

**FAMSI © 2005: Andrew R. Wyatt**

## **Excavations on Agricultural Terraces: Results of the 2004 Field Season at Chan, Belize**



**Research Year:** 2004

**Culture:** Maya

**Chronology:** Late Pre-Classic to Terminal Classic (300 B.C.–A.D. 925)

**Location:** Cayo District, Belize

**Site:** Chan

### **Table of Contents**

[Abstract](#)

[Resumen](#)

[Introduction](#)

[The Chan Site: Location, History, Previous Research](#)

[Research Goals](#)

[Results of 2004 Excavations: Overview](#)

[Results of 2004 Excavations](#)

[Site A](#)

[Site B](#)

[Site C](#)

[Site D](#)

[Chronology](#)

[Discussion](#)

[Conclusions](#)

[Future Research at Chan](#)  
[Acknowledgements](#)  
[List of Figures](#)  
[Sources Cited](#)

## **Abstract**

Archaeological investigations on the agricultural terraces at the site of Chan in the Belize River Valley were conducted in the summer of 2004. A series of excavations on terrace walls, terrace beds, and associated structures and features were designed to provide a chronology of terrace construction and use, as well as provide data on how the terraces were farmed. Excavations demonstrated a high level of water management, including the capture of a natural spring, irrigation on the terrace beds, and small depressions used for the short-term storage of water. Preliminary analysis also indicates that the terraces at the Chan site were first utilized during the Late Formative and Early Classic periods. The findings from these excavations demonstrate that agricultural terracing in the Belize River Valley is more complex and of a longer duration than previously believed.

## **Resumen**

Las investigaciones arqueológicas en las terrazas agrícolas en el sitio de Chan en el Valle del Río Belice se realizaron en el verano de 2004. Una serie de excavaciones en paredes de terraza, lechos de terraza, estructuras y rasgos asociados, se diseñaron para proveer una cronología de la construcción y el uso de terrazas, así como proporcionar los datos de cómo se cultivaron las terrazas. Las excavaciones demostraron un nivel alto de administración de agua, incluyendo la captura de un manantial natural, irrigación en los lechos de las terrazas, y depresiones pequeñas que se usaron para el almacenamiento de agua por corto tiempo. Los análisis preliminares indican también que las terrazas en el sitio de Chan fueron primero utilizadas durante los períodos Formativo Tardío y el Clásico Temprano. Los hallazgos de estas excavaciones demuestran que el terracedo agrícola en el Valle del Río Belice es más complejo y de una duración más larga de lo que se creyó previamente.

Submitted 10/12/2005 by:  
Andrew R. Wyatt  
[awyatt1@uic.edu](mailto:awyatt1@uic.edu)

## Introduction

Researchers have been grappling with the problem of ancient Maya agriculture throughout the history of Maya studies. Chief among these problems was the seeming incongruity of an advanced and complex civilization thriving in a tropical rainforest environment. Accepted wisdom at the time stated that tropical regions were inhospitable to intensive agriculture, high populations, and, therefore, civilization, so the presence of the Maya presented a problem. Mayanists suggested that Maya cities were "empty ceremonial centers" (Thompson 1954), or that the advanced culture had come primarily from the Mexican Highlands (Sanders and Price 1968), and that agriculture was confined primarily to slash-and-burn. However, following the realization that the high populations in the Late Classic could not have survived with simple swidden farming (initially inspired by the Tikal settlement survey work which identified that the population in the Maya Lowlands was much greater than suspected [Haviland 1969]), seminal works have attempted to come to terms with what we mean by Maya Agriculture (Harrison and Turner 1978; Flannery 1982; Fedick 1996a).

Since the pioneering Tikal report, archaeologists have begun to systematically collect data on ancient Maya agricultural regimes and have shown that the ancient Maya used a variety of intensive agricultural strategies, including raised fields, wetland agriculture, and terraces (Adams 1982; Dunning and Beach 1994; Fedick 1994; Healy et al. 1983; Matheny 1978; Pohl 1990; Scarborough 1983; Siemens and Puleston 1972; Turner 1983; Turner and Harrison 1983). Initial research efforts aimed to define the nature of ancient intensive agricultural technologies and thus concentrated on surveying proposed agricultural fields (e.g. Siemens and Puleston 1972), or on testing agricultural constructions to determine general chronologies and construction methods (e.g. Turner 1983; Turner and Harrison 1983). More recently, as researchers have accepted the presence of intensive agricultural strategies, studies have explored the relationship of agriculture to political economy, settlement, gender, and other theoretical issues.

This project is studying the agricultural terraces at Chan, a small, farming village in the Belize River Valley area of western Belize. Based on settlement survey data (Wyatt and Kalosky 2003) and excavation data (Robin 1996; Robin et al. 2002), the Chan site was continuously occupied from the Middle Preclassic to the Early Postclassic periods (ca. 900 B.C.–1200 A.D.). Chan is a relatively small site throughout most of its settlement history with only 10-20% of its households occupied in all periods except for the latter part of the Late Classic (A.D. 670-780) when its occupation increases dramatically to 75-80% (Wyatt and Kalosky 2003). This increase corresponds to the political florescence of the nearby center of Xunantunich located 4 km to the northwest of Chan. The Chan site also has the highest density of terraces in the Belize River Valley (304/km<sup>2</sup>), making it an ideal site to study ancient Maya intensive agriculture.

