XUNANTUNICH ARCHAEOLOGICAL PROJECT

1993 Field Season

Table of Contents

Xunantunich Archaeological Project

1993

Introduction

Richard M. Leventhal
University of California, Los Angeles

Introduction

The second major field season of the Xunantunich Archaeological Project was completed from February - July 1993. This field season was larger than 1992 and consisted of major research foci within the central part of the ancient Maya city as well as the initiation of a large-scale settlement pattern study directed by Dr. Wendy Ashmore of the University of Pennsylvania.

As with 1992, the work at Xunantunich has two primary foci: 1. to continue to conduct research about this ancient Maya city; and 2. to develop this site as a tourist center as part of the long-term tourist development program within the country of Belize. Major advances along both fronts were made during the 1993 field season.

Funding for the 1993 field season came from many sources including the Government of Belize, USAID, the Belize Tourist Board, a University of California Faculty Senate grant, the University of California, Los Angeles, and numerous private donors.

1993 Research

The 1993 Xunantunich research is detailed within the following articles of this field report. Within this introductory section, I will attempt to highlight a few of these areas of research.

An important part of the 1993 field season focused upon an expansion of the already existing maps of Xunantunich and surrounding sites and settlement. Part of this mapping continued the concentric mapping system within the core. During the 1991 initial and preliminary summer field season, only the structures within the central core of the site were mapped. In 1992, the map of the central part of the site was completed including the outlying groups of B and C and D. In 1993, the focus was to complete mapping the nearby groups and structures and to tie a good topographic map to these ancient structures. This was successfully completed. A final note at this point should include the identification of three sacbes or ancient roadways within the central part of the ancient downtown section of Xunantunich.

In addition, the mapping of the important secondary center of Actuncan continued. We learned that the site of Actuncan did not consist solely of a single large

plaza group with a single monumental structure. Rather, this southern section was joined by a series of plazas, buildings, and a ballcourt - all extending to the north. Our view, therefore, of Actuncan, becomes more complex and intriguing when attempting to understand its own developmental trajectory as well as its relation with Xunantunich's development.

Finally, the settlement survey, under the direction of Dr. Wendy Ashmore, was initiated in 1993. The first transect to be mapped was started to the south-southeast of the main center and will continue to a secondary center near the Macal River. A secondary center, Chaa Creek, was the focus of a preliminary reconnaissance this year.

With all of these maps in the process of being surveyed and produced, our knowledge of Xunantunich, its size and potential importance, continues to grow rapidly. These maps help inform the placement and interpretation of our excavations throughout the site.

During the 1993 field season, our excavations were focused upon three locations within the site center. First, we continued the excavations of Structure A-1 located within the middle of the site center. These excavations included a major trench within the central core of the structure and a cut through the center of the southern staircase. The date of this building appears to be no earlier than the end of the Late Classic, perhaps about AD 700.

The west side of the Castillo was also a primary focus of our excavations. This west side was chosen for two reasons: 1. we needed to acquire good information about the structural and chronological relationship between construction phases A-6 1st and 2nd; and 2. major areas of erosion and structural instabilities were evident on the surface of this west side of the Castillo.

These excavations revealed a monumental plaster frieze, similar to the famous frieze located on the east side of the Castillo. In addition, the construction sequence and form can preliminarily be defined for the upper part of this western facade.

Finally, excavations also focused upon the outlying elite residential plaza, Group D. The orientation of this group was defined with the discovery of a sacbe which runs

from the edge of Group D to the north. Functional and formal studies of several of the buildings of Group D were also initiated.

In addition to these excavations within the center, work continued at several other locations including Actuncan, the outlying residential group of San Lorenzo and the enigmatic rubble mounds found near the Mopan River.

Consolidation Work at Xunantunich

The important consolidation work at Xunantunich continued in full force during the 1993 field season. This consolidation was undertaken as part of an overall plan of preservation for the site and as part of the tourist development planned for Xunantunich. This consolidation work is being conducted in association with the Getty Conservation Institute of Los Angeles who are providing invaluable consulting help and scientific analysis.

Much of the architectural consolidation work during the 1993 field season focused upon developing a system of materials and workers which could easily be implemented. The development of this system and the supervision of the work was undertaken by Rudy Larios V who was assisted by Ruben Penados. Almost all of the north side of Structure A-1 was completed in 1993. The only remaining portions of this side of the building are the fourth and upper-most terrace and the upper half of the staircase. These sections will be consolidated at the beginning of the 1994 season.

A serious problem that developed in the middle of the 1993 field season was how to preserve the plaster frieze uncovered on the west side of the Castillo. The Getty Conservation Institute brought in several experts from INAH in Mexico headed by Luciano Cedillo, Haydee Orea, and Veronica Fernandez. Their experience with ancient plaster in Mexico and the experience of the east side Xunantunich frieze clearly indicated that it would be impossible to attempt to keep this frieze open to be viewed by the public. Over even a short period of time, deterioration of this new frieze was evident.

At the end of the field season, the frieze was reburied with the same white dirt which had originally encased it and covered with a stone wall to keep out the rain. In addition, a massive thatch roof covered this west side of the Castillo during the off-

season rainy period. At the present time, the plans for the 1994 season include the final excavation of this west side frieze and then a permanent reburial in order to preserve the original ancient sculpture. The creation of a full-scale replica in under discussion.

Finally, excavation on the west side of the Castillo revealed a series of massive vertical cracks running through the substrate of the building. During the 1994 season, we will examine the extent of these cracks and begin remedial measures to guarantee the structural stability of the Castillo for the future of Belize.

Two major tourist related changes were completed in 1993. First and foremost, a Visitor's Center to house the carved monuments was constructed near the site entrance. Three carved monuments from Xunantunich and a single carved, but badly eroded early monument from Actuncan were placed within the Visitor's Center. Second, the area to the south of the Castillo is now being kept clean of low bush and therefore is available for tourists. This should help take some of the pressure off of the central plazas during periods of high tourist density.

The 1993 Xunantunich Report

This report on the 1993 field work at Xunantunich includes papers written by the field crew who were responsible for much of the field research. In addition, the first two papers were presented at the 1993 Palenque Mesa Redonda in Mexico at the end of the 1993 season and summarize the major finds and interpretations.

Acknowledgments

There are numerous people to acknowledge who helped bring the 1993 Xunantunich Archaeological Project to a successful end. First and foremost, we would like to thank the Acting Commissioners of Archaeology John Morris and Allan Moore and the Archaeological Commissioner Harriot Topsey along with the entire staff of the Department of Archaeology. We would also like to thank Dr. Victor Gonzalez, Permanent Secretary of the Ministry of Tourism and the Environment. These members of the Government of Belize and many others offered continual help, support and encouragement.

The Getty Conservation Institute continues to be an integral part of this research. We appreciate the help, support, and assistance of all the members of the GCI. In particular, the consultants Rudy Larios V, Luciano Cedillo, Haydee Orea, and Veronica Fernandez provided invaluable help and advise.

The 1993 XAP Field Crew included Richard M. Leventhal and Wendy Ashmore (Directors), Scott Zeleznik (Field Director), Lisa LeCount (Lab Director), Julia Sanchez, David Morin, Mike Artemieff, Angela Hiltz, Jennifer B. Braswell, James O. McGovern, Jason Yaeger, Samuel Connell, Jon VandenBosch, Ellen Hardy, Jennifer Ehret, Sabrina Chase, Wendy Natt, Angela Keller, Lady Harrington, Virginia Hetrick, Kathryn Maurer, and William Woods.

We would also like to thank Rudy and Margaret Juan and their family for their help and support, Novelos Distributors for their help, Terri Graham and all of the people of San Ignacio and the surrounding area who have helped and supported our work.

Finally, we would like to thank our entire work crew, including Florentin Penados our foreman, all of the people of the nearby village of San Jose de Succotz, and our archaeological colleagues working in the region.

Xunantunich: A Late and Terminal Classic Center in the Belize River Valley

Richard M. Leventhal
University of California, Los Angeles

Scott Zeleznik
Pennsylvania State University

Thomas Jamison
The University at Albany, SUNY

Lisa LeCount
University of California, Los Angeles

James O. McGovern
University of California, Los Angeles,

Julia Sanchez
Univerisyt of California, Los Angeles

Angela Keller
University of Pennsylvania

A paper presented at the *Palenque Mesa Redonda, Anniversario Katun, 1973-1993*, June 1993, Palenque, Mexico

We would like to begin this paper with what can best be termed 'a call to theoretical arms' for all researchers working within or nearby the Belize River Valley. In many respects, we have a unique opportunity due to the amount of research that has and continues to be conducted within the environs of the valley and due to the amount of data presently available which can and should be used to examine and test models of political, social, and economic development within the Maya lowlands.

The research team of Joseph Ball and Jennifer Taschek has initiated a strong and important theoretical discussion which must be continued. It is not important whether one site is 'bigger' than another site or that one site has a longer history or a bigger pyramid unless these comments are placed within a context of a model or theory of how the occupation of the Belize valley developed and changed over time.

It is with this call in mind that we turn to Ball and Taschek's model for the Belize River Valley. We would like to use this model today as a backdrop for our ongoing work at Xunantunich.

Ball and Taschek set forth their model in a 1991 article in *Ancient Mesoamerica* entitled, "Late Classic Lowland Maya Political Organization and Central Place Analysis: New Insights from the Upper Belize Valley." They argue convincingly for a broad regional approach which allows them to utilize a segmentary state model for the lowland Maya and posit the existence of a large primary polity centered upon Naranjo which, they argue, controlled the valley. We see no problem with this large-scale interpretive picture.

A second major part of Ball and Taschek's model is their functional analysis of the sites located in the valley which constituted part of Naranjo's polity. They identify a series of communities in the upper valley and then argue that the site of Buenavista del Cayo was the principle, local, administrative, multifunctional 'urban center.' Ball and Taschek also focus on Xunantunich and Cahal Pech, both of which, they argue, are restricted access, elite residential citadels which functioned, along with Buenavista del Cayo, during the Late Classic. It is this second part of the model with which we at Xunantunich begin to disagree. We disagree along two lines. The first and probably most important is that the Ball and Taschek model is almost entirely synchronic in its chronological viewpoint. Many of the differences and contrasts between the sites must

actually be identified as diachronic shifts. The most obvious statement of this is that we would argue that Buenavista and Xunantunich are not contemporaneous. Ball has argued that Buenavista primarily dates to the early and middle parts of the Late Classic (500/550 - 650/700 A.D.). In contrast, after almost two seasons of excavation, we have found no evidence of occupation at Xunantunich earlier than 650-700 A.D. We have found some Middle Preclassic ceramics in fill but have recovered no evidence of an occupation for this time period. Dates for Xunantunich then extend from this early 650/700 A.D. time period to about 1,000 A.D. after the collapse with the Terminal Classic and the beginnings of the Postclassic.

We believe that this broad diachronic view adds a crucial level of complexity to the ancient world of the Belize Valley. In addition, with the chronological viewpoint in mind, we would argue that Ball and Taschek's functional identifications for sites such as Xunantunich and Cahal Pech are no longer viable. Xunantunich can not be identified as a castle on the hill but rather is the administrative urban center which follows Buenavista as the controlling site for this western part of the valley.

We have outlined our developmental model for the valley in several other recently presented papers (Leventhal 1992; Ashmore and Leventhal 1993) and will therefore only present this model rather briefly. As Jaime Awe has shown (Awe 1992, 1993; Awe and Campbell 1992), there is a long Preclassic developmental history for the valley which seems to culminate in the existence of several primary Late Preclassic centers such as Cahal Pech, Actuncan and Blackman Eddy, for example. In fact, both Actuncan (the focus of research by James McGovern) and Blackman Eddy have carved monuments which may date to the end of the Late Preclassic or beginning of the Early Classic. Pacbitun is another site, just outside the valley, with a strong Late Preclassic component and carved monument (Healy 1990). This Late Preclassic move towards centralization is truncated and, throughout the Early Classic, a series of small to medium-sized centers maintain small communities or small polities in the valley. These sites include Actuncan, Cahal Pech, and others. Buenavista begins to grow large at the beginning of the Late Classic and may be Naranjo's first attempt at controlling the valley or this 'tension zone' between its own large polity and that of Caracol (Chase and Chase 1987). Finally, this centralized power seems to shift from Buenavista to Xunantunich for the end of the Late Classic and the Terminal Classic.

I would like to now turn to our ongoing archaeological work at Xunantunich to present some data to back-up our model of Xunantunich as a Late Classic and Terminal 'Full Service' valley center.

With our ongoing research and excavation program at Xunantunich, I would like to focus upon several areas of our excavations which help us understand the nature and internal organization of this ancient Maya city. The settlement and ongoing survey around Xunantunich is directed by Dr. Wendy Ashmore of the University of Pennsylvania.

Let us begin this analysis of the internal organization of Xunantunich with an examination of our new map and, in particular, an examination of what appears to be a series of entry points which connect the central part of Xunantunich with the valley to the east and south-west. A series of sacbes have been defined starting with a roadway (Sacbe I) which runs north from Group D. This sacbe was defined with detailed excavations near the end of the 1993 field season. It is a 14 meter wide, plastered roadway with small raised parapets on both sides. The sacbe was initially defined at the northern edge of Group D and it is now clear that this entry point into Group D is marked by a stela. Sacbe I continues from Group D to the north but does not lead directly to the Xunantunich main center. At present, we lose evidence of the sacbe in a flat area to the north of Group D which has at least one meter of colluvial silt covering any and all of these ancient features.

