comprised of two sessions separated by approximately three weeks. The first field session extended from March 27 - April 20, 2006 while the second session was held from May 16 - June 14, 2006. In this time two archaeological field school sessions were held, during the first field of which ten students participated; most of these were from University College London. During the second session seven students from UNCW were enrolled in the archaeology field school at Lamanai. Scott E. Simmons and Laura J. Howard served as Co-Directors of the 2006 field school in archaeology at Lamanai.

The field schools at Lamanai have been directed by Dr. Elizabeth Graham from 1998 to 2000 and by Simmons from 2001 to present. Since 2001 the field schools in archaeology at Lamanai have been part of a larger research program known as the Maya Archaeometallurgy Project (MAP). The MAP is a research program focused on studying the specialized production of copper and bronze objects in the Maya Lowland area during Postclassic and Spanish Colonial times. Since its inception in 1999 a central goal of this project has been to understand the relationships that existed between copper production and socioeconomic differentiation and interdependence among the Maya (Simmons 1999, 2004, 2005a, 2005b; Simmons and Howard 2003). A larger goal for the research project is to provide insights into the relationships that existed between craft production, socioeconomic integration, and cultural evolution in state-level societies.

The research conducted by Drs. Graham and Simmons builds on twelve years of archaeological research directed by Dr. David M. Pendergast, Curator Emeritus of the Royal Ontario Museum (ROM), between 1974 and 1986. During the course of this large-scale, ambitious project, Dr. Pendergast and his associates succeeded in defining the site's chronology, settlement characteristics and range of material culture types and architectural features (Pendergast 1981, 1985, 1986a, 1986b, 1990, 1991). This important research project documented the long duration of Maya occupation at Lamanai. Maize pollen recovered in sediments in the area known as "the Harbour" indicates that the first Maya peoples settled at Lamanai by roughly 1500 BC (Pendergast 1991:338).

The results of archaeological research revealed a long, unbroken sequence of Maya occupation at Lamanai through Preclassic and Classic times (Pendergast 1981). Excavations in the vicinity of the project camp also revealed that Lamanai survived the demographic and sociopolitical collapse that occurred at so many other major Maya sites

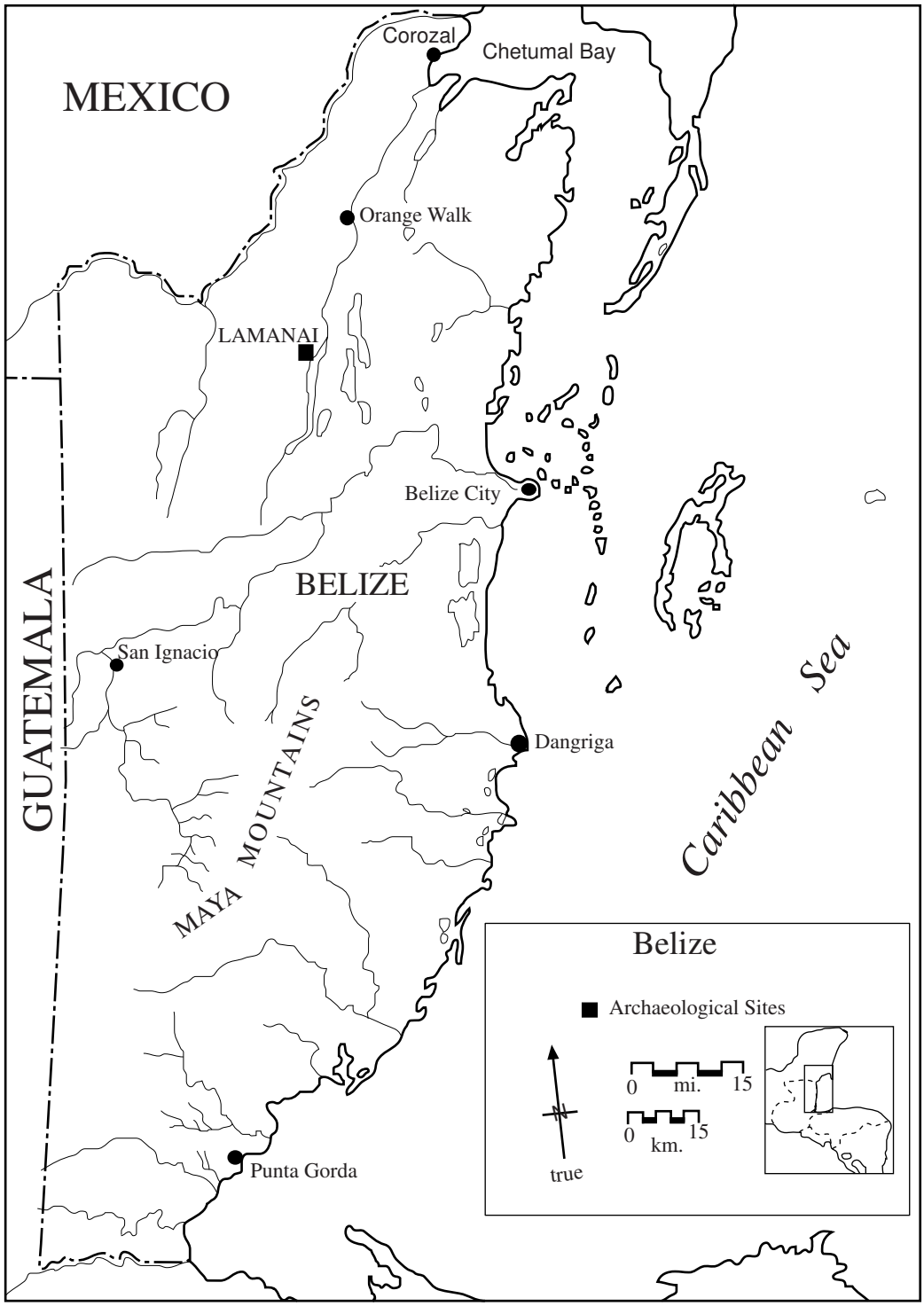


Figure 1
Location of Belize and Lamanai

in the Southern Lowland area during the ninth century AD. Dating of several prominent structures near the lagoon indicated that not only did Lamanai continue to be occupied beyond this period of major cultural transformations, but in a great many regards life at the site during Postclassic times was as vibrant and dynamic as it had ever been (Pendergast 1986b, 1990). The work of Dr. Pendergast at Lamanai has encouraged further investigations at the site in recent years in a variety of research areas, including household archaeology, ceramic analyses, symbolic flaked lithic tools and, as mentioned above, archaeometallurgy. Research conducted since 1997 by Dr. Elizabeth Graham has focused on investigations in both Classic Period and Late Postclassic Period areas of the site (Graham 2004).

Lamanai was the focus of concentrated, yet intermittent, Spanish involvement beginning in the first half of the sixteenth century (Graham et al. 1989; G. Jones 1989, 1998; Pendergast 1986a). Following Spanish withdrawal from Belize in the eighteenth century, British interest in Lamanai revolved around ill-fated millworks for sugarcane processing during the last quarter of the nineteenth century. Had the sugarcane operation been a successful enterprise, Lamanai may have been occupied for even longer. As it stands now, Lamanai bears the distinction of being the longest continuously occupied site in the Maya Lowland area (Pendergast 1981, 1993).

During the latter part of the Royal Ontario Museum's project at Lamanai, the Spanish Colonial Period site center became a prominent focus of research, particularly the area around the two Spanish churches for which the nearby village of Indian Church is named. A variety of copper artifacts had already been recovered in the area of Early and Middle Postclassic occupation, located north of the Spanish churches. The vast majority of those were found associated with elite burials in two of the principle structures of this period, N10-2 and N10-4 (Simmons, Pendergast and Graham n.d.). Metal artifacts appear at Lamanai in considerable quantity in both the Middle Postclassic period and the years of the Terminal Postclassic and early Spanish Colonial periods. The two eras of major occurrence were separated by a hiatus of nearly two centuries in which metal objects seem to have disappeared almost entirely from Lamanai's artifact inventory, and at the same time seem to have assumed an at least partially different meaning in the community's life.

The research conducted during the field school in archaeology at Lamanai during the last several years has contributed much information toward our understanding of the nature of Maya metallurgy. Future research at Lamanai is also expected to provide further insights into this largely unknown Maya technology and the role it played in both the political and domestic economies of the site in Terminal Postclassic and Spanish Colonial times.

The report begins with a summary discussion of the theoretical foundations and main research goals of the Maya Archaeometallurgy Project. A brief summary of the current state of knowledge of Maya metallurgy is presented next, followed by a short history and of previous archaeological investigations by the ROM and Maya Archaeometallurgy Projects. The methods and results of fieldwork during the 2006 field season are presented immediately afterwards.

Theoretical Foundations and Research Goals for the MAP

The research issues that are addressed by the Maya Archaeometallurgy Project intersect with several prominent areas of topical research in the humanities. One of these issues is human social identities - how they are created, negotiated and transformed by both individuals and the groups to which they belong (Cohen 2000; Friedman 1992; Giddens 1979; Holland et al. 2001; S. Jones 1997; Mann 1986; Shennan 1994; Voss 2005). Social Identity Theory, as it was originally conceived by social psychologists, is concerned with understanding the varied ways that individuals identify with, and behave as part of social groups, adopting shared attitudes, beliefs and behaviors (Tajfel 1982; Tajfel and Turner 1986; Turner 1999). Multi-disciplinary research from the fields of anthropology, ethnohistory and recently materials science, has contributed much to the discourse on social identities and social inequalities in Mesoamerica (Chase and Chase 1992; Costin and Wright 1998; French 2000; Gillespie 2000, 2001; Hendon 1999; Hirth 1993; Hosler 1994, 1995; Lohse and Valdez 2004; Restall 1997, 1998; Sandstrom 1991; Smith 1987; Tozzer 1941). We are particularly interested in understanding the social identities of those individuals in ancient Maya society who transformed raw materials into functionally and socially valuable goods, the craft specialists. Additionally, we want to know who had access to certain symbols of social status, such as the copper bells, ornaments, tweezers and other adornments that probably acted as identifiers of social standing among the Maya.

A considerable amount of anthropological research has been devoted to the topic of craft specialization in recent years (Brumfiel 1987; Brumfiel and Earle 1987; Clark and Parry 1990; Clark and Houston 1998; Costin 1991, 1996; Costin and Wright 1998; Dobres and Hoffman 1994; Earle 1987, 2002; Inomata 2001; Jacobs 2000; Masson and Friedel 2002; Peregrine 1991; Schortman and Urban 2004; Wailes 1996; Wilk 1996). The Maya Archaeometallurgy Project combines research from these and other sources to elucidate who the craft specialists were in contact period Maya society and to provide substantive information on the identities and social positions of Maya craft specialists in late precolumbian and Spanish contact times. The project is unique in that it is the first and only one of its kind focusing on the specialized production of metal objects and the role of metal craft specialists in late Maya Lowland society.

A second area of inquiry to which the MAP research contributes is the study of Native American adaptations to European colonialism. Within the field of anthropology the broad topic of culture contact and its repercussions has a long history of research, particularly in the Americas (Bray 1993; Burkhart and Gasco 1996; Cahill and Tovias 2005; Deagan 1998; Dirks 1992; Dyson 1985; Farnsworth 1992; Gasco 2005; Gosden 2004; G. Jones 1989, 1998; Lightfoot 2005; Rogers and Wilson 1993; Thomas 1989, 1990, 1991; Voss 2005). Specific studies of the impacts of Spanish colonial policies on the Maya have yielded valuable insights into the ways in which Maya groups both retained traditional elements of their culture and adopted certain practices (such as Christian worship) introduced by the Spanish (Carmack et al. 1996; Clendinnen 1987: Farris 1984; Graham 1991; Graham et al. 1989; G. Jones 1989, 1998; Patch 1993; Restall 1997, 1998; Pendergast 1991).

In economic and social realms, it appears that the Spanish had varying degrees of influence on transforming certain traditional Maya ways of life. This influence may have extended to those visible symbols that reinforced Maya social identities, but this remains to be substantiated. For instance, preliminary results of MAP research indicate that traditional Mesoamerican symbols of status and identity (i.e., copper tweezers, bells, rings and clothing ornaments) do not appear to have been replaced with Christian symbols, such as crucifixes and medallions of Catholic saints. These and other metal objects were adopted by certain indigenous groups in the Americas and eschewed by others (Bamforth 1993; Eaton 1989; Graham 1998; Hester 1989; Scarry 1990; Thomas 1989, 1990, 1991).

At present we have only a very hazy picture of the identities of those Maya that had access to these powerful symbols of social status, whether the symbols were of Spanish or Maya origin. Once the advent of copper metallurgy is determined and our picture of those Maya is clearer it will be possible to more fully assess the impacts of Spanish colonialism on specific components of late Maya culture, particularly those nodes where social and economic realms intersect.

Broad MAP Research Questions

The Maya Archaeometallurgy Project (MAP) is a long-term, multi-disciplinary research project that seeks answers to a range of questions revolving around the issues of craft specialization and its varied roles in the political and household economies of late Maya communities (Simmons, Pendergast and Graham n.d.). These questions include: who were the craft specialists in Spanish Contact Period Maya society? How did they identify themselves individually and as a social group? How did copper objects function as symbols of Maya cultural values, and how were they used to perpetuate expressions of selfhood and status in Maya society during this period? What were the productive contexts within which craft specialists worked in Contact Period Maya society? Were copper metallurgists attached to elites, did they work independently, or were their efforts undertaken within some other productive contexts that have yet to be identified?

Perhaps influence over the production and distribution of new, often symbolically charged materials, such as metal, was one of the measures Maya elites implemented to maintain their support, validate and reinforce their political and economic power and promote the dynamic stability of those centers not abandoned following the Classic Period 'collapse.' Earle (2002:1) asserts that the political economy is "channeled to create wealth and finance institutions of rule." Did powerful individuals at Lamanai control or oversee the work of craftspeople engaged in copper metallurgy as a way to create wealth for themselves and legitimate their rule? Alternatively, non-elite, independent specialists may have produced copper status and utilitarian objects and could have been influential in their distribution, not only for the enhancement or legitimization of their social status, but for reasons of commercial exchange. Did copper production provide an independent means by which Maya craft specialists and their families could manipulate these objects as symbols of social and economic distinction?

An important objective of MAP research is to explain the context and organization of copper craft production in Contact Period Maya world and how craft specialists were integrated into Maya economies during this time. Because of its long occupation history and rich archaeological record Lamanai is ideal for addressing questions of how dynamic social and economic stability were manifested in the late precolumbian Maya world.

Yet at present there is a paucity of information available on the integration of craft specialists into Maya economic systems in Contact Period times. This is illustrated clearly in the recent publication of an edited volume entitled *Ancient Maya Political Economies* (Masson and Friedel 2002). Only 3 of the 14 articles addressed research focusing on the Maya Postclassic Period, and none focused on craft specialists in Spanish Contact Period political economies.

Graham (2002:415) reminds us that in the Maya area "elites and non-elites both configured the structure of the economy, including the political economy, and that even in cases of what appear to be elite control, non-elites structure the product." In broad terms this research is aimed at understanding how elites and non-elites configured both the structure of the economy and their social status in complex societies through the medium of specialized crafting. By examining the interrelated nature of craft production and social and economic status and power, this study will help to refine current theoretical models currently used by anthropologists.

One such model is the "prestige-goods" or "wealth finance" model. Prestige goods models posit elite control over at least one point in the sequence of craft production and/or distribution, including possibly elite crafting of wealth objects as a means of legitimizing status and manipulating political economies (Earle 2002; Schortman and Urban 2004). Inomata (2001) identifies Classic Period Maya elites as the producers of some finely crafted items, echoing Ames's (1995) concept of *embedded* specialization whereby elites produce crafts for their own use or for the use of other high-status individuals to legitimize their positions of power and status. But Janusek's (1999) embedded specialization takes place in domestic contexts in which kin relations play a more prominent role than elite supervision or control of production.

The work of Ames (1995) and Janusek (1999) points to the need for anthropologists to move beyond the simple conceptual dichotomy of independent and attached specialization to better understand how productive activities were structured in ancient economies. This research seeks to further refine our definitions of the contexts of production and improve our understanding of the social relations of specialized crafting. Specifically, a long-term goal of the MAP research is to provide important insights into the ways in which producers negotiated their social identities in complex societies through specialized crafting. In this way the work will contribute to a more complete understanding of the ways in which craft producers played integral roles in the social milieu of ancient complex societies.

To summarize, the main goals of the Maya Archaeometallurgy Project at Lamanai are to:

- Determine how metal production was organized through time. We're particularly interested in the *context* of production, and especially in determining whether copper metalsmiths worked independently, were attached to local elites or worked within some other kinds of productive contexts
- Understand the specific nature of productive activities, such as the creation of molds, smelting, casting, and annealing techniques, and recycling behavior
- Examine current models that focus on the relationships between craft production, political economies and socioeconomic complexity and contribute to the discourse on these topics through the research of the MAP

Since V. Gordon Childe's research into the nature of specialized copper production and the role that metallurgy played in the development of complex societies in Europe a number of such studies have continued in various regions of the Old World (Al-Saa'd 2000; Brown 1995; Bronson 1996; Chapman 1996; Childe 1936, 1942, 1951, 1958; Earle 2002; Levy and Shalev 1989; Rothenberg and Blanco-Freeijeiro 1981; Sheehan 1999; White and Piggott 1996). In contrast, research on copper metallurgy in the New World has focused almost exclusively on areas in West Mexico (Hosler 1985, 1986, 1994, 1995; Pollard 1987) and South America (Donnan 1973; Graffam et al. 1994, 1996; Hosler 1994; Lechtman 1985; Shimada 1994) and the relationships between the two areas. A prominent gap exists in our knowledge of metalworking and its role in the production and maintenance of social and economic complexity in the Maya Lowland area. Data derived during the course of the Maya Archaeometallurgy Project will be used to address issues regarding the relationships between craft production, political economies, and cultural evolution.

Historical Context – Ancient Maya Metallurgy

Metallurgy appeared relatively late in precolumbian Mesoamerica (Hosler 1986, 1994, 1995; Lechtman 1985), and copper objects did not begin arriving at Maya Lowland sites until very late in precolumbian times (Bray 1977; Hosler 1986, 1994; Pendergast 1962; West 1994). The earliest evidence of metallurgy in Mesoamerica comes from West Mexico, where smiths began working native copper ores by approximately AD 600. Two centuries later copper metallurgy was flourishing in West Mexico (Hosler 1994:12). It was the metallurgical technology that developed in West Mexico, in the states of Jalisco, Nayarit, Guerrero, Michoacan, and Mexico, that spread to other regions of Mesoamerica, including the Maya Lowlands, in Late Postclassic times (by ca AD 1400).

With their wondrous new sounds and colors, copper objects were certainly novel commodities during late precolumbian times in the Maya area (Bray 1977; Hosler 1994; Pendergast 1962; West 1994). But neither native copper deposits nor substantial copper ore sources are found in appreciable quantities within the Maya Area. Copper artifacts, and later the specialized technology needed to produce them, were imported from areas within West Mexico and Lower Central America to the Maya Lowlands, probably via the New River, the Bay of Chetumal and the Caribbean (Figure 1).

Throughout the first several millennia of their history the Maya had relied on stone and other locally available materials from which they could fashion utilitarian tools that could perform a variety of everyday tasks. Likewise, a variety of materials, including stone and shell, were used to create personal adornments. Beginning in Middle Postclassic times, copper artifacts imported from West Mexico made their appearance at Lamanai (Hosler 1994, 1995: Pendergast 1981, 1985, 1986b, 1990, 1991). By the 13th Century AD copper-tin bronze objects were arriving at Lamanai from both West Mexico and lower Central America. The local southeastern Mesoamerican metalworking tradition was characterized by lost wax cast status ornaments; some of these were from copper-gold alloys, others were from copper-tin bronze or copper-arsenic bronze. These objects include elaborate plain-walled bells, filigree finger rings and buttons.

During the Spanish Colonial Period, Maya groups at Lamanai were producing their own copper objects, and Pendergast (1991:339-340) has suggested that the Terminal Postclassic Period residents of Lamanai probably developed metallurgy prior to the arrival of the Spanish, although this assumption remains to be vigorously tested. The strongest evidence for copper production at Lamanai consists of four copper ingots, two casting reservoirs, seven prills (solidified droplets of copper that are a by-product of smelting and casting) and a variety of mis-cast bells and pieces of scrap sheet metal recovered from Terminal Postclassic and Historic Period deposits. These finds are indicative of metal processing and present compelling evidence for on-site copper casting activities. However, several prominent pieces of the puzzle still elude us in our efforts to gain a full picture of Maya metallurgy and the craft specialists engaged in copper production. These include locating a casting center where furnace features should be found, moulds used for casting metal objects, the source(s) of the copper metal, and the social roles that coppersmiths played within Maya society.

Previous Investigations in the Terminal Postclassic and Contact Period Zone

The Royal Ontario Museum's Research at Lamanai

During the first years of the 12-year span of the ROM Lamanai archaeological project, Pendergast and his associates concentrated much of their efforts on the investigation of monumental architecture in the civic-ceremonial core of the site, located in what is now the northern portion of the Lamanai Archaeological Reserve (Pendergast 1981). Some archaeological work was also conducted on the two Spanish mission churches, located south of the Preclassic and Classic Period civic-ceremonial center.

In addition, an important Early-Middle Postclassic structure group (N10-1, N10-2 and N10-4), perhaps the civic-ceremonial center at Lamanai during this time, was investigated near the shore of the lagoon. It was during the excavation of these structures that a number of copper and copper-tin/copper-arsenic bronze artifacts first came to light. Pyriform and globular bells, cutwork finger rings, bell-headed pins, and elaborate button-like ornaments were among the 25 copper and bronze objects recovered during the excavation of Structures N10-2 and N10-4 (see Figures 2 & 3). All were recovered in burial contexts, interred with individuals that had enjoyed some degree of prominence in Lamanai's Postclassic society (Simmons, Pendergast and Graham n.d).

Figure 2
Bell varieties recovered by D.M. Pendergast at Lamanai.

In the latter stages of the ROM project, areas to the south, comprising the Late Postclassic and Spanish Colonial Period zone, were the focus of investigations (Pendergast 1991, 1993). An extensive structure identification and mapping project, led by Dr. Stan Loten and Mr. Claude Belanger, was undertaken at the inception of the ROM project in 1974, and continued throughout the term of Pendergast's investigations at Lamanai. Over 940 structures were identified and mapped during this time (Pendergast, personal communication 2000).

The ROM project was very successful in identifying the occupation history of the site, the construction sequences of numerous monumental architectural remains, the vast array of both locally produced and imported material culture, and the importance of the site as a locus of Maya political and economic life in northern Belize for many centuries. Pendergast demonstrated that Lamanai had developed into an important social and economic center, encouraged in large part by the emergence of powerful elites, by Late Preclassic times. The results of his investigations at the site indicated that Lamanai continued to prosper and develop into a prominent Maya center during the Classic Period (Pendergast 1981).

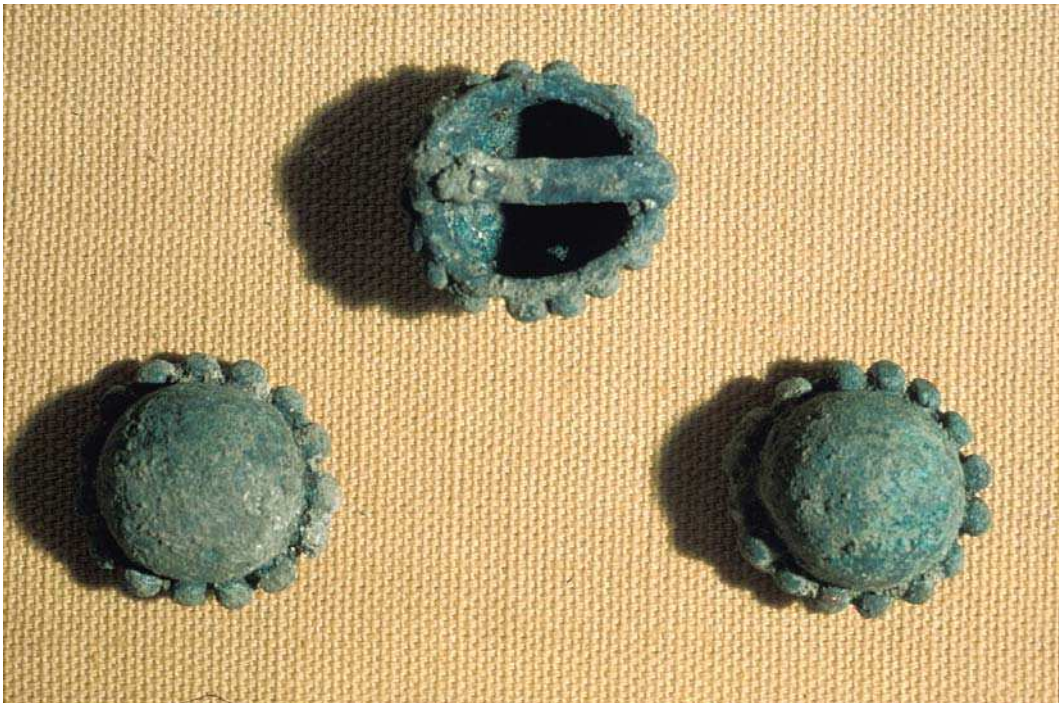


Figure 3
Small Finds LA 90/8a-f. Dome shaped copper ornaments with perimeter beading recovered with Burial N10-4/28, ca. mid-late 15th or possibly early 16th century A.D. Identical ornaments, duplicated in gold, were recovered from Tomb 7 at Monte Alban, Oaxaca.

Perhaps most surprising was the realization that Lamanai had not been completely abandoned in the ninth and tenth centuries AD as so many other neighboring sites in the Southern Lowland area had been. Instead of evidence of decline and decay, Pendergast and his associates found that Lamanai continued to be a vibrant, dynamic community up through the time of initial Spanish contact and into the mid-seventeenth century. New building construction projects in Terminal Classic times resulted in the creation of the ballcourt (Strs. N10-40 & N10-41) and the refurbishment of portions of Structure N10-9, an important temple that probably was the center of Maya ritual life at Lamanai during Terminal Classic and Early Postclassic times (Pendergast 1981).