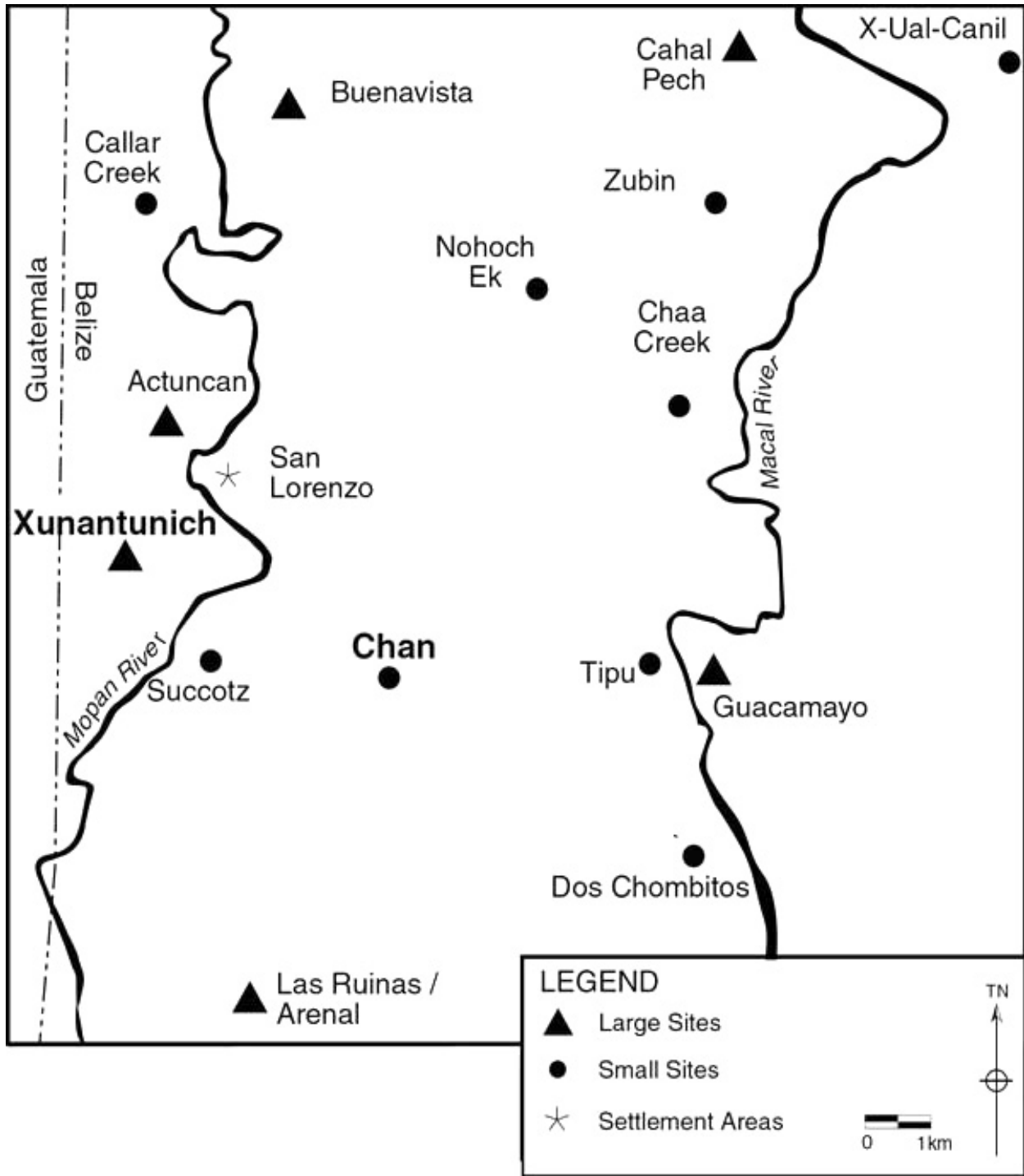


Figure 1. Location of Chan in Belize River Valley.

### The Chan Site: Location, History, Previous Research

The archaeological site of Chan is located in the Belize River Valley in the Cayo district of western Belize ([Figure 1](#), shown above). This area lies within the Central American

Neotropics sharing many characteristics with the region as a whole, including much of the flora and fauna, seasonal wet and dry periods, and dense semi-deciduous and evergreen forests (Wright, et al. 1959: 13-33; West 1964).

The gently rolling hills, rich soils, and fertile flood plains of the Belize River Valley – extending in some areas up to 1 km from the course of the Belize River – have produced an environment well-suited to agriculture. The western Belize River Valley in particular, lying within the foothills of the Maya Mountains, is a hilly environment and provides an excellent environment for agricultural terrace construction. Indeed, this area contains one of the highest regional densities of agricultural terraces in the Maya area.

The first large-scale settlement survey in the Maya area was undertaken in the Belize River Valley at Barton Ramie, a small rural settlement located on the banks of an oxbow lake on the Belize River (Willey et al. 1965). Since Willey's pioneering survey in the late 1950s, numerous settlement surveys (Ashmore et al. 1994; Ford and Fedick 1992) have made the Belize River Valley one of the most intensively surveyed regions in Central America. Household excavations, in conjunction with these surveys (Ashmore 1996; Robin 1996), have also contributed a great deal to our understanding of rural Maya society.

The Chan site is a small, ancient Maya farming village. It is located approximately 4 km southeast of Xunantunich in the upland terrain between the Macal and Mopan drainages of the Belize River in western Belize. Occupied from the Middle Preclassic period to the Early Postclassic period (900 B.C.–1200 A.D.), Chan's period of highest population and intensive land use was during the latter part of the Late Classic period (A.D. 670-780) (Robin 1999). Chan's density of agricultural terracing and rise in population during the fluorescence of the Xunantunich polity suggest its function as a center of agricultural production (Robin 1996).

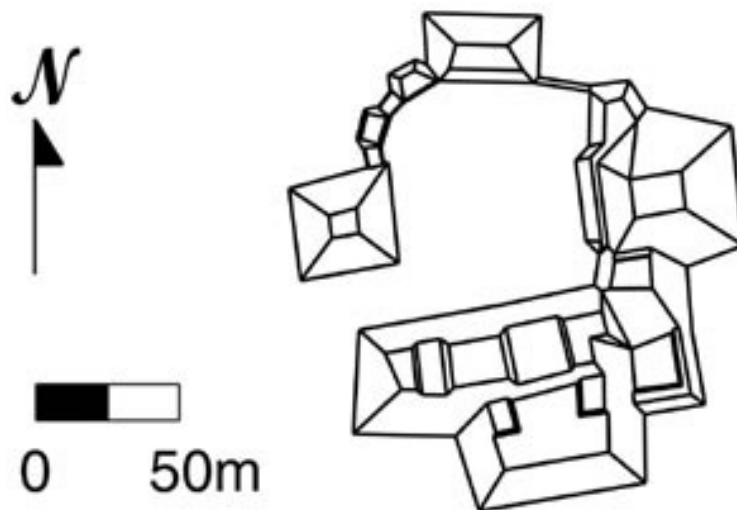


Figure 2. Chan site core.