A second major sacbe (Sacbe II) and an entry point into Group A, the main section of the city, has also recently been defined both from ground configurations and the existence of a stela (Stela 5) which again marks this entrance point. The eastern end, as with Sacbe I, disappears into the colluvial silt to the east of the center. Do these two sacbes meet in this area? What significance does this area of possible convergence play for the ancient site of Xunantunich? Is it a staging area and part of the main entrance to the site? Is this area the point of connection between the site core and the valley population to the east? These are tantalizing questions which will have to wait until next year for some resolutions. However, although this new map shows the existence of an extensive occupation near the sacbes, the colluvial silt may be hiding additional construction associated with the termination of both Sacbes I and II.

The western end of Sacbe II brings people into Plaza A-1, which appears to always have been the focal point for ritual activity at the site. We will discuss Plaza A-1 in detail below.

This entrance-sacbe-stela assemblage has also opened up the possibility of a third sacbe (Sacbe III) and an additional site entrance to the west, almost directly opposite the A-6/A-4 entrance. This western entrance is associated with Structure A-21 located on the south-west edge of the main group. A plain, badly eroded and broken stela has recently been identified on the southeast side of Structure A-21. We believe that this marks the entrance of another sacbe into the site. Preliminary examination has proven inconclusive and more work will be necessary in 1994. But we are fairly confident of the existence of a primary set of east-west entrance points into Plaza A-1 and the central part of ancient Xunantunich.

We would like to make a couple of quick comments at this point in relation to the entrance points and sacbes we have just described for Xunantunich. It is not unusual to find stelae marking the entrance points of sacbes into a central section of ancient Maya cities. Copan is a good example with Stela H (Fash 1991). What is also interesting is another similarity with Copan. Both Copan and Xunantunich are primarily north-south oriented centers with primary access points along sacbes to the east and the west creating a broad scale quadripartite orientation for both sites. The neighboring and possibly controlling site of Naranjo has a similar north-south quadripartite layout.

To finish this discussion of the internal organization of Xunantunich, we need to add diachronic perspective as we begin to see this site change during and after the collapse - a period of political and social instability (Pendergast 1986; Thompson 1940). We have tentatively marked the initial construction of the city at AD 700. As yet, however, we have not completed enough excavations throughout the central group to know what was constructed at this early time period. We do know that Structure A-1, located between Plazas A-I and A-II had a single construction phase for its large substructure with later phases only evident in the upper construction/platform.

With the construction of Structure A-1 and the identification of the two central sacbe entry points, it becomes clear that Plaza A-I is the most important public space at Xunantunich. In fact, we believe that it will be possible to demonstrate that this public space, and access to the space, changes dramatically as Xunantunich survives the

collapse and continues until about AD 1,000. Within the areas to the north of the Castillo, we can speculate that Plaza A-I and A-II were initially a single, large plaza extending from the Castillo north to Plaza A-III. Structure A-1, built near the end of the Late Classic, begins to focus access and activity within the new Plaza A-1. We even see the emphasis upon this plaza more clearly defined with the construction of a wall connecting the southeast corner of Structure A-1 and the west side retaining wall of Structure A-3. This wall would block movement between Plazas A-I and A-II. This definition of public space is also evident to the south of the Castillo where, during the end of the Late Classic, we see the construction of a series of enclosed or walled-off plaza areas which limit access to the Castillo and the northern plazas. Excavations and the analysis of the remains within this southern area indicate that the focus shifts away from this area during the Terminal Classic as the site contracts inward toward Plaza A-1. We see this construction of Xunantunich as the result of social, political and economic tension during the period of instability brought about by the collapse. This tension and instability continues into the post-collapse periods.

We would like to add one final note about the excavations of Structure A-1. As mentioned, only one main construction phase has been identified. Within the Late Classic building phase, we see a highly structured and organized construction system. Small construction bins or areas hold defined layers of fill or fill of all one color or texture. Pink fill, black fill, gray/brown fill, small cobbles, large cobbles, limestone rubble were not simply mixed together. Each was placed in a separate and clearly appropriate location. Previous discussions of such fill techniques have argued for different families or groups being responsible for the construction and fill of certain bins or areas. However, this highly defined and differentiated layering and color separation forces us to describe the fill as 'symbolic fill' which not only constructs the building but also places this important building into the symbolic framework of the ancient Maya world view.

Finally, we would like to turn briefly to Structure A-6 or the Castillo. There are two things to note at this point in our research. First, the shifting focus and contraction of the site towards Structure A-1 is also evident within the Castillo. Two final phases of construction have been defined. The earlier A-6-2nd faced all four directions with three doorways to the north, south, east and west. With the final construction phase, A-6-1st, the focus shifts to two directions - only north and south with a greater emphasis on the

north. With the final shift away from the southern areas during the Castillo's use, the northern Plaza A-I focus dominates.

A second point to mention about the Castillo is the discovery of a new section of a monumental plaster frieze on the west side of the building (MacKie 1961, 1985). This frieze is associated with the A-6-2nd construction phase and is another portion of the well-known frieze on the east side of the building initially excavated in the 1950s (Satterthwaite 1951). This frieze originally ran around all four sides of A-6-2nd. The east, west, and southern sides of A-6-2nd and the frieze were covered by the ancient Maya with the construction of A-6-1st leaving the north side open at all times to Plaza A-I. The north and south sides have completely eroded away leaving the excavated fragments to the east and west.

As with most monuments in the Maya lowlands, this frieze was a political statement placing the ruling lineage and its ancestors into a context of power and the Maya view of the world. Specifically, we see the east side referring to the morning sky with the moon, the sun and venus all represented. On the west side, we have identified more associations with the underworld, bloodletting, and ancestors.

The preservation of this new section of the frieze has proceeded with great help of the Getty Conservation Institute and INAH from Mexico, specifically with help from Luciano Cedillo, Haydee Orea, and Veronica Fernandez.

To summarize, the picture that emerges from this work and these excavations is of a burgeoning center at Xunantunich which is the nexus of both sacred and secular activity. The center is supported by a sizable population in its immediate periphery which was formally connected to the surrounding settlement in the valley. We also see Xunantunich as a center which begins to contract into itself during the time of the social and political unrest of the collapse and terminal classic.

References Cited

Ashmore, W., and Leventhal, R. M.
1993 Xunantunich reconsidered. Paper presented at the Belize Conference, University of North Florida, Jacksonville FL, March.

Awe, J. 1992. Dawn in the land between the rivers: Formative occupation at Cahal Pech, Belize and its implications for Preclassic development in the Maya lowlands. Ph.D. dissertation, Institute of Archaeology, University of London.

Awe, J. 1993. (ed.) *Belize Valley Archaeological Reconnaissance Project: Progress Report of the 1992 Field Season*. Trent University, Peterborough.

Awe, J., and M. Campbell. 1992. (eds.) *Progress Report of the Fourth Season (1991) of Investigations at Cahal Pech, Belize*. Trent University, Peterborough.

Ball, J. W., and J. T. Taschek
1991 Late Classic lowland Maya political organization and central-place analysis: New insights from the upper Belize valley. *Ancient Mesoamerica* 2: 149-165.

Chase, A., and D. Chase. 1987. *Investigations at the Classic Maya City of Caracol, Belize, 1985-1987*. Monograph 3. Pre-Columbian Art Research Institute, San Francisco.

Culbert, T. P. 1988. The collapse of Classic Maya civilization. In *The Collapse of Ancient States and Civilizations*, ed. N. Yoffee and G. L. Cowgill, pp. 69-101. University of Arizona Press, Tucson.

Demarest, A. A. 1993. Warfare, ecology and the collapse of Maya civilization: New discoveries from the Petexbatun region of Guatemala. Paper presented at the 11th Annual Maya Weekend, The University Museum, University of Pennsylvania, Philadelphia.

Fash, W. L. 1991. *Scribes, Warriors, and Kings: The City of Copan and the Ancient Maya*, Thames and Hudson, London.

Healy, P. F. 1990. Excavations at Pacbitun, Belize: Preliminary report on the 1986 and 1987 investigations. *Journal of Field Archaeology* 17: 247-262.

Leventhal, R. M., ed.

1992 *Xunantunich Archaeological Project: 1992 Field Season.* Belmopan and Los Angeles.

MacKie, E. W.

1961 New light on the end of Classic Maya culture at Benque Viejo, British Honduras. *American Antiquity* 27: 216-224.

1985 *Excavations at Xunantunich and Pomona, Belize, in 1959-1960.* BAR International Series 251. Oxford: British Archaeological Reports.

Pendergast, D. M. 1986. Stability through change: Lamanai, Belize, from the ninth to the seventeenth century. In *Late Lowland Maya Civilization*, ed. J. A. Sabloff and E. W. Andrews V, pp. 223-249. University of New Mexico Press, Albuquerque.

Pendergast, D. M., and E. Graham

1981 Fighting a looting battle: Xunantunich, Belize. *Archaeology* 34 (4): 12-19.

Satterthwaite, L. 1951. Reconnaissance in British Honduras. *Bulletin of the University Museum* 16 (1): 21-37.

Thompson, J. E. S.

1940 Late ceramic horizons at Benque Viejo, British Honduras. *Contributions to American Anthropology and History*, no. 35. Publication 528. Washington D.C.: Carnegie Institution of Washington.

The Immediate Settlement Context of Xunantunich, Belize

Wendy Ashmore
University of Pennsylvania

Jason Yaeger
University of Pennsylvania

Sabrina M. Chase
Rutgers University

Jon VandenBosch
Pittsburgh University

Sam V. Connell
University of California, Los Angeles

A paper presented at the *Palenque Mesa Redonda, Anniversario Katun, 1973-1993*, June 1993, Palenque, Mexico

This presentation is one of two this morning describing recent research at Xunantunich, in west central Belize. Although this Late Classic Maya site is easily accessible, sees more than 16,000 visitors a year, and is frequently cited in the archaeological literature, its research history has consisted, until now, of a series of small-scale investigations conducted intermittently since the beginning of this century (e.g., Gann 1925; MacKie 1961, 1985; Pendergast and Graham 1981; Thompson 1940). The result is that what we know about this place has remained frustratingly little.

The current Xunantunich Archaeological Project, or XAP, was formed in 1991 to develop the first systematic, multi-year program of archaeological investigation and site consolidation in and around the hilltop civic center (Leventhal 1992). In 1991, Acting Archaeological Commissioner John Morris invited Richard Leventhal to direct this new project, and in the presentation after this one, Richard will describe new findings in the civic core. From the outset, he saw the need to balance site-core work with settlement survey and excavations in the immediate Xunantunich hinterland, in order to understand the ancient community as a whole. In 1991, he asked me to develop a settlement program, and in 1992-93 my co-authors, Jason Yaeger, Sabrina Chase, Jon VandenBosch, Angie Keller, and Sam Connell, have collaborated in planning and executing the first phase of this program (see also Ashmore and Leventhal 1993; Leventhal 1992; Leventhal et al. 1992; Yaeger and Ashmore 1993).

In this paper we'll first present a *very brief* background on previous and ongoing research in the area, then tell you our preliminary observations on settlement and what we think they tell us about ancient Xunantunich.

To begin with, the oft-visited civic center is located on the west bank of the Mopán river, also known as the West Branch of the Belize river, approximately a kilometer from the Guatemalan border in west-central Belize. Gordon Willey's settlement research at Barton Ramie and nearby areas of the middle and upper Belize valley was effectively the beginning of a long and still-growing series of investigation in this region. For our XAP research we draw, of course, on all this prior and ongoing research, but especially on the recent work of the Belize River Archaeological Settlement Survey (BRASS; e.g., Ford and Fedick 1992), whose most

recent findings will be discussed by Anabel Ford later this morning, on the Macal-Mopán Triangle Project of Joe Ball and Jennifer Taschek (1991), on settlement survey in the vicinity of Cahal Pech by Jaime Awe and his team (e.g., Awe and Campbell 1992), and on the ethnohistorically-guided work at Negroman-Tipú by Elizabeth Graham, Grant Jones, and their colleagues (e.g., Graham, Jones, and Kautz 1985).

Taken together, these and other projects have documented a sequence of occupation by farming populations, starting about 1000 B.C., in the Middle Preclassic, and continuing into Postclassic and Historic times. By the Late Preclassic, localized centers of political and administrative authority had begun to appear, and while the fortunes of individual centers and discrete occupational zones varied, the ancient demographic and organizational climax was reached in the Late and Terminal Classic, about A.D. 700-900. As Leventhal describes, Xunantunich was a late arrival on the scene, and what we want to know, from the settlement angle, is what kind of social, political, and economic context it arose and flourished *in*.

What we have observed so far suggests the following--I'll state the observations pretty baldly, then give you the evidence to date, then tell you how we plan to investigate further, and what this tells us about the larger picture. For one thing, relatively dispersed local settlement is organized most commonly into spatial clusters, whose discreteness or boundedness seems clearer in relatively smaller clusters, those on the order of 5-10 patio groups. We think these probably correspond to *pet kah* or hamlet-sized clusters of kin-linked residential groups (e.g., Marcus 1983). Other farmstead are scattered in the vicinity, but out initial findings suggest to us that, in general, the fortunes of all these local residents, in hamlets or more isolated, were relatively loosely tethered to the fates of their overlords in places like Xunantunich. That is, we think that political and economic developments in the civic center were often abrupt and cataclysmic, but believe that this was not a tightly integrated urban environment like those of Tikal or Caracol or Copán, and that the life of most of the populace will prove to have been less directly affected by events in Xunantunich center than was the case for populaces of those more centralized polities. We likewise expect to find the strongest settlement boundaries at these *pet kah* or hamlet levels, with little or *no* evidence of boundaries between social or political units at larger scales.