Public works projects in Early Postclassic times, albeit smaller in scale than those in preceding centuries, resulted in the construction of Strs. N10-2 and N10-4, principal foci of Early Postclassic life at Lamanai. Robust trade in commodities such as copper with peoples both within and outside the Maya area was also evident, as were indications that political leadership was still strong and steady throughout Postclassic times (Pendergast 1991, 1993). The final years of the ROM project focused on investigations of areas in the heart of the Terminal Postclassic and Spanish Colonial Period community. Chief among the areas investigated were the Structure N11-4 group, and Structure N11-18. These were investigated by Pendergast and his associates in 1983 and 1984 (Pendergast 1985).

1999 - The first field season of the Maya Archaeometallurgy Project

The results of the first full season of the Maya Archaeometallurgy Project, which took place in June and July 1999, have already been discussed in detail (Simmons 1999). The 1999 field season was supported by the H. John Heinz Fund Grant Program for Latin American Archaeology. The following is a summary overview of the 1999 season, particularly the work around Structure N11-18, so that the larger context of investigations in the area that was the focus of work in 2001 and 2002 can be more easily understood.

During the 1999 season the goals of the MAP included surveying a large area of the Terminal Postclassic-Spanish Colonial occupation zone and identifying possible areas of Maya metal production. Slightly more than half of the 1999 field season was spent conducting a survey over a substantial area of the N12 and N13 grid block at Lamanai. Much of the metal that was found appears to be British sheet pieces of copper associated with the failed late 19th century sugarcane operation (Pendergast 1981). However, the areas in which several other notable copper objects were recovered, including a 500g oblong, roughly rectangular copper object were found, await further investigation.

Another prominent goal of the work in 1999 was to re-locate Str. N11-18, the principal Terminal Postclassic Period structure at Lamanai (Pendergast 1991). The results of excavations in 1984 at this important structure provided sufficient research grounds for relocating the structure, the area around which had long-since been overgrown in thick, very dense secondary forest growth complete with all manner of nearly impenetrable vines, brush and small to medium sized trees.

Given the ephemeral nature of the architectural remains of Structure N11-18 (see Pendergast 1985), its relocation was a fairly challenging endeavor, particularly since none of the facing stones that form its most prominent architectural components rise more than roughly 15 cms above the existing ground surface. In addition, the extremely dense, secondary bush in the area made spotting the inconspicuous structural remains difficult as well. Nevertheless, Structure N11-18 was relocated during the last half of the 1999 field season. Metal detector survey was conducted in previously unexcavated areas around the structure, predominantly on its northern side (Simmons 1999).

The Terminal Postclassic-Spanish Colonial Period occupation zone at Lamanai also happened to be the locus of intensive occupation by Guatemalan and Salvadoran refugees who had fled the political turmoil in their countries during late 1983 and early 1984. Unfortunately, the Guatemalan and Salvadoran refugees who settled in this archaeologically fascinating area of the site were prodigious consumers of canned meat products, the now-buried metal containers for which quite effectively preclude any successful magnetic-based differentiation between Terminal Postclassic and Spanish Colonial Period Maya copper artifacts and that mid-1980's refuse.

Two 1x1 m excavation units were placed in the extensive midden deposit abutting that portion of the structure that had been identified as the north wall (Simmons 1999). This midden had first been identified during testing in the mid-1980's and had yielded a number of copper artifacts, among a great many other types of Terminal Postclassic Maya artifacts Pendergast (1984). Testing in this midden in 1999 was aimed at

identifying various magnetic anomalies identified during metal detector survey of the area (Simmons 1999). Bells comprised the majority of the copper artifacts recovered from the midden testing in 1999, but several other metal artifacts were recovered as well (Table 1).

Table 1. Summary of Copper and other Metal Objects Recovered during 1999

Artifact Type	Small Find Numbers	Total
Cu artifacts		
Bells	Whole: LA 1232/1, 1234/1	2
	Miscast: LA 1238/1, 1240/1, 1242/1, 1243/1, 1244/1, 1246/1	6
Sheet	LA 1241/1	1
Ring	LA 1230/1	1
		10
Unidentified Metal		
Needle	LA 1236/1	1
Total metal artifacts recovered in 1999	-	**11**

2001 - The second field season of the Maya Archaeometallurgy Project

The principal aim of the 2001 season was to continue architectural clearing of previously unknown portions of Str. N11-18 in order to explore possible copper production areas associated with the structure. Another aim was to work toward completing the architectural documentation of this important Contact Period structure, believed by Pendergast (1985) to be the residence of the principal Colonial Period Maya authority at Lamanai, the cacique. The areas investigated in 2001 included sections of the building located both to the east and to the north of the area excavated by the ROM in 1983. The 2001 MAP investigations at Str. N11-18 lasted a total of eight weeks, from May to August 2001.

The results of investigations in 2001 suggested that either Str. N11-18 extended further east and north of the northern and easternmost areas of the building exposed by Dr. Pendergast and his associates (Simmons and Howard 2003: Figure 3) or that another structure was constructed immediately adjacent to (northeast of) Str. N11-18. Given the very close proximity of architectural features identified in 2001, it is likely that these features represent some kind of addition to the structure. This addition probably had a perishable roof, was open on its sides, and had identical floor ballast and retaining stones as those excavated by Pendergast in 1984 (see below).

Although a copper production area was not found during the 2001 field season, more copper objects, including evidence for on-site productive activities in the form of mis-cast copper bells, were recovered in both midden and floor ballast deposits (Table 2). Five of the eight copper artifacts recovered during the 2001 season were production

failures, mis-cast during lost-wax casting activities (see Simmons and Howard 2003: Figures 43-45). The presence of these artifacts lends further support to the idea that copper production was taking place at Lamanai, probably in the immediate vicinity of Str. N11-18.

Table 2. Summary of Copper Objects Recovered during 2001

Artifact Type	Small Find Numbers	Total
Bells	Whole: LA 1578/1	1
	Miscast: LA 1580/19, LA 1580/20, LA 1576/10, LA 1566/1	4
Needles	Whole: LA 1581/25	1
	Miscast: LA 1580/18	1
Fishhook	LA 1575/2	1
	Total	**8**

Excavations in 2001 also resulted in further delineating architectural features of Str. N11-18. Specifically, several lines of vertically set cut limestone blocks, identical in form and aligned similarly to vertically set stones identified at Str. N11-18 by Pendergast in 1984 were identified in 2001. Lines A, C & E were found to be oriented roughly parallel (on an approximate N-S azimuth) to the easternmost line of vertically set stones identified in 1984 (Simmons and Howard 2003:15). Lines A and B were found to intersect these N-S stone alignments at roughly right angles, forming square-shaped architectural features. In addition to the lines of vertically set limestone block a line of large, flat limestone slabs, some evidently modified, were found beneath Line D, oriented at approximately the same azimuth (Simmons and Howard 2003: Figures 21-23). Roughly between 5-10 cms. of lighter brown soil was found immediately beneath Line D, separating these two architectural features. This deposit of dense silty clay appears on stratigraphic as well as artifactual grounds to pre-date other construction features identified in this particular area, making it likely that the linear limestone slab feature pre-dates the use of Str. N11-18.

Concentrations of fist sized and slightly larger pieces of unmodified limestone and soil were found associated with the square alignments of vertically set limestone blocks in 2001. The presence of Cib and Yglesias ceramic bowl fragments mixed in with this rubble and soil matrix suggests that this material was used as construction fill that was brought in by the Maya sometime during Terminal Postclassic/Spanish Colonial times. Specifically, these deposits most likely represent floor ballast material that was used to create elevated platforms retained by the facing stones identified as Lines A-F (Simmons and Howard 2003: Figure 3).

Testing conducted west of Str. N11-18 and north of Str. N11-3 (Simmons and Howard 2003:Figure 4) established the horizontal and vertical extent of midden deposits extending north of Str. N11-3. This large midden north of Str. N11-3 had been tested by Pendergast (1984) in trenching north of Str. N11-3, an important Late Postclassic and Contact Period building that probably pre-dates the construction of Str. N11-18. Our intent in 2001 was to test the expansive 'off-platform' area located immediately to the north of Str. N11-3 for evidence of copper production.

Following re-clearing of secondary growth that had returned after initial clearing of the area in 1999, metal detector survey was conducted in this area at the beginning of the 2001 season using the same Garrett Master Hunter metal detector with a 12" Crossfire II searchcoil. The results of the metal detector survey suggested that copper objects might be present in several 'off-platform' areas north of Str. N11-3. The excavation of two 2 m^2 blocks as well as a 4 x 2.5 m area produced several copper objects, including a complete fish hook (Simmons and Howard 2003: Figure 38).

Excavations north of Str. N11-3 also yielded evidence of perishable structures that dated to the Spanish contact period. These structures lacked the substantial stone rubble and earth platforms that were typical of others structures dating to this period, but several burials were recovered in association with what must have been at least one rather small and barely discernable structure. Several possible post features, seen as cylindrical depressions in the limestone bedrock, were recorded in this area. One of the burials was a flexed human interment while the other appears to have been that of a dog, located approximately 60 cms. southwest of the human burial (Simmons and Howard 2003:19-25). Stratigraphically it appears that both burials were interred by excavations through the upper dark midden deposit and the underlying lighter brown, densely packed silty clay.

Since the midden deposit dates to Terminal Postclassic-Spanish Colonial times these burials, and presumably the perishable residence with which they were associated, are contemporaneous with the occupation of Str. N11-18. Again, very little 'off-platform' testing was conducted at Lamanai during the twelve-year ROM project directed by Dr. Pendergast. These finds are therefore notable for several reasons, not the least of which is that future investigations in areas of the Spanish zone having no discernable above-ground architectural remains can nonetheless be rewarding, particularly since they might yield evidence of various aspects of Maya domestic life at the site during the time of Spanish contact.

2002 - The Third Field Season of the Maya Archaeometallurgy Project

The third field season of the MAP again centered on the area of Str. N11-18. This was a comparatively short, four-week project that included excavations both at Str. N11-18 and preliminary testing of a previously unrecorded structure located approximately 12 meters north of Str. N11-18, designated Str. N11-27 (Simmons and Howard 2003). Excavations continued to the north and east of the areas investigated at Str. N11-18 in 2001 (Simmons and Howard 2003: Figure 3).

Additional floor ballast deposits were encountered immediately east of the areas around Str. N11-18 investigated by Pendergast in 1984. It appears that these deposits are associated with a structure that was either attached or located immediately north and east of Str. N11-18. Most likely the floor ballast material, comprised of earth and limestone rubble retained by vertically set limestone blocks, represents a structural addition to Str. N11-18 (see above discussion).

In addition to the work conducted at Str. N11-18, excavations were also expanded at nearby Str. N11-27, which is located approximately 12-15 meters north of Str. N11-18. This apparently small structure was identified during clearing of brush and other secondary growth in the latter part of the 2002 field season. The structure was not recorded by Pendergast during his investigations in this particular area of the site in 1984. This is likely because no structural remains were initially visible above ground after clearing of the area, either in 1984 or in 2002. Once the leaf litter had been removed in 2002, however, several stones that appeared to have been modified were noted in this area.

Faint magnetic anomalies were noted during the metal detector survey conducted in this particular area, which appears topographically as a low rise that slopes to the east, toward the lagoon. These faint anomalies usually signal the presence of more deeply buried (not near-surficial) metal objects. Usually the modern (1980's) aluminum tins and other metal (usually steel) refuse present in the area (see above discussion) produce fairly strong magnetic anomalies that are easily identified by the metal detector and verified with limited probing of the ground surface by MAP team members.

Excavations at Str. N11-27 in 2002 consisted of the removal of approximately 25 cms of dark silty loam in a 2 m^2 area that appeared to represent the approximate mid-point of the low topographic rise. A total of five copper prills and a probable copper bell clapper were recovered in this 2 m^2 area (Table 3), confirming our suspicions of this area based on the results of metal detector survey. These copper artifacts were recovered from floor ballast deposits consisting of soil mixed with mostly fist-sized limestone rubble. The presence of this material and associated artifacts confirmed that this low topographic rise was indeed a Maya structure. The recovery of Yglesias sherds in the platform construction fill indicates a late occupation date of somewhere after approximately AD 1450 (Graham 1987, 2004).

Table 3. Summary of Copper Objects Recovered during 2002

Artifact Type	Small Find Numbers	Total
Bells	Whole: LA 2070/5, LA 2044/4	2
Bell clapper	LA 2081/2	1
Prills	LA 2081/1, LA 2096/1, LA 2096/2, LA 2106/1, LA 2106/2	5
	Total	**8**

In addition to the 2 m^2 area excavated at the high point of this particular topographic rise, a 1x 3 m trench was excavated 4 meters east of the 2 m^2 unit in an attempt to locate additional structural remains that would help delineate Str. N11-27. Substantially high densities of rubble core, comprised of generally larger than fist-sized stones, were encountered in this trench up to roughly 40 cms. below the present ground surface. Artifact densities were generally low throughout the E-W length and depth of the trench. No vertically set or other possible facing or platform retaining stones were identified in this trench, however, suggesting that we had not reached the eastern 'edge' of this platform. No additional work was conducted in this area in 2002.

In sum, the results of MAP investigations in 2002 included identification of a structure immediately north of the principal Spanish Contact Period residence, Str. N11-18. This newly recorded structure, N11-27, was tentatively found to date to at least the earlier period of occupation of Str. N11-18 based on the presence of Yglesias pottery sherds. No Spanish or other European cultural materials was recovered during limited testing of this structure in 2002, thus it is uncertain if the structure was in use after first Spanish contact at Lamanai, which probably occurred sometime after 1544. Although only limited testing of Str. N11-27 was conducted in 2002, the recovery of clear evidence of copper production in the form of five (and possibly six) copper prills was quite encouraging, and provided the impetus for future testing of the structure in following field seasons.

2004 - The Fourth Field Season of the Maya Archaeometallurgy Project

The 2004 MAP field season at Lamanai lasted six weeks, with four of those (from May 12 to June 9) being part of the field school for UNCW archaeology students. The research goals for the 2004 field season were to 1) continue the process of completing the architectural documentation of Str. N11-27 through horizontal exposure of construction features, 2) search for additional evidence of metalworking activities, specifically the production of copper and bronze objects, in and around Str. N11-27 and 3) document the spatial and functional relationships between Structures N11-18 and N11-27 and Maya copper production activities.

Horizontal or block excavation was the primary method of subsurface investigation conducted in 2004. In addition, some limited trenching was undertaken in 2004 for the purposes delineating architectural features of Str. N11-27 and identifying possible midden deposits that might yield the same kinds of copper production failures (such as mis-cast bells) and raw materials (such as copper pigs and scrap sheet pieces) found in the north side midden of Str. N11-18. Most excavation blocks measured 2m^2; trenches varied in total length but measured .50 m in width.

During 2004 the MAP investigations were designated Op 04-02 and Str. N11-27 was the focus of these investigations. The 'Sub-Op" designation has not been used in the past at Lamanai, although 'Operation' is a designation used for specific investigations undertaken in various parts of the site. In general, the field and lab methods used to conduct the 2004 Field School excavations are those designed and currently utilized by the Lamanai Archaeological Project (LAP). Archaeological investigations of Lamanai by

David Pendergast began in 1974 and Elizabeth Graham became the Principal Investigator in 1996.

In terms of the research conducted during 2004 there were several noteworthy achievements. First, we were able to more fully define the horizontal extent of one of Str. N11-27, possibly an outbuilding of the kind Farris (1984:178-179) mentions as typically associated with the residences of Maya *caciques*. With few exceptions, these buildings, and indeed those of Maya Contact Period *caciques*, have not been studied extensively in the Lowland Maya area. Positive identification of these structures in the future will provide information on the architectural and functional nature of these buildings.

In the case of Str. N11-27 at Lamanai, only a portion of the building was investigated completely. The north wall was defined as a line of unmodified limestone rocks, as were portions of the west wall. While the north wall was completely exposed during 2004, both the east and west walls of the small structure were only partially cleared (Simmons 2004: Figure 3). That portion of the west wall that was exposed appears to have been comprised of the same small, unmodified limestone rocks that made up the north wall. But on the east side the rocks were found abutting much larger limestone boulders, only the western edges of which were exposed in 2004 (Simmons 2004:19). Interior flooring was made up of masses of small to fist-sized pieces of limestone and earth that were presumably packed down to create internal flooring for the structure. This construction technique has been noted at nearby Structure N11-18 and at various structures at the site of Tipu, located in the Cayo District of Belize (Graham 1991; Graham and Bennett 1989; Pendergast et al. 1993: Simmons and Howard 2003).

A human burial (N11-27/1) was encountered during excavations at Str. N11-27 in 2004. Found in a flexed position near the northeast corner of the structure, the human remains were found to be in a fairly poor state of preservation. A partial crypt, consisting of a single course of limestone rocks, some of which had been modifies, was found to the north, south and east sides of the burial (Simmons 2004:Figures 16 & 17). No grave goods were found with the individual, and it was not possible to identify the age at death or sex of the individual with any degree of certainty.

For the purposes of our research on the nature of Maya copper metallurgy at Lamanai several important steps were taken during 2004. First, the recovery of two more copper prills and three sheet copper fragments provides additional evidence of on-site Maya metallurgy (Table 4). The recovery of these small artifacts adds to the corpus of copper objects that can be chemically analysed for manufacturing characteristics. Presently Dr. Aaron Shugar is completing an analysis of copper objects recovered from the north Side midden of Str. N11-18, and his report on the results of these analyses is forthcoming. Using analytical techniques such as laser ablation inductively coupled plasma mass spectrometry (LA-ICP), light optical microscopy (LOM), and scanning electron microscopy (SEM), Dr. Shugar's findings add further weight to the idea that the Maya at Lamanai were actively engaged in copper production activities during Spanish colonial times, and probably earlier.

Table 4. Summary of Copper Objects Recovered during 2004

Artifact Type	Small Find Numbers	Total
Prills	LA 2909/6, LA 2936/7	2
Scrap pieces	LA 2909/7, LA 2924/12, LA 2932/1	3
	Total	**5**

The continued absence of copper artifacts of European design, form and chemical composition adds strength to the idea that the Maya of Lamanai developed the technology of copper metallurgy prior to the arrival of the Spanish in Yucatan (Simmons 2005a; Simmons, Pendergast and Graham n.d.). The recovery of the seven copper prills in contexts that likely pre-date Spanish contact can be taken as tentative evidence to support this idea as well. Undoubtedly much more work must be done in order for us to be confident in identifying copper metallurgy as an indigenous Maya technological innovation, and not one that was introduced by the Spanish after contact.

It is very clear, however, that archaeological investigations conducted during 2004 provided further compelling evidence that Str. N11-18 and its immediate environs, including Str. N11-27, were very likely a locus for copper production, the technology for which was very new to the Maya. The productive nature of this technology has not yet been documented in the Maya area, and although to date no production features have been identified, the recovery of mis-cast copper objects and production debris, specifically the prills and scrap sheet pieces recovered in 2004, strongly suggests that we are closer than ever to identifying the locus or loci of copper production at the site.

In addition, the strength of the association between the contact period occupants of Strs. N11-18 and N11-27 and copper metallurgy seems to be growing based on information derived during MAP excavations in 2001, 2002 and 2004. Excavations during the first two seasons were focused on the north end of Str. N11-18, and roughly half (8 of 15) of the copper artifacts we recovered there were either production failures or production debris. Thus far all five of the copper artifacts recovered from excavations at nearby Str. N11-27 are production debris. This trend continued in 2005 with the recovery of several more copper artifacts that represent production materials.

2005 - The Fifth Field Season of the Maya Archaeometallurgy Project

Excavations in 2005 were aimed at completing some unfinished work begun in 2004. A main focus was to delineate the southern extent of Structure N11-27, specifically locating and documenting what we expected to be a southern platform face. Our expectation was that a southern platform face, consisting of a single line of unmodified limestone rocks, would be similar to those encountered on the north and east sides of the structure (see Simmons 2004:34). It appears that no platform face existed on

the south side of this structure, a finding that is atypical of the pattern documented at other contact period residential structures thus far.

A human burial, the second identified at Str. N11-27, was found in the southwest corner of the structure. As in the case of Burial N11-27/1, this burial (N11-27/2) was found just beneath the presumed hard-packed earthen and limestone cobble floor of this residential building. Unlike Burial N11-27/1, however, the human remains found during the 2005 field season were in a very poor state of preservation (Simmons 2005b:Figure 14). Two artifacts found in direct association with the Burial N11-27/2 were noteworthy. The first, a large green-blue stone axe head (LA 2981/1) weighing 229 grams, was found just above and slightly to the east of the skull of the individual, whose sex and age could not be assessed with sufficient clarity in the field. The second, much smaller artifact was a copper prill (LA 2981/2) found in the area of the individual's pelvis (Simmons 2005b:Figure 13). In total, six copper prills and a bell clapper (or large copper prill) have been found in either floor ballast or burial fill deposits in Str. N11-27. It is likely that the earth and stones used in the construction of this small residential structure were brought in from an area, presumably located nearby, where copper production was taking place.

In terms of the building's architectural features the east platform face of Str. N12-27 appeared to have been butted up against and in places incorporated portions of a line of larger, unmodified limestone rocks, which were essentially small limestone boulders, designated Line C (Simmons 2004). Against the west face of these large stones had been placed some smaller stones of the type used in the construction of the north and west platform faces, suggesting that Structure N11-27 was constructed sometime after the large limestone blocks of Line C were laid down.

Specifically, this line of very large stones appeared to represent the remains of either a structure or some kind of feature that had not been previously identified in the area of the *cacique's* house. The placement of excavation units around several of these large stones in the area just north of Structure N11-18 was aimed at exposing these stones for the purpose of architectural documentation of this prominent feature, Line C. In addition, we were able to gain a better understanding of the construction history of this particular feature, which seems on stratigraphic grounds to date to Classic times. We are still unsure how its use was related to contact period activities at Structures N11-18 and N11-27. But it is at least possible to say that this long line of substantial, shaped limestone blocks appears to be a Classic Period construction against which the eastern platform face of a small Spanish contact period structure, N11-27, was built.

Another goal of the 2005 Maya Archaeometallurgy Project was to complete the chemical compositional analyses of a select group of copper artifacts that had been recovered during the first field season of the MAP. Dr. Aaron Shugar of Buffalo State University completed these analyses using analytical techniques such as laser ablation inductively coupled plasma mass spectrometry (LA-ICP), light optical microscopy (LOM), and scanning electron microscopy (SEM). Analytical work was conducted at the Smithsonian Institution's Museum Conservation Center (formerly the Center for Materials Research and Education) and at the Lehigh University Archaeometallurgy Laboratory.

The results of this work add further weight to the idea that the Maya at Lamanai were actively engaged in copper production activities during Spanish colonial times, and probably earlier. Specifically, these analyses showed that cold working and annealing of sheet and other kinds of copper objects was taking place, likely on-site. These analyses also showed that bells from this first group of objects were made using the lost-wax casting technique. Finally, the analysis of this group of objects demonstrated it was possible to distinguish between certain objects, specifically sheet copper, that were made during Spanish contact times from those that were made centuries later and most likely brought to the site by British sugarcane workers.

Table 5. Summary of Copper Objects Recovered during 2005

Artifact Type	Small Find Numbers	Total
Prill	LA 2981/2	1
Bell	LA 2966/12	1
	Total	**2**

Thus far all six of the copper artifacts recovered from excavations in 2004 and 2005 at Structure N11-27 are production debris. The functional relationship of this structure and the implied social relationships its residents may have had with those residing at adjacent Str. N11-18 are intriguing but are still not completely understood. Yet in 2005 we were able to more fully define the horizontal extent of Structure N11-27, possibly an outbuilding of the kind Farris (1984:178-179) mentions as typically associated with the residences of Maya *caciques*. With few exceptions, these buildings, and indeed those of Maya Contact Period *caciques*, have not been studied extensively in the Lowland Maya area.

Research Goals and Methods for the 2006 Field Season

The focus of MAP (Maya Archaeometallurgy Project) research at Lamanai in 2006 was the area located immediately east of the Spanish mission churches (Figure 4). MAP investigations were conducted in this area based in part on the findings of Ms. Darcy Wiewall and her field crew in an area located approximately 60 m east of Str. N12-13, the second Spanish church at Lamanai. Excavations in an area that appears on physiographic grounds to be part of the seasonal floodplain of the New River Lagoon were undertaken by Wiewall and her crew in 2004. In Lot LA 2790 of a .50 x 1 m area two large, irregularly-shaped copper pieces were found in direct association with three copper axe fragments that fit together to form a complete axe (Simmons, Pendergast and Graham n.d). Directly below this lot, in LA 2791, another copper axe was found; it had been broken in two pieces.