The Chan site was first identified during the settlement survey of the Xunantunich Archaeological Project by Dr. Cynthia Robin ([Figure 2](#), shown above). Initial household-focused work at the Chan site was carried out in 1996 at a cluster of farmsteads lying to the south of the site center (Robin 1999). In 2002 and 2003, a survey of the entire Chan site, an area encompassing 1 km<sup>2</sup> surrounding the site core (defined using nearest-neighbor analysis [Ashmore et al. 1994]) was completed. The findings of the final 2003 survey season at Chan documented a concentration of terraces greater than any in the Belize River Valley (304 km<sup>2</sup> [Wyatt and Kalosky 2003]), revealing an exceptional level of landscape alteration unique in the Maya region.

Contour terraces are the most widespread type of agricultural construction at Chan with over 89% of the total. This type of terrace transforms a hillside into a series of stepped, level planting surfaces, providing erosion control and water management (Donkin 1979: 32). Many of the contour terraces at Chan are exceptionally well preserved and exhibit a wide variety of sizes and locations. Terrace walls range in height from less than 50 cm to over 2 m and correspond to hillslopes of very gentle grades of 5° to steep grades of 35°. Contour terraces are often found adjacent to large household structures as well as far from any visible housemounds.

Cross-channel terraces make up 2% of the total number of terraces. Cross-channel terraces are made up of a series of steps built horizontally across a seasonally inundated channel or gully, trapping sediments and providing very rich soils (Donkin 1979: 32). Due to the accumulative nature of cross-channel terraces, their walls are often quite high, with some at Chan as much as 3.5 m in height. Although only a small percentage of the total number of terraces, their size often make them a prominent feature of the landscape where they are found. Cross-channel terraces are often considered organizationally different in terms of construction and maintenance compared to contour terraces (Dunning and Beach 1994; Fedick 1994), yet at Chan we find these two types of terraces adjacent to and even connected to one another. This suggests that our models of terraces and the organization needed to construct and maintain them are not yet complete.

## **Research Goals**

Timothy Earle defines political economy as "the material flows of goods and labor through a society, channeled to create wealth and to finance institutions of rule (2002:1)." Accordingly, a complete analysis of political economy must consider both the consumers as well as the producers of a society's output. Many of the archaeological studies in the Maya area have analyzed the political economy from the perspective of the elites and their role as recipients of tribute (both goods and labor) and as the center of a system of redistribution (e.g. Chase and Chase 1992; Masson and Friedel 2002). However, recent archaeological research has begun to address the role of the producers of Maya society by focusing on rural sites and "minor centers" (Iannone et al.

2003; Iannone 2004; Yaeger and Robin 2004). This project seeks to understand the position of the Maya commoner, the farmer, within this system; specifically, how and to what extent their "goods and labor" are utilized and controlled by the elite to build and maintain their cities and institutions.

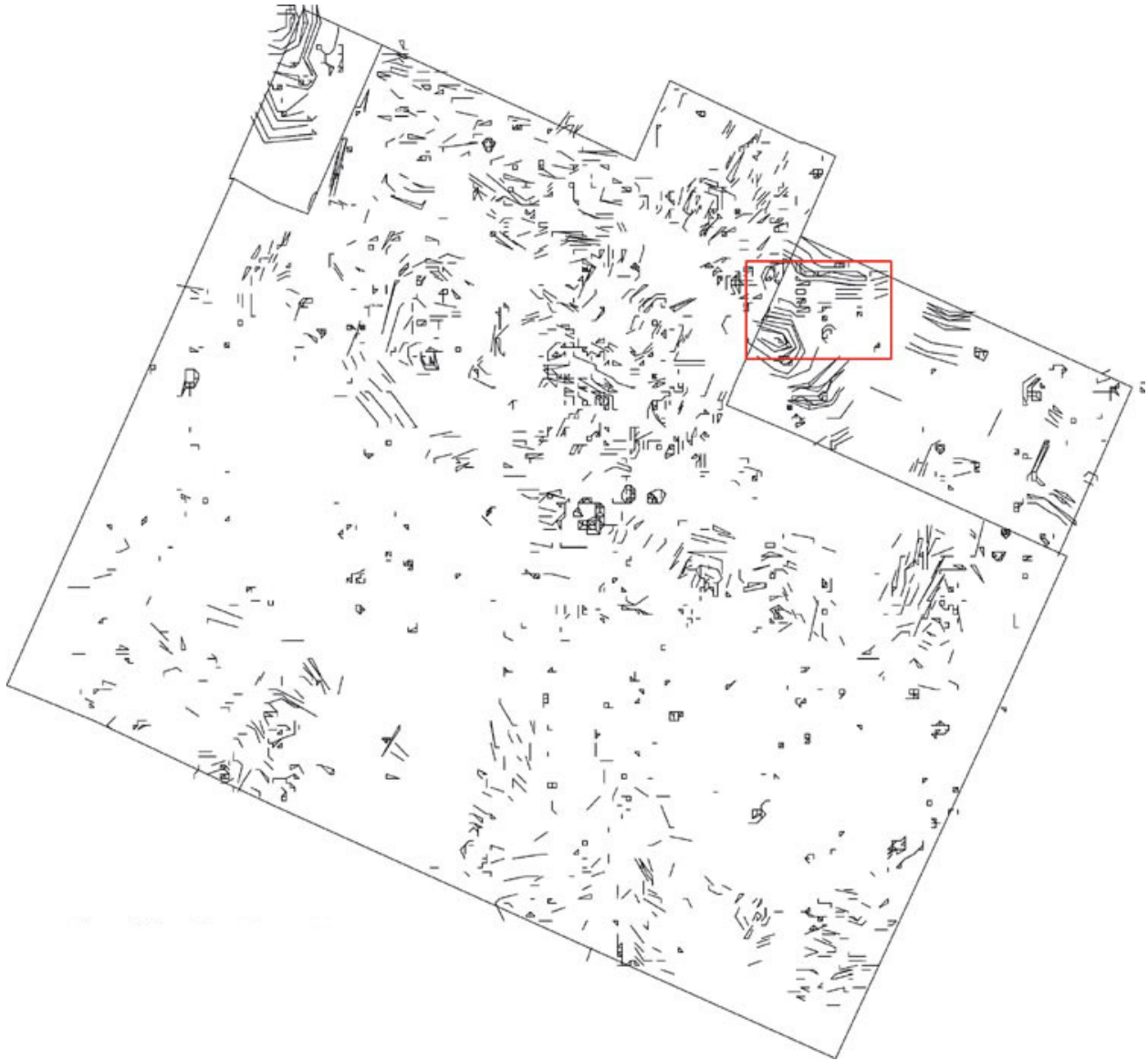
Archaeologists have long recognized that intensive agricultural strategies, such as terracing, raised fields, and irrigation works, are means through which people are able to extract more resources from the land (Boserup 1965). But debates still continue as to when and why farmers would turn to intensification. Was it a response to high populations? Extractive political economies? Or a development from the local knowledge bases of agrarian focused households and communities? As Fedick has argued, these questions can only be answered through detailed and chronologically focused excavations of agricultural areas (Fedick 1996b). Agricultural methods and technologies, therefore, provide an excellent means to address a broad range of issues relating to household, local, and regional economy.