. . .

Research in 1992-1993

Settlement archaeology at Xunantunich includes two kinds of programs, a series of systematic survey and excavation samples, and opportunistic investigation in areas we believe are interpretively important but which lie beyond the bounds of the systematic samples (Yaeger and Ashmore 1993).

The systematic samples consist of a series of transects to document the evolution of *both* local settlement and the natural landscape it occupies.

Four archaeological transects are planned, the first three of which are 400m wide and of variable length. Collectively, they sample how settlement relates locally to differing topography, soils, river drainage, and distance from Xunantunich. The first transect (TA1), begun this year, extends east from Xunantunich, across the Mopán river to the Macal, sampling both hillier upland terrain and the limited bottom lands of both rivers. The second transect (TA2) will run north along the western bank of the Mopán, through the important site of Actuncán (McGovern 1992; Willey et al. 1965) to near Callar Creek, some 5 km distant from Xunantunich. The third transect (TA3) will roughly parallel the Macal, extending from the eastern terminus of the first transect, at Dos Chombitos, passing through the Negroman-Tipú zone, and ending on the outskirts of a settlement complex at Chaa Creek. These combined samples will allow extension and further testing of Scott Fedick's BRASS-based model of settlement patterns linked to soil distributions (Fedick 1988, 1993; Fedick and Ford 1990), as well as the hilltop settlement-cluster models emerging from work in the Cahal Pech area by Jaime Awe and his colleagues. They will also allow direct comparison of settlement dynamics in the two very different *river* systems of the Macal and Mopán, as well as clearer integration of our findings with those of the important Macal-Tipú Project.

The fourth archaeological transect (TA4) is more nearly square in shape, approximately a kilometer on a side, and will survey the area between Xunantunich and the nearby Guatemalan border. This area is interpretively crucial because of presumed ties between Xunantunich and Naranjo, 15 km to the west, ties apparently supported in principle by discovery of a formal entry to Xunantunich from the west. This and related discoveries were documented in mapping by Angie

...

Keller of the University of Pennsylvania, and Richard will describe these in the talk following this one.

Research in 1992 comprised pilot reconnaissance in this general vicinity (Yaeger 1992), and in 1993, Jason Yaeger, of the University of Pennsylvania, and Sam Connell, of UCLA, began survey along the first transect. They have observed a wide range of site forms, from individual mounds, to small patio groups, to larger sites with imposing architectural remains. An emergent pattern is a series of hilltop sites, which seem to occur at roughly 2 km intervals, and which have pyramidal mounds in the 4-5 m range. Clusters of smaller structures can be observed between these arguably focal sites, at least where modern destructive clearing is less pervasive. This clustering is impressionistically consistent with hilltop clustering reported by Awe and his team around Cahal Pech (Awe and Campbell 1992; Iannone 1993). Some degree of economic specialization is suggested by discovery of loci of chert-tool reduction near the east bank of the Mopán river, although the relationship of these loci to larger economic patterns remains to be clarified.

A second general observation is the apparent density of occupation--as yet impressionist and unquantified, but attested both by the abundance of *mound* remains encountered, as well as by the abundance of nearby *hillslope terraces,* presumably for agricultural use. Soil samples have been collected at regular intervals along the transect, and William Woods (SIU-Edwardsville) will analyze these for soil quality assessments and phosphate residues (e.g., Woods 1977; Eidt 1977, 1985; Ball and Kelsay 1992).

We have initial and still quite tentative chronological assessments, based on shovel test finds and observations of surface remains at each architectural site encountered, and remains thus far appear largely restricted to the Late Classic period. This does *not* accord *either* with the time depth revealed in more intensive work done in nearby areas (e.g., Awe and Campbell 1992) *or* with our own initial expectations. We think the reason is either that these initial collections reflect subsurface remains only poorly, or that our initial hypothesis of landholding longevity of local households, lineages, or hamlets is incorrect.

A formal test-pitting program will seek expanded artifact samples from a subset of sites in 1994. The test-pitting program will also incorporate tests of for "hidden

...

housemounds," or platformless settlement traces. With completion of survey and test-pitting along all archaeological transects, a sample of approximately a half dozen clusters will be selected for more extensive clearing excavations over approximately two field seasons, to gain more detailed views of the makeup of daily life in the Xunantunich hinterland. This site sample will be stratified according to location, complexity of organization, and apparent longevity of occupation, in order to examine as broad a cross-section of settlement forms and developmental histories as possible.

In addition to "purely" archaeological survey, we'll look at how the landscape, especially the river bottom lands, has change in the last 2-3 millennia. In 1992, William Woods, Rinita Dalan, and George Holley, all of SIU-Edwardsville, carried out a brief remote sensing study on the east bank of the Mopán river, north of Xunantunich. Succeeding test excavations, together with work in the same general area by Jon VandenBosch (1992 and below), documented shifts in channel location, as well as deeply buried remains of Late Preclassic settlement--not detected by the remote sensing--and roughly datable changes in local hydrology and alluviation. Specifically, as outlined elsewhere by Woods, Holley, and Dalan (1993), abandonment of the Preclassic remains was followed by major local flooding in the Late Preclassic or Early Classic, suggestive of deforestation and probably agricultural expansion farther upstream in those times. Clearly we need to examine geomorphic changes, to understand their impact on settlement in antiquity, as well as to account for their erosive or masking effects on ancient settlement traces in subsequent centuries.

To that end, a second series of 10 transects will extend across the alluvial bottom lands, 5 each in the Macal and Mopán drainages. Those on the Mopán will be spaced at regular intervals along the river, while those along the Macal will be placed within the smaller, more disjunctive pockets of alluvium available there. For comparison purposes, one of the Macal transects will be placed within the area described by Muhs, Kautz, and MacKinnon (1985) as likely having supported rich cacao groves for early colonial Tipú.

The settlement program also taps information available opportunistically, from features encountered before the systematic samples were defined, or falling outside the transect bounds. The most prominent--and continuing--such studies

...

have developed literally out our front door, adjacent to our camp in an area known locally as San Lorenzo.

Excavations of the principal San Lorenzo complex were begun in 1992 and are directed by Sabrina M. Chase of Rutgers University (Chase 1992). This complex consists of nine patio groups of varying size and internal complexity, along with at least eight isolated structural remains, all distributed on a series of terraces upslope from the east bank of the Mopán. The whole constitutes a group-focused patio cluster (Ashmore 1981: 51), posited to have represented a largely kin-linked residential grouping, possibly equivalent to a *pet kah* or hamlet, as mentioned earlier (Marcus 1983: 469). The cluster has marked internal variability in scale of construction, possibly indicative of hierarchical differences in social and economic standing (e.g., Arnold and Ford 1980), and/or tied to household occupation histories of differential length (e.g., Haviland 1982; Tourtellot 1988).

Chase's excavations have centered on one patio group, in which limestone-block architecture has turned out to be relatively well preserved, and from whose quality of construction and artifactual remains we have inferred a relatively high socioeconomic standing. Terminal debris was found in situ on the final surface of this patio, and stratified construction and occupation remains attest to a sequence of occupation reaching back to the beginning of the Late Classic (Chase 1992; LeCount 1992). Possible agricultural terraces were identified on hillslopes north of the residential area, and Bill Woods of SIU will test these in 1994.

The overall aim at San Lorenzo is to place small midden-seeking tests in all groups of the cluster, and to clear several groups extensively in the two upcoming seasons. These tests will also include phosphate sampling, as mentioned above, and tests of vacant terrain for "hidden housemounds" between evident patio groups and other mounds. The goals are to provide a general outline of cluster development, and a more detailed view of the distribution of activities and role relationships in at least the closing phases of occupation. This set of excavations, along with excavations in Group D, an elite-residential group in Xunantunich (Braswell 1992), serves as a prototype and pilot for extensive excavations planned elsewhere in the settlement area in future years (see above).

...

Northeast of this San Lorenzo cluster, Jon VandenBosch of the University of Pittsburgh has undertaken investigation of some rather stubbornly enigmatic cobble features (VandenBosch 1992). These are made of unshaped limestone and chert cobbles, with no evidence of cut stone or plastered surfaces. Most are less than 60 cm high, and orientations are variable and irregular. It was excavation deep below one of these features that yielded the buried Late Preclassic floor cited earlier. All surface features are west of a relict Mopán channel, on a single Late Classic surface.

Originally interpreted as chert-tool reduction stations, these surface features have yielded only very sparse artifactual debris of any kind, from any surface or excavated context. The few associated ceramics suggest the Late Classic date already mentioned. This general paucity of materials makes functional inference difficult, but the working hypothesis is that the site served some specialized nonresidential function, possibly economic and related to transshipment of perishable goods. What seem to be similar features have been identified this year on the opposite, west bank of the Mopán, in greater numbers and some with heights of up to 2 m, more than three times the usual height on the San Lorenzo side. Despite scarcity of clues as to their use, these mounds' puzzling nature and sheer abundance mark them as important, and will keep us trying to solve the puzzle.

Discussion and Future Work

At the close of XAP's second full season, then, a working model of local settlement organization and dynamics emerges. Thus far, it is generally and gratifyingly consistent with expectations, and with comparative data from adjacent areas. The Xunantunich hinterland seems to have been relatively densely populated, although we cannot yet offer actual abundance or density figures. The settlement remains occur generally in discrete clusters, whether near the river (as at San Lorenzo) or on and adjacent to hilltops (as documented in transect survey). Each well-marked cluster may be equivalent to a hamlet or *pet kah*, and such units are provisionally interpreted as largely kin-linked residential and landholding groups, located adjacent to their farmlands. Terracing--presumably agricultural--occurs with some frequency, although its total distribution and slope and soil associations are not yet fully clear. Some isolated structures are known, and the distribution may be more sparsely continuous, or less tightly clustered, in proximity to Xunantunich center. As expected, a pronounced hierarchy in settlement is evident in scale of architecture, formality of arrangement, and size of clusters, and

...

the survey has already documented a substantial range within the posited hierarchy. We cannot speak yet of details of local life, nor of how local circumstances related to events and developments in the Xunantunich core. But as we complete more of the survey and excavation as now envisioned, we hope to report such detailed interpretations, as well as the evidence for them.

ACKNOWLEDGMENTS: The Xunantunich Archaeological Project (Richard M. Leventhal, Director) was developed in 1991 at the invitation of the Department of Archaeology, Government of Belize, then under direction of Acting Archaeological Commissioner John Morris. For their continuing support and encouragement, we would like to thank Mr. Morris, the current Archaeological Commissioner, Allan Moore, and others in the Department of Archaeology, as well as the Honorable Glenn Godfrey, Minister, and Dr. Victor Gonzales, Permanent Secretary of the Ministry of Tourism and the Environment. We also thank these and other individuals and agencies who have provided funds for our research, including USAID, the University of California, Los Angeles, the University of Pennsylvania (Department of Anthropology and Research Foundation), the University of Pittsburgh, National Science Foundation, and Sigma Xi. We happily acknowledge our debt to our many friends and colleagues working on XAP and other projects in the Belize valley and adjacent regions, and would like to note special appreciation for the contributions of Florentino Penados, Rudy and Margaret Juan, Lisa LeCount, William Woods, George Holley, Rinita Dalan, and Mick Watters. Most of all, we thank Richard Leventhal, for encouragement, support, and *nearly* unfailing good humor.

REFERENCES CITED

Arnold, J. E., and A. Ford

1980 A statistical examination of settlement patterns at Tikal, Guatemala. *American Antiquity* 45: 713-726.

Ashmore, W.

1981 Some issues of method and theory in lowland Maya settlement archaeology. In *Lowland Maya Settlement Patterns*, ed. W. Ashmore, pp. 37-69. Albuquerque: University of New Mexico Press.

Ashmore, W., and Leventhal

1993 Xunantunich reconsidered. Paper presented at the Belize Conference, University of North Florida, Jacksonville FL, March.

Awe, J., and M. D. Campbell

1992 (eds.) *Progress Report of the Fourth Season (1991) of Investigations at Cahal Pech, Belize.* Peterborough ON: Department of Anthropology, Trent University.

Ball, J. W., and R. G. Kelsay

1992 Prehistoric intrasettlement land use and residual soil phosphate levels in the upper Belize valley, Central America. In *Gardens of Prehistory: The Archaeology of Settlement Agriculture in Greater Mesoamerica*, ed. T. W. Killion, pp. 234-262. Tuscaloosa: University of Alabama Press.

Ball, J. W., and J. T. Taschek

1991 Late Classic lowland Maya political organization and central-place analysis: New insights from the upper Belize valley. *Ancient Mesoamerica* 2: 149-165.

Braswell, J. B.

1992 The excavations at Group D. In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R. M. Leventhal, pp. 56-73. Belmopan and Los Angeles.

Chase, S. M.

1992 South Group Plaza 1 and Nabitunich Plaza Group. In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R. M. Leventhal, pp. 35-55. Belmopan and Los Angeles.

Eidt, R. C.