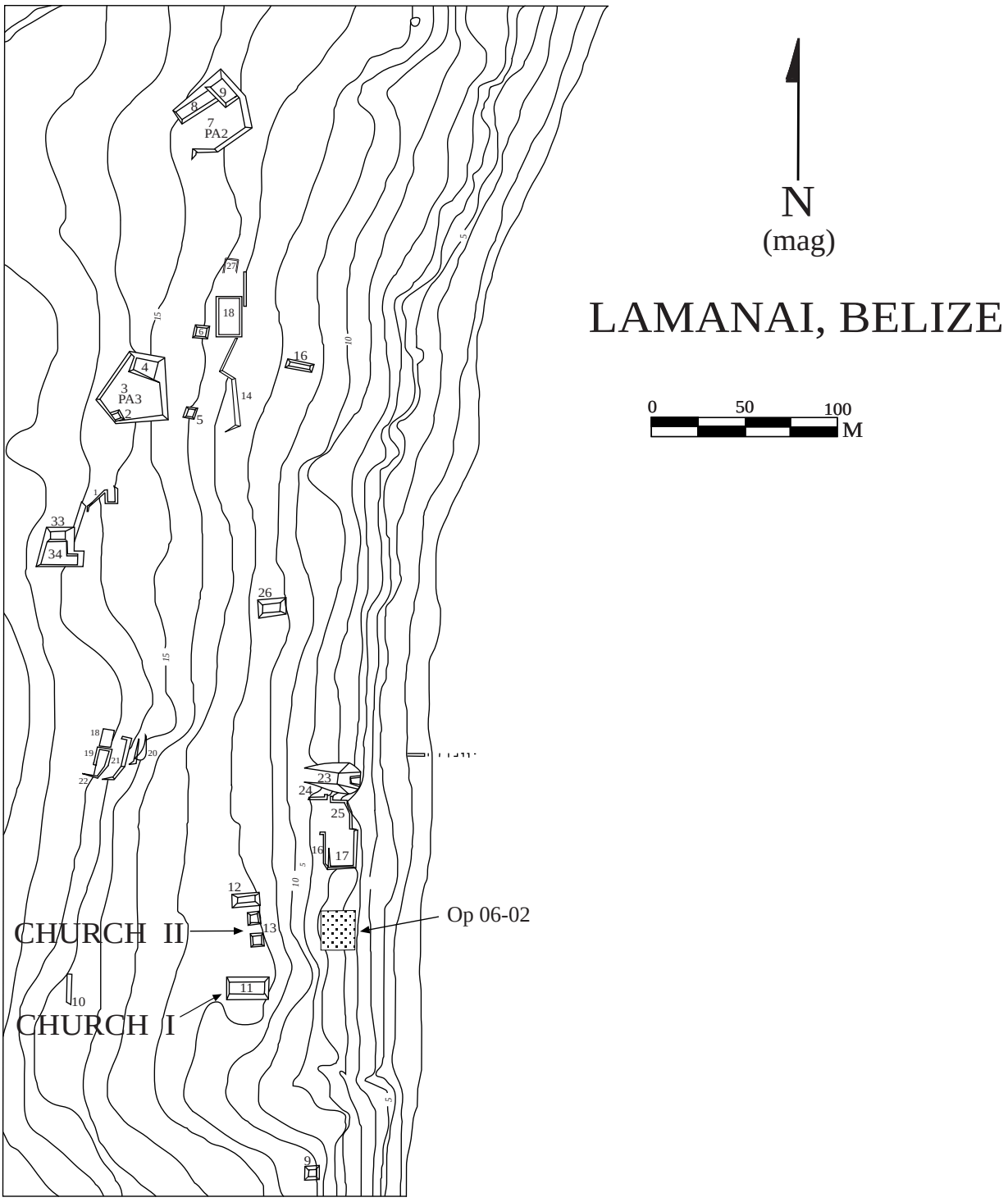


Figure 4
Site Plan, N12 Grid Block and Op 06-02,
Lamanai, Belize

Preliminary observations and assessments of these objects suggests that the large copper lumps likely represent the remains of casting reservoirs, or those remnants of the lost-wax casting process where copper solidified in the upper funnel-like portion of the lost wax mold (see Long 1964). Several lines of evidence converge to suggest that these casting reservoirs, as well as the copper axe fragments found with them, were destined for recycling whereby they would be melted down and recast into other object forms. First, the results of Hosler's (1994) analyses on the chemical composition of contact period copper artifacts from Lamanai indicate that some objects made by the Maya of Lamanai were produced from stock metal obtained from melted down copper objects that had arrived at the site earlier, perhaps in Early Postclassic times.

Second, Shugar (personal communication 2004) believes that the axes may have been intentionally broken to fit into crucibles for recycling (melting). Not only would breaking the axes allow them to readily fit into a crucible, but the reduced surface areas of these copper pieces would have greatly facilitated their melting. The presence of these particular artifacts, along with an axe fragment recovered from construction fill deposits in nearby Str. N12-17, located just north of this area of the site, suggested that explorations in this particular area might yield additional evidence of on-site copper metallurgy.

In addition, we hoped to continue to build a larger base of information on the domestic residences of Maya commoners at the site during contact times. MAP investigations at Lamanai undertaken since 2001 have successfully documented several small, previously unknown contact period residential structures in the Spanish Church Zone. Areal excavations as well as trenching have provided data on the layout, dimensions and construction methods used in these household structures. MAP research has also added to our understanding of the range of material culture, subsistence preferences, treatment of burials, refuse disposal practices, and relative social and economic positions of the residents of these contact period structures. Excavations in this particular area of the site were envisioned as a way to continue documenting contact period life while at the same time exploring the possible relationships that may have existed between household residents and copper production.

Specific goals of the 2006 field season included exploring a larger area of the midden deposit in which Wiewall (2004) recovered the probable copper casting reservoirs and axe fragments. The aim here was twofold: 1) recover a larger sample of artifacts, including finished copper objects and production debris and 2) determine the depositional history of the midden, particularly in relation to the long, linear feature of stones, Feature N25 E60, identified by Pendergast first in 1984 and later reported on by Wiewall in 2004. Another goal of the 2006 field season was to better understand the nature of Spanish contact period Maya use of the terrace feature situated immediately west of the seasonal floodplain of the New River Lagoon and Feature N25 E60. This feature, discussed in more detail below, may represent an exposed natural outcrop of limestone bedrock which is itself located at the intersection of the lagoon floodplain and this terrace feature, itself shown lying between the 7-8 m contour lines on Figure 4.

Field and Laboratory Methods

Field Methods

During the 2006 field school season a total of 14 units were systematically excavated, covering a total area of 46.0 square meters. Unit dimensions varied but most measured between 1 to 2 meters square in area. Several 1 m wide trenches were also excavated (see below) and a rather substantial area, measuring approximately 50 x 30 m (N-S x E-W) was cleared of underbrush to check for surface indications of ancient Maya occupation and other uses of the area.

Excavation units were tied into a horizontal grid system that has as its benchmark (N0, E0) point the southwest corner of Structure N12-13 (YDL II), the second Spanish church. Therefore, all excavation units situated north and east of the southwest corner of Structure N12-13 were given a N/E coordinate. No excavations were conducted south of Str. N12-13 in 2006. Excavation unit coordinates were referenced using the grid coordinate of the southwest corner of each unit.

Vertical elevations were taken from five temporary datum points, all of which were established from the vertical benchmark found at the top of the uncarved stela situated immediately in front (west) of YDL II (Str. N12-13). The elevation of this benchmark above mean lagoon level (amll) is 14.07 m. This designation, above mean lagoon level (amll) has been used throughout the Lamanai Archaeological Project as a standard vertical reference designation (Simmons and Howard 2003).

All lots within the units were trowelled and any visible cultural material was hand collected in a zinc tray. All soil excavated during the 2006 field season was screened through ¼" metal mesh, and soil color descriptions were based on the Munsell Soil Color Chart. Artifact trays were transported to the laboratory for processing. Students enrolled in the Lamanai Archaeological Project's field school generally carried out the majority of the fieldwork and laboratory processing of artifacts recovered with help from two local Belizean field assistants from Indian Church.

Excavations followed natural stratigraphic deposits in 2006. If discrete soil deposits exceeded 10 cm in depth then arbitrary 10 cm levels were excavated within those deposits in order to maintain some horizontal control over the locations of artifacts within those strata. All excavated cultural material, including modern refuse, was collected in the field for processing in the archaeology laboratory. Once counted and briefly described in the laboratory this modern refuse, nearly all of which was deposited in 1983 and 1984 when Salvadoran and Guatemalan refugees resided in this area of the site, was discarded.

The field school curriculum dictates that the first week of the course be reserved for introductions to Maya archaeology, archaeology at the site of Lamanai and in our specific research area, and the methods utilized by the LAP. As a result, excavations did not begin until the second week of the program. Required fieldwork for participants includes tape and compass mapping, leveling with the transit and level, detailed archaeological note taking, plan and profile drawing, soil description and excavation techniques. Laboratory work for field school students is described below.

Excavations in Operation 06-02 were concentrated in four separate Sub-operations or sub-ops, all of which were situated between 50-70 m east of YDL II (Str. N11-13), the second Spanish church (Figure 4). As discussed below, excavations were conducted in this area to identify commoner household remains and additional evidence of copper metallurgy in the area. It is anticipated that this area of the site, like the area located immediately around Str. N11-18, located north of the Spanish churches, will provide additional evidence of on-site copper metallurgy in the coming seasons. A total of 42 separate lots were excavated in Operation 06-02 during the 2006 field season (Table 6).

Laboratory Methods

All excavated cultural material was transported in zinc trays from the field to the on-site laboratory at the Lamanai Archaeological Reserve where the artifacts were washed, dried, sorted, and analyzed. The LAP procedures include sorting all washed artifacts by material, with the intent being that artifacts permanently stored by material makes them easier to locate for future analyses. It is during this phase of sorting by material type that culturally and/or temporally significant finds, termed Small Finds, are separated, also by their respective lots. Small Finds were designated by their lot number and a specific catalog number, such as a copper bell designated LA 3004/1. A corresponding form is completed for each Small Find recovered (see Appendix 1).

Special Ceramics are also separated at this stage in laboratory processing. Special Ceramics are temporally or stylistically diagnostic ceramic artifacts that have the potential of increasing our understanding of stylistic preferences and temporal sequences at the site and in the region and are separated for future analyses from the mass of less diagnostic ceramic sherds recovered during LAP field investigations. The presence and relative quantities of modern cultural material (less than 50 or so years in age) were noted in field notebooks but were not retained for processing and analyses.

Although Lot and Operation Records are considered field forms they are completed while laboratory processing is taking place during the course of the field season. The Operation form for Op 06-02 is shown in Appendix 2. Also, during laboratory processing Lot and Small Finds Records are entered into LAP's archaeological database software program, *Superbase*. Descriptions of field and laboratory recording procedures are summarised in Table 6 below. Both Lot Record and Small Finds summary information are presented in Appendices 3 & 4 of this preliminary report. Other cultural material that is not considered a Small Find, such as ceramic sherds, chert flakes, obsidian blades, bone, and shell, were sorted by lot and counted, weighed and recorded on the LAP Artifact Count and Weight Forms. A total of 14,481 artifacts, ecofacts and human remains (small bone fragments from Burial 06-01) were recovered and processed in 2006. Summary tables of artifact counts and weights by lot are created in MS Excel and can be seen in Appendices 5 & 6.

Table 6. Description of Field and Laboratory Recording Procedures*

LAP System	2006 Field Season Designations	Description
OPERATION & SUB-OPERATION	OP 06-02 SUB-OPS 1-4	OP indicates an operation, the 06 indicates the year in which the operation was assigned and carried out. The second number is assigned in chronological order and indicates the number of operations that have been assigned that year. Each distinct area under investigation at Lamanai is assigned a separate operation that tracks all lot numbers, burials, vessels, etc. that are assigned for that project. Sub-operations are designations of discrete areas within each operation.
LOTS	LA 2992 – LA 3033 42 total lots assigned in 2006	Lot numbers are then assigned and numbered sequentially within each operation. A lot is a distinct area under investigation and can include, but is not limited to, an architectural feature, a 10-20 cm (or other) arbitrary level of soil, or any other significant deposit. A lot form is filled out (Appendix 1) for each distinct area under investigation and provides information such as thickness of deposit, date of deposit, and relationship to datum and/or surface. A master list of lots is maintained for reference and to aide in assignment of open lot numbers.
SMALL FINDS	LA 2992/1 – LA 2986/2 290 total Small Finds recovered in 2006	Culturally and/or temporally significant artifacts, termed small finds, are pulled from their lot and given a distinct catalog number. For example, a possible copper prill was recovered which has a catalog number of LA 3018/6; it was the sixth significant (diagnostic) find in lot LA 3018. Attribute analyses are conducted and a separate form is completed for each small find that contains information such as the dimension, weight, provenience, and illustration (Appendix 1). A master small find list is maintained for reference and ease in assignment of catalog numbers. All small finds are labeled and stored in the secure bodega at Lamanai.
BURIALS	Burial 06-01 1 burial identified in 2006	Burial control numbers have typically been assigned according to the structure number, Burial 06-01 is the first burial recovered from Operation 06-02. There are detailed field and laboratory forms that require all human remains to be systematically recorded. All relevant lots are recorded.

* Copies of all Operations forms, Lot Record forms and Small Finds forms are found in Appendix 1.

Formal analyses the Op 06-02 material assemblage have not yet been conducted as of the writing of this preliminary report. Various detailed kinds of analyses, however, are planned for the Maya ceramic, lithic and metal artifacts that were recovered during the 2006 field season. The results of these analyses will be published separately in the coming years. It is possible, however, to offer preliminary statements regarding the nature of certain groups of artifacts recovered and while these statements are based on only preliminary observations they nonetheless provide us with a basic understanding of both Maya, Spanish and later British occupation of Op 06-02.

The importance of proper laboratory processing is stressed to all LAP field school students. Each field school participant is required to complete every step of laboratory processing in order to expose them to these procedures as well as assist with assuring that all initial lab work is completed by the end of each season. The cultural material recovered from each operation is well labeled and stored in secure plastic packing boxes with snap-tight lids at the on-site bodega in the Lamanai Archaeological Reserve. At present we are beginning the process of utilizing zinc boxes for the long-term storage of artifacts recovered from Lamanai. These boxes will greatly increase researchers' abilities to access certain artifact collections for study and will facilitate the long-term stability of these materials in terms of their conservation.

Research Results from the 2006 MAP Field Season

The following section presents a summary of the results of excavations at Operation 06-02, the primary focus of archaeological investigations in 2006. This section of the preliminary report is organized into three sections. The first section addresses the results of field investigations at Operation 06-02, specifically the architectural features encountered in each of the sub-operations investigated. The next section presents a discussion of stratigraphic deposits encountered in Op 06-02. A preliminary discussion of the types of cultural material encountered during excavations in Op 06-02 will also be presented in this second section of the report. The last section of the research results from the 2006 MAP field season focuses on dating and preliminary assessments of dates of occupation of structures tentatively identified but not yet fully delineated in 2006.

Excavations in Operation 06-02

The entire area in which Op 06-02 is located sits on what appears on geomorphological grounds to be a natural terrace feature located just above the floodplain of the lagoon (Figure 4). Four discrete areas were investigated in Op 06-02 during the 2006 field season at Lamanai (note that surveying in Op 06-02 with a GTS Total Station will be conducted in 2007 and therefore a detailed site plan is unavailable at this time). Each of these areas was chosen for investigation based on either the results of previous work in the area (by Pendergast in 1983 and 1984 and by Wiewall in 2003 and 2004) or on the basis of surface indications of buried structural features and/or concentration of cultural material. Presented below is a discussion of the results of archaeological investigations in each of the four sub-operations in Op 06-02; this is followed by a synthesis of information on Spanish contact period and earlier architectural remains and

material culture obtained during the 2006 field season in the area immediately east of the Spanish churches.

Sub-Op 1

This particular area of the site is situated approximately 25 m north and 53 m east of the southwest corner of YDL II, Structure N12-13 (Figure 4). As mentioned briefly above, previous investigations conducted in the area by Pendergast in 1985 revealed the presence of a substantial semi-circular stone feature situated approximately 25 m east of Str. N12-13 (Pendergast unpublished field notes 1985). Pendergast designated the feature the "Amfiteatro." Excavations in and immediately around this particular feature resulted in the identification of 12 human burials, all interred in Christian fashion (extended, dorsal burials, facing east), as well as two bundles of human bones. Wiewall's subsequent excavations in this area in 2004 resulted in the identification of another Historic period Christian burial in the approximate center of the feature.

The feature is intriguing in its unusual semicircular form as well as by virtue of its location in the heart of the Spanish Church Zone (Figure 5). Constructed of three concentric lines of vertically set cut limestone blocks, the feature was likely used during Historic times at Lamanai. These "typical vertically set facing stones" (Pendergast 1986b:241) retaining earth and rubble fill are not only found throughout the Spanish Church Zone at Lamanai but are also found at several other Maya sites in northern and western Belize with similar late occupation components. These sites include nearby Chau Hiix (Andres and Pyburn 2004) and Progresso Lagoon (Oland 2002, 2005; Masson 1997, 2000) as well as Santa Rita Corozal (Chase and Chase 1988), and Tipu (Graham 1991; Graham and Bennett 1989). Indeed, the presence of vertically set stones as facings for low platforms is likely indicative of fifteenth-century or later Maya architecture in Belize (Pendergast et al. 1993:70).

Due to the presence of Christian burials in and around Feature N25 E50, the 'Amfiteatro,' it was determined that excavations inside the arc of this feature would likely yield more human burials and therefore the 'inner' portion of the feature was to be avoided. It was, however, deemed prudent to conduct limited excavations in a portion of the outer area of the feature to determine if the feature was part of a larger structure, or attached to a structure to the north, where a prominent rise in the ground surface suggested some subsurface accumulation of material. Three contiguous $2m^2$ excavation units were placed immediately northeast of the northeastern-most stones that form the arc of the feature.

Excavations in these three contiguous $2m^2$ areas revealed generally very light colored soil (10YR 6/6 and 10YR 7/4), loose throughout much of the excavated area, with abundant crumbled yellow-tan-brown (10YR 8/6 in Munsell Rock Color Chart) limestone rocks (Figure 6). This was by far the most challenging area to excavate in Op 06-02. Decomposing bedrock/marl was encountered just below the existing ground surface in the northern $2m^2$ excavation units (see Figure 6) and crumbly marl was found throughout. In some cases soil and rock were found in roughly equal amounts in each of the 10 cm lots excavated in this sub-op.

Figure 5
Feature N25 E50, the 'Amfiteatro,' Operation 06-02. Stones of Feature N25 E60 are visible at the top edge, left-center of this image. Sup-Op 1 was situated just to the north of the northern extent (seen on extreme left side) of this semi-circular stone feature. Excavations in 1985 by Pendergast and in 2004 by Wiewall revealed a number of Historic Period burials. This feature is intriguing due to its unusual design and placement in the heart of the Spanish Church Zone. Its function prior to use as a Christian cemetery is unknown. View East.

Artifact densities were comparatively low throughout this area, although several pieces of copper, including a whole globular bell (LA 3004/1) and a mis-cast bell (wall fragment – LA 3014/1) were recovered in Sub-Op 1 (see Table 7 and Appendix 5). A copper nail (LA 3004/4) and a piece of sheet copper (LA 2999/1) that appears identical to those identified by Shugar (2005) as most likely British, were also recovered. It is notable, but not entirely unexpected, that historic artifacts were recovered throughout the generally shallow excavations undertaken in Sub-Op 1. These historic artifacts include 19th century whitewares and pearlwares along with kaolin clay British tobacco pipe fragments, assorted ferrous metal fragments and different colored pieces of glass. British occupation throughout much of the Spanish Church Zone was fairly heavy and this is reflected in the artifact totals shown below, where historic ceramics, glass and metals

accounted for nearly 30% (28.52%) of the total number of artifacts recovered during excavation in Sub-Op 1.

The presence of 19th century British artifacts along with variations in surface topography are indicative of post-contact disturbance in this particular area of Op 06-02, but overall the level of disturbance does not exceed that seen in some other parts of the operation (see below discussion). No evidence of intact structural remains that might represent an extension of Feature N25 E50 was identified, nor were any other associated construction features noted in this particular area. Excavations were fairly shallow in this area, terminating approximately 20-30 cms below ground surface (bgs).

Excavations were discontinued in Sub-Op 1 mid-way through the 2006 field season for several reasons. First, almost no cultural material was recovered below approximately 25 cms bgs. Small, unidentifiable ceramic sherds and very few lithic artifacts represent the bulk of cultural material recovered in the first two 10 cm levels of soil excavated in this sub-op. Diagnostic ceramic types observed during laboratory processing include Yglesias and Cib vessel fragments along with what are most likely earlier, less diagnostic Classic Period sherds.

Also, dense accumulations of crumbly limestone, mainly buff-yellow in color, were encountered throughout much of Sub-Op 1, making excavations difficult and time-consuming. This material appears to be weathered limestone and may represent near-surface decomposing bedrock or *sascab*. The possibility that this is weathered limestone bedrock is strengthened by preliminary observations of surface topography and hydrology of this particular area of the site. Specifically, Sub-Op 1 appears to be situated in an area immediately east of Str. N12-13, the second Spanish church, this is subjected to surface erosion of soils possibly to a greater extent than in surrounding or adjacent areas of Op 06-02.

Although several pieces of copper were recovered in this area these appear to have come from near surface deposits of the kind typically referred to by Lamanai Archaeological Project researchers as PAA or Post Abandonment Accumulation. In addition, the absence of structural or other types of features and the desire not to encounter additional Historic Period burials led to the decision to terminate investigations in this particular area of Operation 06-02. Future, more in-depth investigations in this area might be profitable, particularly if a principal aim of such work is to study the paleodemography of the Christianized segment of the Spanish Contact Period Maya population at Lamanai.

Figure 6
Sub-Op 1 overview. Three contiguous $2m^2$ units were excavated in Sup-Op 1, two of which are shown here partially excavated. The orange-yellow colored area in the northeastern (bottom right) excavation unit is crumbling limestone of the kind found throughout much of the western area of Op 06-02. In much of Sub-Op 1 this decomposing limestone and associated small limestone pebbles comprised much of the soil matrix. The extreme northern edge of Feature N25 E50, the 'Amfiteatro,' is in the top center of this image (see Figure 5 for an overview of Feature N25 E50). Excavations in this particular area of Op 06-02 were very shallow in nature, in part because an objective was to simply delineate more of the northern portion of this feature and also because excavations in 2004 revealed a Christian-style burial along the central axis of the feature. The heavy concentration of decomposing tan-yellow bedrock/marl in the uppermost $2m^2$ excavation unit along with the crumbled bedrock/marl seen in the lower right $2m^2$ unit appears to indicate that the northern extent of Feature N25 E50 lies to the immediate south of Sub-Op 1. Excavations had not yet begun in Unit N24.3 E 54.95, located at the bottom left, at the time this image was taken. View West.

Figure 7
LA 3004/1, a globular copper bell found during excavation in Sub-Op 1 that is fairly typical of others that have been recovered from Contact Period deposits at Lamanai. Note the prominent stress crack at the junction of the resonator slit and the bell wall. This is likely caused by prying the resonator slit open in order to insert the bell clapper. Also, a small downsprue remnant can be seen at the top of the bell's suspension loop.

Table 7. Major Artifact Classes by Lot Number Identified in Sup-Op 1, Operation 06-02

	Lot Number						
Artifact Class	**LA 2993**	**LA 2999**	**LA 3004**	**LA 3008**	**LA 3014**	**LA 3021**	**TOTAL**
Ceramic sherds	51	24	81	33	48	97	**334**
Chert	19	10	27	22	15	12	**105**
Obsidian	2	2	1	2	0	1	**8**
Bone	41	37	39	30	20	19	**186**
Shell	3	2	7	0	0	3	**15**
Special ceramics	0	1	0	0	1	0	**2**
Small Finds	3	2	7	3	3	1	**19**
Historic artifacts*	41	9	136	47	6	69	**267**
TOTAL	**160**	**87**	**257**	**137**	**93**	**202**	**936**

* Includes 19th Century ceramic artifacts, ferrous metals and glassware

Sub-Op 2

Located between approximately 5-16 m north and 55-65 m east of the southwest corner of YDL II (Str. N12-13), Sub-Op 2 was the most extensively investigated area in Operation 06-02. Five contiguous $2m^2$ excavation units along with a 1x5 m trench were excavated in Sub-Op 2. In addition, a single 1x3.5 m trench was excavated just south of the contiguous excavation units and trench mentioned above. In total, a 28.5 m^2 area was excavated in 17 separate lots in Sub-Op 2.

This particular area of the site was investigated mainly because the presence of surface stones oriented in three roughly N-S trending alignments suggested the presence of several small structures of the kind identified in previous field seasons in the Spanish Church Zone (Simmons and Howard 2003; Simmons 2004, 2005b). Surface collections in the area had also produced several pieces of Spanish olive jars, the existence of which had already been reported by Pendergast some twenty years earlier (Pendergast 1985 unpublished field notes).

One of these alignments of stone, designated Line C, is shown in Figure 7. The other two alignments of large stones, designated Lines A & B, are both located in the area of Sub-Op 4 and will be discussed below. It was also clear upon initial inspection of this area that surface topography varied slightly in some areas and somewhat more dramatically in others, although in the latter case the topographic 'bumps' observed were most likely to have been created through the recent deposition of 'backdirt' - soil excavated from the nearby Spanish churches in the 1980's by D. M. Pendergast.

Subsurface investigations in Sub-Op 2 revealed the presence of Maya structural remains just below the existing ground surface. These remains consisted of the same kinds of seemingly unorganized masses of earth mixed with small, unmodified limestone rocks that we have recently recorded elsewhere in the Spanish Church Zone at Lamanai (Simmons 2004, 2005b; Simmons and Howard 2003). The masses of stone appear somewhat unorganized in that clusters of stones appear in certain areas and in others in this sub-op there are 'gaps' or vacant areas where either a gravelly matrix of weathered limestone (Michael Smith personal communication 2006) was present or where little or no stone is present (Figure 8).

This is clearly an area of Maya construction, however, and is characterized by the use of smaller, eroded pieces of limestone and limestone pebbles, gravel-like in character, as fill material. This is seen in both the larger 4 m^2 excavation block (Figures 9 & 10) as well as in the 1x5 m trench extending to its east (Figure 11). These pebbles may represent floor ballast, serving as a leveling mechanism for the floor of this probable domestic structure. Particularly dense clusters of stone were found in two contiguous excavation units at N12.25 E57 and N14.25 E57. In contrast, an adjoining $2m^2$ excavation block, located at N10.25 E55 was virtually absent of stone throughout much of its horizontal area.

Figure 8
Line C stones (center of image) and base of Lots LA 3028 & 3029, Sub-Op 2. None of Line C stones appear to have been modified in any way and almost all were visible on the existing ground surface. Bottom of image faces north.

Construction stones extended to approximately 30 cm bgs, which is the greatest depth to which excavations extended in Sub-Op 2. Artifact densities were higher here than in Sub-Op 1 and this is most likely because sherds, lithic material, shell, bone and other artifacts were included in the construction fill used to build up this area. In addition, it appears that domestic midden deposits were encountered in the southern portion of this sub-op as the relatively high densities of artifacts, particularly ceramic and

bone objects in Lot LA 3029, indicates. Over 1/3 of all of the faunal material recovered in Sub-Op 2 was found in lot LA 3029. Table 8 presents a summary of the total number of major artifact types recovered from Sub-Op 2. Unfortunately we were not able to fully delineate the horizontal extent of construction in 2006. As a result, it is not known if this construction represents a single structure or parts of several adjoining structures.