Within the framework of these theoretical questions, the goals of the 2004 season of excavations were to: 1) excavate multiple terrace walls to determine construction techniques and chronologies; 2) excavate a large structure located on the terraced hillslope, also to determine a chronology of occupation; 3) expose large areas of terrace beds to look for hidden structures as well as take soil samples for flotation and soil chemistry analysis; and, 4) explore several small depressions and their possible role as water storage facilities. The analysis of these data will provide information on the techniques of intensive terrace agriculture as practiced by the ancient Maya in the tropical rainforest environment, as well as address the larger issues of political economy and the relationship of the farmer to this system. This research on the agricultural terraces will also complement the work being done by Dr. Cynthia Robin as the director of the overarching Chan Archaeological Project and its study of the 2000-year history of an ancient Maya farming community, as well as the work of Chelsea Blackmore of the University of California, Riverside and her study of mid-level settlements on the outskirts of the Chan site.

### **Results of 2004 Excavations: Overview**

Excavations funded by a grant from the Foundation for the Advancement of Mesoamerican Studies, Inc., (FAMSI) in 2004 were undertaken in an area of particularly dense terracing to the north of the site center ([Figure 3](#)). These excavations concentrated on the exposure of significant areas of terrace bed surfaces and terrace walls as well as revealing the function and construction sequence of an adjacent household and associated domestic middens located on the terraced hillside (Wyatt 2004). Excavations illustrated a contiguous construction of terrace and structure walls, thereby making it possible to propose dates for terrace construction based on the construction history of the associated household structure. Also, careful excavation of terrace wall fill provided dates for the construction of terraces away from the structure. Preliminary ceramic analysis indicates that both the structure and the terraces here date

to the Early Classic/Late Terminal Formative period, based upon the presence of waxy slips and identifiable vessel forms (LeCount personal communication).



**Figure 3. Location of excavations.**

Our methodology of utilizing extensive areal excavations on terrace beds, terrace walls, and the structure located on the terraced hillside allowed us to document a number of significant features that would have otherwise gone unnoticed. In these excavations we were able to identify: 1) buried terrace bed surfaces, providing a context for paleoethnobotanical findings; 2) multiple terrace construction phases, including an early terrace wall buried within the terrace bed; 3) the articulation of terrace walls and the structure, demonstrating that they could be stratigraphically linked, and; 4) a complex



range of water management features associated with the terraces and the structure. These findings demonstrate the utility of excavating large areas in agricultural areas.

The results of the 2004 season suggest several basic conclusions. First of all, the farmers in this area had been modifying and cultivating the landscape for a long period of time. These were not newcomers expanding into the hinterlands because of a Late Classic population explosion, but people who had been cultivating the hillslopes at Chan for many generations. Secondly, the small-scale water management features hint at a complexity of agricultural practices suggested only by large-scale features at sites such as Tikal (Scarborough 2004). The farmers at Chan thus seem more akin to the agricultural smallholders discussed by Netting, who have devoted labor towards the creation of landesque capital, in contrast to shifting cultivators or large-scale food monocroppers (1993:2-3).

## **Results of 2004 Excavations**

Excavations were carried out in four different locations: Site A, Site B, Site C, and Site D ([Figure 4](#)). Site A excavations were centered around Structure C-304 and Sites B and C were located approximately 25 m from the structure. Site D is actually several sites clustered nearby each other and represents the explorations of several small depressions.

### **Site A**

Excavations at structure C-304 revealed a complex series of constructions episodes ending in a Late to Terminal Classic (A.D. 600-900) household (Wyatt 2004). This structure is somewhat unusual in that it is a fairly large structure (3 m in height on the north side) with a long history, yet exists without any adjacent structures; single mounds are not unusual in this area, but it is rare for them to be this size and to have multiple construction episodes. The structure also sits on a hillside connected to several terrace walls and most likely served as a focal point for agricultural activities. However, the truly unique nature of this structure is in its earliest incarnation as a "springhouse".

Excavations on the terrace beds and terrace walls adjacent to the structure on the east revealed a natural spring (now dry) emanating from the side of the hill near the southeast corner of the structure. The spring was diverted to the agricultural terraces as well as into and through the earliest construction of the structure. Bedrock was cut and stones were set in place to guide the spring from its origin through a small opening in the wall of the structure at the far southeast corner. Once inside the structure, the water was guided through the interior and was collected in a small pool or basin created by the placement of large stone blocks ([Figure 5](#)). This basin also had a small spillway that would guide the excess water away from the structure.