1977 Detection and examination of anthrosols by phosphate analysis. *Science* 197: 1327-1333.

1985 Theoretical and practical consideration in the analysis of anthrosols. In *Archaeological Geology*, ed. G. Rapp, Jr., and J. A. Gifford, pp. 155-190. New Haven: Yale University Press.

Fedick, S. L.

1988 Prehistoric Maya settlement and land use patterns in the upper Belize River area, Belize, Central America. Ph.D. dissertation, Arizona State University. Ann Arbor: University Microfilms (8907699).

1993 Ancient Maya agricultural terracing: Predictive modeling and initial field verification. Paper presented at 58th Annual Meeting of the Society for American Archaeology, St. Louis MO, April.

Fedick, S. L., and A. Ford

1990 The prehistoric agricultural landscape of the central Maya lowlands: An examination of local variability in a regional context. *World Archaeology* 22: 18-33.

Ford, A., and S. L. Fedick

1992 Prehistoric Maya settlement patterns in the upper Belize river area: Initial results of the Belize River Archaeological Settlement Survey. *Journal of Field Archaeology* 19: 35-49.

Gann, T. F.

1925 *Mystery Cities*. New York: Charles Scribner's Sons.

Graham, E., G. D. Jones, and R. R. Kautz

1985 Archaeology and ethnohistory on a Spanish Colonial frontier: The Macal-Tipú Project in western Belize. In *The Lowland Maya Postclassic*, ed. A. F. Chase and P. M. Rice, pp. 206-214. Austin: University of Texas Press.

Haviland, W. A.

1982 Where the rich folks lived: Deranging factors in the statistical analysis of Tikal settlement. *American Antiquity* 47: 427-429.

Iannone, G.

...

1993 "Minor centers" and ancient Maya settlement: Current research in the periphery of Cahal Pech, Cayo, Belize. Paper presented at 58th Annual Meeting of the Society for American Archaeology, St. Louis MO, April.

LeCount, L.

1992 Xunantunich ceramics - 1992. In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R. M. Leventhal, pp. 127-144. Belmopan and Los Angeles.

Leventhal, R. M., ed.

1992 *Xunantunich Archaeological Project: 1992 Field Season*. Belmopan and Los Angeles.

Leventhal, R. M., W. Ashmore, L. LeCount, T. Jamison, and V. Hetrick

1992 Xunantunich Archaeological Project, 1992 Research. Paper presented at the 91st annual meeting, American Anthropological Association, San Francisco.

MacKie, E. W.

1961 New light on the end of Classic Maya culture at Benque Viejo, British Honduras. *American Antiquity* 27: 216-224.

1985 *Excavations at Xunantunich and Pomona, Belize, in 1959-1960*. BAR International Series 251. Oxford: British Archaeological Reports.

Marcus, J.

1983 Lowland Maya archaeology at the crossroads. *American Antiquity* 48: 454-488.

McGovern, J. O.

1992 1992 study of Actuncan (Cahal Xux). In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R. M. Leventhal, pp. 74-83. Belmopan and Los Angeles.

Muhs, D. R., R. R. Kautz, and J. J. MacKinnon

1985 Soils and the location of cacao orchards at a Maya site in western Belize. *Journal of Archaeological Science* 12: 121-137.

Pendergast, D. M., and E. Graham

1981 Fighting a looting battle: Xunantunich, Belize. *Archaeology* 34 (4): 12-19.

Thompson, J. E. S.

1940 Late ceramic horizons at Benque Viejo, British Honduras. *Contributions to American Anthropology and History*, no. 35. Publication 528. Washington D.C.: Carnegie Institution of Washington.

Tourtellot, G.

1988 Developmental cycles of households and houses at Seibal. In *Household and Community in the Mesoamerican Past*, ed. R. R. Wilk and W. Ashmore, pp.97-120. Albuquerque: University of New Mexico Press.

VandenBosch, J.

1992 Excavation of rubble mound features in the periphery. In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R. M. Leventhal, pp. 84-109. Belmopan and Los Angeles.

Willey, G. R., W. R. Bullard, Jr., J. B. Glass, and J. C. Gifford

1965 *Prehistoric Settlement in the Belize Valley*. Papers of the Peabody Museum of Archaeology and Ethnology, 54. Cambridge: Harvard University.

Woods, W. I.

1977 The quantitative analysis of soil phosphate. *American Antiquity* 42: 248-252.

Woods, W. I., G. R. Holley, and R. A. Dalan

1993 Dynamic geomorphology and prehistoric settlement within a Rio Mopán study area. Paper presented at the Belize Conference, University of North Florida, Jacksonville FL, March.

Yaeger, J.

1992 Xunantunich settlement survey. In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R. M. Leventhal, pp. 110-126. Belmopan and Los Angeles.

Yaeger, J., and W. Ashmore

1993 Xunantunich at the end of the Classic: Dynamics of settlement in a time of crisis. Paper presented at 58th Annual Meeting of the Society for American Archaeology, St. Louis MO, April.

The 1993 Excavations and Consolidation of Structure A-1

Scott Zeleznik
Pennsylvania State University

Introduction

The Xunantunich Archaeological Project was initiated in 1991 with the broad goals of (1) learning about the history and function of Xunantunich as a Maya political, ceremonial, and demographic center in the changing social and political landscape of the Late Classic and Terminal Classic periods, (2) learning more about the role that these "middle-level" centers played in the general social and political organization of the Classic Period Maya; and (3) consolidating and preserving portions of the archaeological site for the promotion of tourism in Western Belize. Excavations at structure A-1 began in 1992 under the direction of Thomas Jamison with four general goals deriving from the larger project goals. These were to consolidate part of the structure for tourism, to learn about construction techniques, to document construction history, and to determine the function of the structure with respect to other structures around the site core.

Structure A-1 was chosen as the place to begin the systematic archaeological investigation of the Xunantunich site core for several reasons. Foremost among these reasons was its location. Its centrality and the manner in which its disproportionately large size and rectangular shape partition the central plaza indicate its possible late addition and subsequent functional importance to the site core. It is situated in the middle of the central plaza and consists of a 30.75 by 39 meter rectangular, pyramidal substructure, approximately 10.2 meters high, that effectively divides the central plaza into two plazas. Plaza A-1 is focused on the imposing structure A-6 to the south and plaza A-2 is bounded by the presumed royal residential complex to the north. There are two staircases that climb the full height of the substructure and face each of the two plazas on the north and the south sides, heightening the bipartite segregation.

Another reason for the investigation of structure A-1 was its uniqueness. It is the only structure around the central plaza that lacks evidence of a superstructural edifice. The substructure is crowned by a 6.75 by 13.75 meter rectangular platform, at least 1.6 meter high, that in its final construction phase lacks evidence of supporting a permanent superstructural edifice. The unique function of the structure is further demonstrated by the placement of the only three carved monuments recovered at the site along its southern edge.

A final reason for initiating excavations in the site core at structure A-1 was logistical. The size of the structure which is large enough to possibly contain earlier structures in its core, but not too large to be effectively trenched -- as is the case with structure A-6 -- made it a suitable structure to investigate. Also the fact that limited prior work here had revealed possibly more than one phase of construction and an interesting cache of eccentric flints in the top of the platform increased the possibilities of immediately realizing some of the project goals.

Excavation Goals

The north side of structure A-1 was the object of the first of our four general excavation goals. Our primary intent was to consolidate the latest phase of construction of the substructure for tourism. This side of the structure is prominent when a visitor first enters the site, and it was hoped that this introduction to the site would give visitors an understanding of the type of architecture at the site as well as a model with which to view unexcavated and unconsolidated portions of the site that they would subsequently visit. The result of clearing the vegetation and collapse debris from the final phase of construction of the substructure also gave us an indication of the size, shape, form, and orientation of the latest construction phase of the structure. These are all important for determining the function of the building and its temporal and functional relationship to other buildings around the central plaza. A secondary excavation aim on the north side of the structure was to clear the latest plaza floor immediately adjacent to the structure. As a part of this operation we conducted a few test excavations into the plaza floor examining the construction history of this area of the plaza and searching for caches and burials that might be associated with structure A-1.

The south side of the structure was the object of our latter three excavation goals --to learn about the construction techniques, construction history, and function of the structure with respect to other structures around the site core. To accomplish this goal, we placed a four meter wide axial trench into the full height of the substructure. The four meter wide axial trench was also extended into the platform on top of the substructure where we cut approximately two-thirds of the way (from north to south) through the platform and into the substructure. Our specific intent with this trench was to isolate construction phases and possibly earlier, buried structures in order to provide temporal and stylistic relationships between this structure and the other structures around the Xunantunich site core in

addition to providing a temporal framework for the overall site core itself. We were also interested in the method of construction of the substructure in order to examine questions about general construction techniques, labor investment, and the availability of human and material resources in the phases of construction. This knowledge could be used as a guide for future excavations into substructures at the site such as the prospects of trenching and tunneling into structure A-6. Finally, by placing the trench axially, we had hoped to find caches and burials that might give us further indications of the chronology of the structure and possibly the function of the structure, in addition to answering more general questions regarding the social and political history of Xunantunich.

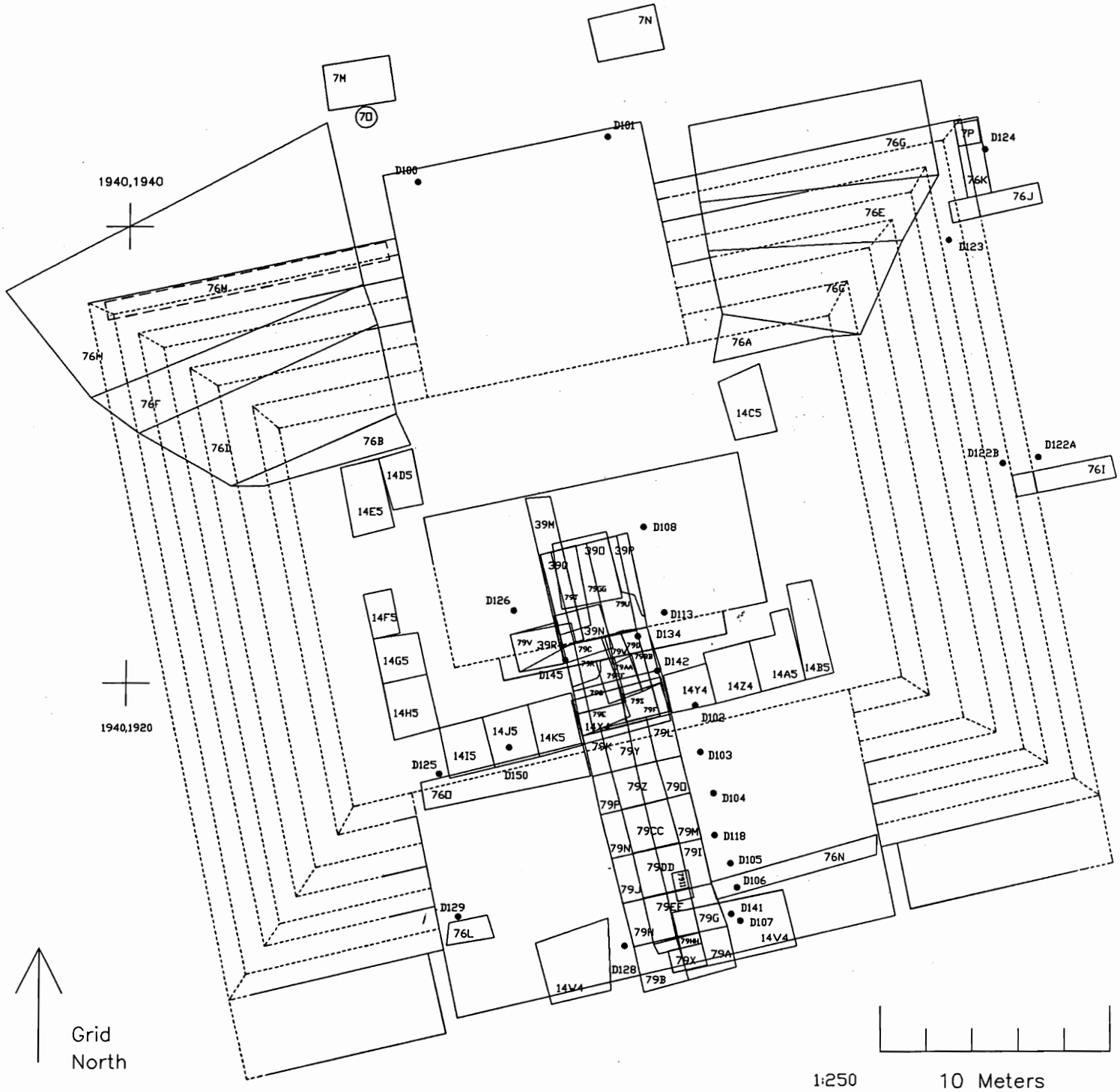
Excavation Strategy

We designed our excavation strategy to meet the specific excavation goals outlined above and to maintain the integrity of distinct spatial and behavioral units. We accomplished this through the excavation of six operations, 202 sub-operations, and more than 600 lots in 1992 and 1993. Operations 7 and 13 were designed to clear and test the plaza floors immediately adjacent to the north side (plaza A-2) and the south side (plaza A-1) of the structure respectively. Operation 14 was opened in 1992 as a clearing operation, exposing the latest phase of construction, along the north and south edges of the substructure and along the edges of the north and south stairsides. This operation was extended to include the clearing of the top edges of the substructure around the platform. Operation 39 was used to investigate the platforms on top of the substructure. Operation 76 was opened in 1993 as a clearing operation for the specific purpose of consolidating the latest construction phase of the north side substructure. We included three sub-operations in this operation that were excavated on the east side of the substructure in order to locate the basal line of the lowest east side terrace retaining wall for the purpose of reconstructing the missing northeast corner of the substructure. Also, there were three sub-operations excavated as a part of this operation on the south side of the substructure. They were placed with the intent of finding the eastern and western extent of the construction stairs. Finally, operation 79 represented our excavations in the four meter wide axial trench into the south side of the substructure (Figure 1).