Table 8. Major Artifact Classes by Lot Number Identified in Sup-Op 2, Operation 06-02

	Artifact Class								
Lot Number	**Ceramic sherds**	**Chert**	**Obsidian**	**Bone**	**Shell**	**Special Ceramics**	**Small Finds**	**Historic Artifacts***	**TOTAL**
LA 2994	78	23	0	9	1	1	7	52	**171**
LA 2998	65	66	22	22	2	0	13	131	**321**
LA 3000	83	9	2	5	0	1	2	13	**115**
LA 3002	136	45	1	17	1	7	6	17	**230**
LA 3003	57	29	5	19	3	1	7	48	**169**
LA 3005	321	61	6	29	13	2	5	12	**449**
LA 3006	67	16	4	12	1	0	1	6	**107**
LA 3009	84	25	0	9	1	1	3	1	**124**
LA 3017	235	49	4	62	4	7	3	20	**384**
LA 3018	77	24	1	20	5	15	7	85	**234**
LA 3023	133	10	2	17	3	0	7	4	**176**
LA 3025	177	69	8	76	13	0	8	59	**410**
LA 3028	202	24	2	69	9	0	5	20	**331**
LA 3029	542	69	7	222	12	0	9	49	**910**
LA 3030	156	8	1	12	5	3	3	4	**192**
LA 3032	153	42	4	50	7	2	20	98	**376**
LA 3033	53	19	1	4	2	0	2	3	**84**
TOTAL	**2619**	**588**	**70**	**654**	**82**	**40**	**108**	**622**	**4783**

* Includes 19th Century ceramic artifacts, ferrous metals and glassware

Excavations suggest that the upper 20-30 cms bgs in many areas of Sub-Op 2 is part of what is likely a rather extensive sheet midden deposit, composed of mixed 19th Century (British) and Spanish contact period materials that extends throughout much of Operation 06-02. Historic artifact totals decline after the first 20-30 cms bgs and this appears to represent the lower limit of 19th Century disturbance of the area. Unfortunately time did not permit us to extend our excavations in this area below the third 10 cm level, or roughly 30 cm bgs.

Figure 9

Surface of Lot LA 3009 (bottom) and Lot LA 3005 (top), Sub-Op 2. Note uneven distribution of unmodified limestone pieces as well as intermittent gravel/pebble fill in approximate center of image. Much of this gravel/pebble fill appears to be identical to the crumbling yellow-brown limestone pieces found throughout Sub-Op 1. Artifact densities were fairly low, overall, within the stone and earth fill material that evidently was used by the Maya as core for the platform of a Terminal Postclassic-Spanish Colonial Period household structure. Bottom of image faces north.

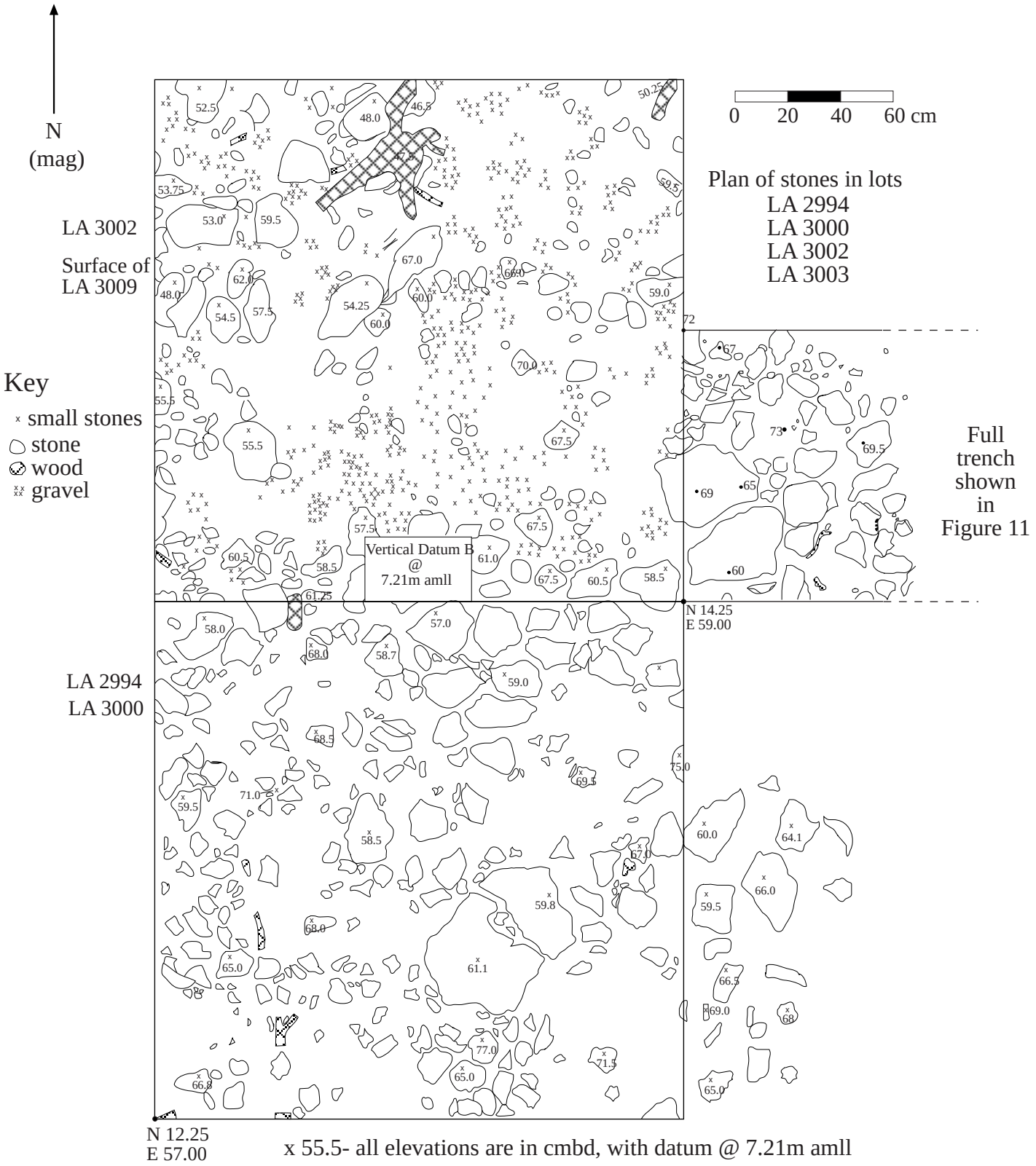


Figure 10

Sub-Op 2 distribution of stones at roughly 20 cms bgs. Note mix of stone sizes, gravel and voids where construction material is absent.

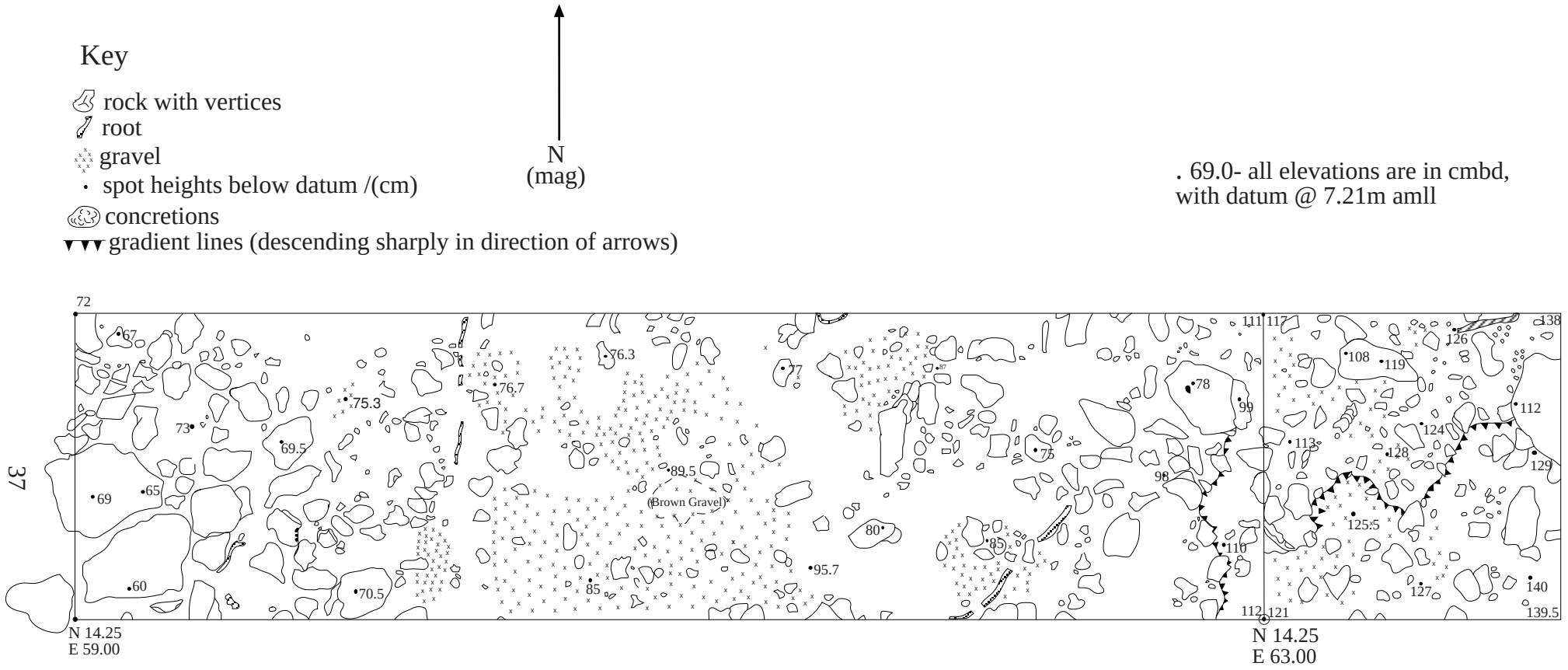


Figure 11

Eastern trench, Sub-op 2. Base of Lots LA3003and LA3011. Note uneven distribution of stones, presence of gravel and voids where construction material is absent. Portion of large stone shown on right edge of figure is part of Feature N25 E60.

The eastern trench excavations in Sub-Op 2 extended to the west face of the large stones that comprise Feature N25 E60. Indeed, the principal purpose of excavating this trench was to examine the area to the east of what are likely the remains of a contact period Maya structure (described above) located immediately west of Feature N25 E60. The limited excavations conducted in this particular area of Sub-Op 2 revealed that the Maya intentionally used various-sized stones along with artifact-laden soil to build up the area immediately west of Feature N25 E60. As mentioned above, the stones were only somewhat organized and further investigations in this area will document the depths to which these stones and other construction materials were deposited by the Maya.

The presence of the gravel-like small, weathered limestone pebbles throughout the E-W extent of the trench (Figure 12) suggests that much of the eastern edge of the terrace feature that lies between 4-6 m amll (see Figure 4) may have been modified by the Maya for the purpose of elevating and leveling a landform that sloped naturally to the east, toward the lagoon. It is likely that elevating the area by the addition of limestone cobbles and gravel-size stones would have helped to create a relatively flat surface that was more conducive for residential construction, a point that will be discussed further below.

Figure 12
Overview of principal area of Sub-Op 2. Construction stones comprised of both fist-sized (and some larger) pieces of limestone along with smaller gravel-size stones. Many of the smaller stones can be seen clearly in the trench at far left of image. The roughly N-S oriented large stones of Feature N25 E60 are just out of view to the left of this image. View South.

Sub-Op 3

Located between approximately 22-23 m north and 64-65 m east of the southwest corner of YDL II (Str. N12-13), Sub-Op 3 consisted of a single 1 x 4 m, East-West oriented trench, the western end of which abutted the east face of Feature N 25 E 60. A total of ten separate lots were excavated in this trench (Table 9), which reached a maximum depth (at its eastern end) of approximately 1 m bgs (Figure 13).

Sub-Op 3 was chosen as an area worth investigating because previous work by Pendergast (1985) and Wiewall (2004) indicated that extensive Contact Period midden deposits were present along the western shoreline of the New River Lagoon. Well preserved organic materials, including bones, fish scales and charcoal, along with abundant inorganic cultural materials, were found by those researchers in previous field seasons. In particular, during the 2004 field season Wiewall recovered six copper axe fragments, five of which fit together to form two axes, along with two masses of copper that have since been interpreted as casting reservoirs from lost-wax casting process (Aaron Shugar, personal communication 2005). Shugar believes that the axe fragments would have been an ideal size for remelting in a crucible, and at some point before their disposal in the midden all eight of the copper artifacts may have destined for recycling. The presence of these remarkable finds, which provide additional evidence of on-site copper casting, led us to explore this area further during 2006.

The feature and its associated midden deposit were also of interest and therefore worth exploring because neither had been examined in any detail before. The previous investigations mentioned above suggested that Lamanai's lagoonside residents had used the area immediately east of the feature as a dumping area, but the vertical extent of the midden in this area had not yet been sufficiently investigated. Specifically, we wanted to determine the date(s) of midden deposition, its vertical extent, and its relationship to the prominent stone feature, N 25 E 60.

Table 9. Major Artifact Classes by Lot Number Identified in Sup-Op 3, Operation 06-02

	Artifact Class								
Lot Number	**Ceramic sherds**	**Chert**	**Obsidian**	**Bone**	**Shell**	**Special Ceramics**	**Small Finds**	**Historic Artifacts***	**TOTAL**
LA 2995	135	17	3	90	5	1	7	52	**310**
LA 2997	300	129	7	380	32	6	13	171	**1038**
LA 3001	390	99	6	230	32	7	12	2	**778**
LA 3010	712	121	6	315	76	22	26	1	**1279**
LA 3015	596	71	6	174	39	27	12	0	**925**
LA 3016	78	14	0	16	5	1	0	0	**114**
LA 3022	261	80	1	19	7	11	5	0	**384**
LA 3026	0	0	0	54	0	0	0	0	**54**
LA 3027	123	21	0	139	7	0	1	0	**291**
LA 3031	28	4	0	4	0	0	0	0	**36**
TOTAL	**2623**	**556**	**29**	**1421**	**203**	**75**	**76**	**226**	**5209**

* Includes 19th Century ceramic artifacts, ferrous metals and glassware

Figure 13
Overview of E-W oriented trench in Sub-Op 3. Note the large pieces of limestone that form the eroded wall of Feature N 25 E 60 at the bottom of the image. Also note the number of fist-sized and larger pieces of limestone, probably tumbled downhill (toward the lagoon) from the built feature. The high water mark of the lagoon during the time of the dry season in which this photograph was taken was located roughly 10 m east of the trench (toward the top of this image). View East.

Soils encountered throughout the midden deposit were very dark brown (10YR 2.5/1) and contained abundant stones ranging from fist-sized to lesser numbers of larger stones, some measuring roughly 30 cms across. Some disturbance in the form of tree roots and one possible animal burrow, located along the south wall of the trench, was noted but most bioturbations were present in the upper 30 cms of the trench.

Following removal of the thin leaf litter/humus deposit a number of stones and roots were encountered. Cultural material was immediately abundant as well. But intact (undisturbed) midden deposits were not encountered until approximately 20-25 cmbs (centimeters below surface). Below this depth the midden appeared to be undisturbed, with the exception of what might have been a rather shallow rodent burrow located in the western quarter of the trench, i.e., near Feature N25 E60. Twenty to twenty-five cmbs coincided roughly with the upper portion of Lot LA 3010, where close to 1300 artifacts were recovered (see Table 9 above). Most of these were ceramic sherds, and preliminary examination of these indicates the majority were from Yglesias vessels. In addition, roughly 1/3 of all the Small Finds encountered in this trench came from this lot, including the ceramic frog (?) effigy head seen below in Figure 14. Likewise, bone, shell and chert counts were also fairly high in LA 3010, and preservation of the former was fairly good.

Figure 14
Ceramic frog or crocodile head fragment (LA 3010/14) recovered from LA 3010. Note the small amount of probable stucco coating part of the mouth below the left eye.

Lot LA 3015, located immediately below LA 3010 (Figure 15) was found to be the deepest deposit of dark brown (10YR 2.5/1) soil in the trench; it was overlying what appears to be a transitional stratum of sorts, excavated as Lot LA 3016. This particular lot was lighter in color (10YR 4/3) but still contained cultural material in what appears to be an earlier midden deposit, although artifact totals are much smaller (Table 9). Lot LA 3015 contained fewer artifacts compared with the lot above it, LA 3010, but preservation of faunal material was very good, and a number of mammal, fish and bird species appear to be represented. Yglesias ceramic sherds were recovered from throughout the entire midden deposit.

Lot LA 3016, the basal midden deposit (Figure 15), yielded even fewer artifacts but one of those provided an important *terminus post quem* date for the midden deposits above. A single Nueva Cadiz twisted glass bead (LA 3016/9) was found at the base of LA 3016, at approximately 30 cm bgs, in the eastern quarter of the trench (Figure 16). Deagan (1987:163) notes that these beads were produced during the first half of the sixteenth century. The stratigraphic position of this bead indicates that nearly the entire extensive midden abutting Feature N25 E60 that was excavated in this particular trench was deposited sometime after roughly 1500-1550. According to ethnohistorical records (Jones 1989) the site was largely abandoned following burning of the second church in 1641, indicating that at least this particular part of the midden was created over the course of no more than one to one and one-half centuries.

Preliminary examinations of the midden had been undertaken by Pendergast and Wiewall in previous field seasons (Pendergast 1985; Wiewall 2004). Limited subsurface testing in 1985 and 2004 provided some general data on the temporal placement of the refuse deposit. But the fortuitous recovery of the Nueva Cadiz glass bead at the base of the midden has greatly refined our understanding of the period of time in which Lamanai's residents used this particular area of the Spanish Church Zone for refuse disposal. Examination of surface contours of the landform lying immediately east of and paralleling Feature N25 E60 suggests that even though it was used for only 1 – 1½ centuries the midden is quite extensive in area. It appears that residents of the Spanish Church Zone may have used this as a sort of community dumping area for household and other refuse. It is likely the Contact Period Maya simply walked to the edge of the lagoon terrace, delineated by a rough wall of limestone blocks (Feature N25 E60), and dumped their trash over the edge onto the lower lagoon floodplain (Figure 17). Although the refuse may have been conveniently out of sight it's almost certain that prevailing breezes from the East would have occasionally reminded Lamanai's lakeside residents of the presence of their malodorous waste.

The probable size of the midden itself, measuring at least 10 m (E-W) x 40 m (N-S) suggests it was used by a considerable number of the Lamanai's Contact Period Maya residents. The types of refuse discarded are informative as well. While common household refuse was recovered materials associated with specialized production of craft items, such as the copper casting reservoirs and axe fragments, were also found in this midden. The presence of the latter suggests that copper metalsmiths were producing metal objects nearby, possibly somewhere on the terrace feature lying between the Spanish Churches and Feature N25 E60.

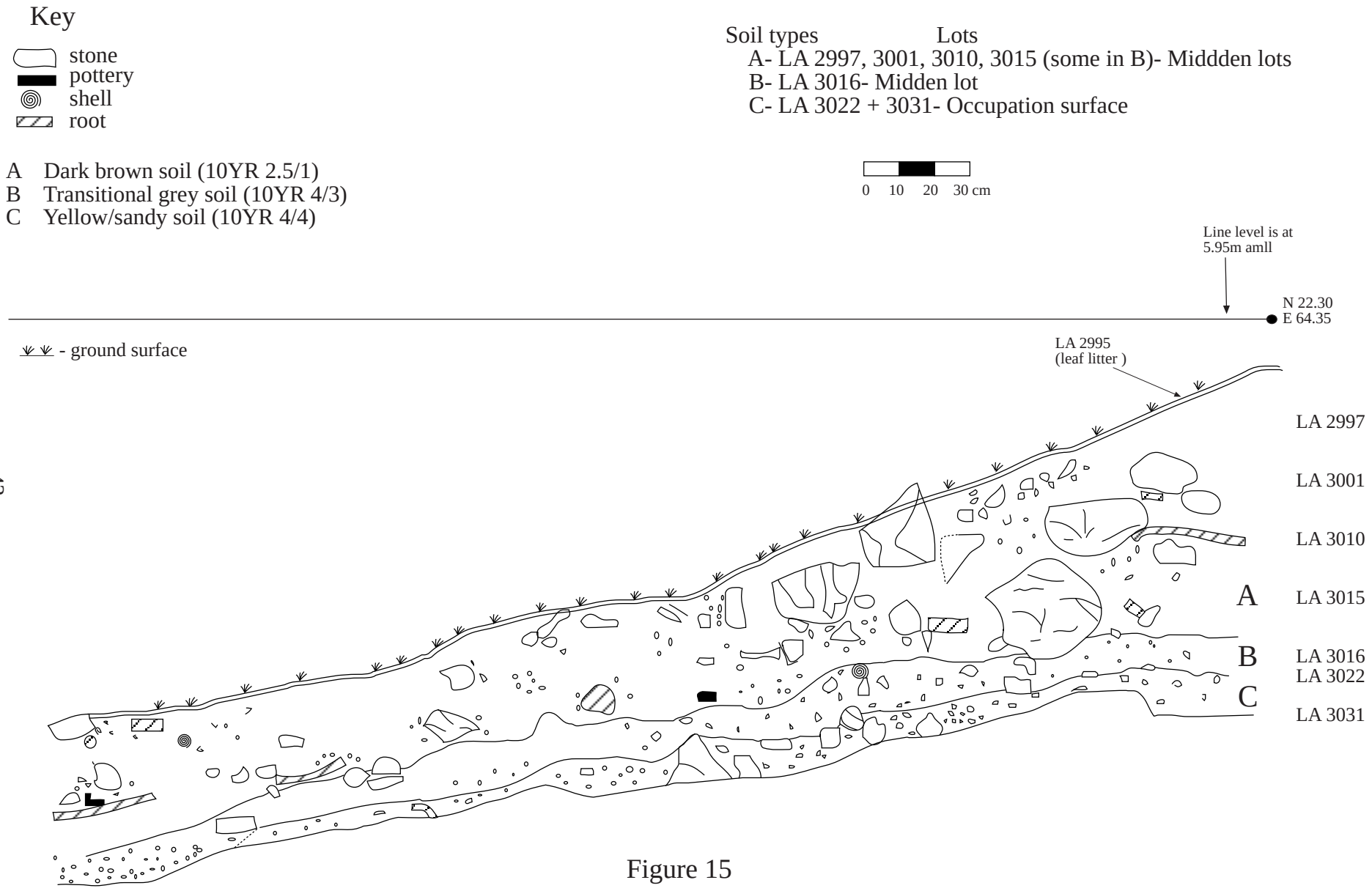


Figure 15

South wall profile of trench, Sub-Op 3.

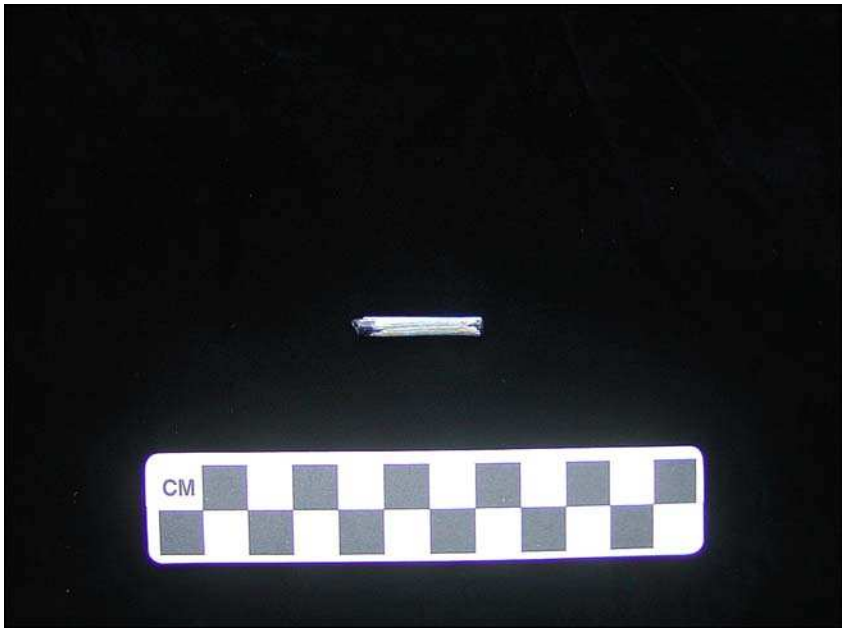


Figure 16
Nueva Cadiz twisted glass bead, LA 3016/9. Deagan (1987:163) notes that these beads were produced between roughly A.D. 1500-1550. The bead was found at the base of the midden deposit investigated in Sub-Op 3.

Feature N25 E60, mentioned briefly above as one of two identified in previous field seasons is intriguing for several reasons. First, its orientation parallel to the lagoon shore is noteworthy, particularly since it appears to terminate at the southeast corner of a rather substantial structure, N11-17, which Pendergast notes was likely used during Spanish contact times (Figure 2). Second, the feature appears to be part of a natural landform, namely the eroded east face of a terrace feature lying several meters above the lagoon-shore floodplain. But it is also very likely this natural feature, comprised of some very large limestone boulders, many of which are exposed bedrock, was modified by the ancient Maya by the addition of smaller limestone cobbles.

Burial 06-01

Excavations in the eastern quarter of the trench near the base of Lot LA revealed what appeared initially to be four stones surrounded by a matrix of very dark brown (10YR 2.5/1) soil, identical to the kinds we had been excavating throughout the trench to that point (Figure 17). But upon removal of the stones and probing in the roughly circular-shaped soil pocket directly below it became evident that the stones and soil were part of a cultural feature of some kind. Small capstones of sorts located at the eastern end of the trench excavated in Sub-Op 3. Stones (possible 'wall tumble' were still being recovered at the interface of Lots LA 3015 and 3016 but the four capstones were larger in size than those other stones and were also tightly abutting one another; in other words, these stones did not appear to represent random wall tumble.