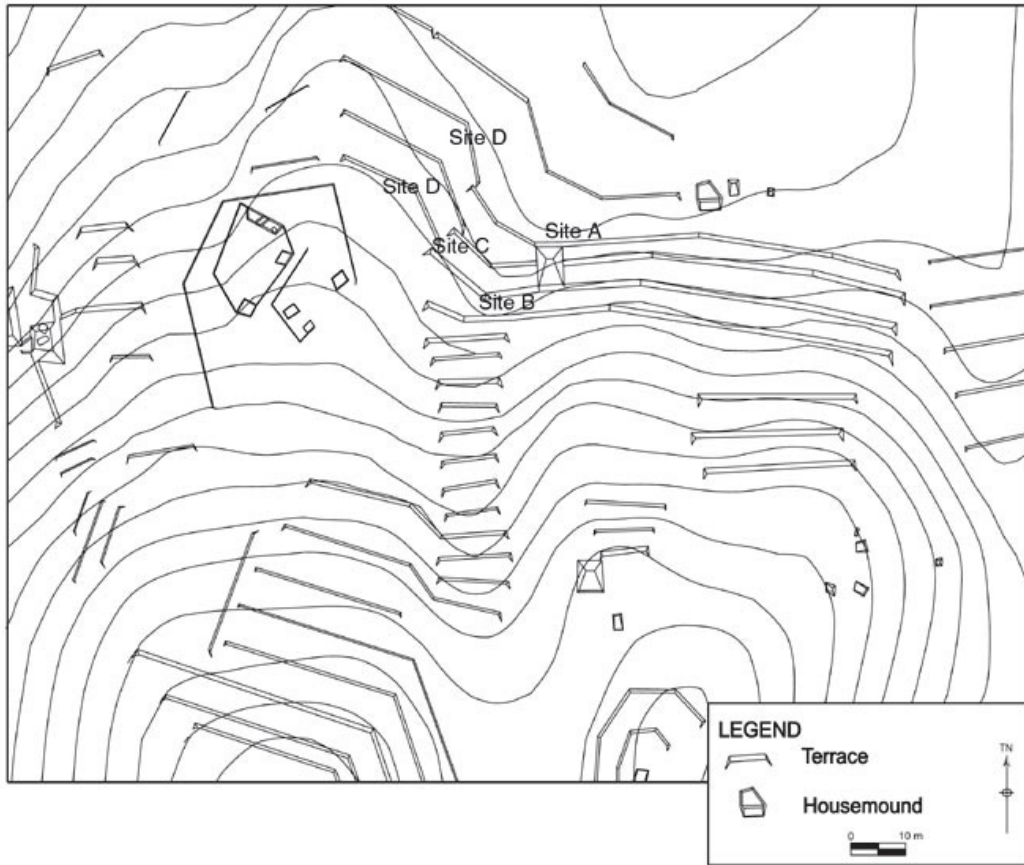


Figure 4. Location of sites.



Figure 5. Interior of structure and basin for collecting springwater.



**Figure 6. Lip-to-lip offering.**

While the exact function of this structure is unclear, its focus was certainly the collection and maintenance of springwater. Whether it was to create a climate-controlled food storage facility or to collect water for drinking (or, most likely, both) it represents an extensive knowledge and use of the hydrology in this locale. Interestingly, indicators of a ritual function for the springhouse are minimal. No burials were found associated with the structure, and no ritual paraphernalia were found. However, near the water basin is an offering of three lids; two set lip to lip with a third atop those ([Figure 6](#), shown above). On either side of this ceramic offering were two eccentric cherts ([Figure 7](#) and [Figure 8](#), shown below).



Figure 7 and Figure 8. Eccentric chert.

Also, in the SE corner of the structure, a similar offering, but without the eccentric chert objects, was placed upon the sealing of the early structure. Offerings of lip-to-lip vessels are common throughout the Belize River Valley, and while there was certainly ritual associated with the construction and subsequent building episodes of the springhouse, there appears to be no particularly important ritual function.

As mentioned above, the spring also served to irrigate the terrace beds adjacent to the structure as well. A natural sluice gate carved into the bedrock just below the source of the spring guided water through the terrace wall and the terrace bed ([Figure 9](#), shown below).

Underneath the ultimate terrace wall construction at the southeast corner of the structure were three small stone walls following a 50° NE angle; the angle of the natural uplift of the bedrock. These angled walls most likely guided the springwater to the terrace bed below, after passing through the sluice gate. The spring therefore served a dual purpose; to irrigate the nearby terraces and to supply water for the springhouse.



**Figure 9. Spring and sluice gate.**

However, at some point the spring either dried up completely, or failed to provide enough water to warrant the continued maintenance of a springhouse. Later construction episodes filled in the interior channels and basin of the springhouse, and the exterior channels were filled in as well. A later terrace wall was then constructed over the angled walls.

A total of 22 general utility bifaces were also recovered throughout the excavations in the structure, either in fill or in middens ([Figure 10](#)). Made of limestone or poor-quality chert, the size and form of these implements suggest an agricultural function, similar to a modern-day hoe. This structure therefore has served both an agricultural purpose as well as a water management function, and represents localized control of resources.



Figure 10. Limestone general utility bifaces.

### **Site B**

A trench excavated through two cross-channel terrace walls and three terrace beds at site B revealed unique construction techniques as well as evidence of an earlier terrace wall on the terrace bed ([Figure 11](#)). The majority of terrace walls excavated in Mesoamerica consist primarily of a vertical facing wall of large stones or cut blocks with small fill piled behind the wall to facilitate drainage. Occasionally, walls will be constructed of two vertical walls of large stones with fill in between (this is the construction of the terrace wall at the northeast corner of structure C-304). While this form of terrace construction maximizes the planting surface on the terrace bed, it also requires a great deal of time spent on maintenance of the wall. During periods of high rainfall, hydrostatic pressure builds up and sections of the wall will collapse.

The terrace walls at site B, however, were constructed with smaller stones, with the walls at a 45-degree angle to the planting surface. The excavation profile showing stones with quite a bit of soil mixed in indicates that these walls were most likely built accretionally over time with more stones piled against the wall as soil continued to accumulate through alluvial processes. Unlike the terraces at large sites such as

Caracol (Healy 1983; Chase and Chase 1998) which were built with large vertical stones, the Chan cross-channel terraces resemble terrace construction associated with smaller households (Donkin 1979; Smith and Price 1994).



**Figure 11. Trench through terrace walls at Site B.**



**Figure 12. Remains of early terrace wall.**

The angled terrace wall would also save on maintenance as the wall would be less likely to collapse during periods of heavy rainfall. The 45-degree angle would serve as a buttress and create a much stronger wall. While not as aesthetically pleasing as a cut stone wall, such as one might want in the elite center of a city, the construction of angled terrace walls utilizing smaller stones is more functional and less time-consuming to maintain.