Plaza A-2

In 1992 the latest phase plaster plaza floor was cleared in a 3 meter wide strip to the north of the north side staircase and in two 2 meter wide strips to the east and

Structure A-1 Sub-Operations and Datum Points 1993



Grid North

1:250

10 Meters

S. Zeleznik 1993

the west of the staircase stairsides. This clearing exposed some anomalies and breaks in the plaster surface that were subsequently investigated on the possibility that they marked the location of caches or burials. The investigation of these breaks did not produce any identifiable cultural features; however, they did expose the remains of a second plastered plaza floor 5 cm. below the upper one. One pit, placed axially against the lowest step of staircase, was excavated to bedrock which was found to be no more than 40 to 50 cm. below the surface of the upper plaza floor.

At the northeastern and northwestern corners of the cleared portion of plaza A-2, the 1992 crew exposed large areas lacking a plaster surface with small stones that appeared to be the fill of a pit dug into the plaza. The northwestern area was partially excavated to the level of a localized, 1.0 by 0.6 meter area of small to medium-sized, mounded, angular limestone rocks approximately 60 cm. below the surface of the upper plaza floor. But, due to a lack of time they were unable to complete the excavations.

In 1993 we continued the excavation of this feature. We extended the area to the north of the original cleared plaza area exposing a 2 by 4.5 meter area in which we found no traces of either the first or the second plastered plaza surfaces with the exception of in the extreme southeastern corner of the unit. As noted in 1992, slightly below the level of the lower plaza floor, the soil changed from a light gray-brown to a medium dark yellow-brown color, and we found that small, angular limestone rubble covered the rectangle which is what we might expect for the upper layer of plaza floor fill. The exception to this was an 1.5 by 2.6 meter roughly oval-shaped area in the south-central portion of the unit that lacked the limestone rubble fill. It was contiguous with the area excavated in 1992, and we proceeded to excavate this area as the northern extension of the feature identified and excavated in 1992.

We excavated both inside and outside of the oval area since once we were below the initial level of the feature it became increasingly difficult to distinguish differences in the plaza and feature fill. The soil varied little in terms of color, texture, and compactness throughout our excavations. There were some distinctions in the size and concentration of the stone fill in the excavations as a whole; but these distinctive areas changed shape and location as we proceeded downward, making their relevance as a cultural feature suspect. In the end, we excavated the whole of a 2 by 2 meter square down to bedrock that was uneven,

approximately 1 to 1.1 meters below the surface of the latest plaza floor, and that sloped slightly to the northwest.

The only exception to this uniformity was a small cylindrical area (0.95 cm. in diameter and 30 to 35 cm. deep) with significantly darker soil below both the feature identified in 1992 and our 1993 feature and directly above bedrock. However, this cylindrical area did not distinguish itself, with respect to the surrounding fill, in terms of its stone fill or artifact assemblage. Apart from the soil color differentiation, we found no evidence that this represented any kind of special pit dug into the plaza fill.

Internally we found no conclusive evidence that the area as a whole had been a pit dug into the plaza floors subsequent to their construction. But when we compare the excavations in this area to other excavations into the plaza fill we see some differences that indicate the uniqueness of this section of plaza fill. The most unique feature of the excavations in this area was the artifact assemblage. The artifact assemblage was dominated by *pachychilus glaphus* (jute) shells, just like what was found to the south in 1992. We removed literally thousands of them. Coupled with them were about 40 drilled shell beads. However, we were unable to distinguish any localized area of distribution of the shells. They came from both inside and outside of the defined feature as well as from both the upper and the lower levels all of the way down to bedrock.

The second unique aspect of our excavations here was that we did not find a level of dark brown dense soil with few stone inclusions that was the dominant soil layer found in the our other excavations into the plaza fill around the structure. This latter difference may be the result of the fact that the other excavations were conducted immediately adjacent to or under the structure; but, taken in conjunction with the unique artifact assemblage and the lack of plastered plaza surfaces, we could have been working in some kind of special deposit that even our 2 by 2 meter cut did not capture the full extent of.

We were able to discern something about plaza A-2's construction method and history in this area. Below the level of the plaza floors there were two principal levels in the fill. The upper level contained small to medium-sized limestone rubble with a coarse trend toward an increasing quantity and size of stone the farther

down we excavated. The ceramics that were recovered were temporally a mixture of Late Classic, Early Classic, and Preclassic. The lower level, the last 20 to 25 cm. above bedrock, was characterized by slightly lighter brown soil than the level above due to the decomposing limestone bedrock, and it was dominated by large limestone boulders with an average size of 40 by 30 by 20 cm. Interestingly, all of the temporally diagnostic ceramic sherds recovered from this lower level were Preclassic and Early Classic.

We took advantage of an opportunity created in the process of locating and restoring the northeast corner of the lower terrace retaining wall of the substructure and explored a 1 by 1 meter square below the corner into the plaza floors. Here we found that the upper plaza floor lipped up onto the terrace wall and did not continue under it while the lower, second plaza floor did continue under the terrace walls beyond the western limits of our excavations. Similar to what we found under the plaza floors to the south of the substructure and similar to what was observed in the 1992 field season to the north of the north staircase, we removed a 25 cm. layer of dark brown soil with relative little limestone rubble inclusions followed by a very hard and dense level of lime mezcla and decomposing limestone bedrock sitting above the bedrock. We removed Late Classic diagnostic ceramic sherds from the dark soil layer, but we failed to recover ceramic sherds from the lower decomposing bedrock layer.

Plaza A-1

To the south of the substructure we cleared the section of plaza floor that was in the confines of our four meter wide axial trench that we were excavating into the south side of the substructure. The plaza A-1 floor continued under the latest phase staircase 70 cm. where it was clearly broken in a line roughly parallel with the line of the staircase. At that point there was approximately 15 to 20 cm. of unplastered space with soil and stone rubble characteristic of subfloor fill. Beyond this space, to the north, was the clear broken edge of another plaster surface at roughly the same level as the first surface to the south. This surface continued the full northward extent of our four meter wide excavation trench.

We excavated a 1 by 1.5 meter pit placed axially and 25 cm. behind (north of) the line of the lowest step of the latest phase staircase in order to capture both of the plaster surfaces and the space between them. In this unit we found no other plaster

surfaces below either of the upper surfaces. Below the plaster surfaces and the subfloor layer we encountered very similar fill to that excavated under the northeast corner of the substructure and that reported on the north side of the substructure in 1992. There was a very dark brown, dense soil with few stone inclusions varying from 20 to 40 cm. in depth depending upon the level below which gave way to a layer of mixed decomposing limestone, lime mezcla, large limestone rubble, and dark brown soil sitting above the bedrock.

The difference here was the nature of the limestone bedrock. Primarily, there was a 75 to 80 cm. wide axial cut in the bedrock running the full north-south length of the unit. The cut was flanked on either side by three superimposed 10 to 20 cm. thick slabs of limestone that were stepped in to the north, continued into the northern wall of the excavation unit, and appeared to be part of the bedrock. Second, the centrally placed cut was sloping markedly down to the north under the structure. In the span of only one meter, we found bedrock 85 cm. below the northern plaza surface of the unit and 105 cm. below the southern plaza surface. Unfortunately, time did not permit us to explore the cut farther to the north.

We did do limited excavations into the plaza floor farther to the north however. We found that the upper plaza floor continued into the substructure to the north. About 30 cm. to the north of the line of the lowest step of the construction stairs, the floor dipped down about 6 cm. and leveled off, continuing under the lowest terrace construction wall which is where we stopped our excavations in 1993. Fifteen cm. to the south of the line of the bottom of the construction stairs, and 12 cm. below the surface of the upper plaza floor we found a second plastered surface. This surface continued only 1.3 meters to the north of the line of the bottom of the construction stairs where it was broken in a rough line and gave way to dark brown fill similar to the fill encountered elsewhere below the plaza floors.

All of the levels that we excavated had ceramic assemblages with Late Classic temporally diagnostic sherds with the exception of the level immediately above bedrock that had only Middle Preclassic temporally diagnostic ceramic sherds.

North Side Substructure

The north side of the substructure had been the focus of excavations in the 1950's and 1960's. These excavations were limited to the clearing of the staircase, and they exposed a large squared block staircase consisting of treads and risers approximately 30 cm. wide and 30 cm. high. Seven of these final construction phase steps are preserved in decreasing length from the base upwards. The full width of the staircase was approximately 11.60 meters. Behind and above the final phase staircase, the earlier excavators exposed a much rougher staircase made of small faced blocks running about four-fifths of the way up the substructure. We interpret this staircase as a construction staircase analogous to the construction staircase uncovered on the south side of the structure. Excavations along and into the stairsides for consolidation showed that this earlier staircase did not extend the full width of the latest phase staircase and did not have formal stairsides.

The clearing of the north side of the substructure began in 1992 with the excavation of two 2 meter wide trenches excavated up the east and west side of the staircase. The excavators uncovered two lower terrace retaining walls that were relatively well preserved, the scant remains of a third terrace retaining wall above that, and the questionable remains of an upper fourth terrace retaining wall. Our complete clearing and consolidation work in 1993 provided little further evidence due to the poor preservation of this latest construction phase. Indeed, we were struck by the lack of *in situ* building stone and patterned collapse material coming from the latest construction phase on the whole of structure A-1.

The best preserved architectural feature on the north side of the substructure was the lowest terrace retaining wall. To the west of the staircase we found at least one course of stone preserved 13.75 meters all of the way to the northwest corner of the substructure; and to the east of the staircase we had at least one course of stone preserved some 12.5 meters or 1.25 meters short of the northeast corner of the substructure. Extending not more than 50 cm. from the staircase on either side, we were able to reconstruct the full height of the terrace retaining wall. It rose 1.2 meters to meet an upper apron molding outset by 8 cm. The apron continued up another 1.45 meters to the level of a 1 meter wide first terrace level.

The stones of the terrace retaining walls were generally large rectangular blocks averaging 40 cm. on a side, but they were only 20 cm. deep. Consequently, because the height and width was greater than the depth of the stone, they were not

tenoned into the structure core behind them. This veneer effect and the softness of the limestone probably combined to create the poor state of preservation of these terrace retaining walls.

Also of note on the lowest terrace retaining wall was a "T"-shaped niche situated approximately 8.3 meters west of the stairside above the first course of wall stones (30 cm. above the plaza floor). Only the east side of the niche was preserved, but we assume that it was symmetrical. The base of the niche was 51 cm. wide, 28 cm. deep, and 27 cm. high. The upper portion of the "T" was 87 cm. wide, 28 cm. deep, and 23 cm. high. We had only one course of stone preserved in the analogous position to the east of the staircase, and therefore we were not able to determine whether or not the element was symmetrical.

Above the first terrace level, we were able to consolidate small portions of the second terrace retaining wall, second terrace level, and third terrace retaining wall. From these remains we were able to determine that the second terrace retaining wall was constructed exactly the same as the lowest terrace retaining wall. It rose 1.2 meters before reaching an 8 cm. outset apron molding which then continued up another 1.45 meters. The second terrace level was one meter wide as well. The third terrace was more problematic since we were able to consolidate no more than a few blocks of the retaining wall. This was the extent of the height of the stairside that was preserved as well. As a consequence it was difficult to reconstruct the height and width of the upper terraces and to determine whether or not they too had apron moldings.

In the process of consolidating the lowest terrace to the west of the north staircase stairside we encountered an east-west running retaining wall 80 centimeters behind, to the south, of the latter wall. We first encountered this wall immediately behind the northwest corner of the substructure. We followed the wall 2.45 meters to the east in order to determine the extent of it. At that point, instead of following the wall further to the east, we decided to conduct a test excavations into the structure core which demonstrated that the wall was at least 9.5 meters in length. This second retaining wall had a number of interesting features. First of all, it was only 80 cm. behind the latest phase wall, and it continued down to the level of the plaza floor. Second, its western terminus literally abutted the back (east side) of the west facing lower terrace wall. It was no more than the width of a

stone behind the west terrace wall. Third, the second retaining wall was best preserved in its western area instead of in the east, closer to the stairside as we might have expected. Our two eastern most test areas turned up no evidence of the second wall. Fourth, from our excavations in the western 2.45 meter test area, the retaining wall appeared to be perfectly vertical and not battered. Furthermore, the western portion still had a considerable amount of plaster on its vertical surface. Fifth, the size and shape of the stones used in the construction of this second retaining wall were different than that of the stones used in the first one. It consisted of primarily small well-faced blocks that were generally twice as wide as they were high, and had much more depth to them relative to the dimensions of their face, giving them a more tenoned effect into the core than that of the later retaining wall blocks. Sixth, we did not find a similar wall to the east of the staircase as we might have expected.