Figure 17

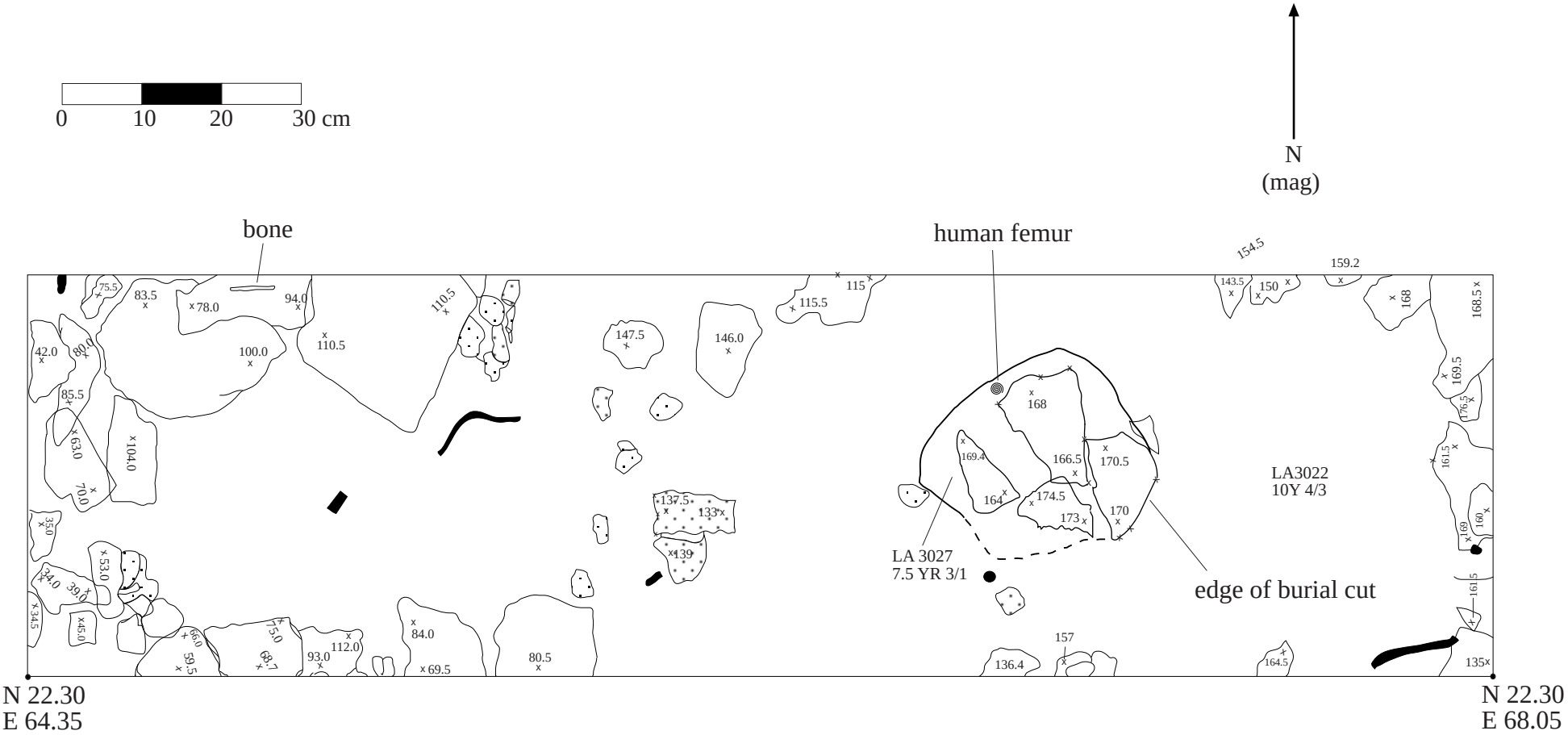
Sub-Op 4, Operation 06-02. The very large stones of Feature N25 E60 are shown in the background (top) of this image, oriented N-S, roughly parallel with the shore of the lagoon. In the foreground of the image note the four stones that served as capstones to the seated burial (Burial 06-01) that extends below the surface of Lot LA 3022, on which the folding scale and north arrow are resting. An area measuring as large as approximately 400 m^2 may contain Contact Period midden deposits that abut Feature N25 E60. The folding scale at the far (western) end of the trench is extended to 1 m in height. View West.

Removal of soil directly beneath these stones, shown in Figure 18, revealed the first of several human bones lying just beneath the capstones; one of these was the proximal end of the right femur of the individual, which was the first bone encountered (Figure 19). This was a seated burial, with the individual facing northeast and legs drawn up to the chest (Figure 20). Overall, the skeletal material was in a fairly good state of preservation (Figure 21). Based on several lines of evidence it appears that the pit for Burial 06-01 was excavated down through at least a portion of the Contact Period midden to inter the individual. The pit extended into the lighter yellow (10YR 4/4) sandy clay soil, designated as Lots LA 3022 and 3031. This lighter sandy clay soil likely represents an ancient occupation surface onto which refuse was deposited in early Spanish Colonial times; Lots LA 3022 and 3031 will be discussed further below.

Mixed dark, midden soils and the lighter silty clay soils characterized the burial fill, Lot LA 3027 (Figure 21). Cultural material recovered in Lot LA 3027 included well preserved faunal material, including turtle bones and fish vertebrae, shells, chert flakes, a small chert biface, and 123 ceramic sherds, all of which, unfortunately, are non-diagnostic. A total of 291 artifacts were recovered from LA 3027, a relatively high number when one considers this material came from an area measuring slightly less than 25 cm^3. Both the numbers and characteristics of the cultural material from LA 3027 strongly suggest that the bulk of burial fill artifacts came from the midden deposits, including Lots 3016, 3015, and possibly lots higher in the soil profile as well (see Figure 15). If the pit was dug through the midden to inter the individual, as appears almost certain, this means that Burial 06-01 dates to Spanish Colonial times.

It is reasonably clear that like the other three Terminal Postclassic-Spanish Colonial Period Maya burials we have encountered within the Spanish Church Zone (but outside the immediate area of the churches) this particular individual was buried in a location and disposition that suggests they had not been baptized by circuit-riding Spanish priests. In terms of its treatment Burial 06-01 stands in sharp contrast to a human burial excavated by Wiewall at nearby Feature N25 E50 during the 2004 field season (Wiewall 2004). The remains of this particular individual are located a mere 13m west of Burial 06-01 and were found in a supine position, with head to the west in typical baptized, Christian style. It is situated near what is likely the eastern edge of the cemetery associated with the second Spanish church, Structure N12-13. So it appears that while some residents of Lamanai's Contact Period community evidently had been baptized and thus could be interred in the church cemetery, others presumably had not embraced Christianity and were buried in a more traditional, non-Christian manner outside the confines of the church cemeteries.

The human remains of Burial 06-01 were not fully exposed; as a result the approximate age and sex of the individual are not known. Based on the observation of fused long bone epiphyses it is known, however, that the individual had reached adulthood at the time of death. Because examination of human skeletal material was not part of the research proposal Simmons submitted to the Belize Institute of Archaeology the remains were not excavated. At the close of the 2006 field season both the burial and the entire trench were backfilled.



Key

limestone

concretions

roots

not well defined

x 115.5 all elevations in cmbd- Datum C @ 7.14amll
Datum C @ N 21.46 E 64.12

Figure 18

Plan of capstones for Burial 06-01, Sub-Op 3. Other stones encountered at the level of the burial capstones are also shown in this figure.

Figure 19

Overview of excavated Burial 06-01, Sub-Op 3. This is a seated burial with the right femur and tibia shown immediately to the right of the skull, near the northern edge of the burial cut. The upper half of burial fill was excavated in 2006 and the burial was backfilled shortly after this image was taken. Soil in the foreground of the trench has been compacted during excavation, but the typical color of the surrounding soil matrix is seen around the menu board. Feature N25 E60 is shown in the upper portion of this image. Note the relative volume of what appears to be 'wall tumble' in the western portion of the trench and throughout the depth of the soil profile. The extensive midden discussed above appears to continue east of this trench, toward the lagoon edge, which is located approximately ten meters away (toward the bottom of this image). View West.

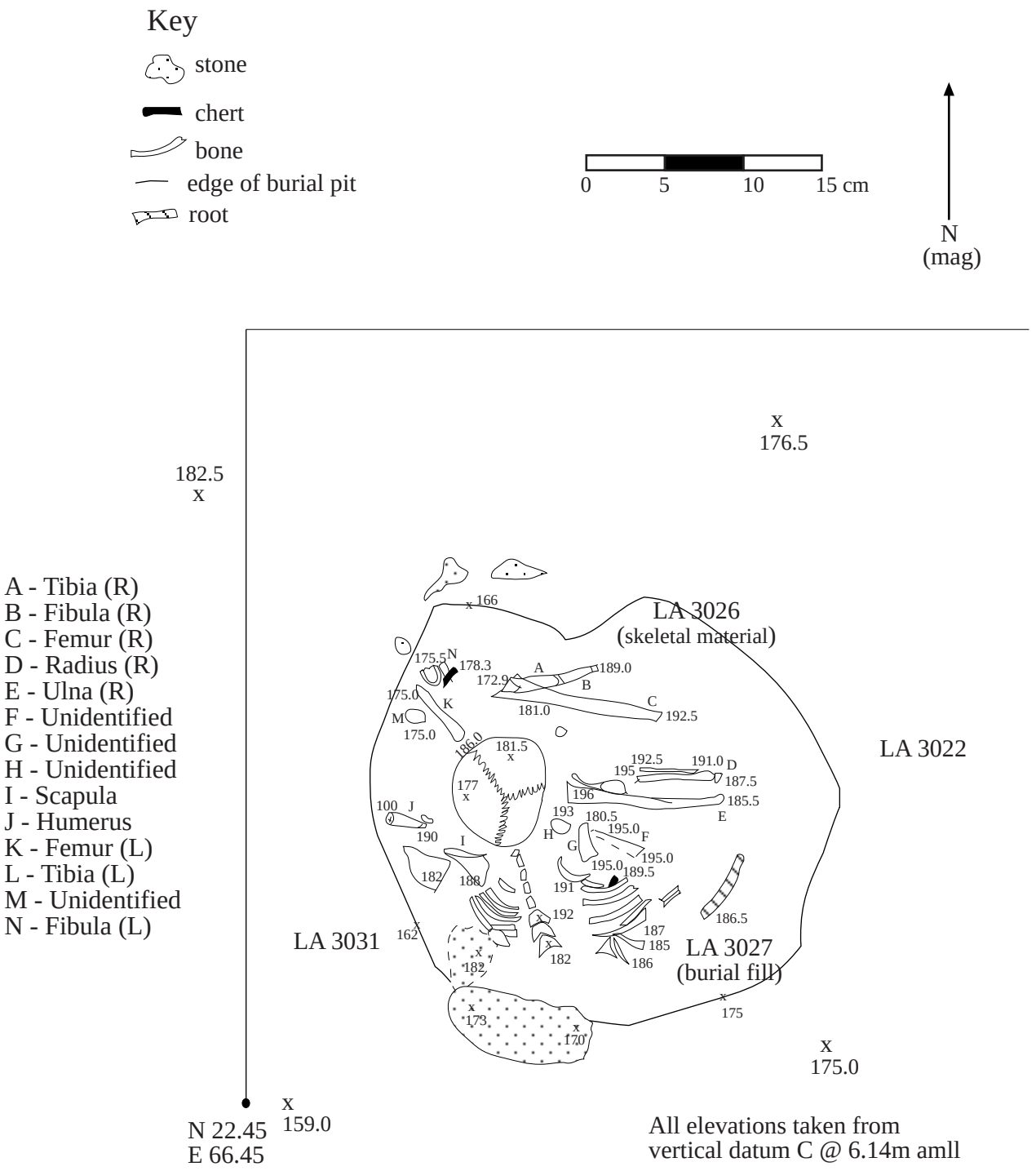


Figure 20
Plan of Burial 06-01, Sub-Op 3.

Figure 21

Overview of excavated Burial 06-01, Sub-Op 3. Ribs and vertebrae appear on the left side of the burial pit to the left of and below the skull. The individual's drawn up legs are shown to the right of the burial pit; the right forearm, with ulna to the left and radius just to its right, are seen directly below the skull. The Maya excavated through at least a part of the midden and into the lighter brown soil underlying the midden to inter the individual in a simple pit capped by four stones. Note that several small stones also appear at the southwestern edge of the pit. No grave goods were recovered with Burial 06-01, although artifacts from the overlying midden were present in the burial fill. View West.

The deepest deposits excavated in the trench in Sub-Op 3 were characterized as light brown (10YR 4/3 and 10YR 4/4) silty clay with some sand that appears to have been an ancient occupation surface. Relatively small number of artifacts was recovered from Lots LA 3022 and LA 3031. Ceramic sherds were generally small in size and badly eroded, with most of their slips absent. Likewise, chert flakes exhibited heavy patina and very little faunal material was recovered. The condition of cultural material from these lots suggests that artifacts had been subjected to weathering agents, particularly the sun and rains, leading us to believe that Lot LA 3022 may represent an ancient occupation surface that pre-dates Spanish Contact. One of the few culturally/temporally diagnostic artifacts recovered from the surface of Lot LA 3022 was a fragment of the face of a Chen Mul or "Mayapanoid" incensario (Figure 22).

Sub-Op 4

Located between approximately 5-10 m north and 60-70 m east of the southwest corner of YDL II (Str. N12-13), Sub-Op 4 was situated closest to the lakeshore of any of the four sub-ops investigated in 2006. This area was chosen for investigation because of the presence of three distinct lines of limestone blocks that appeared to be cultural features (Figures 22 & 23). These alignments, designated simply Lines A & B in the eastern portion of Sub-Op 4, were oriented at 10º (E of N) and 5º (E of N), respectively. Line A measures at least 7.3 m in length whereas Line B extends at least 6.3 m in length (Figure 23). A single 1 x 4 m, East-West oriented trench was excavated in this sub-op as was a 1.75 x 2 m excavation unit. Only three lots were excavated in Sub-Op 4 (Table 10), reaching a maximum depth (in the trench) of approximately 20 cmbgs (Figure 24).

Most noteworthy of Sub-Op 4 were the relatively high densities of cultural material recovered in a comparatively small area (Figure 24 and Table 10). It is possible that this area, although located 14 m east of the midden deposit encountered in Sub-Op 3, may be an extension of that apparently expansive midden. It is also possible that the material recovered in Sub-Op 4 is part of a separate, discrete midden deposit that might be associated with Maya residential remains. The latter seems like the most probable scenario given the presence of organized stone alignments that appear to be cultural features and masses of stone representative of structural core would seem to suggest.

As noted above, these unorganized masses of fist-sized stones were found in nearby Sub-Op 2 as well, and are identical to those that have been documented in previous seasons as part of Terminal Postclassic-Spanish Colonial Period household remains (Simmons 2004, 2005b; Simmons and Howard 2003). Packed earth and stone commonly served as platforms or substructures for perishable pole and thatch superstructures in the Spanish Church Zone. If this is the case then only a portion of the structure was investigated in 2006. Given the relatively high densities of cultural material mixed in with what are most likely core stones for a packed earth and stone platform it seems likely that the Maya used midden material in their construction efforts.

Somewhat surprising were the numbers of Spanish ceramic artifacts recovered from this area of Op 06-02. Over ¼ (nine) of the 34 total Spanish Olive jar sherds and all

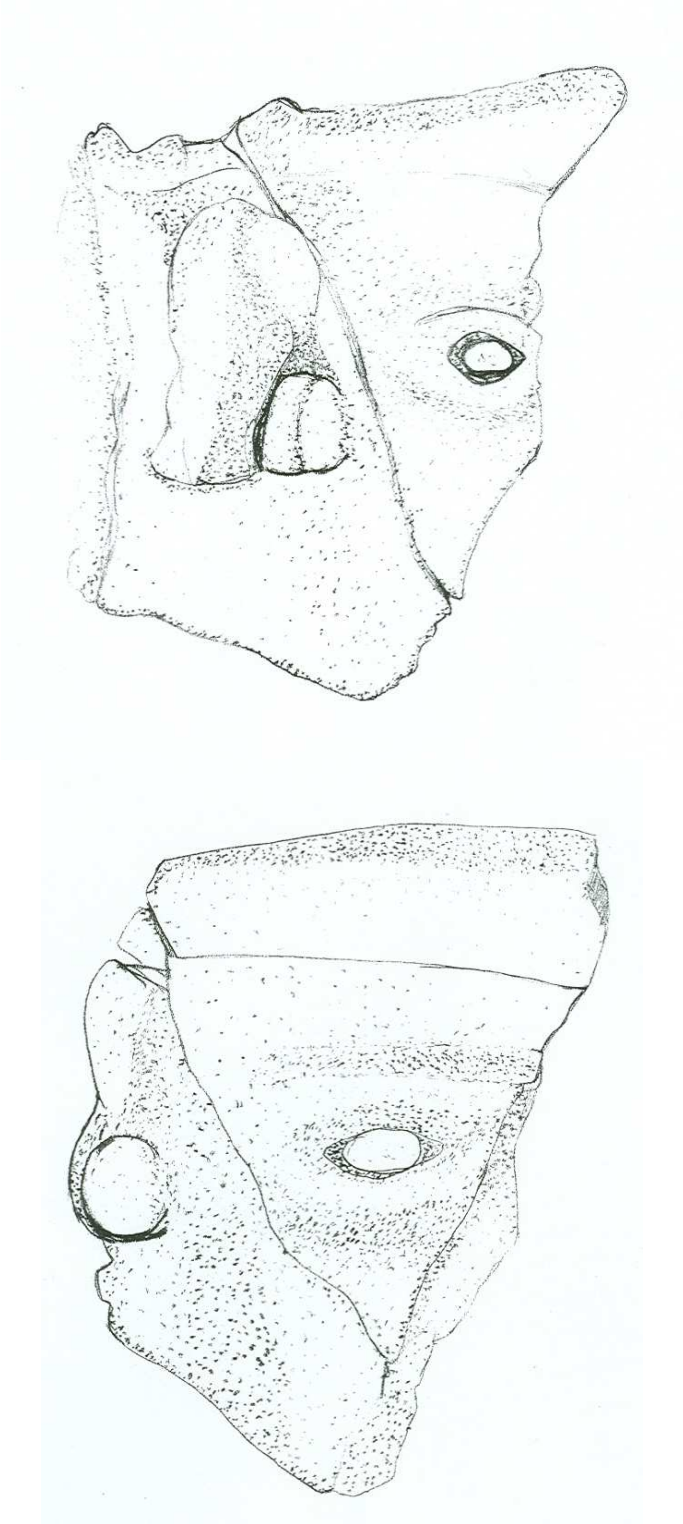


Figure 22
Chen Mul incensario fragment recovered from the surface of Lot LA 3022.
Drawing by Morgan Pereira.

Table 10. Major Artifact Classes by Lot Number Identified in Sup-Op 4, Op 06-02

	Lot Number			
Artifact Class	**LA 3007**	**LA 3013**	**LA 3020**	**TOTAL**
Ceramic sherds	458	372	596	**1426**
Chert	16	41	144	**201**
Obsidian	4	4	5	**13**
Bone	12	118	408	**538**
Shell	16	5	10	**31**
Special ceramics	0	8	13	**21**
Small Finds	8	17	23	**48**
Historic artifacts*	4	0	4	**8**
TOTAL	**518**	**565**	**1203**	**2286**

* Includes 19th Century ceramic artifacts, ferrous metals and glassware

Figure 23
Exposed alignments of large limestone rocks designated Lines A (background) and B (foreground) in Sub-Op 4. Unorganized masses or concentrations of stone, generally fist-sized and slightly larger, can be seen between the lines of large limestone rocks. Only very small stones in a dark, midden-like matrix were excavated at the time this image was taken. In the 2 x 1.75 m excavation unit to the left a single 10 cm lot, LA 3020 was excavated, yielding over 1200 artifacts, nearly 35% of which was faunal material (see Table 10 above). The base of Lot LA 3020 is seen in this image. Two 10 cm lots, LA 3007 and LA 3013, were excavated in the 1 x 4 m trench to the right of this image. Relatively high densities of cultural material were also recovered in the three lots excavated in Sub-Op 4. View East.

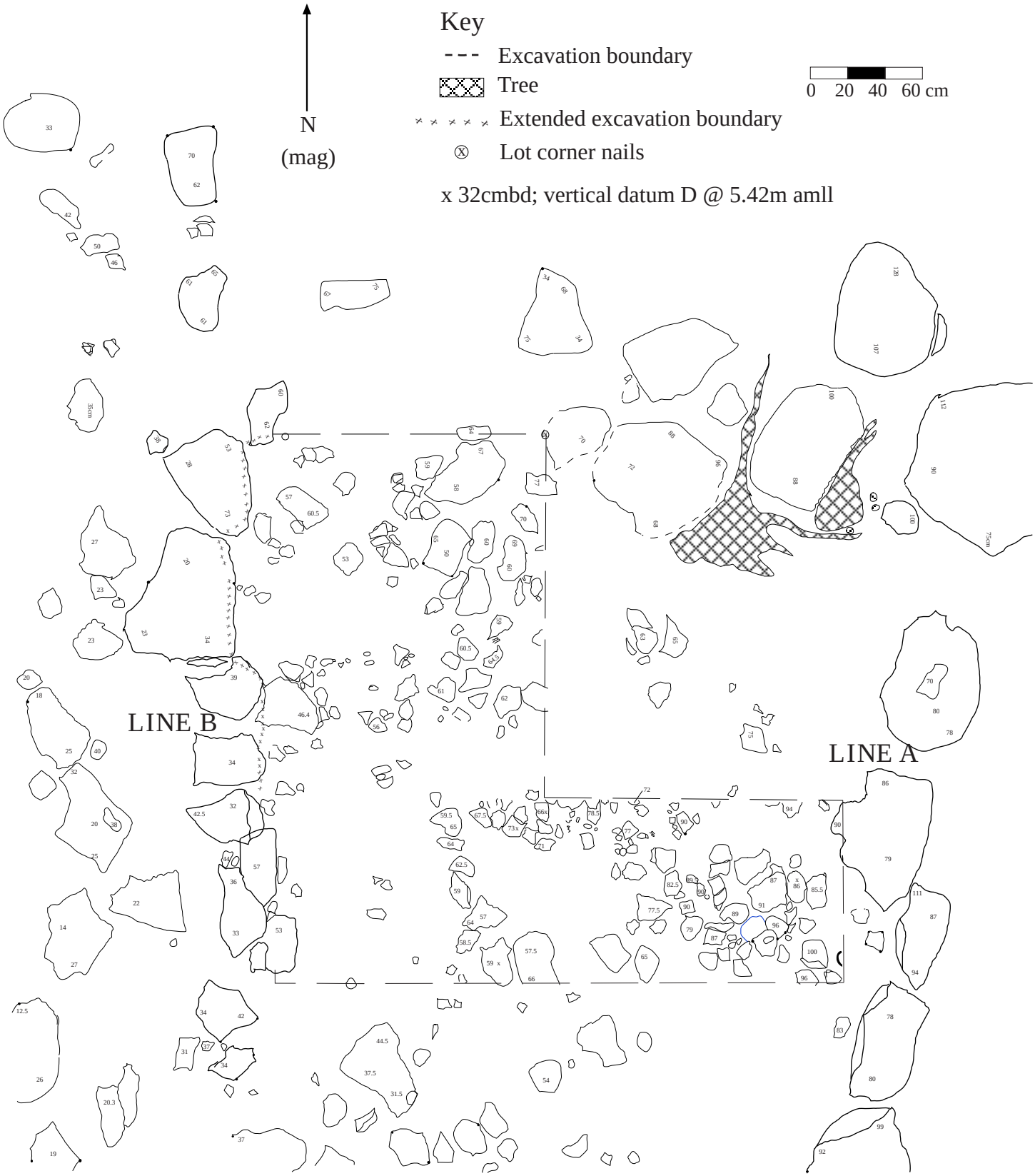


Figure 24
Plan of linear stone features, Lines A & B,
Sub-Op 4.

four of the majolica sherds recovered in 2006 came from excavations here. More locally produced Yglesias ceramic sherds were found throughout the three lots excavated, reaching a maximum depth of 20 cms bgs. Ceramic beads of the types see in Figure 25, along with ceramic net sinkers (both notched sherds and un-slipped 'date seed' varieties), and small side-notched projectile points made on chert flakes were recovered in Sub-Op 4 lots. It is very likely that cultural materials extend east of the area investigated in Sub-Op 4, probably into the shallow waters along the shoreline of the lagoon.

If the large stone alignments designated Lines A & B and the smaller fist-sized stones are part of a Maya structure then the presence of Spanish cultural material in what may be core indicates that the structure had to have been constructed after first Spanish contact in the region in the mid-sixteenth century. All nine of the olive jar sherds, some of which are fairly large (Figure 26) and four majolica fragments were recovered in the presumed construction fill of what may have been a fairly small residential structure. This structure may have been part of a lagoonside household or some other special use building in use sometime during the Spanish Colonial Period. Given that the 13 Spanish artifacts were recovered from construction fill (core) it follows that sufficient time had passed between when the Spanish vessels first arrived at Lamanai and the time they were discarded and then swept up with other midden materials to be used as core material. This entire 'life-cycle' probably occurred over the course of as much as several decades, which in turn suggests that the structure was built sometime during mid-late Spanish Colonial Period at Lamanai, possibly during the last quarter of the sixteenth century or first quarter of the seventeenth century.

Figure 25
Un-slipped clay bead varieties recovered in Op 06-02.

Figure 26
Large Spanish Olive Jar body sherd (LA 3013/8) recovered from the second 10 cm lot excavated in the 1 x 4 m trench in Sub-Op 4. Note the clearly visible 'throw lines' from wheel turning present on the inner surface of this vessel fragment. Other diagnostic Olive Jar sherds recovered in Op 06-02 appear to fall into the "Middle style" category (see below).

The stone alignment designated Line C appears to have been the upper- and western-most N-S oriented line of large limestone rocks present in the southern portion of Op 06-01 (Figures 8 & 27). Line C was discussed briefly above in the summary of results of investigations in Sub-Op 2, but this feature appears to be one of three stone alignments, the other two of which (Lines A & B) were investigated in Sub-Op 4 (see above discussion). It appears that each of the three lines of stone serves as a kind of terrace facing, where a relatively flat, level area is present behind or to the west of each line of stones. In each of these three areas located behind or west of the lines of stones we found evidence of Maya construction in the form of unorganized masses of limestone rocks, leading us to believe these terrace features were created by the Maya in order to create level on which residential and other structures could be constructed. Creation of these terrace features would have required only minimal modification of the natural slope of the lagoon terrace by the Maya. Further testing in each of these areas will provide more evidence of how these areas were used and the time period(s) in which their use took place.