Located on the terrace bed between the two excavated terrace walls, we uncovered the remains of what is likely an earlier terrace wall ([Figure 12](#)). Although fragmentary, this line of stones resting on bedrock suggests that an earlier attempt to build a terrace wall was built over by later constructions.





**Figure 13. Irrigation channel located on terrace bed.**

### **Site C**

Excavations in this location were begun at the corner of two terrace walls, revealing an irrigation/drainage channel running across the terrace bed. At the corner, a series of stones were set in place to guide water down the wall of the terrace, and onto the terrace bed. From that point, a channel was created alternately with stones, cut bedrock, and natural bedrock features. Similar to the spring water channel at site A, this

channel ran at a 50-degree northeast angle, again utilizing the natural topography ([Figure 13](#)).

Originally we suspected that this was simply a channel to drain excess water, a necessity during the rainy season. However, a small pile of stones was placed directly in the channel at two points, resembling a water distribution system utilized by terrace farmers in Switzerland (Netting 1993). In this system, water is released from a reservoir located farther up the hill and allowed to drain down a channel. At various points, a barrier is placed in the channel, causing the water to pool and spread across the terrace bed, providing water for crops. A large series of reservoirs are located above the terraces on a plateau, possibly providing a water source for this particular irrigation channel.

This provides the first evidence of small-scale irrigation of agricultural terraces in the Maya Lowlands. Much of the irrigation projects throughout Mesoamerica consist of large-scale public works projects such as the *chinampas* outside Tenochtitlán and the raised fields in Pulltrouser Swamp. What this demonstrates is that small scale farmers could and did create and maintain intensive agricultural systems away from centralized control. Scarborough (2004) shows how the Tikal elite controlled access to water for a large area surrounding the site core. In the hinterlands, however, similar systems were constructed and maintained by a non-elite farming populace.

### **Site D**

Site D is not one specific location, but refers to three excavations undertaken in what we have come to term "*aguaditas*" ([Figure 14](#)). *Aguadita* refers to a very small depression visible on the surface, often no more than 2 meters in diameter, and less than a meter deep. Originally we thought these were simply depressions created by tree fall, but closer inspection revealed they lacked the normal mound of dirt created by the uplifted roots on one side. Excavations revealed that of the three *aguaditas* excavated, two are unequivocally human-made structures with the other most likely an *aguadita*, but not definitely. We have called them *aguaditas* because we believe they were small water reservoirs for practicing "pot irrigation"; filling small containers with water and watering plants by hand.



Figure 14. "Aguadita" located on agricultural terraces.

## Chronology

Recently completed ceramic analysis has provided evidence of the lengthy occupation of the structure and the associated terraces. Two middens associated with the ultimate construction phase of structure C-304 show that it was occupied up to the end of the Late Classic, with a possible Terminal Classic component. Ceramics obtained from construction fill in the earlier construction phases show that the structure extends back to the terminal Late Preclassic and Early Classic periods ([Figure 15](#)).

Ceramics from terrace wall fill and from excavations on the terrace beds are less certain owing to the paucity of ceramics. However, a number of excavations were able to provide dates from the terminal Late Preclassic and Early Classic periods as well (see [Figure 16](#)).



**Figure 15. Ceramics from Early Classic found in structure associated with agricultural terraces.**



**Figure 16. Ceramics from Early Classic found in structure associated with agricultural terraces.**

These ceramics, as well as the dates provided by structure C-304, provide ample evidence of the early construction and occupation of the terraces at this area of the Chan site.

## Discussion

Preliminary analyses of the excavations of the agricultural terraces at Chan illuminate several important aspects of ancient Maya agriculture as practiced by farmers in the hinterlands. First of all, the structure and terraces in this area show a lengthy occupation. The structure located on the terraces shows at least five different construction episodes, with final abandonment occurring during the Late to Terminal Classic, and the earliest construction of the springhouse built at least previous to the Late Classic (Wyatt 2004). The structure has always been associated with the hillslope agricultural terraces, as demonstrated by the simultaneous use of the spring as feeding the basin in the springhouse as well as irrigating the terrace beds nearby. As the structure was rebuilt, the terraces were also rebuilt to accommodate the reconstruction. The nearby terrace transect also reveals multiple construction episodes in the terrace walls through the partial dismantling of an earlier wall construction located on the later terrace bed. Initial analysis of the ceramics from this buried terrace wall indicates a date also previous to the Late Classic.

What this shows us is that terraces were being constructed prior to the Late Classic population explosion, contrary to accepted theories of agricultural intensification. Theories of least-effort are often utilized to explain the development of intensive agriculture in many parts of the world (Boserup 1965). Only when problems such as a population increase or a lack of land assert themselves will farmers turn from extensive agricultural practices, such as slash-and-burn, to more intensive forms such as irrigation, raised fields, or terraces. Archaeologists have applied this to the Maya area to explain the existence of terraces as a response to the increase in population during the latter half of the Late Classic. Prior to the Late Classic, it is believed, Maya farmers practiced extensive *milpa* agriculture in fields away from their households, keeping house gardens nearby to supply some vegetables, spices, and herbs.

But raised and channelized fields located in Northwestern Belize dating to the Preclassic (Turner and Harrison 1983), as well as the terraces at Chan, indicate that all intensive agriculture is not necessarily associated with the Late Classic. The farmers at Chan, therefore, constructed agricultural terraces without the apparent impetus of population pressure.

What, then, caused them to expend the effort to create these terraces? One possibility may have been the need to create more food for larger nearby centers, such as Xunantunich. Another possibility may be that constructing and maintaining these agricultural terraces was not necessarily perceived as a greater expenditure of labor than swidden agriculture. Terrace construction at Chan indicates an accretional process, rather than a temporally concentrated effort such as a major irrigation work, and is reflected in agricultural terraces in other parts of the world (Donkin 1979; Smith and Price 1994). The style of terrace construction also suggests that maintenance may have been kept at a minimum due to the greater durability of the 45° angled walls. Given that clearing forests for swidden agriculture would have been accomplished with stone tools, the Chan farmers may have concluded that the slow construction and upkeep of the terraces was less labor intensive than clearing a patch of forest every

several years.