South Side Substructure

Preservation of the latest phase of construction on the south side of the substructure was comparable, if not worse, than that on the north side. Clearing excavations in 1992 along the base of the substructure revealed the full length of the lowest step of the 19.65 meter wide staircase in addition to portions of four more steps above the basal one. They also revealed the lower line of the lowest terrace retaining wall which was preserved to at least one course high all of the way to the southeast and southwest corners of the substructure. In addition, there were two one course high terraces added to the staircase insets at the foot of the lower terrace retaining walls, and a one course high retaining wall linking the southeast corner of structure A-1 with structure A-3. Two 2 meter wide trenches were excavated along the east and west sides of the south side, latest phase staircase in 1992. These excavations exposed the poorly preserved remains of three terrace levels above the plaza floor. The terraces were best preserved to the west of the staircase where Jamison reports the height of the lower terrace retaining wall as 2.65 meters. This was exactly the same height that we measured for the reconstructed north side terrace walls, and we have reason to assume that these terraces had the same form as the ones consolidated on the north side given their similar positions and dimensions. However, not enough of them remained -- especially the upper ones -- to make a certain determination.

There were three major differences in the latest phase of construction between the north side and the south side. First of all, the south side terraces and

staircase appeared to be oriented in a slightly more northeasterly direction than that of the north side terraces and staircase and the final phase platform on top of the substructure. Second, the staircase on the south side was almost twice as wide as the one on the north side. We had little remaining of the latest phase staircase, but the construction of the steps themselves seemed to have been similar to that of the north side staircase with large squared blocks constituting treads and risers approximately 30 cm. wide and high. However, Jamison (1992) did note differences in the stairside constructions with the south side stairsides being composed of a mixture of large and small-sized veneer facing blocks instead of the exclusively large veneer blocks of the north side stairside. Finally, there were the curious small terrace additions that were set into the stairside insets along the major length of the south side substructure.

Our primary concern on the south side of the substructure in 1993 was the excavation of a 19.72 by 4 meter axial trench into the substructure and the platforms on top of the substructure. For logistical purposes we subdivided the trench into two sections. The upper, northern 8 by 4 meter section fell on top of the substructure, and we excavated it vertically into the fill of the substructure. In the 1993 field season we were able to reach a depth of 5.3 meters below the top of the remnants of the latest phase platform and 3.5 meters below floor #7 which was the lowest plaster surface we found covering the top of the substructure. The lower, southern 11.72 by 4 meter section of the trench fell along the inclined remains of the staircase, and we excavated the staircase fill both vertically and horizontally until we reached a set of battered terraced construction retaining walls. This resulted in an obtuse triangular cut with a width of 5.25 meters at the level of the plaza and the full height of the substructure.

Substructure Core

In the first 45 cm. of excavations below floor #7 into the substructure we encountered a rough, 5 cm. thick mezcla surface with an "L"-shaped line of small, faced, but not squared, stones running to the north and then turning to the east. The line of stones was never more than one course high, and there were no opposing lines that would suggest the base of a free-standing wall. Below this thin mezcla cap we entered the core of the substructure. The core of the substructure was characterized by a series of horizontally small, but vertically large rectangular construction bins defined by rough construction retaining walls running parallel to

the axes of the structure. The construction walls did not form a uniform grid pattern, however, with bins being extremely varied in width and length. The pattern appeared very haphazard in conception. We followed these construction bins 2.1 meters down into the substructure where we encountered a distinct but thin and rough mezcla surface running over most of the 8 by 4 meter trench. Below the surface there was a new set of construction walls and bins. A majority of the walls and bins were in different locations than the ones above although they were still oriented in the same directions, parallel to the axes.

The construction walls were built of every conceivable variety of stone rubble. The stone was generally medium to large in size, not cut, and often not even faced, but it was clearly stacked in such a way as to create a retaining wall that in the least defined a fill area if not actually providing sufficient support to retain the fill. It was not always easy to distinguish the face from the back of the wall, but that was generally irrelevant since many of the construction bins were defined by the face of one wall and the back of another. In the upper level, we exposed some fifteen different construction walls defining thirteen unique construction bins. The integrity of these construction bins generally became less well defined the farther away from the core that they were located.

The core construction bin appeared to be an approximately 2 by 2 meter square extending into the north central portion of our 8 by 4 meter trench. We encountered a core of large, loosely placed, soft and decomposing, dry-laid, yellow and pink limestone rubble with very little dirt included in the fill. What little dirt we did find was a product of the decomposing limestone or had filtered down from upper levels.

To either side of the core, in the northeast and northwest corner of the 8 by 4 meter trench, we encountered small 1 by 1 meter construction bins. The northeast bin contained a large amount of small, angular, black and grey limestone rubble reminiscent of chunks of slag removed from lime kilns. On the contrary, the northwest bin contained an extraordinary amount of medium to large-sized soft, decomposing, pink limestone; pink lime mezcla; and pink lime silt. South of the core bin was a 2 by 2 meter bin containing loose, dry-laid small to medium-sized limestone rubble in a matrix of medium dark yellow-brown silty loam. This proved to be the predominant type of fill in the construction bins. However, we

encountered several areas that had smaller stone and a darker, more clayey loam matrix; larger or smaller stone in the fill; and one area that contained no stone in the fill at all.

Despite the numerous differences in the types of fill there was very little difference in the artifact assemblages. The uppermost levels excavated in the substructure, the lowest levels, and all of the levels in between had a mixture of Preclassic, Late Classic I, and Late Classic II temporally diagnostic ceramic sherds. There were very few bone, shell, or lithic artifacts, and certainly no abnormal concentrations. We did find widely scattered human remains such as teeth, phalanges, and occasional fragments of long bones, but nothing that could be construed as a burial.

Staircase

We began our excavations into the latest phase staircase by removing what little remained of the stair steps, as described above. Twenty-five to forty cm. to the north of the latest phase staircase we encountered a second set of steps. These steps consisted of only three risers and treads extending up from the plaza floor. The risers had very rough faces with no faced stones and no visible coursing, and they varied substantially in height from 30 to 40 cm. The treads had polished plaster surfaces varying from 10 to 15 cm. in width that lipped up in places along their back (north) edge, but they did not meet the face of the successive risers.

We removed the silty tan fill of the second phase staircase and uncovered a layer of pink lime mezcla which was thickest at the bottom of the stairs and dissipated as we reached the midsection of our inclined trench. This mezcla layer covered a third staircase that ran the full height of the substructure and appeared to be oriented at a slightly different angle, more northwest to southeast, than the first phase stairs. Although the staircase is one architectural entity, its state of preservation highlighted three divisions. The lower section began at the level of the plaza floor and continued up sixteen steps. This portion of the staircase was very steep with treads averaging 15 cm. in width and risers averaging 20 cm. in height. The middle section was a roughly 2 meters vertically by 1.7 meters horizontally (north-south) jumbled mess of stair stones and fill that had suffered considerable collapse and deterioration. But, above the middle section, the steps continued in remarkably good condition another 15 steps to the top of the substructure. The

upper portion was not as steep as the lower section with treads and risers approximately 20 to 25 cm. wide and 20 cm. high respectively.

We believe this third staircase was built as a construction staircase. There are three reasons for this belief. First, although these stairs were well preserved compared with the majority of the rest of the architecture associated with the structure, the construction of the staircase was really very poor. It was made of small to medium sized faced stones that varied considerably in size such that the coursing of the stones was uneven and could vary from one to four courses in any given riser. There were several places in the staircase where vertical lines ran through ten or more consecutive risers. Second, the lime mezcla making up the fill of the staircase also surrounded and covered it. There was no sign of finished plaster on any of the treads or risers. Third, we performed test excavations on the western and eastern edges of the staircase, and we found that the staircase extended to within 80 cm. of the western latest phase stairside and to within 120 cm. of the eastern latest phase stairside. The construction staircase did not have a formal stairside, and the edges of the staircase and its fill ran continuously into the fill of the later staircase.

Unlike the staircases above it, the construction staircase was filled in a manner similar to that of the core of the substructure. We found different sections of fill that were horizontally small (70 to 80 cm. wide) and vertically large (more than 6.5 meters) behind the facing of the staircase. These sections were distinguished not by the content of the fill but by the color of the fill so that we had a stripe of yellow-tan lime mezcla in the west, pink lime mezcla in the central portion, and yellow-tan lime mezcla in the east. All of the fill was a wet-laid mostly lime with some dirt mezcla that contained small to medium-sized limestone rubble. The wet-laid lime fill made the fill fine but dense and difficult to excavate. The central stripe was further demarcated by construction walls made of small faced stones rising from the plaza floor to within 80 cm. of the top of the third terrace retaining wall on its east side and to the top of the second terrace retaining wall on its west side. Both walls were set directly against the terraced construction walls to the north discussed directly.

A set of four battered terraced construction retaining walls divided the fill used in the construction of the staircases from the fill of the substructure. To the

south of the terraced construction walls we had the lime mezcla. To the north we had the predominant medium dark yellow-brown silty loam with small to medium-sized limestone rubble. These construction walls were similar in most respects to the construction walls we observed in the core of the substructure with medium to large-sized limestone pieces of all shapes. Most of the stone was faced and not cut, but many were not even that well prepared. The walls were not uniform in either their height or their angle of slope, but the width of the terrace levels was fairly uniform. From bottom to top the heights of the walls were 2.4, 2.1, 2.5, and 2.4 meters, and the width of the terrace levels averaged 1.1 meters.

At the base of the terraced construction retaining walls we uncovered a curious step-like feature that was set against the lowest construction wall, on top of the plaza floor, and in the fill of the construction stairs. There were three treads and three risers approximately 15 to 30 cm. wide and 30 cm. high. They began 60 cm. west of the east wall of the trench and continued into the east wall. The steps were rough but clearly evident by the alignment of stones at the union of the treads and risers and the difference in fill inside and outside of the feature. The fill constituting the step-like feature was the same as the fill found within the terraced construction walls while the surrounding fill was the lime mezcla fill of the construction stairs. The step-like feature did not continue into the construction wall or below the plaza floor.

Platforms

Our excavations into the platforms on top of the substructure provided the most complex architectural construction sequences that we uncovered in our explorations around structure A-1. The majority of this was exposed in our four meter wide axial trench that we excavated in 1993 into the south side of the structure. This trench cut more than 4 meters or approximately two-thirds of the way into the platforms from the south side. In 1992 they excavated a 2 meter wide axial trench and a 1 meter wide transaxial trench into the latest phase platform as well.

The substructure was capped by a polished plastered surface designated in the field as floor #7. We picked up this surface 1.2 meters to the south of the line of the retaining wall of the latest phase platform, and it extended out of the east and west sides of the trench and 5.5 meters to the north out of the north side of the trench.

We assume that it covered the entirety of the platform, and that the southern portion of the floor deteriorated since it was not covered by the subsequent platforms and their collapse material and left exposed, closer to the surface.

Sitting directly on top of floor #7 we found another polished plaster surface approximately 7 cm. thick including the ballast layer (floor #6) covering almost the full extent of floor #7. In the eastern edge of the trench, 1.5 meters to the north of the south edge of the latest phase platform retaining wall, we encountered a 45 cm. in diameter circular break in the plaster surface that broke through floor #7 as well and continued down 75 cm., tapering into the fill below. While there were several breaks in floor #7 and floor #6, this is the only one that continued below the floors as a well-defined pit.

Directly above floor #6, in the northern portion of the trench, we exposed two more superimposed plaster surfaces. Floor #8 consisted of a rough broken plaster surface 4-8 cm. thick including the gravel ballast layer. The southern extent of the plaster surface varied from 1 to 2 meters to the north of the line of the south retaining wall of the latest phase platform. Floor #9 was a more substantial polished plaster surface sitting on top of floor #8. We exposed only 0.70 by 1.6 meter triangle of the 8 to 9 cm. thick plaster and gravel ballast floor in the northeastern corner of the 4 meter wide trench. The northwest-southeast running edge of the plaster surface was defined by a rough line of small uncut stones.

Sitting on top of floors #6, #8, and #9 we found a retaining wall, one block wide running north-south perpendicular to the south and north edges of the platform and some 55 cm. to the west of the north-south axis of the latest phase platform. The southern end of the wall was immediately behind (north of) the terrace associated with the A-1 second platform and floor #2 discussed below, and the wall continued beyond the northern limit of our excavations. The wall appeared to be faced to the west although many of the blocks, especially in its southern half were roughly cut. It varied in height from one course of stone in the southern portion to three courses at its northern extreme. This height difference may have been related to the level of the plaster surfaces above it which were lowest in the south and highest in the north. Despite our best attempts, we found no other architectural features associated with it.

The north-south running wall was sitting in the fill of a series of platforms and plaster surfaces constructed above it. The fill consisted of a 5 to 7 cm. cap of soil without stone inclusions covering floors #6, #8, and #9. This was covered by a loose, dry-laid fill with predominantly medium-sized limestone rubble. The fill included several chunks of painted plaster, cut stone with plaster, and a possible vault stone. This may indicate that an architectural feature was removed to construct the platforms above.

Fifty cm. above floor #6 and an average of 1.45 meters to the north of the line of the south retaining wall of the latest phase platform we encountered another plaster surface (floor #2). Its southern end was defined by a line of stones one course high forming a small retaining wall that was in the same line as the retaining wall for the A-1 second platform above it and ended into fill 40 cm. above floor #6. Floor #2 continued to the north 1.6 meters where it abruptly ended in a broken, lipping edge, suggesting that there was a previous wall, step, or bench defining its northern end that was removed as part of the construction of the platform above. We speculate that it was removed because it rose above the level of the subsequent surface that they wanted to construct.