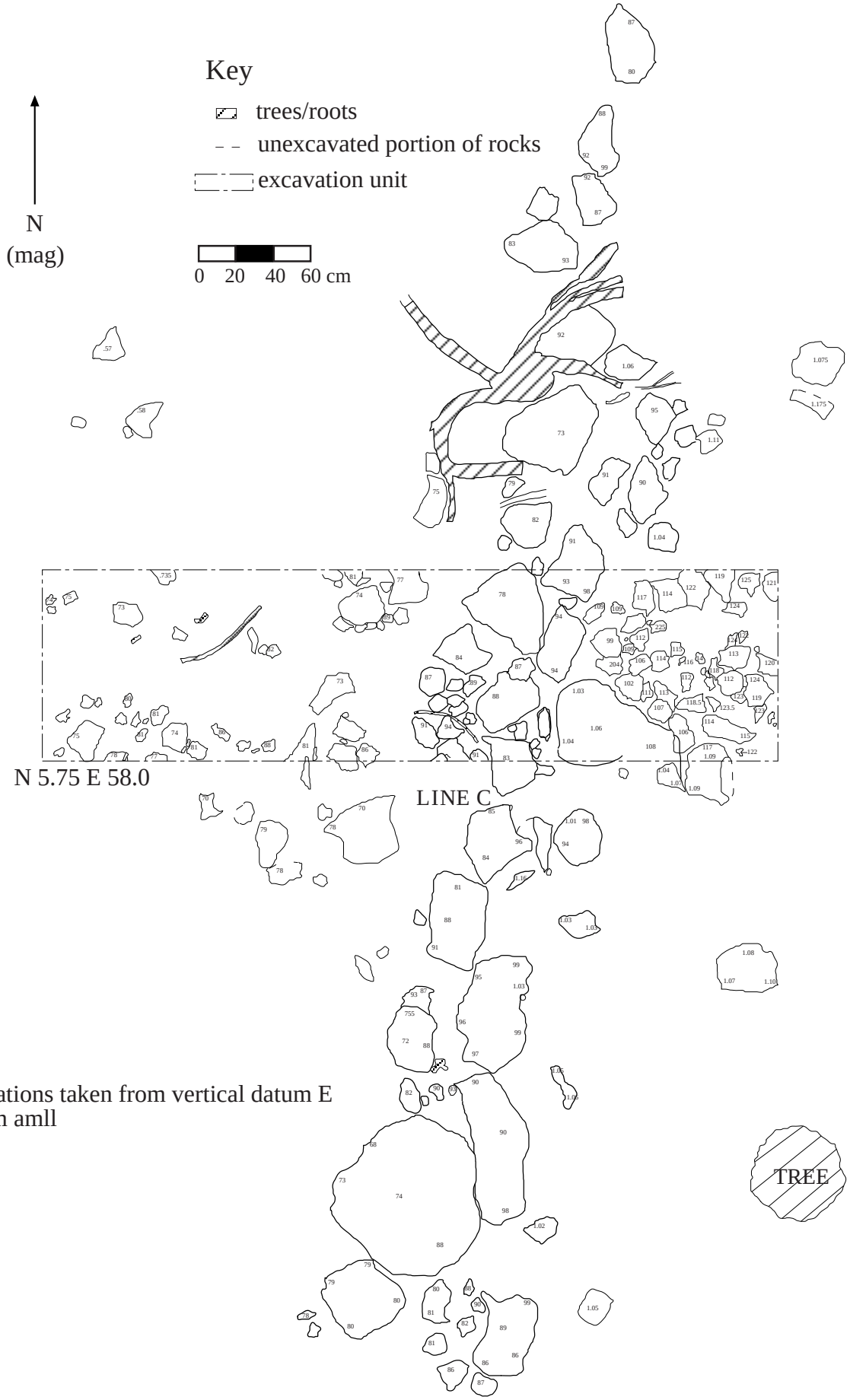


Figure 27
Plan of Line C stones, Sub-Op 4

Stratigraphy, Artifacts and Dating

Stratigraphy

As one of the main aims of the 2006 MAP work was to sample a wide area of that portion of the site lying east of the Spanish churches it was not possible to investigate the cultural deposits in Op 06-02 to any great depth, except in the trench in Sub-Op 3. In addition, cultural deposits at Lamanai generally do not have great depth due to the presence of limestone bedrock within roughly 1-2 meters below the existing ground surface. As a result, at this point only very preliminary statements can be made about the nature of the stratigraphy in this particular area of the site. While bedrock was not encountered during the 2006 field season in any of the four excavation areas discussed above, we did encounter what appeared to be an older occupation surface in the area in which the greatest depths below the existing ground surface were reached, Sub-Op 3.

The strata encountered in 2006 were similar to those recorded throughout the areas we have investigated over the last several field seasons in the Spanish Church Zone (Simmons 2004, 2005b; Simmons and Howard 2003). In each of the four sub-ops investigated Post Abandonment Accumulation (PAA) made up the uppermost soil deposit. This soil was characterized as a very dark brown (10YR 2/1 or 3/1) silty loam with varying densities of cultural material. Limestone rocks of varying size were noted in this PAA deposit. Very little modern material was present in the PAA, although British artifacts dating from the last quarter of the nineteenth century were relatively abundant in the upper 10-15 cms of soil excavated in Op 06-02. The sole exception to this is in Sub-Op 3, where very little British cultural material was encountered in the upper lots excavated. Likewise, little evidence of disturbance, other than the modern pieces of bottle glass and plastic, was observed in any of the four sub-ops investigated.

Soil descriptions following Munsell Soil Color descriptions (except where noted) for each of the four sub-ops investigated in Op 06-01 can be summarised as follows:
Sub-Op 1: 10YR 6/6, 10YR 7/4; 10YR 6/6 in Munsell Rock Color Chart
Sub-Op 2: 10YR 3/1 very dark gray silty clay
Sub-Op 3: 10YR 2/1-2.5/1 black silty clay (midden lots); 10YR 4/3 silty clay (LA 3022); 10YR 4/4 dark yellowish brown (Lot LA 3031)
Sub-Op 4: 10YR 2/1 black silty clay

In the area in which excavations reached some depth in 2006, Sub-Op 3, the midden was found to be quite homogeneous with regard to its color and texture. The geomorphological differences between this particular area of the site and those sub-ops located on the lagoon terrace above has been summarised above. While some British materials were recovered in the first 15 cms of the trench in Sub-Op 3 the remaining lots (LA 3010, 3015, 3016, 3022 and 3031) yielded only Maya cultural material.

The presence of Yglesias ceramic sherds in all but the last of the two lots listed above indicates that the midden deposit lying in the lagoon floodplain east of Feature N25 E 60 is very late in date. In addition, a Nueva Cadiz bead was recovered at the base of Lot LA 3016, deep in the midden approximately 40 cm bgs. It is clear that although they were both found at the eastern end of the trench, the glass bead was situated well

outside the pit in which Burial 06-01 was identified, indicating that the bead could not have been re-deposited deep in the midden by backfilling later midden deposits atop Burial 06-01. This point is somewhat significant given the temporal bracketing we have for contact and abandonment of Lamanai, specifically that the site was likely first contacted by Spaniards sometime after 1544 and then abandoned by its Maya residents by 1641 (Jones 1989). It seems likely then that at least this part of the midden was created over the course of a century or century and a half, at most. In light of the estimated size of the midden, conservatively measuring 400 m^2, it seems unlikely its creation can be attributed to one or even several Maya families. What seems most probable is that the midden was more communal in nature, with a number of Contact Period Maya families living around the churches depositing their domestic refuse in this particular area of the site.

Artifacts and Dating

In-depth analyses of artifacts recovered during the past four field seasons are scheduled during 2007 & 2008. No field work is planned for these two seasons so that detailed analyses of various artifact classes, including ceramics, can be conducted. The results of such analyses will greatly enhance our ability to make more meaningful statements regarding the nature of the various assemblages, and how the data derived from these bears on the research questions discussed above. We can, however, make some preliminary statements regarding cultural material recovered in Op 06-02.

A total of 14,481 artifacts were recovered in Op 06-02. Over half of these artifacts (n=7,377) were ceramic sherds (Appendix 5). Artifact totals are somewhat inflated, no doubt, due to our excavations in a rich Spanish Colonial midden. Fully one-quarter (24.9%) of all of the artifacts recovered in 2006 came from the 1 x 3.7 m trench excavated in Sub-Op 3. Other artifacts were recovered in construction deposits, mainly platform core, and surface finds made up 5% of the total number of artifacts recovered in 2006. Many of the objects recovered in 2006 were used by Lamanai's Contact Period residents in various kinds of domestic economic activities (Figures 28-30).

Lithic artifacts generally consisted of chert flakes with lesser numbers of formal tools, most of which were small side-notched projectile points (Figures 29 & 30). Chert debitage made up 10.5 % (n=1,526) of the total number of artifacts recovered in 2006. Not surprisingly, obsidian was found in much more limited quantities (see Graham and Pendergast 1988). Obsidian flakes were generally small in size and made up only 7.8% (n=130) of the lithic assemblage (n=1,656) from Op 06-02 (Appendix 5). As mentioned above, preservation of faunal material, particularly in the Sub-Op 3 midden, was generally good. As a result, skeletal material of various animals, including mammals, fish and amphibians, constitutes 21% (n=3,049) of the cultural material recovered in 2006. Animal bone and both freshwater and marine shell together comprise 23% (n=3,387) of the total number of artifacts recovered from Op 06-02. This material will be analysed in future field seasons so that we might better understand dietary preferences among the Contact Period Maya residing around the Spanish Churches and also make comparisons with patterns in faunal use seen among Contact Period Maya residing in other parts of the Spanish Church Zone (see Stanchly 2005).

Figure 28
Net sinkers recovered during excavations in the midden (LA 3010), Sub-Op 3. On the left is a notched ceramic sherd and the two on the right are modeled date seed net sinkers.

Figure 29
Multi-purpose chert tool (LA 3005/2) from core deposits, Sub-Op 2. The edge to the right was heavily utilized as evidenced by its slightly notched form and multiple overlapping flake scars. The edge of the left side of the image was heavily ground and polished, with three distinct facets.

Figure 30
Two small side-notched projectile point fragments with rounded base forms. Tools such as these were made on thin percussion flakes and worked either unifacially or bifacially; oftentimes a combination of reduction techniques was noted on individual artifacts.

Figure 31
Spanish Olive Jar sherd (LA 2992/13) recovered from surface contexts in Op 06-02. The neck form seems is consistent with Goggin's (1960) "Middle" style, noted by Deagan (1987:33) to be "the most widely distributed and frequently occurring of the Olive Jar styles."

Preliminary analyses of Maya ceramic artifacts from Op 06-02 reveals that the vast majority date to Postclassic and Contact times. Buk, Cib and Yglesias sherds were recovered in each of the four sub-ops investigated. Earlier Classic and Preclassic Period sherds were found as well. With the exception of some of those found in midden contexts most sherds are relatively small in size and a great many are non-diagnostic body sherds.

One UNCW student, Lucy Stortors, conducted a preliminary analysis of ceramic sherds from Sub-Op 3, where she excavated the 1x3.7 m trench. Stortors's findings are summarised in Table 11. It appears, based on this preliminary assessment, that only approximately 10% of the sherds recovered from the trench in Sub-Op 3 may be temporally diagnostic artifacts. But these preliminary findings add further support to the idea that the midden abutting Feature N25 E60 was created almost entirely during Spanish Colonial times, and that the lighter brown, sticky clay soil of Lots LA 3022 and 3031 underlying the midden represent an earlier, Postclassic Period occupation surface of some kind.

Table 11. Preliminary Temporal Placement of Ceramic Sherds Recovered in Sub-Op 3

Lots	Preclassic and Classic	Terminal Classic	Post Classic	Buk	Cib	Yglesias	Total sherds	Total Diagnostic Sherds	Total Analysed	% of Diagnostic Analysed
LA2995	0	0	0	0	1	4	136	15	5	33
LA2997	0	0	1	3	0	15	300	38	19	50
LA3001	0	0	1	8	1	1	340	32	11	34
LA3010	0	0	3	0	1	14	712	60	18	30
LA3015	4	1	0	4	0	15	566	56	24	42
LA3016	2	2	0	4	0	10	607	79	18	22
LA3022	1	1	0	3	0	0	259	10	5	50
LA3031	1	0	0	2	0	0	28	3	3	100
TOTAL	8	4	5	24	3	59	2978	293	103	avg = 45

More Spanish artifacts were found at Op 06-02 than in seasons past (see Simmons 2004, 2005b; Simmons and Howard 2003). In addition to the Nueva Cadiz glass bead four majolica sherds were recovered along with 32 olive jar sherds, two of which are shown in Figures 26 and 31. The majolica sherds are each very small in size, but no decoration was noted on any of the four so it is possible they represent fragments of Columbia Plain vessels.

With regard to Spanish Olive Jar sherds recovered in Op 06-02 all were found in either surface or near-surface contexts (PAA), making their temporal associations impossible to assess on stratigraphic grounds. All appear to be what Goggin (1960:12) terms "Middle style" Olive Jars. Deagan (1987:34) notes that the walls of middle-style Olive Jars range from about 10 to 12 mm in thickness. Mean wall thicknesses of the sample (n=32) of Olive Jars recovered in Op 06-02 equal 10.4 mm. This is an admittedly small sample of these course earthenware sherds, and unfortunately dating for middle-style vessels remains unclear at present (Deagan 1987:34). But it appears that early-style

Olive Jars were being replaced by middle-style vessels by about 1570, so if middle-style Olive Jar sherds are represented in the 2006 assemblage this is concordant with the post-1544 contact of the community by Spanish priests (Jones 1989). Other possible Spanish artifacts include metal objects recovered in Op 06-02. A total of seven copper artifacts were found during the 2006 field season (Table 12), although it is not known at this point which, if any of these are of European origin.

In sum, the artifacts recovered during the 2006 field season reflect the site's long-term occupational history by its three principal culture groups, with Maya occupation producing by far the greatest amount of cultural material. Spanish artifacts, though substantial in number compared with other areas of the Spanish Church Zone, still comprise less than one percent of the total number of artifacts recovered from Op 06-02. Still, the comparatively high number of majolica and olive jar sherds is not unexpected as investigations in the immediate area of the Spanish churches in past years have produced similar results (Pendergast 1991:347). In comparison, British material culture was well represented in the assemblage of artifacts from Op 06-02. Over one thousand pieces of nineteenth century ceramics and glass were recovered in 2006; most of these originated from surface contexts (Appendix 5). Some of the sheet copper objects and nails, along with nearly all of the other metal artifacts (n=324) were also likely British, all reflecting the presence of British families associated with sugarcane operations in the last quarter of the nineteenth century (Pendergast 1982).

As discussed previously (Simmons 2004:44) the question of dating late deposits in the Spanish Church Zone is complicated by the similarities that exist between the Terminal Postclassic and Spanish Colonial Period Maya ceramic assemblages (Graham 1987). The degree of temporal resolution that is afforded (or not) by the ceramic artifacts from these periods at Lamanai has been discussed above and elsewhere (Pendergast 1991:348).

Specifically, the presence of Yglesias ceramic sherds in deposits that contain Spanish ceramic and glass objects indicates that although this ceramic tradition began in Terminal Postclassic times, Yglesias vessels continued to be produced throughout the Spanish Colonial Period (Graham 1987:91-95; Pendergast 1991:348). This continuity in ceramic vessel form and technology parallels that seen in the lithic assemblage from Late Postclassic and Spanish Colonial times, making temporal separation of the two periods difficult in the absence of Spanish or other European artifact types (Simmons 2002:66). Because our research focus in Op 06-02 was oriented more toward identifying household and other special use structures, such as (hopefully!) copper workshops, shallow, areal excavations were conducted almost exclusively. As a result, we do not at this point have deep stratigraphic separation of deposits and the artifacts they contain.

A total of eight charcoal samples were taken during 2006; six of these were taken from sealed midden deposits in Sub-Op 3 while the remaining two were taken from deposits that appeared to be undisturbed in Sub-Ops 1 & 2. Hopefully at least some of these samples will be radiocarbon dated so that we may better understand the temporal placement of structural remains in Sub-Ops 1 & 2. Charcoal samples from the trench in Sub-Op 3 may add to the preliminary data we have at present from the preliminary

assessment of ceramic sherds from midden and non-midden contexts and help us to refine our understanding of the depositional history of these deposits abutting Feature N25 E60.

Table 12. Summary of Copper Objects Recovered during 2006

Artifact Type	Small Find Numbers	Total
Sheet fragment	LA 3017/2, LA 3025/6	1
Bell	LA 2966/12	1
Bell fragment	LA 3014/1	1
Nail	LA 2998/15, LA 3004/4	2
Possible prill	LA 3018/6	1
	Total	6

Copper Production at Lamanai: The Evidence from 2006

A summary of the copper artifacts encountered in 2006 is presented above in Table 12. The sheet pieces and nails are more typical of British copper objects than those that would have been produced by the Maya. Nails have not been reported from pre-contact Maya sites (Bray 1977; Pendergast 1962) and the sheet fragments recovered in Op 06-02 are remarkably similar to those brought by the British to Lamanai during the last quarter of the nineteenth century (Shugar 2005). Without microstructural and other analyses it will not be possible to assess the glob of copper (LA 3018/6) recovered from PAA contexts in Sub-Op 2. This object does, however, have the appearance of a prill (Figure 32), a solidified droplet of metal that is a by-product of casting, and thus may be the ninth such piece of copper production debris identified thus far at the site (Simmons, Pendergast and Graham n.d.).

The copper bell recovered in Sub-Op 1 (LA 3004/1) is a globular form, the most common type that has been found at Lamanai (Simmons, Pendergast and Graham n.d.). It is shown in Figure 7. Technological aspects of copper production will be presented in detail in a forthcoming paper by Shugar and Simmons. But based on macroscopic analysis it appears that this particular bell was cast using the lost-wax casting method. The resonating slit was evidently pried open in order to insert the clapper (which was missing) and then the bell's walls were crimped closed in an attempt to hold the clapper in place (Figure 7). The bell fragment (LA 3014/1) appears to be a portion of a mis-cast globular bell, specifically a portion of the bell wall (Figure 33). The recovery of this bell and bell wall bring the total number of Terminal Postclassic-Spanish Colonial Period copper artifacts at Lamanai to 187 (Table 13).

Figure 32
Probable copper prill (LA 3018/6) recovered from PAA deposits in Sub-Op 2. Prills are droplets of molten copper that have cooled and solidified, and provide compelling evidence for on-site copper metallurgy at Lamanai.

Figure 33
Mis-cast copper bell (LA 3014/1) recovered from PAA deposits in Sub-Op 1. The bell's suspension loop would have been at the top, but it and most of the remaining parts of the bell were not completely cast in a lost-wax mould.

Table 13. Precolumbian and Spanish Colonial Period Copper Artifacts from Lamanai, Belize

Object Type	Number	Percentage of Assemblage
Bells (whole)	21	11.2
Bells (incomplete/mis-cast)	27	14.4
Bells (flattened,distorted)	31	16.5
Bell clappers	1	0.53
Axe/celt/chisel	12	6.4
Axe fragments	11	5.8
Axe Blanks	1	0.53
Rings	14	7.5
Ornaments	13	7.0
Sheet fragments	12	6.4
Needles	10	5.3
Ingot/pigs	4	2.1
Casting reservoirs	2	1.1
Prills	9	4.8
Fish hooks	5	2.7
Pins	2	1.1
Tweezers	4	2.1
Bell-headed pins	2	1.1
Pin tip	2	1.1
Pin head	2	1.1
Tinkler	1	0.53
Necklace	1	0.53
TOTAL	**187**	**100**

*Totals as of August 2006

Until analyses are conducted on the sheet fragments recovered from Op 06-02 we will not be in a position to make any kind of conclusive statements regarding their probable places or origin. Based on analyses that have already been conducted, however, on similar artifacts by Shugar (2005) it is likely the sheet pieces recovered in 2006 will prove to be British rather than Maya objects.

Summary & Conclusions

The first four field seasons of the Maya Archaeometallurgy Project at Lamanai have been successful in terms of both teaching and research. Both have gone hand in hand at Lamanai since the field school began at Lamanai under the direction of first Dr. Elizabeth Graham and, beginning in 2001, Dr. Scott Simmons. During the 2001 and 2002 field seasons a total of thirty-eight students, including three Belizeans, were trained in archaeological field and laboratory methods at Lamanai. In 2004 a total of 14 students from a variety of US universities completed the field school in archaeology at Lamanai. The same number of students attended the field school in 2005 and one of these was a Belizean student. In 2006 a total of 17 students participated in the spring University College London and summer University of North Carolina Wilmington field school sessions. After successfully completing the field school all of these students, with the exception of those that chose not to do so, received academic credits for the field school in archaeology from their home universities.

In terms of the research conducted during 2006 there were several noteworthy achievements. First, we were able to identify what are likely at least three separate structures in the relatively flat area that lies east of the second Spanish church, Str. N12-13. These structures appear to have been occupied during at least the early part of the Spanish Colonial period. Residents of the area were actively engaged in a variety of household economic activities, as reflected in the domestic refuse they dumped over the edge of Feature N25 E60, the long, linear alignment of very large limestone rocks that parallels the shore of the New River Lagoon. Feature N25 E60 likely represents the eroded face of the natural terrace feature lying above the floodplain of the lake; it was almost certainly modified by the ancient Maya of Lamanai by the addition of stones of varying size, a number of which tumbled down the slope toward the lake and onto the extensive midden deposit that abuts Feature N25 E60.

Second, in terms of copper metallurgy we have added to our understanding of when copper production activities were taking place at the site. This was indirectly the result of recovering a Nueva Cadiz glass bead at the base of the midden abutting Feature N25 E 60. As mentioned above, the bead was came from what appear to be undisturbed contexts at the base of the midden, just above soil that probably represents a pre-contact occupation surface. In 2004 Wiewall recovered five copper axe fragments and two copper casting reservoirs in Lot LA 2790, the second 10 cm level in a 1x2 m trench excavated adjacent to the trench excavated in 2006 in Sub-Op 3 (see Simmons 2004; Wiewall 2004). Given the stratigraphic positions of these copper production materials in relation to the more deeply deposited Spanish trade bead it seems likely that Maya metalsmiths at Lamanai were actively engaged in copper metallurgy during the century between Spanish contact and Maya abandonment of Lamanai. This already had been assumed (Simmons 2004, 2005a) but the recovery of the glass bead at the base of this large midden would seem to substantiate this point. Of course, it is equally possible that the copper artifacts recovered in the midden could have been deposited sometime after copper metallurgy has ceased at Lamanai, although this seems like a less probable scenario.

We still have not yet been able to determine with any certainty *when* copper production activities began at the site. But given the intermittent nature of Spanish *encomienda* activity in the region, the almost complete absence of copper objects of European form, and the relatively small quantity of metal involved, we believe that metallurgy at Lamanai had its roots in Late or Terminal Postclassic times, and therefore reflects a Maya technological innovation. One of the most notable aspects of the assemblage of copper objects from Lamanai is that it lacks Spanish religious items such as devotional medals, personal crosses and crucifixes, rosaries, copper-alloy stars, reliquaries, seals, stamps and rings**,** which are found so commonly at 16th and 17th-century Spanish colonial sites throughout Florida and the Caribbean (Deagan 2002). All but possibly one of the copper objects found thus far at Lamanai are distinctly Mesoamerican in form and design**,** and based on preliminary metallurgical analyses (Shugar 2005) it appears that manufacturing technologies were distinctly Mesoamerican as well (but see forthcoming paper by Shugar and Simmons).

Third, although we continue in earnest to attempt to avoid Maya skeletal remains as they are not at this time part of our research design the identification of another Maya burial in 2006 adds to our understanding of burial practices during Spanish Colonial times. Recent investigations have found that at least some Maya burials in seated or flexed positions that were interred outside the immediate area of the Spanish churches (but still within the broader Spanish Church Zone) were either buried under the floors of residential structures, most likely domiciles (Simmons 2004:32-36, 2005b:35-40), or, like Burial 06-01, were interred beneath midden deposits located immediately adjacent to household compounds (Simmons and Howard 2003:19-25, 51-53). It is clear, however, that two burials found beneath midden deposits and two beneath house floors does not constitute patterning in Contact Period Maya burial practices very convincingly.

We are nonetheless intrigued by the idea that at least some members of the Contact Period community were evidently not baptized and by extension seem to have not adopted Christianity. It is also possible that certain members of the sixteenth and seventeenth century community simply did not have the opportunity to be baptized on the very infrequent visits made by circuit-riding Spanish priests. This could also explain why we have found Contact Period Maya burials over the years in traditional flexed or seated positions in locations outside the church cemeteries. Clearly, further work is needed in this area of inquiry if we are to more completely assess the impacts Christianity had on the ancient Maya of Belize.

Investigations in up-coming years will turn toward intensive laboratory analyses of the materials we have recovered during the past four field seasons of the MAP. This includes a careful analysis of both the ceramic and lithic assemblages from Op 06-02 as well as Ops 05-01, 04-02, 02-06 and 01-05, the last three of which are located in the northern portion of the Spanish Church Zone around Str. N11-18 (Figure 4). We look forward to continuing MAP investigations at Lamanai.