The Maya farmers at Chan also demonstrate a deep knowledge of the topography and hydrology of the area, indicative of their lengthy tenure at the site and their investment in the landscape. First of all, many of the drainage and irrigation features are constructed with the natural uplift of the bedrock, taking advantage of the inherent features of the site. Both the irrigation/drainage channel and the irrigation features below the terrace wall adjacent to the structure are constructed at a 50° northeast angle, the natural direction of the flow of the water. This angle does not necessarily follow the slope of the hillside and would have been visible only through the removal of topsoil to the bedrock and careful observation of the flow of water.

The hydrology of the area as well would only have been understood and controlled through long-term observation and use, especially the underground spring located on the terrace bed to the west of the structure. This and the use of the spring located behind the structure show a lengthy and deep-seated investment in the landscape.

## **Conclusions**

The early results of the excavations of the agricultural terraces at the Chan site demonstrate several important facets of Maya agriculture as practiced by small-scale farmers in the hinterlands. First of all, the ceramics as well as the multiple construction episodes of the structure and the terraces show that agricultural intensification in the form of terraces occurred earlier than the Late Classic population expansion. Although this finding is neither surprising nor unprecedented (suggested by the early dates for raised field agriculture), it is the first evidence of early construction for agricultural terraces.

Secondly, this long-term occupation and the deep knowledge of the landscape through the utilization of underground water sources and natural topography show a strong and loyal commitment to the area. The farmers at Chan were not latecomers to this area, but rather had been there for generations, maintaining their agricultural practices for years.

As Smith and Price (1994) demonstrate in their work on agricultural terraces in Aztec period Morelos, agricultural intensification in the form of terraces can occur at the household level, rather than at a larger, state-wide level. This, I believe, is precisely what the farmers at Chan have done. The slow, accretional construction process and the deep knowledge of the landscape indicate a household (or at least community) level of intensification. The distance from any large centers at the time of initial construction of the terraces also suggests that whatever was the stimulus to creating the agricultural terraces, was most likely an inside process rather an influence exterior to the community. This suggestion corresponds to the relatively decentralized nature of the Maya region in general.

## **Future Research at Chan**

Excavations in the 2005 field season will focus on terraces and housemounds situated in different locations around the Chan site and representing different construction types. We will be focusing on a terrace group located approximately 1.5 km distant from the site core in order to sample terraces in the hinterlands of the Chan site. This group is represented by significantly smaller terraces and housemounds. We will also be excavating a group of large cross-channel terraces to gain a representative sample of this type of terrace. And finally, we will be excavating a group of terraces located only 150 m from the site core to provide a sample located at the center of the site.

These different excavations will ideally provide a representative sampling of the types of terrace constructions located at the Chan site, as well as the organization of the different people who constructed, maintained, and farmed in this area.

## **Acknowledgements**

The 2004 field season at Chan was made possible by financial support from the Foundation for the Advancement of Mesoamerican Studies, Inc., (FAMSI). Sandra Noble was especially helpful in guiding me through the application process.

Excavation was carried out under a permit from the Belize Institute of Archaeology acquired by Dr. Cynthia Robin of Northwestern University. I would especially like to thank Don Ishmael Chan of San José Succotz, Belize for allowing us to excavate on his land.

Excavations were carried out by Don Bernabe Camal, José López, Ishmael Chan, and Placido Cunil; all of San José Succotz. Without their years of experience I would not have been able to achieve all the goals of this project.

I would like to thank my advisor Dr. Joel Palka of the University of Illinois at Chicago for all of his help, suggestions, guidance, assistance, and threats. And finally I would like to thank Dr. Cynthia Robin for all of her help she has given me that is just too lengthy to list here.

## List of Figures

[Figure 1.](#) Location of Chan in Belize River Valley.

[Figure 2.](#) Chan site core.

[Figure 3.](#) Location of excavations.

[Figure 4.](#) Location of sites.

[Figure 5.](#) Interior of structure and basin for collecting springwater.

[Figure 6.](#) Lip-to-lip offering.

[Figure 7.](#) Eccentric chert.

[Figure 8.](#) Eccentric chert.

[Figure 9.](#) Spring and sluice gate.

[Figure 10.](#) Limestone general utility bifaces.

[Figure 11.](#) Trench through terrace walls at Site B.

[Figure 12.](#) Remains of early terrace wall.

[Figure 13.](#) Irrigation channel located on terrace bed.

[Figure 14.](#) "*Aguadita*" located on agricultural terraces.

[Figure 15.](#) Ceramics from Early Classic found in structure associated with agricultural terraces.

[Figure 16.](#) Ceramics from Early Classic found in structure associated with agricultural terraces.



## Sources Cited

Adams, R.E.W.

- 1982 "Ancient Maya Canals: Grids and Lattices in the Maya Jungle." In *Archaeology* 35(6):28-35.

Ashmore, Wendy

- 1996 "Settlement Archaeology at Xunantunich, 1996." In *Xunantunich Archaeological Project 1996 Field Season*, ed. R.M. Leventhal. pp. 17-21. Report on file with Belize Institute of Archaeology, Belmopan.

Ashmore, Wendy, S.V. Connell, J.J. Ehret, C.H. Gifford, L.T. Neff, and J. VandenBosch

- 1994 "The Xunantunich Settlement Survey." In *Xunantunich Archaeological Project: 1994 Field Season*, ed. R. Leventhal and W. Ashmore. pp. 248-284. Report on file with Belize Institute of Archaeology, Belmopan.

Boserup, Ester

- 1965 *The Conditions of Agricultural Growth*. Aldine: Chicago, IL.

Chase, Arlen F. and Diane Z. Chase

- 1992 "Mesoamerican Elites: Assumptions, Definitions, and Models." In *Mesoamerican Elites: An Archaeological Assessment*, Arlen F. Chase and Diane Z. Chase, eds. pp. 3-17. University of Oklahoma Press: Norman, OK.

Donkin, R.A.

- 1979 *Agricultural Terracing in the Aboriginal New World*. Viking Fund Publications in Anthropology No. 56. University of Arizona Press.

Dunning, Nicholas P. and Timothy Beach

- 1994 "Soil Erosion, Slope Management, and Ancient Terracing in the Maya Lowlands." In *Latin American Antiquity* 5:51-69.