Along the southern edge of floor #2, immediately behind (north of) the retaining wall, we isolated two circular breaks in the plaster. These were at the eastern and western edges of our excavation trench and separated from each other by 3.35 meters. The circular breaks were 30 and 35 cm. in diameter, and they defined the upper edges of tapering pits 52 and 42 cm. deep enclosed by small rocks ending at the surface of floor #6. The eastern pit contained a substantial amount of charcoal, but they were otherwise undistinguished in terms of their artifact assemblages. Floor #2 itself was darkly stained and covered by a thick (5 to 15 cm.) layer of very dark soil containing some small flecks of charcoal. The dark soil layer was thinnest in the west and increased in thickness towards the east.

South of the line of stones marking the southern edge of floor #2 we exposed a small terrace extending 1.4 meters further to the south. Its plaster surface (floor #3) was 35 cm. above floor #6, and the southern end of the terrace was defined by a one to two course high retaining wall sitting on top of floor #6 and running parallel to the retaining walls of the platforms. Its surface (floor #3) lipped up onto the retaining wall of floor #2 and the A-1 second platform. As was the case with floors

#2 and #1 the plaster surface of the terrace was darkly stained and a substantial layer (in some areas more than 15 cm. thick) of dark soil was mounded against the retaining wall of the A-1 second platform. This layer was darkest to the point of being black and thickest in the eastern side of the unit. In places the mounded layer extended slightly above the level of floor #2, although it did not seem to be a continuation of the dark deposit on top of floor #2.

South of the small terrace there was a 10 cm. thick plastered surface (floor #4) that runs under the latest phase platform steps and retaining wall and lips up on to the small terrace retaining wall. Floor #4 sits directly on top of floors #6 and #7, and it extends no farther to the south than the two lower floors.

The line of stones defining the southern edge of floor #2 extended upward to form a three course high retaining wall for the A-1 second platform. The fill of the platform, above the layer of dark soil sitting on top of floor #2, consisted of an extremely loose, dry-laid, small to medium-sized limestone rubble with very little soil matrix. The fill to the north of the north line of floor #2 appeared to be continuous all of the way down to the surface of floors #6, #8, and #9.

The polished plaster surface of the platform (floor #1) extended the full distance to the north and west retaining walls of the later A-1 first platform. The eastern extent of the surface was not examined. As we saw with floors #2 and #3 below, there was a roughly 2 by 4 meter area of discolored plaster covered by a mounded layer of very dark soil in the north central part of the platform. Amongst this dark soil we recovered the burnt fragments of several partial Terminal Classic period incensarios sitting directly on the surface of floor #1.

Initial clearing of the top of the substructure in 1992 exposed one to two courses of portions of the west and south retaining walls and the entirety of the east and north retaining walls. Therefore, we can be reasonably confident of the estimated 93 square meter surface area of the platform, and the orientation of the platform which, interestingly, is in alignment with the north side of the substructure instead of the south side of the substructure. The south side of the platform is where we found evidence of three and possibly four poorly preserved stairs leading up to the platform. However, the original height of the latest phase platform is more difficult to discern since we have no more than two courses of the

retaining walls preserved and no evidence of the plaster surface that must have crowned the platform. It had to have been at least 1.6 meters high which is the difference between the height of the collapsed mound that remains and the surface of the uppermost plastered surface on the substructure, floor #4.

The fill of the A-1 first platform was dry-laid with predominantly small to medium-sized limestone rubble set in little soil matrix, and it was some of the loosest fill that we removed anywhere around structure A-1. Excavations in the fill of this latest phase platform, including the layer of dark soil on top of the A-1 second platform, yielded the only Terminal Classic period ceramic sherds that we recovered in our explorations into the platforms on top of the substructure; and these were the only temporally diagnostic sherds to come from the final phase platform excavations in 1993.

Conclusions: Plazas

From our limited test excavations into the fill of plaza A-1 and plaza A-2, the initial modification of the Xunantunich hilltop could have begun as early as the Early Classic period, or even the Preclassic period. A layer of large limestone slabs and boulders, undoubtedly broken from the surrounding bedrock itself, was removed and replaced to level the surface. All of the temporally diagnostic ceramic sherds we removed from the lowest levels of our excavations in the plaza fill were Middle Preclassic with the level above lowest levels in plaza A-2 containing Early Classic material. Despite the prospect that the leveling of the top of the Xunantunich hill began in the Preclassic period, the great majority, if not all, of plaza construction was a Late Classic phenomenon. The lower level was covered by a densely packed, dark brown soil -- especially next to the A-1 structure --that was in turn covered by a medium dark brown soil with small to medium-sized rubble fill serving as the subfloor base.

To the north of the structure in plaza A-2 we had two superimposed plastered surfaces with the upper surface lipping onto the structure and the lower surface running under the base of the structure. The lower surface may match up with the upper plaza surface on the south side of the structure which also runs under the structure. If this is true then plaza A-2 would have been replastered sometime after plaza A-1; the small retaining wall running between the southeast corner of

structure A-1 and structure A-3 may represent the termination of this upper plaza A-2 surface.

Conclusions: Substructure

Our excavations into the structure A-1 substructure provided some indication of Late Classic construction techniques since we found very little evidence for multiple phases of construction and no evidence that any portion of the substructure was constructed prior to the later part of the Late Classic period.

Our most limited evidence concerns the central core of the structure which we failed to reach in the 1993 field season. In the north central portion of our trench into the top of the substructure, we had some indication that the substructure was built around a central core of large, loosely placed, dry-laid limestone rubble with very little soil included in the fill. Around this core the substructure was most likely filled in a series of at least two and probably four 2.1 meter levels with sets of small rectangular construction bins within each level. The size of the construction bins varied considerably, and they generally became less well defined the farther away from the core that they were located.

The small and varied size of the construction bins and the extremely varied fill patterns within the construction bins suggests to me that they were each filled by different task groups. These task groups would have been small in number given the small horizontal space that they were responsible for filling. Moreover, each of them probably would have been independently responsible for excavating and carrying the fill for the bins from different areas of the site given the diverse content of the fill.

Enclosing the construction bins was a set of four battered terraced construction retaining walls that marked the division between the fill of the substructure and the fill used in the construction of the staircase. Our 4 meter wide axial excavations, however, did not permit us to determine whether or not these terraced construction walls extended the full width of the substructure or just the width of the staircase. The base of the construction walls lay some 1.6 meters inside of the final phase terrace retaining walls to either side of the staircase, and their heights, widths, and angles of acclivity did not align themselves with the final terraces as well.

The remains of the retaining wall that we exposed behind the lowest, northwest retaining wall of the substructure were the most intriguing evidence we had for an earlier phase of construction in the core of the substructure. The vertical wall was substantial, fairly well constructed, and had the remains of plaster on its vertical surface; it continued down to the level of the plaza floor, nearly two meters, all suggesting it was more than just a construction retaining wall. What was curious about it, and what will remain an enigma since we completed the consolidation work in front of it, was the fact that it continued from the northwest corner of the substructure to within only 3 meters of the west side stairside where we lost it. Furthermore, there was no clear evidence that it turned a corner in its western extreme. We also never found an analogous feature to the east of the north side staircase.

With such limited information several possibilities present themselves to explain this wall. The first is simply a question of collapse. As we observed in the exposition of the wall, it slumped out farther to the north the more to the east that we followed it. The increasing weight of the structure fill towards its center could have pushed it farther and farther out until it no longer existed at the height in which we were following it. Therefore, the wall would be an earlier representation of the same structure. Second, the remainder of the wall could have been removed to construct the north side staircase. Third, this wall could represent the remains of a much smaller structure that originally only occupied the western portion of the later structure A-1 substructure. For example, there could have been a building similar to and opposite from the "stela house" (A-16) to the east of structure A-1, although a 9.5 meter structure wall would intimate a much more substantial building.

Conclusions: Staircases

Set against the terraced construction retaining walls on the south side of the structure was a set of three staircases. I have suggested above that the innermost staircase was a construction staircase, thus making it part of a second construction phase of the staircases. The fill used to create these construction stairs was different from that of the core of the substructure, but we still found the small horizontal differentiation of the fill suggesting that the same division of labor into small task groups obtaining, and in this case mixing, the fill was preserved. The change from

dry-laid fill to wet-laid mostly lime fill underscored the necessity for a more compact fill in the stability of the staircase.

Placed against the construction staircase was another layer of mezcla that served as support for the scant remains of a second staircase under the final phase staircase. This second staircase is curious because we had so little of it remaining. We might have expected to find this staircase in a better state of preservation than the final phase staircase, but we had no more than three treads and risers, and the face of the risers was uneven and without faced stone. One possibility is that it never existed above its current height. Another possibility is that the second staircase was intentionally destroyed in order to construct the final staircase.

Two aspects of the intentional destruction of the second phase staircase could have led to its observed state. First of all, I believe the facing blocks of what remained of the second phase staircase were scavenged, probably to construct the final phase staircase. This belief rests on the facts that the plaster treads of the second staircase were only 10 to 15 cm. wide, and they ended in a lipping edge in the back (north) and a broken edge in the front (south). This was less than half the width of the later phase treads. Furthermore, the risers were very rough and lacked faced stone. They were 30 to 40 cm. high which approximated the height of the later phase risers, but this was twice the size of their associated treads.

Second, I assume that the substructure already existed at its present height and summit surface area since the construction stairs ascended the full height of the substructure. This means that the addition of a new, final phase staircase set slightly out to the south from the earlier staircase at its base would have to ascend the substructure at more acute angle than its predecessor in order to reach the summit at the same spot. This would allow the lower portion of the earlier staircase to remain intact, while most of the upper portion would have to be removed.

Conclusions: Platforms

The construction of the platforms was more complicated in sequence, but simpler in technique than that of the substructure. As opposed to the single construction phase, or possibly two construction phases of the substructure, modification of the platforms on top of the substructure went through at least four

distinct construction phases. All of this construction necessarily postdated the major construction of the substructure.

Phase 4

Initially a plaster surface was laid down across the entire top of the substructure (floor #7). This would have occurred no earlier than the latter half of the Late Classic period since we have Late Classic II temporally diagnostic sherds from the fill of the substructure below. This surface was then directly superseded by another plaster surface (floor #6) that appeared to have covered the entire top of the substructure as well. Evidence on structure A-1 and other structures around the site core suggest that plaster surfaces were used to distinguish construction phases -- a new plaster surface being laid down prior to initiating a new addition or construction phase. This begs the question as to what construction floor #7 is associated with. There remains the possibility that there was a perishable structure on top of the substructure that underwent a couple of modifications before the construction of the platforms. We did find one possible posthole in the eastern portion of the trench, but no other supporting evidence.

Sitting on top of floor #6 we found two more plaster surfaces (floors #8 and #9). The lower one, floor #8, probably represented a replastering event, but floor #9 seemed to be a more substantial construction. However, our limited excavation area did not turn up any architectural features associated with either of the floors. We did find a north-south running wall sitting on top of floors #6, #8, and #9, but the rough face of the wall in its southern half, the manner in which it unevenly rested on all three of the floors, and the lack of areal exposure of it did not help to clarify the question as to whether it was a construction wall defining a fill retaining bin for the platforms above, a finished retaining wall for a small architectural feature in the north that was then later added on to in the southern half to ultimately serve as construction wall, or a finished retaining wall in its entirety. The evidence supports the first more than the latter two possibilities.

Phase 3

The other architectural feature that we exposed sitting on top of floor #6 was the small terrace wall to the south. There is some question as to what other architectural feature this terrace is associated with. The plaster surface of the terrace, floor #3, lips up onto the line of stones that defines the southern edge of floor #2

and forms the bottom course of the southern retaining wall of the A-1 second platform. Since floor #2 is the lower of the two and since the line of stones defining the edge of the floor ends in fill and does not continue down to rest upon any kind of surface, I believe that the terrace and floor #2 were constructed as part of the same construction phase. The fill under floor #2 and into the terrace did appear to be continuous. These constructions must have culminated in whatever architectural feature floor #2 lipped up on to. We also found the two postholes in the southern end of floor #2 that suggests that the floor was covered by a perishable superstructure.

Phase 2

It is at the initiation of the second phase of construction that we unearthed the first evidence of possible terminal burning events. Both floors #3 and #2 were darkly stained and covered with dark soil. This presumably ritual event, closing off and killing the earlier structure, must have occurred immediately prior to laying down the fill for the A-1 second platform above. In order to construct this platform it appears that the architectural feature to the north of floor #2 was removed, and part of it was used in the fill. The line of stones defining the southern edge of floor #2 was extended up two more courses forming a retaining wall for the new platform. The northern, western, and probably eastern edges of the second phase platform were extended to their final locations. The small terrace to the south was retained as part of the new platform. The question remains as to how individuals reached the top of the second platform since the difference in height between the surface of the terrace (floor #3) and the surface of the platform (floor #1) was 54 cm. or twice the height of a normal step.

Phase 1

Marking the beginning of the final phase of construction and the closing of the A-1 second platform was another terminal burning event similar to the one before it. This burning event covered the north central part of the platform. It must have occurred in the Terminal Classic period since we found numerous Terminal Classic incensario fragments associated with the burning residue, and the fill of the final phase platform contained only Terminal Classic temporally diagnostic ceramic sherds. Consequently, sometime in the Terminal Classic period the retaining walls on the northern, western, and eastern edges of the A-1 second platform were

extended upwards, the southern retaining wall was moved farther to the south over the small terrace, and a staircase was added to the south side.