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Appendix 1

Field and Laboratory forms used by the MAP and LAP at Lamanai

OPERATIONS FIELD RECORD OP NUMBER:

SITE:	YEAR EXCAVATED:
Dates:	Excavator(s):
OPERATIONS DESCRIPTION:	
General Description:	
Datum Points:	
Lot Numbers:	
Burials:	
Caches:	
Features:	
Other Observations:	

Completed by/date:_____
Entered computer by/date: _____

Lamanai Archaeological Project **LOT RECORD** **LOT NUMBER:**

SITE:		**YEAR EXCAVATED:**
Operation:		**Assessment:** **1)**
Structure:		**2)**
Lot(s) Above: **Lot(s) Below:**		**Associated Lot:** **Equivalent Lot(s):**
Thickness of Deposit:	**Area:**	**Volume:**
Grid Reference:		
Date of Deposit?		
Screened? ☐ **Quantity:** **Screen Size:**		
Float? ☐ **Quantity:**		
Photos:		
Datum Point(s):	**Relationship to Datum and/or Surface (Vertical):**	
	Relationship to Datum (Horizontal):	
Location of Drawings & Field Notes:		
Soil Description (Munsell):		
Evidence of Disturbance?:		
Other Observations/Artifacts/Notes etc.:		

Entered by & Date:_____

Computer Entered by & Date:_____

Lamanai Archaeological Project

SMALL FINDS RECORD **LOT/CATALOGUE NUMBER:**

SITE:	**YEAR EXCAVATED:**	
PROVENIENCE:		
Structure:	Burial No:	
Cache No:	Assessment 1): 2):	
Grid Reference:		
CHARACTERISTICS:		
Material:	Category (e.g., use/function):	
Description (1st level):	Type (specialization):	
Description continued:		
2nd level:	3rd level:	4th level:
REMARKS:		
DIMENSIONS:		
Length:	Thickness:	
Width:	Diameter:	
Weight: Other Dimensions? (SPECIFY):		
WHOLE	**FRAGMENTARY less than 50%**	**FRAGMENTARY more than 50%**
Illustrate? ☐	**Photo? ☐**	**Float? ☐** **Screen? ☐**
ILLUSTRATION:		

Entered by & Date: _____

Computer Entered by & Date _____

LAMANAI ARCHAEOLOGICAL PROJECT

SMALL FINDS RECORD

LOT # ________________

LOT/SMALL FIND #	DESCRIPTION

LOT # ________________

LOT/SMALL FIND #	DESCRIPTION

LOT # ________________

LOT/SMALL FIND #	DESCRIPTION

LOT # ________________

LOT/SMALL FIND #	DESCRIPTION

PHOTOGRAPH RECORD

Lamanai Archaeological Project

SITE:			YEAR:
FILM:	ASA:	CAMERA:	ROLL #:

FRAME:	STR./OP.	SUBJECT :	LOT:	LOOKING:	DATE:

Lamanai Archaeological Project

DATE_____ ARTIFACT COUNTS **LOT#**_____

Sherds:	**Chert:**	**Bone:**
Notched Sherds:	**Obsidian:**	**Shell:**
Perforated Sherds:	**Ground Stone:**	**Teeth:**
Other Worked Sherds:	**Granite:**	**Charcoal:**
Spindle Whorls:	**Slate:**	**Limestone (artifact):**
Date Seed Sinkers:	**Basalt:**	**Daub:**
Metal:	**Pyrite:**	**Stucco:**
Silver:	**Hematite:**	**Mudstone:**
Copper:	**Quartzite:**	**Jade:**
Bronze:	**Rock Crystal:**	**Pearls:**
Iron:	**Sandstone:**	**Turquoise:**
Brass:	**Metamorphic:**	**Coral:**
Gold:	**Plastic:**	**Foreign Stone:**
Special Ceramics:	**Glass:**	**Small Finds:**

Last modified Jan 2006

DATE _____ **Lamanai Archaeological Project** LOT#_____

ARTIFACT WEIGHTS

Sherds:	**Chert:**	**Bone:**
Notched Sherds:	**Obsidian:**	**Shell:**
Perforated Sherds:	**Ground Stone:**	**Teeth:**
Other Worked Sherds:	**Granite:**	**Charcoal:**
Spindle Whorls:	**Slate:**	**Limestone (artifact):**
Date Seed Sinkers:	**Basalt:**	**Daub:**
Metal:	**Pyrite:**	**Stucco:**
Silver:	**Hematite:**	**Mudstone:**
Copper:	**Quartzite:**	**Jade:**
Bronze:	**Rock Crystal:**	**Pearls:**
Iron:	**Sandstone:**	**Turquoise:**
Brass:	**Metamorphic:**	**Coral:**
Gold:	**Plastic:**	**Foreign Stone:**
Special Ceramics:	**Glass:**	**Small Finds:**

Appendix 2

Operation Form for Op 06-02

SITE: Lamanai, Belize	**YEAR EXCAVATED:** 2006
Dates: March 27 - April 20, 2006; May 16 - June 14, 2006	**Excavator(s):** Scott E. Simmons, Laura J. Howard, Michael Pendergast, Mike Marino, Richard Luckyn-Malone, David Hemphill, Ed Scott-Clarke, Charlotte Knappe, Sirja Moilanen, Will Trimble, Bridget O'Brien, Peggy Donnelly, Jessica Pittard, Morgan Periera, Adrianne Wells, Jessica Drew, Erin West, Lucy Stortors, Melanie Fann
OPERATIONS DESCRIPTION: Maya Archaeometallurgy Project, 2006 field season	
General Description: Area located roughly 30 – 70 m east of YDL II, Structure N12-13. There are two distinct physiographic sections of this specific area. One of these, situated closest to the east side of the second church, might be considered a bench or terrace above the lagoon floodplain. Two of the four sub- operations (Sub-Ops 1 & 2) are situated on this bench or terrace feature above the lagoon floodplain. The other two Sub-Ops (3 & 4) are situated in the lagoon floodplain. Total approximate area of OP 06-02 is +/- 30 m (N-S) x +/- 36m (E-W).	
Datum Points: Horizontal datum (N0, E0) at SW corner of YDL II, Structure 12-13. Vertical datum points - above mean lagoon level (amll) & above ground surface (ags): Datum A – 7.60 m amll, 64.0 cm ags. Datum B – 7.21 amll, 54.0 cm ags. Datum C – 6.14 m amll, 23.5 cm ags. Datum D – 5.42 m amll, 54.5 cm ags. Datum E – 7.14 m amll, 37 cm ags.	
Lot Numbers: LA 2992 (surface collection), LA 2993, LA 2994, LA 2995, LA 2996 (surface collection of Structure N12-17), LA 2997, LA 2998, LA 2999, LA 3000, LA 3001, LA 3002, LA 3003, LA 3004, LA 3005, LA 3006, LA 3007, LA 3008, LA 3009, LA 3010, LA 3011, LA 3012, LA 3013, LA 3014, LA 3015, LA 3016, LA 3017, LA 3018, LA 3019, LA 3020, LA 3021, LA 3022, LA 3023, LA 3024, LA 3025, LA 3026, LA 3027, LA 3028, LA 3029, LA 3030, LA 3031, LA 3032 & LA 3033	
Burials: 06-01	
Caches: - None -	
Features: Feature N 25 E 50, semi-circular feature of three parallel courses of vertically set stones, designation by Darcy Weiwall in 2004, also called the "Amfiteatro" by David M. Pendergast in 1984. Feature N 25 E 60, long, linear feature of limestone boulders, designation by Darcy Wiewall in 2004. Feature extends south of Op 06-02 area and at least as far north as Structure N12-17, a large Maya platform modified somewhat by the British in the mid-late 19th century. "Cobble pavement" or possibly structure (earth & stone) platform in Sub-Ops 1, 2 & 4).	
Other Observations: Feature N25 E60 may be a natural feature, probably eroded bedrock that delineates the abovementioned terrace from the lagoon floodplain. It's possible it was added to/modified by the Maya at some point, as the presence of some large and numerous smaller (ca 15-20 cm dia) stones in the midden trench (Sub-Op 3) suggests. The extensive "lagoonside midden" reported by Pendergast in the 1980's ROM testing abuts this long, linear alignment of what appears to be an eroded, exposed limestone bedrock feature. The other prominent feature, N25 E50, portions of which are exposed at the present ground surface, has not been explored extensively in 2006, as a Christian-style burial was found in a trench excavated by Darcy Wiewall in 2004. Testing in the area situated immediately northeast of this feature revealed what appears to be eroded, disfigured limestone bedrock, along with concretions of limestone pebbles and smaller, light tan-yellow stone that have not been seen by Simmons or Howard anywhere else in the Spanish Church Zone at Lamanai. Cobble (house platform?) features present throughout the area of Sub-Ops 2 and 4. Terrace features, designated (from east to west) Terrace A, B & C, marked by N-S alignments of large limestone rocks, present at extreme southern edge of cleared area of Operation 06-02.	

Completed by/date: S.E. Simmons 20 June 2006
Entered computer by/date: S.E. Simmons 2 July, 2006

Appendix 3

Summary of Lots Excavated, Operation 06-02, 2006 MAP Field Season

Number	Area	Lot Description
LA 2992	OP 06-02	Surface collection, N to S = +/- 29m; E to W = +/- 36 m
LA 2993	Subop 1	Very dark gray (10YR 3/1) soil; 2x2m unit. 1st 10cm level; PAA; N26.3 E52.95
LA 2994	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit. 1st 10cm level; PAA; N12.25 E57.0
LA 2995	Subop 3	Very dark. gray (10YR3/1) soil; 1x3.7m trench. 3cm leaf litter; N22.3 E 64.35
LA 2996	Str. N12-17	Surface collection of OP 06-02; N-S = +/-20m; E-W = +/- 15m
LA 2997	Subop 3	Very dark gray (10YR3/1) soil; 1x3.7m trench; 1st 10 cm level PAA. Lot immediately below LA 2995; N22.3 E 64.35
LA 2998	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; 1st 10cm level; PAA; N14.25 E57.0
LA 2999	Subop 1	Very dark gray (10YR3/1) soil; 2x2m unit; 10 cm level; PAA. Lot immediately below LA 2993; N26.3 E 52.95
LA 3000	Subop 2	Very dark gray (10YR3/1) soil; 2x2m; 2nd 10 cm level; PAA; Lot immediately above LA 2994; N12.25 E57.0
LA 3001	Subop 3	Very dark gray (10YR3/1) soil; 1x3.7m trench; 2nd 10 cm level; Midden-2. Lot located immediately below LA 2997; N22.30 E64.35
LA 3002	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; 2nd 10 cm level; Floor ballast. Lot located immediately below LA 2998; N14.25 E57.0
LA 3003	Subop 2	Very dark gray (10YR3/1) soil; 1x4m trench; 1st 10 cm level; PAA. Lot immediately above LA 3006; N14.25 E59.0
LA 3004	Subop 1	Very dark gray (10YR3/1) soil; 2x2m unit; 10cm level; PAA. Lot immediately above LA 3008; N26.3 E52.95
LA 3005	Subop 2	Very dark gray (10YR3/1) in Munsell Soil Color Chart & 10YR8/6 in Rock Color Chart; 2x2 m unit; 10cm level; Floor ballast. Lot located immediately below LA 3000; N12.25 E57.0
LA 3006	Subop 2	Very dark gray (10YR3/1) soil; 1x4m trench; 10cm level; 2nd 10 cm level; Floor ballast. Lot immediately below LA 3003; N14.25 E59.0
LA 3007	Subop 4	Very dark gray (10YR3/1) soil; 1x3.22m trench; 1st 10 cm level; PAA or Midden –3; Lot immediately above LA 3013; N 5.25 E 69.35
LA 3008	Subop 1	(10YR6/6; 10YR7/4 & 10YR8/6 in Rock Color Chart); 2x2m; 10 cm level; Floor ballast or occupation surface; Lot located immediately below LA 3004; N26.3 E54.95
LA 3009	Subop 2	Very dark gray (10YR3/1) in Munsell Soil Color Chart & 10YR8/6 in Rock Color Chart); 2x2m unit; 3rd 10 cm level; Floor ballast; Lot located immediately below LA 3002; N14.25 E57.0
LA 3010	Subop 3	Very dark gray (10YR 3/1) soil; 1x3.7m trench; 3rd 10 cm level; Midden-2; Lot immediately below LA 3001
LA 3011	Subop 2	Very dark gray (10YR3/1) soil; 1x1m unit; first 10cm level; PAA; N14.25 E63.0
LA 3012	Subop 2	Very dark gray (10YR3/1) soil; 1x4m trench; 10 cm level; Floor ballast; Lot immediately below lot LA 3006; N14.25 E59.0
LA 3013	Subop 4	Very dark gray (10YR3/1) soil. 1x3.22m trench; 10 cm level; Floor ballast; Lot immediately below LA 3007; N5.25 E69.35
LA 3014	Subop 1	(10YR6/6; 10YR7/4 & 10YR8/6 in Rock Color Chart); 2x2m unit; 10cm level; Floor ballast? Lot immediately below LA 3008; N26.3 E52.95
LA 3015	Subop 3	Black (10YR2/1) soil; 1x3.7m trench; 10 cm level; Midden-2; Lot immediately below LA 3010; N22.30 E64.35
LA 3016	Subop 3	Black (10YR2/1) soil; 1x3.7m trench; 10 cm level; Midden-2; Lot immediately below LA 3010; N22.30 E64.35
LA 3017	Subop 2	Very dark gray (10YR3/1) soil ; 2x1.10-1.38m unit; first 10 cm level; Lot immediately above LA 3023; PAA; N10.25 E57.0
LA 3018	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; first 10 cm level; Lot immediately above LA 3025; PAA; N12.25 E55.0

LA 3019	Subop 2	Very dark gray (10YR3/1) soil; 2x.25-.58m excavation area east of possible stone alignment @ N10.25 E58.50; first 10cm level; PAA
LA 3020	Subop 4	Black (10YR2/1) soil; 2x1.5m excavation area; first 10cm level; PAA; N6.25 E69.35
LA 3021	Subop 1	Very dark gray (10YR3/1) soil; 2x2m unit; first 10cm level; PAA; N24.3 E54.95
LA 3022	Subop 3	Brown (10YR4/3) silty clay soil; 1x3.7m trench; 10cm level; Lot immediately below LA 3016; Occupation surface; N22.30 E64.35
LA 3023	Subop 2	Very dark gray (10YR3/1) soil; 2x1.10-1.38m unit; 10cm level; floor ballast; Lot immediately below LA 3017; N10.25 E57.0
LA 3024	Subop 2	Very dark gray (10YR3/1) soil in between wall? stones; 2x.55-.64m; first 10cm level; ballast; N10.25 E58.04
LA 3025	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; first 10cm level; PAA; Lot immediately below LA 3018; N12.25 E55.0
LA 3026	Subop 3	Burial 06-01 skeletal material; N22.65 E67.50
LA 3027	Subop 3	Burial 06-01 fill – very dark gray (10YR3/1) soil (from LA 2997, 3001, 3010, 3015 & 3016) mixed with brown (10YR4/3) soil (from LA 3022)
LA 3028	Subop 2	Very dark gray (10YR3/1) soil; 1x.98-1.33m area; first 10cm level; PAA
LA 3029	Subop 2	Very dark gray (10YR 3/1) soil; 1x2.38-2.46m; first 10cm level; PAA; N5.75 E58.0
LA 3030	Subop 2	Very dark gray (10YR3/1) in Munsell Soil Color Chart & 10YR8/6 in Rock Color Chart); 2x2m unit; 10 cm level; Floor ballast; Lot located immediately below LA 3025; N12.25 E55.0
LA 3031	Subop 3	Brown (10YR4/3) silty clay soil; 1x3.7m trench; 10cm level; Lot immediately below LA 3022; Occupation surface; N22.30 E64.35
LA 3032	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; first 10 cm level; Lot immediately above LA 3033; PAA; N10.25 E55.0
LA 3033	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; 10 cm level; Lot immediately below LA 3032; floor ballast?; N10.25 E55.0

Appendix 4

Small Finds Recovered from Op 06-02, 2006 MAP Field Season

LA 2992

Lot/Small Find #	Description
LA 2992/1	kaolin clay pipe stem
LA 2992/2	kaolin clay pipe stem
LA 2992/3	kaolin clay pipe stem
LA 2992/4	limestone mano frag.
LA 2992/5	perforated shell bead
LA 2992/6	kaolin clay pipe bowl
LA 2992/7	ceramic net sinker
LA 2992/8	kaolin clay pipe bowl
LA 2992/9	chert biface
LA 2992/10	olive jar sherd
LA 2992/11	ground stone metate frag
LA 2992/12	ceramic net sinker
LA 2992/13	olive jar sherd (neck, rim)
LA 2992/14	green bottle (base)
LA 2992/15	biface frag
LA 2992/16	net sinker
LA 2992/17	biface
LA 2992/18	chert grinding stone
LA 2992/19	pipe frag
LA 2992/20	ground stone
LA 2992/21	green stone
LA 2992/22	ground stone

LA 2993

Lot/Small Find #	Description
LA 2993/1	chert biface
LA 2993/2	button (shell)
LA 2993/3	kaolin clay pipe stem
LA 2993/4	kaolin clay pipe bowl

LA 2994

Lot/Small Find #	Description
LA 2994/1	kaolin clay pipe stem
LA 2994/2	spindle whirl fragment
LA 2994/3	kaolin clay pipe stem
LA 2994/4	chert biface
LA 2994/5	kaolin clay pipe bowl
LA 2994/6	kaolin clay pipe stem
LA 2994/7	lead shot

LA 2995

Lot/Small Find #	Description
No Small Finds	

LA 2996

Lot/Small Find #	Description
LA 2996/1	olive jar sherd
LA 2996/2	worked shell
LA 2996/3	ground stone granite, metate

LA 2997

Lot/Small Find #	Description
LA 2997/1	chert point
LA 2997/2	utilized chert flake
LA 2997/3	chert biface
LA 2997/4	chert core/hammer stone
LA 2997/5	perforated ceramic bead
LA 2997/6	perforated ceramic bead
LA 2997/7	chert point
LA 2997/8	chert point
LA 2997/9	obsidian point
LA 2997/10	chert point
LA 2997/11	chert point
LA 2997/12	chert point
LA 2997/13	date seed net sinker

LA 2998

Lot/Small Find #	Description
LA 2998/1	kaolin clay pipe stem
LA 2998/2	Not Assigned
LA 2998/3	kaolin clay pipe stem
LA 2998/4	Not Assigned
LA 2998/5	kaolin clay pipe bowl
LA 2998/6	projectile chert point
LA 2998/7	kaolin clay pipe stem
LA 2998/8	kaolin clay pipe stem
LA 2998/9	kaolin clay pipe stem
LA 2998/10	kaolin clay pipe stem
LA 2998/11	kaolin clay pipe bowl
LA 2998/12	kaolin clay pipe bowl
LA 2998/13	kaolin clay pipe bowl
LA 2998/14	kaolin clay pipe stem
LA 2998/15	copper nail

LA 2999

Lot/Small Find #	Description
LA 2999/1	copper sheet
LA 2999/2	ceramic net sinker

LA 3000

Lot/Small Find #	Description
LA 3000/1	chert biface
LA 3000/2	kaolin clay pipe bowl

LA 3001

Lot/Small Find #	Description
LA 3001/1	clay bead
LA 3001/2	ceramic net sinker
LA 3001/3	worked slate
LA 3001/4	worked chert
LA 3001/5	chert biface
LA 3001/6	obsidian small side-notched pt
LA 3001/7	ceramic net sinker
LA 3001/8	olive jar sherd
LA 3001/9	Not Assigned
LA 3001/10	small side notched point
LA 3001/11	spindle whorl ceramic
LA 3001/12	date seed net sinker
LA 3001/13	chert SSNP

LA 3002

Lot/Small Find #	Description
LA 3002/1	kaolin clay pipe stem
LA 3002/2	kaolin clay pipe stem
LA 3002/3	kaolin clay pipe stem
LA 3002/4	chert biface point
LA 3002/5	chert biface point
LA 3002/6	chert biface

LA 3003

Lot/Small Find #	Description
LA 3003/1	kaolin clay pipe stem
LA 3003/2	kaolin clay pipe stem
LA 3003/3	kaolin clay pipe stem
LA 3003/4	kaolin clay pipe stem
LA 3003/5	chert biface fragment
LA 3003/6	kaolin clay pipe bowl
LA 3003/7	kaolin clay pipe bowl
LA 3003/8	kaolin clay pipe bowl

LA 3004

Lot/Small Find #	Description
LA 3004/1	copper bell, globular
LA 3004/2	chert core
LA 3004/3	chert flake tool
LA 3004/4	copper nail
LA 3004/5	chert biface
LA 3004/6	olive jar fragment
LA 3004/7	bark beater fragment

LA 3005

Lot/Small Find #	Description
LA 3005/1	kaolin clay pipestem
LA 3005/2	chert tool
LA 3005/3	small side-notched point
LA 3005/4	chert biface
LA 3005/5	ceramic bead
LA 3005/6	ceramic bead
LA 3005/7	pipe fragment (British)

LA 3006

Lot/Small Find #	Description
No Small Finds	

LA 3007

Lot/Small Find #	Description
LA 3007/1	olive jar fragment
LA 3007/2	human tooth
LA 3007/3	kaolin clay pipe stem
LA 3007/4	ceramic net sinker
LA 3007/5	ceramic net sinker
LA 3007/6	date seed net sinker
LA 3007/7	ceramic bead
LA 3007/8	greenstone axe frag.
LA 3007/9	granite metate

LA 3008

Lot/Small Find #	Description
LA 3008/1	chert biface fragment
LA 3008/2	kaolin clay pipe stem
LA 3008/3	perforated tripod foot frag

LA 3009

Lot/Small Find #	Description
LA 3009/1	ceramic bead
LA 3009/2	ceramic bead
LA 3009/3	ceramic bead (barrel)

LA 3010

Lot/Small Find #	Description
LA 3010/1	ceramic date seed sinker
LA 3010/2	ceramic date seed sinker
LA 3010/3	ceramic net sinker
LA 3010/4	ceramic net sinker
LA 3010/5	ceramic net sinker

LA 3010

LA 3010

Lot/Small Find #	Description (cont'd)
LA 3010/6	ceramic nert sinker
LA 3010/7	ceramic bead
LA 3010/8	ceramic net sinker
LA 3010/9	eroded net sinker
LA 3010/10	ceramic bead
LA 3010/11	spindle whirl
LA 3010/12	kaolin clay pipe stem
LA 3010/13	chert point
LA 3010/14	ceramic figurine (frog/croc?)
LA 3010/15	ceramic net sinker
LA 3010/16	ceramic bead
LA 3010/17	ceramic bead
LA 3010/18	chert uniface (flake tool)
LA 3010/19	biface chert
LA 3010/20	ceramic net sinker
LA 3010/21	ceramic net sinker
LA 3010/22	obsidian biface
LA 3010/23	biface point (chert)
LA 3010/24	chert biface
LA 3010/25	chert point tip (biface)
LA 3010/26	chert biface

LA 3011

Lot/Small Find #	Description
LA 3011/1	olive jar sherd
LA 3011/2	olive jar sherd
LA 3011/3	kaolin clay pipestem
LA 3011/4	olive jar sherd
LA 3011/5	olive jar sherd
LA 3011/6	ceramic net sinker
LA 3011/7	olive jar sherd

LA 3012

Lot/Small Find #	Description
No Small Finds	

LA 3013

Lot/Small Find #	Description
LA 3013/1	olive jar sherd
LA 3013/2	ceramic bead
LA 3013/3	unassigned find
LA 3013/4	obsidian biface
LA 3013/5	ceramic bead
LA 3013/6	ceramic bead
LA 3013/7	perforated shell frag
LA 3013/8	olive jar sherd
LA 3013/9	majolica sherd
LA 3013/10	olive jar sherd
LA 3013/11	ceramic bead frag.
LA 3013/12	majolica sherd
LA 3013/13	date seed net sinker
LA 3013/14	chert biface frag.
LA 3013/15	ceramic net sinker
LA 3013/16	chert core?/biface
LA 3013/17	cut shell, marine
LA 3013/18	ceramic bead
LA 3013/19	chert point
LA 3013/20	ceramic bead

LA 3014

Lot/Small Find #	Description
LA 3014/1	copper bell, miscast
LA 3014/2	British pipe frag.
LA 3014/3	rattle, ceramic

LA 3015

Lot/Small Find #	Description
LA 3015/1	ceramic net sinker
LA 3015/2	unassigned find
LA 3015/3	ceramic bead
LA 3015/4	ceramic net sinker
LA 3015/5	ceramic net sinker
LA 3015/6	small side-notched point
LA 3015/7	ceramic net sinker
LA 3015/8	ceramic net sinker
LA 3015/9	biface point
LA 3015/10	ceramic net sinker
LA 3015/11	ceramic net sinker
LA 3015/12	utilized chert flake
LA 3015/13	antler, incised?/cut?

LA 3016

Lot/Small Find #	Description
LA 3016/1	net sinker
LA 3016/2	net sinker
LA 3016/3	5th inter. Phalanx (human)
LA 3016/4	chert point
LA 3016/5	net sinker
LA 3016/6	net sinker
LA 3016/7	net sinker
LA 3016/8	net sinker
LA 3016/9	Nueva Cadiz glass bead
LA 3016/10	ceramic net sinker

LA 3017

Lot/Small Find #	Description
LA 3017/1	chert scraper?
LA 3017/2	copper? Sheet
LA 3017/3	British pipe frag.

LA 3018

Lot/Small Find#	Description
LA 3018/1	British pipe frag.
LA 3018/2	British pipe frag.
LA 3018/3	British pipe frag.
LA 3018/4	British pipe frag.
LA 3018/5	shell bead
LA 3018/6	copper glob/large prill
LA 3018/7	British pipe frag.
LA 3018/8	chert biface frag.