Earle, Timothy

- 2002 *Bronze Age Economics: The Beginnings of Political Economies*. Westview Press.

Fedick, Scott L.

- 1994 "Ancient Maya Agricultural Terracing in the Upper Belize River Area: Computer-Aided Modeling and the Results of Initial Field Investigations." In *Ancient Mesoamerica* 5:107-127.

- 1996a *The Managed Mosaic: Ancient Maya Agriculture and Resource Use*. Salt Lake City, UT: University of Utah Press.
- 1996b "An Interpretive Kaleidoscope: Alternative Perspectives on Ancient Agricultural Landscapes of the Maya Lowlands." In *The Managed Mosaic: Ancient Maya Agriculture and Resource Use*, Scott Fedick, ed. pp. 107-131. University of Utah Press: Salt Lake City, UT.
- Flannery, Kent V., ed.  
1982 *Maya Subsistence: Studies in Memory of Dennis E. Puleston*. Academic Press: New York, NY.
- Ford, Anabel and Scott Fedick  
1992 "Prehistoric Maya Settlement Patterns in the Upper Belize River Area: Initial Results of the Belize River Archaeological Settlement Survey." In *Journal of Field Archaeology* 19(1):35-49.
- Harrison, Peter D. and B.L. Turner II, eds.  
1978 *Pre-Hispanic Maya Agriculture*. University of New Mexico Press: Albuquerque, NM.
- Haviland, William A.  
1969 "A New Population Estimate for Tikal Guatemala." In *American Antiquity* 34(4):429-433.
- Healy, Paul F., John D.H. Lambert, J.T. Arnason, Richard J. Hebda  
1983 "Caracol, Belize: Evidence of Ancient Maya Agricultural Terraces." In *Journal of Field Archaeology* 10:397-410.
- Iannone, Gyles  
2004 "Problems in the Definition and Interpretation of "Minor Centers" in Maya Archaeology with Reference to the Upper Belize River Valley Area." In *The Ancient Maya of the Belize Valley: Half a Century of Archaeological Research*, James Garber, ed. University of Florida Press.
- Iannone, Gyles and Samuel V. Connell, eds.  
2003 *Perspectives on Ancient Maya Rural Complexity*. Cotsen Institute of Archaeology at UCLA. Monography 49. Los Angeles, CA.
- Masson, Marilyn A. and David A. Friedel (eds.)  
2002 *Ancient Maya Political Economies*. Altamira Press.

Matheny, Ray T.

- 1978 "Northern Maya Lowland Water-Control Systems." In *Pre-Hispanic Maya Agriculture*, Peter D. Harrison and B.L. Turner II, eds. pp. 185-210. University of New Mexico Press: Albuquerque, NM.

Netting, Robert McC.

- 1993 *Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture*. Stanford University Press: Stanford, CA.

Pohl, Mary, ed.

- 1990 *Ancient Maya Wetland Agriculture: Excavations on Albion Island, Northern Belize*. Westview Press: Boulder, CO.

Robin, Cynthia

- 2002 "Outside of Houses: The Practices of Everyday Life at Chan N'óhol Belize." In *Journal of Social Archaeology* 2:245-268.

- 1999 *Towards an Archaeology of Everyday Life: Maya Farmers of Chan N'óhol and Dos Chombitos Cik'in Belize*. Ph.D. Dissertation, Department of Anthropology, University of Pennsylvania, Philadelphia.

- 1996 "Xunantunich Rural Settlement Project–1996." In *Xunantunich Archaeological Project: 1996 Field Season*. Report on file with Belize Institute of Archaeology.

Sanders, William T. and Barbara J. Price

- 1968 *Mesoamerica: The Evolution of a Civilization*. Random House: New York, NY.

Scarborough, Vernon L.

- 1983 "Raised Field Detections at Cerros, Northern Belize." In *BAR International Series. British Archaeological Reports* 189:123-136.

- 2004 *The Flow of Power: Ancient Water Systems and Landscapes*. School of American Research Press: Santa Fe, NM.

Siemens, Alfred H., and Dennis E. Puleston

- 1972 "Ridged Fields and Associated Features in Southern Campeche: New Perspectives on the Lowland Maya." In *American Antiquity* 37(2): 228-239.

Smith, Michael E. and T. Jeffrey Price

- 1994 "Aztec Period Agricultural Terraces in Morelos, Mexico: Evidence for Household-Level Agricultural Intensification." In *Journal of Field Archaeology* 21(2):169-179.

Thompson, J. Eric S.

1954 *The Rise and Fall of Maya Civilization*. The University of Oklahoma Press: Norman, OK.

Turner II, B.L.

1983 *Once Beneath the Forest: Prehistoric Terracing in the Rio Bec Region of the Maya Lowlands*. Dellplain Latin American Studies no. 13. Westview Press.

Turner II, B.L. and Peter D. Harrison, eds.

1983 *Pulltrouser Swamp: Ancient Maya Habitat, Agriculture, and Settlement in Northern Belize*. University of Texas Press: Austin, TX.

West, Robert C., ed.

1964 *Handbook of Middle American Indians, Vol. 1: Natural Environment and Early Cultures*. University of Texas Press: Austin, TX.

Willey, Gordon R., William R. Bullard, Jr., John B. Glass, and James C. Gifford

1965 *Prehistoric Maya Settlements in the Belize Valley*. Papers of the Peabody Museum of Archaeology and Ethnology, No. 54. Harvard University, Cambridge, MA.

Wright, A.C.S., D.H. Romney, R.H. Arbuckle, and V.E. Vial

1959 *Land in British Honduras Land Use Survey Team*. Colonial Research Publication No. 24.

Wyatt, Andrew

2004 "Operation 4." In *The Chan Project: 2004 Season*. Report on file with the Belize Institute of Archaeology.

Wyatt, Andrew and Ethan Kalosky

2003 "Chan Settlement Survey." In *The Chan Project: 2003 Season*. Report on file with the Belize Institute of Archaeology.

Yaeger, Jason and Cynthia Robin

2004 "Heterogeneous Hinterlands: The Social and Political Organization of Commoner Settlements near Xunantunich, Belize." In *Ancient Maya Commoners*, Jon C. Lohse and Fred Valdez, Jr., eds. pp. 147-173. University of Texas Press: Austin, TX.