LA 3019

Lot/Small Find#	Description
LA 3019/1	olive jar sherd
LA 3019/2	olive jar sherd

LA 3020

Lot/Small Find#	Description
LA 3020/1	majolica sherd
LA 3020/2	bead fragment
LA 3020/3	majolica sherd
LA 3020/4	olive jar sherd
LA 3020/5	chert biface frag.
LA 3020/6	chert biface frag.
LA 3020/7	ceramic bead
LA 3020/8	chert biface
LA 3020/9	net sinker fragment
LA 3020/10	net sinker comp
LA 3020/11	human tooth (incisor)
LA 3020/12	ceramic bead
LA 3020/13	biface fragment
LA 3020/14	olive jar sherd
LA 3020/15	olive jar sherd
LA 3020/16	biface fragment
LA 3020/17	biface fragment
LA 3020/18	olive jar sherd
LA 3020/19	olive jar sherd
LA 3020/20	net sinker comp
LA 3020/21	net sinker fragment
LA 3020/22	ceramic bead
LA 3020/23	bead

LA 3021

Lot/Small Find#	Description
LA 3021/1	greenstone celt

LA 3022

Lot/Small Find#	Description
LA 3022/1	net sinker
LA 3022/2	net sinker
LA 3022/3	biface fragment
LA 3022/4	partial stone mano
LA 3022/5	spindle whorl

LA 3023

Lot/Small Find#	Description
LA 3023/1	olive jar sherd

LA 3024

Lot/Small Find#	Description
No Small Finds	

LA 3025

Lot/Small Find#	Description
LA 3025/1	net sinker
LA 3025/2	biface point
LA 3025/3	ceramic bead
LA 3025/4	ceramic bead
LA 3025/5	chert flake tool
LA 3025/6	copper sheet
LA 3025/7	British pipe frag.
LA 3025/8	flake tool
LA 3025/9	British pipe frag.
LA 3025/10	net sinker fragment
LA 3025/11	olive jar sherd

LA 3026

Lot/Small Find#	Description
No Small Finds	

LA 3027

Lot/Small Find#	Description
LA 3027/1	chert point

LA 3028

Lot/Small Find#	Description
LA 3028/1	chert worked tool
LA 3028/2	chert worked tool
LA 3028/3	cut/worked shell
LA 3028/4	olive jar sherd
LA 3028/5	olive jar sherd

LA 3029

Lot/Small Find#	Description
LA 3029/1	olive jar sherd (2 frags)
LA 3029/2	greenstone axe
LA 3029/3	olive jar sherd
LA 3029/4	British pipe frag.
LA 3029/5	olive jar sherd
LA 3029/6	chert biface frag.
LA 3029/7	British pipe frag.
LA 3029/8	biface fragment

LA 3029/9	biface fragment

LA 3030

Lot/Small Find#	**Description**
LA 3030/1	bone bead
LA 3030/2	copper sheet
LA 3030/3	copper sheet

LA 3031

Lot/Small Find#	**Description**
No Small Finds	

LA 3032

Lot/ Small Find#	**Description**
LA 3032/1	chert flake tool
LA 3032/2	small side-notched point
LA 3032/3	olive jar sherd
LA 3032/4	olive jar sherd
LA 3032/5	British pipe frag.
LA 3032/6	British pipe stem
LA 3032/7	Olive jar fragment
LA 3032/8	British pipe stem
LA 3032/9	Olive jar fragment
LA 3032/10	British pipe stem
LA 3032/11	British pipe stem
LA 3032/12	British pipe stem
LA 3023/13	British pipe stem
LA 3023/14	British pipe stem
LA 3023/15	Ceramic bead

LA 3033

Lot/Small Find#	**Description**
LA 3033/1	ceramic bead
LA 3033/2	obsidian tool

Appendix 5

Summary of Artifact Counts by Type Recovered in 2006, Operation 06-02

Summary of Artifact Counts by Lot, 2006 Field Season, Op 06-02, Lamanai, Belize

Lot Number | **Material Type**

	Ceramic sherds	Chert	Bone	Obsidian	Shell	Stucco/ Plaster	Charcoal Samples	Historic Ceramics	Special Ceramics	Small Finds	Quartz/ Quartzite	Teeth	Slate	Metamorphic	Glass	Concretions	Daub	Metal	**Total Artifact Count**
LA 2992	319	41	74	7	6	1	0	132	4	22	0	4	0	0	94	0	0	13	**728**
LA 2993	51	19	41	2	3	0	0	15	0	3	0	1	0	0	17	0	0	9	**161**
LA 2994	78	23	9	0	1	0	0	9	1	7	1	2	0	0	18	0	0	25	**174**
LA 2995	136	17	90	3	5	0	0	1	1	0	1	1	0	0	3	0	0	1	**259**
LA 2996	0	0	0	0	0	0	0	1	2	3	0	0	0	0	1	0	0	0	**7**
LA 2997	300	129	380	7	32	0	0	171	6	13	5	2	0	0	9	4	0	3	**1061**
LA 2998	65	66	22	22	2	0	0	13	0	13	0	2	0	0	76	2	0	42	**325**
LA 2999	24	10	37	2	2	0	0	2	1	2	0	0	0	0	2	0	0	5	**87**
LA 3000	83	9	5	2	0	0	0	5	1	2	0	0	0	0	1	0	0	7	**115**
LA 3001	390	99	230	6	32	2	0	1	7	12	3	1	0	0	0	16	0	1	**800**
LA 3002	136	45	17	1	1	0	0	5	7	6	0	0	0	0	6	1	0	6	**231**
LA 3003	57	29	19	5	3	0	0	9	1	7	2	0	0	0	22	2	0	17	**173**
LA 3004	81	27	39	1	7	0	0	27	0	7	2	0	0	0	47	26	0	21	**285**
LA 3005	321	61	29	6	13	0	0	1	2	5	0	1	0	0	6	1	1	5	**452**
LA 3006	67	16	12	4	1	0	0	3	0	1	0	0	0	0	2	0	0	1	**107**
LA 3007	458	43	160	5	16	0	0	4	0	8	7	1	0	0	1	1	0	7	**711**
LA 3008	33	22	30	2	0	0	0	16	0	3	0	0	0	0	18	0	0	13	**137**
LA 3009	84	25	9	0	1	0	0	0	1	3	1	0	0	0	1	1	4	0	**130**
LA 3010	712	121	315	6	76	2	1	0	22	26	1	1	2	1	1	1	1	0	**1289**
LA 3011	21	4	20	1	0	0	0	0	1	7	0	0	0	0	13	0	0	7	**74**
LA 3012	- not excavated in 2006 -																		
LA 3013	372	41	118	4	5	1	0	0	8	17	2	2	0	0	0	4	0	0	**574**
LA 3014	48	15	20	0	0	0	1	0	1	3	3	0	0	0	4	0	1	2	**98**
LA 3015	596	71	174	6	39	4	1	0	27	12	0	1	0	0	0	0	0	0	**931**
LA 3016	78	14	16	0	5	0	1	0	1	0	0	0	0	0	0	0	1	0	**116**
TOTALS	**4510**	**947**	**1866**	**92**	**250**	**10**	**4**	**415**	**94**	**182**	**28**	**19**	**2**	**1**	**342**	**59**	**8**	**185**	**9025**

Summary of Artifact Counts by Lot, 2006 Field Season, Op 06-02, Lamanai, Belize (continued)

	Ceramic sherds	Chert	Bone	Obsidian	Shell	Stucco/ Plaster	Charcoal Samples	Historic Ceramics	Special Ceramics	Small Finds	Quartz/ Quartzite	Teeth	Slate	Metamorphic	Glass	Concretions	Daub	Metal	**Total Artifact Count**
LA 3017	235	49	62	4	4	0	0	7	7	3	3	7	0	0	10	0	0	3	394
LA 3018*	77	24	20	1	5	0	0	15	15	7	2	0	0	1	24	0	0	46	237
LA 3019	34	4	8	1	1	0	0	1	0	2	0	0	0	0	3	0	0	1	55
LA 3020	596	144	408	5	10	0	0	4	13	23	16	6	0	1	3	0	0	3	1232
LA 3021	97	12	19	1	3	29	0	7	0	1	3	29	0	0	43	0	0	19	263
LA 3022	261	80	19	1	7	0	1	0	11	5	0	0	1	0	0	0	0	0	386
LA 3023	133	10	17	2	3	0	1	1	0	7	1	0	0	0	2	0	0	1	178
LA 3024	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
LA 3025	177	69	76	8	13	0	0	10	0	8	7	0	0	0	29	0	0	20	417
LA 3026	0	0	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
LA 3027	123	21	139	0	7	0	2	0	0	1	0	0	0	0	0	0	0	0	293
LA 3028	202	24	69	2	9	0	0	14	0	5	2	0	0	0	3	0	0	3	333
LA 3029	542	69	222	7	12	0	0	15	0	9	5	2	0	0	23	0	0	11	917
LA 3030	156	8	12	1	5	0	0	1	3	3	0	0	0	0	2	0	0	1	192
LA 3031	28	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36
LA 3032	153	42	50	4	7	0	0	26	2	20	2	0	0	0	42	0	0	30	378
LA 3033	53	19	4	1	2	0	0	0	0	2	4	0	1	0	2	0	0	1	89
TOTALS	**2867**	**579**	**1183**	**38**	**88**	**29**	**4**	**101**	**53**	**96**	**45**	**44**	**2**	**2**	**186**	**0**	**0**	**139**	**5456**
GRAND TOTALS	**7377**	**1526**	**3049**	**130**	**338**	**39**	**8**	**516**	**147**	**278**	**73**	**63**	**4**	**3**	**528**	**59**	**8**	**324**	**14481**

Appendix 6

Summary of Artifact Weights by Type Recovered in 2006, Operation 06-02

Summary of Artifact Weights by Lot, 2006 Field Season, Op 06-02, Lamanai, Belize

(All weights in grams)

Lot Number **Material Type**

	Ceramic sherds	Chert	Bone	Obsidian	Shell	Stucco/ Plaster	Charcoal Samples	Historic Artifacts	Special Ceramics	Small Finds	Quartz/ Quartzite	Teeth	Copper	Slate	Meta - morphic	Glass	Concretions	Daub	Foreign stone	Metal	**Total Weights**
LA 2992	3009	243	303	6	29	1	0	586	131	1550	0	0	0	0	0	1180	0	0	0	938	**7976**
LA 2993	226	27	68	1	3	0	0	11	0	7	0	0	0	0	0	18	0	0	0	26	**387**
LA 2994	442	23	14	0	1	0	0	9	1	19	1	2	0	0	0	15	0	0	0	75	**602**
LA 2995	862	42	389	1	39	0	0	2	7	0	1	1	0	0	0	9	0	0	0	11	**1364**
LA 2996	0	0	0	0	0	0	0	13	5	782	0	0	0	0	0	101	0	0	0	0	**901**
LA 2997	1879	239	1147	1	119	0	0	853	53	856	22	4	0	0	0	5	204	0	0	15	**5397**
LA 2998	222	65	29	7	2	0	0	22	0	11	0	4	0	0	0	95	15	0	0	88	**560**
LA 2999	91	8	58	6	1	0	0	5	72	14	0	0	0	0	0	2	0	0	0	23	**280**
LA 3000	456	17	19	0	0	0	0	6	0	6	0	0	0	0	0	1	0	0	0	44	**549**
LA 3001	3112	253	645	2	204	29	0	2	387	90	12	4	0	0	0	0	701	0	0	2	**5443**
LA 3002	861	160	26	1	30	0	0	0	47	37	0	0	0	0	0	2	38	0	0	9	**1211**
LA 3003	357	44	25	2	2	0	0	22	14	8	2	0	0	0	0	23	60	0	0	97	**656**
LA 3004	225	38	62	1	4	0	0	32	0	43	1	0	0	0	0	30	1080	0	0	80	**1596**
LA 3005	1879	160	23	2	65	0	0	1	8	53	0	2	0	0	0	7	104	8	0	11	**2323**
LA 3006	416	24	5	1	3	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	**453**
LA 3007	2637	143	412	2	96	0	0	9	0	59	11	0	0	0	0	1	5	0	0	9	**3384**
LA 3008	157	30	38	1	0	0	0	46	0	52	0	0	0	0	0	15	0	0	0	66	**405**
LA 3009	991	118	11	0	1	0	0	0	12	17	5	0	0	0	0	1	53	9	0	0	**1218**
LA 3010	5142	541	683	3	252	35	0	0	407	171	2	1	0	4	96	1	28	22	0	0	**7388**
LA 3011	122	6	60	1	0	0	0	0	2	252	0	0	0	0	0	10	0	0	0	12	**465**
TOTALS	**23086**	**2181**	**4017**	**38**	**851**	**65**	**0**	**1620**	**1146**	**4028**	**57**	**18**	**0**	**4**	**96**	**1517**	**2288**	**39**	**0**	**1507**	**42558**

Summary of Artifact Weights by Lot, 2006 Field Season, Op 06-02, Lamanai, Belize (continued)

Lot Number **Material Type**

	Ceramic sherds	Chert	Bone	Obsidian	Shell	Stucco/ Plaster	Charcoal Samples	Historic Artifacts	Special Ceramics	Small Finds	Quartz/ Quartzite	Teeth	Copper	Slate	Meta - morphic	Glass	Concretions	Daub	Foreign stone	Metal	**Total Weights**
LA 3012	not excavated in 2006																				
LA 3013	2483	237	337	2	45	12	0	0	93	379	1	1	0	0	0	0	214	0	0	0	**3804**
LA 3014	332	36	36	0	0	0	0	0	4	3	8	0	0	0	0	3	0	4	0	5	**431**
LA 3015	5106	219	258	1	179	17	0	0	800	53	0	1	0	0	0	0	0	26	0	0	**6660**
LA 3016	3976	286	283	2	97	0	0	0	336	46	0	1	0	0	0	0	0	5	27	0	**5059**
LA 3017	938	147	1031	1	30	0	0	6	2	11	4	0	0	0	0	28	0	0	0	98	**1368**
LA 3018	373	52	20	1	19	0	0	62	0	14	11	0	3	0	3	99	0	0	0	260	**918**
LA 3019	211	8	32	1	4	0	0	1	0	21	0	0	0	0	0	8	0	0	0	13	**299**
LA 3020	3383	300	847	1.5	57	0	0	3	142	337.5	34	4	0	0	0	1.5	0	0	0	7	**5117.5**
LA 3021	323	12	17	4	1	1	0	7	0	35	20	2	0	0	0	89	0	0	0	0	**514**
LA 3022	1153	193	12	1	4	4	0	0	290	691	0	0	0	1	0	0	0	0	19	0	**2364**
LA 3023	596	15	16	1	11	0	0	2	0	68	1	0	0	0	0	1	0	0	0	6	**717**
LA 3024	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	**150**
LA 3025	1755	110	134	4	41	0	0	23	0	62	29	0	0	0	0	136	0	0	0	83	**2377**
LA 3026	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**83**
LA 3027	603	53	123	0	10	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	**792**
LA 3028	875	24	83	25	18	0	0	33	0	45	7	0	0	0	0	4	0	0	0	97	**1211**
LA 3029	1989	106	255	2	21	0	0	22	0	123	10	2	0	0	0	0	0	0	0	74	**2651**
LA 3030	833	9	22	1	2	0	0	2	135	3	2	0	0	0	0	3	0	0	0	2	**1014**
LA 3031	150	32	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**184**
LA 3032	836	164	58	2	29	0	0	58	9	113	3	0	0	0	0	163	0	0	0	126	**1561**
LA 3033	189	60	14	1	3	0	9	0	0	4	5	0	0	0	0	14	0	0	0	4	**304**
TOTALS	**26104**	**2063**	**3663**	**50.5**	**571**	**34**	**9**	**219**	**1961**	**2011.5**	**135**	**11**	**3**	**1**	**3**	**549.5**	**214**	**35**	**46**	**775**	**37578.5**
GRAND TOTALS	**49190**	**4244**	**7680**	**88.5**	**1422**	**99**	**9**	**1839**	**3107**	**6039.5**	**192**	**29**	**3**	**5**	**99**	**2066.5**	**2502**	**74**	**46**	**2282**	**80136.5**

OPERATIONS FIELD RECORD **OP NUMBER: 06-02**

SITE: Lamanai, Belize	**YEAR EXCAVATED:** 2006
Dates: March 27 - April 20, 2006; May 16 - June 14, 2006	**Excavator(s):** Scott E. Simmons, Laura J. Howard, Michael Pendergast, Mike Marino, Richard Luckyn-Malone, David Hemphill, Ed Scott-Clarke, Charlotte Knappe, Sirja Moilanen, Will Trimble, Bridget O'Brien, Peggy Donnelly, Jessica Pittard, Morgan Periera, Adrianne Wells, Jessica Drew, Erin West, Lucy Stortors, Melanie Fann

OPERATIONS DESCRIPTION: Maya Archaeometallurgy Project, 2006 field season

General Description: Area located roughly 30 – 70 m east of YDL II, Structure N12-13. There are two distinct physiographic sections of this specific area. One of these, situated closest to the east side of the second church, might be considered a bench or terrace above the lagoon floodplain. Two of the four sub- operations (Subops 1 & 2) are situated on this bench or terrace feature above the lagoon floodplain. The other two Subops (3 & 4) are situated in the lagoon floodplain. Total approximate area of OP 06-02 is +/- 30 m (N-S) x +/- 36m (E-W).

Datum Points: Horizontal datum (N0, E0) at SW corner of YDL II, Structure 12-13. Vertical datum points - above mean lagoon level (amll) & above ground surface (ags): Datum A – 7.60 m amll, 64.0 cm ags. Datum B – 7.21 amll, 54.0 cm ags. Datum C – 6.14 m amll, 23.5 cm ags. Datum D – 5.42 m amll, 54.5 cm ags. Datum E – 7.14 m amll, 37 cm ags.

Lot Numbers: LA 2992 (surface collection), LA 2993, LA 2994, LA 2995, LA 2996 (surface collection of Structure N12-17), LA 2997, LA 2998, LA 2999, LA 3000, LA 3001, LA 3002, LA 3003, LA 3004, LA 3005, LA 3006, LA 3007, LA 3008, LA 3009, LA 3010, LA 3011, LA 3012, LA 3013, LA 3014, LA 3015, LA 3016, LA 3017, LA 3018, LA 3019, LA 3020, LA 3021, LA 3022, LA 3023, LA 3024, LA 3025, LA 3026, LA 3027, LA 3028, LA 3029, LA 3030, LA 3031, LA 3032 & LA 3033

Burials: 06-01

Caches: - None -

Features: Feature N 25 E 50, semi-circular feature of three parallel courses of vertically set stones, designation by Darcy Wiewall in 2004, also called the "Amfiteatro" by David M. Pendergast in 1984. Feature N 25 E 60, long, linear feature of limestone boulders, designation by Darcy Wiewall in 2004. Feature extends south of Op 06-02 area and at least as far north as Structure N12-17, a large Maya platform modified somewhat by the British in the mid-late 19th century. "Cobble pavement" or possibly structure (earth & stone) platform in Subops 1, 2 & 4).

Other Observations: Feature N25 E60 may be a natural feature, probably eroded bedrock, that delineates the abovementioned terrace from the lagoon floodplain. It's possible it was added to/modified by the Maya at some point, as the presence of some large and numerous smaller (ca 15-20 cm dia) stones in the midden trench (Subop 3) suggests. The extensive "lagoonside midden" reported by Pendergast in the 1980's ROM testing abuts this long, linear alignment of what appears to be an eroded, exposed limestone bedrock feature. The other prominent feature, N25 E 50, portions of which are exposed at the present ground surface, has not been explored extensively in 2006, as a Christian-style burial was found in a trench excavated by Darcy Wiewall in 2004. Testing in the area situated immediately northeast of this feature revealed what appears to be eroded, disfigured limestone bedrock, along with concretions of limestone pebbles and smaller, light tan-yellow stone that have not been seen by Simmons or Howard anywhere else in the Spanish Church Zone at Lamanai. Cobble (house platform?) features present throughout the area of Subops 2 and 4. Terrace features, designated (from east to west) Terrace A, B & C, marked by N-S alignments of large limestone rocks, present at extreme southern edge of cleared area of Operation 06-02.

Completed by/date: S.E. Simmons 20 June 2006
Entered computer by/date: S.E. Simmons 2 July, 2006

Summary of Lots Excavated for Op 06-02, Lamanai, Belize
2006

Number	Area	Lot Description
LA 2992	OP 06-02	Surface collection, N to S = +/- 29m; E to W = +/- 36 m
LA 2993	Subop 1	Very dark gray (10YR 3/1) soil; 2x2m unit. 1st 10cm level; PAA; N26.3 E52.95
LA 2994	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit. 1st 10cm level; PAA; N12.25 E57.0
LA 2995	Subop 3	Very dark. gray (10YR3/1) soil; 1x3.7m trench. 3cm leaf litter; N22.3 E 64.35
LA 2996	Str. N12-17	Surface collection of OP 06-02; N-S = +/-20m; E-W = +/- 15m
LA 2997	Subop 3	Very dark gray (10YR3/1) soil; 1x3.7m trench; 1st 10 cm level PAA. Lot immediately below LA 2995; N22.3 E 64.35
LA 2998	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; 1st 10cm level; PAA; N14.25 E57.0
LA 2999	Subop 1	Very dark gray (10YR3/1) soil; 2x2m unit; 10 cm level; PAA. Lot immediately below LA 2993; N26.3 E 52.95
LA 3000	Subop 2	Very dark gray (10YR3/1) soil; 2x2m; 2nd 10 cm level; PAA; Lot immediately above LA 2994; N12.25 E57.0
LA 3001	Subop 3	Very dark gray (10YR3/1) soil; 1x3.7m trench; 2nd 10 cm level; Midden-2. Lot located immediately below LA 2997; N22.30 E64.35
LA 3002	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; 2nd 10 cm level; Floor ballast. Lot located immediately below LA 2998; N14.25 E57.0
LA 3003	Subop 2	Very dark gray (10YR3/1) soil; 1x4m trench; 1st 10 cm level; PAA. Lot immediately above LA 3006; N14.25 E59.0
LA 3004	Subop 1	Very dark gray (10YR3/1) soil; 2x2m unit; 10cm level; PAA. Lot immediately above LA 3008; N26.3 E52.95
LA 3005	Subop 2	Very dark gray (10YR3/1) in Munsell Soil Color Chart & 10YR8/6 in Rock Color Chart; 2x2 m unit; 10cm level; Floor ballast. Lot located immediately below LA 3000; N12.25 E57.0
LA 3006	Subop 2	Very dark gray (10YR3/1) soil; 1x4m trench; 10cm level; 2nd 10 cm level; Floor ballast. Lot immediately below LA 3003; N14.25 E59.0
LA 3007	Subop 4	Very dark gray (10YR3/1) soil; 1x3.22m trench; 1st 10 cm level; PAA or Midden –3; Lot immediately above LA 3013; N 5.25 E 69.35
LA 3008	Subop 1	(10YR6/6; 10YR7/4 & 10YR8/6 in Rock Color Chart); 2x2m; 10 cm level; Floor ballast or occupation surface; Lot located immediately below LA 3004; N26.3 E54.95
LA 3009	Subop 2	Very dark gray (10YR3/1) in Munsell Soil Color Chart & 10YR8/6 in Rock Color Chart); 2x2m unit; 3rd 10 cm level; Floor ballast; Lot located immediately below LA 3002; N14.25 E57.0
LA 3010	Subop 3	Very dark gray (10YR 3/1) soil; 1x3.7m trench; 3rd 10 cm level; Midden-2; Lot immediately below LA 3001
LA 3011	Subop 2	Very dark gray (10YR3/1) soil; 1x1m unit; first 10cm level; PAA; N14.25 E63.0
LA 3012	Subop 2	Very dark gray (10YR3/1) soil; 1x4m trench; 10 cm level; Floor ballast; Lot immediately below lot LA 3006; N14.25 E59.0
LA 3013	Subop 4	Very dark gray (10YR3/1) soil. 1x3.22m trench; 10 cm level; Floor ballast; Lot immediately below LA 3007; N5.25 E69.35
LA 3014	Subop 1	(10YR6/6; 10YR7/4 & 10YR8/6 in Rock Color Chart); 2x2m unit; 10cm level; Floor ballast? Lot immediately below LA 3008; N26.3 E52.95
LA 3015	Subop 3	Black (10YR2/1) soil; 1x3.7m trench; 10 cm level; Midden-2; Lot immediately below LA 3010; N22.30 E64.35
LA 3016	Subop 3	Black (10YR2/1) soil; 1x3.7m trench; 10 cm level; Midden-2; Lot immediately below LA 3010; N22.30 E64.35
LA 3017	Subop 2	Very dark gray (10YR3/1) soil ; 2x1.10-1.38m unit; first 10 cm level; Lot immediately above LA 3023; PAA; N10.25 E57.0
LA 3018	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; first 10 cm level; Lot immediately above LA 3025; PAA; N12.25 E55.0

LA 3019	Subop 2	Very dark gray (10YR3/1) soil; 2x.25-.58m excavation area east of possible stone alignment @ N10.25 E58.50; first 10cm level; PAA
LA 3020	Subop 4	Black (10YR2/1) soil; 2x1.5m excavation area; first 10cm level; PAA; N6.25 E69.35
LA 3021	Subop 1	Very dark gray (10YR3/1) soil; 2x2m unit; first 10cm level; PAA; N24.3 E54.95
LA 3022	Subop 3	Brown (10YR4/3) silty clay soil; 1x3.7m trench; 10cm level; Lot immediately below LA 3016; Occupation surface; N22.30 E64.35
LA 3023	Subop 2	Very dark gray (10YR3/1) soil; 2x1.10-1.38m unit; 10cm level; floor ballast; Lot immediately below LA 3017; N10.25 E57.0
LA 3024	Subop 2	Very dark gray (10YR3/1) soil in between wall? stones; 2x.55-.64m; first 10cm level; ballast; N10.25 E58.04
LA 3025	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; first 10cm level; PAA; Lot immediately below LA 3018; N12.25 E55.0
LA 3026	Subop 3	Burial 06-01 skeletal material; N22.65 E67.50
LA 3027	Subop 3	Burial 06-01 fill – very dark gray (10YR3/1) soil (from LA 2997, 3001, 3010, 3015 & 3016) mixed with brown (10YR4/3) soil (from LA 3022)
LA 3028	Subop 2	Very dark gray (10YR3/1) soil; 1x.98-1.33m area; first 10cm level; PAA
LA 3029	Subop 2	Very dark gray (10YR 3/1) soil; 1x2.38-2.46m; first 10cm level; PAA; N5.75 E58.0
LA 3030	Subop 2	Very dark gray (10YR3/1) in Munsell Soil Color Chart & 10YR8/6 in Rock Color Chart); 2x2m unit; 10 cm level; Floor ballast; Lot located immediately below LA 3025; N12.25 E55.0
LA 3031	Subop 3	Brown (10YR4/3) silty clay soil; 1x3.7m trench; 10cm level; Lot immediately below LA 3022; Occupation surface; N22.30 E64.35
LA 3032	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; first 10 cm level; Lot immediately above LA 3033; PAA; N10.25 E55.0
LA 3033	Subop 2	Very dark gray (10YR3/1) soil; 2x2m unit; 10 cm level; Lot immediately below LA 3032; floor ballast?; N10.25 E55.0