Final Conclusions

We recovered little direct evidence in the form of artifact assemblages, caches, burials, or other cultural features that reflects the function of the structure. Most of our observations regarding the function of the structure were evident prior to excavation. The prominent placement of structure A-1 in the middle of the central plaza, the erection of the carved stelae at the southern edge of the substructure, the presumed ritual burning events initiating new phases of construction, the lack of a permanent superstructure, and the orientation of the platforms to the south towards the more public structure A-6 instead of the more private royal residential plaza to the north all suggest that this structure was used for the enactment of public rituals.

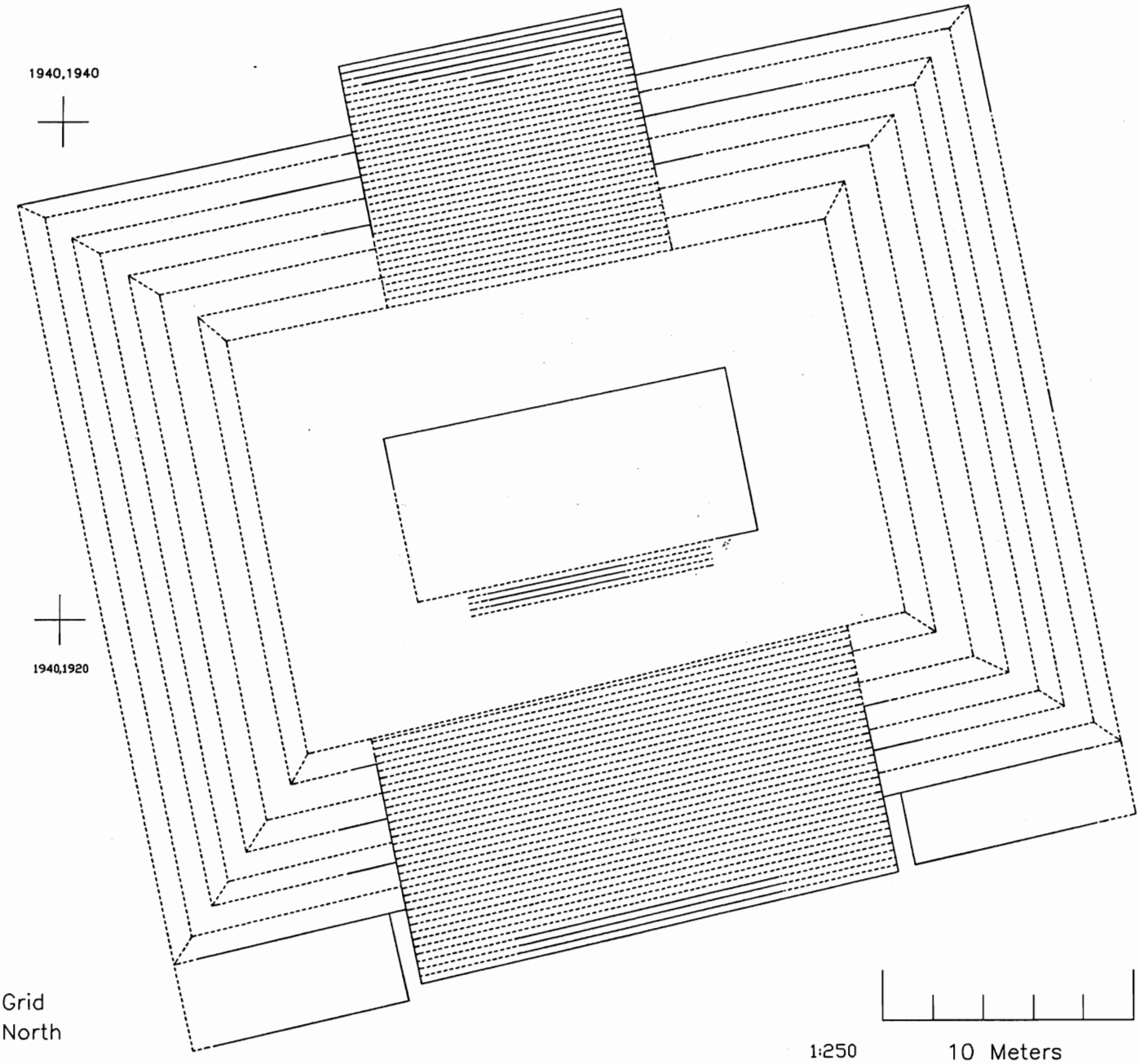
The majority of the conclusions that we can draw from the excavations in and around structure A-1 to this point have to do with the construction techniques and its history of construction. Our 1993 excavations only reached a third of the way into the substructure of structure A-1, but we found no conclusive evidence to suggest that there was a substantial structure at this location prior to the latest phase of construction. This is not to say that the remains of a structure do not exist in the unexcavated core of the substructure. But, given the extent of our excavations to this point, an earlier structure would cover no more than half of the surface area of the later substructure and would be no more than half of its height to the top of the platform. Thus, it could have no more than one-fourth of the volume of the later structure A-1. This massive construction project probably took place as a single event in the latter half of the Late Classic period. Some later modifications did occur such as the possible addition of a new staircase on the south side, the addition of the two stairside insets on the south side, and the addition and modification of the platforms on top of the substructure. While the majority of the construction probably occurred in the Late Classic period, it is clear that the structure continued to be used and modified well into the Terminal Classic period.

Acknowledgments

This report is not complete without acknowledging the people who made the excavations, analyses, and interpretations possible. Foremost among this group of

Xunantunich Structure A-1

Reconstruction of Latest Construction Phase



S. Zeleznik 1993

people are Dr. Richard Leventhal and Dr. Wendy Ashmore, the co-directors of the Xunantunich Archaeological Project. They provided invaluable support and guidance in the field, and all of this would not have been relevant or possible without them. Wendy Natt was responsible for supervising a significant portion of the excavations in and around structure A-1. Her hard work, advice, and criticism contributed greatly to the realization of our excavation goals and my interpretations of the results of these excavations. The most essential members of the project were the workmen of Succotz and Benque Viejo whose labor made the realization of the project goals possible. Special thanks go to Tino Penados, Jim Puc, and Amirto Uck. Finally, my gratitude goes to the other members of the Xunantunich Archaeological Project, especially David Morin, Lisa LeCount, Jim McGovern, Angela Keller, Jason Yaeger, and Jennifer Briggs Braswell for their assistance and advice.

1993 Excavations on *El Castillo*, Xunantunich, Belize

Julia L. J. Sanchez
University of California, Los Angeles

The Xunantunich Archaeological Project began its second season of excavation in February, 1993. One of the goals of this season was to begin excavation of A-6, a pyramidal structure located in the central part of the site center (Figure 1). Because this pyramid is the largest structure at this hilltop site, it represented an imposing and visible symbol, not only to people at the site but also to people for miles around it. The structure is composed of two flat-topped platforms, one on top of the other, that form the sub-structure. A six room limestone block building, designated A-6 1st, is the super-structure on top of these terraces. A-6 1st represents the latest construction phase of the structure. It rests on top of an earlier structure, designated A-6 2nd. Although A-6 2nd has not been fully excavated, it is larger than A-6 1st and may have had fourteen or eighteen rooms (Figure 2). A-6 2nd had a decorative frieze around the upper facade of the building which was covered when A-6 1st was built. This frieze has collapsed on the north and south sides of the building, but the east side was excavated during the 1950s.

The goals for the 1993 excavation season involved work on the west side upper terrace of A-6. Two crews worked from February to June under my direction. Specifically, the goals were to define the construction sequence of this part of the terrace, and to uncover the remaining portion of the A-6 2nd frieze on the west side. Although this was a monumental task, work progressed quite rapidly, and we now have a much better understanding of the construction of A-6, its use, and the image it presented to inhabitants of the site and others. To make interpretations and description clear, these excavations will be discussed in order of the architectural sequence, not the excavation sequence, beginning with discussions of A-6 2nd. This will be followed by discussions of A-6 1st, then areas which can not be assigned to either construction phase. During excavation, floors were numbered and walls were named to make discussions of these features easier. Retaining walls were given color names, while structure walls were given bird names.

A-6-2nd

The west wall of the A-6 2nd superstructure was designated Parrot wall (Figure 3). Parrot wall was constructed of cut limestone blocks an rmed the outer wall of the superstructure of A-6 2nd. According to descriptions c -6 2nd from excavations in the 1950s, each side of the building. On the west wa.., these doorways would have led into either one long vaulted room or three separate vaulted rooms

(see Figure 2). Above the doorways was a decorative frieze over three meters high made of roughly shaped stone and covered with plaster. The upper courses of Parrot wall were collapsed toward the south and much of the exterior of the vault was gone, causing the frieze which had been built onto this vault to completely collapse from the south half of Parrot wall. The frieze and vault were better preserved at the north end of the structure.

At the south end of the structure, some of the interior vault stones of Parrot wall were still present, but the exterior vault stones and the frieze above the Door 3 had fallen. Plastered surfaces representing the base of the door lintel, the top of the door lintel, and the vault spring were found. The plaster was intact on the door jamb and basal moulding, and there were traces of red paint, suggesting that parts of A-6 2nd or the entire super-structure may have been painted red. This would have presented a striking symbolic structure from the hilltop to people below.

When A-6 1st was constructed, most of the rooms of A-6 2nd were filled with stones and mortar, sealing the building and making it more stable for the new structure on top of it. The three rooms on the north side were left open, making the structure appear to be two stories high on the north side. In Door 3 on the west side, as the room was filled, the wooden lintel above the door was removed and large stones were placed across the top of the doorway to add more stability when A-6 1st was constructed on top of A-6 2nd. The same technique was probably used with all of the interior and exterior doorways of A-6 2nd, except those left open on the north side. This filling and covering was done carefully, so that little damage was done to the structure of A-6 2nd even though it was not to be used again.

Due to time constraints, only the upper portion of the remaining frieze was exposed (Figure 4). The preserved portion of the frieze extended from the northwest corner to about the middle of Parrot wall. The frieze was badly eroded towards the top where parts of A-6 1st above the frieze and some of the material covering the frieze had fallen away, but it was better preserved lower down. Grass had grown on top of the frieze in some areas and the roots had caused much damage. Conservators from Mexico, Luciano Cedillo, Haydee Orea, and Veronica Fernandez, assisted in consolidation of the frieze and trained one of the excavation crews in consolidation techniques. This consolidation work consisted of using lime mixtures to fill cracks and holes caused by roots and erosion and cover some areas to protect the frieze and

to prevent further damage.

The elements of the frieze appeared to be similar in form to those on tl side, but the designs themselves were different (for interpretation of these de see Fields, this volume). The frieze consisted of two bands. The lower band i: above the doorways and is about one-and-a-half meters high. Above this, the band is set back about half a meter. The height of this upper band is uncertai: the upper portions are eroded on the east and west sides, but it was probably a two meters high. On the upper band, the main element appears to be a large, three-dimensional seated figure towards the north end. Only the legs of this and the designs around it are well-preserved. The figure appears to have wor loincloth and decorative bands around the ankles. The arms possibly held something, but the size of the arms or the dress of the individual may make i appear this way. Above the figure are sky symbols. To each side of the figure lines of tear-drop shaped elements. This figure is flanked by smaller figures (side. To the south, there is a figure that appears to be contorted as if dancing. body of the small figure faces north (towards the large seated figure) with its r and arm raised. The left arm extends behind it, and the head is turned to face behind. The figure to the north of the seated figure is kneeling. The head of figure has fallen away.

Only the top half of the lower band of the frieze was excavated during 1993 season. Directly below the seated figure there is a large mask. Further s(the earflare of an even larger mask was uncovered. This mask is at the middle of Parrot wall and much of it is eroded. Between these two masks is a smaller head with scrolls coming from the forehead. Other elements on the frieze include a stylized shell design, several mat symbols, cross or "X" designs, and a serpent

There are similarities to the frieze on the east side of A-6, excavated du the 1950s. On the east side frieze upper band, small figures flank what once w two free-standing elements at the north and south ends of the frieze. I believ this design is similar to the west side frieze; that the free-standing elements o east side were originally three-dimensional seated figures like the one excava the west side but are now eroded. The two smaller figures on either side are on the east and west sides. I feel that these similarities indicate that on both t and west side friezes there were two large seated figures, flanked by smaller fi

at the north and south ends. These similarities are also found in the lower band. On the east frieze, there is a mask at each end of the building below where the seated figures would have been. If the east and west sides are symmetrical, it would appear that both sides originally had a mask below each seated figure. The center area of the east side frieze has not been excavated. Since there appears to be a third, larger mask in the center of the west frieze, perhaps there is a third mask on the east side as well. These three masks were probably centered over the three doorways on each side.

Although the individual elements are different, because the form is the same on the east and west sides, the east side frieze provides a guide for the reconstruction of the entire west frieze. This also assists in future excavations of the frieze on the west side and possibly also the previously unexcavated portion of the east side frieze. During the 1994 season, the remainder of the frieze will be excavated and consolidated. To protect the frieze during the rainy season, a wall was erected in front of the frieze and filled behind with limestone sascab. This will form a sturdy shield while not causing any damage to the frieze itself.

A-6-1st

A series of construction phases were associated with the construction of A-6 1st, covering A-6 2nd and the frieze. First, the superstructure of A-6 2nd was filled in. The rooms were filled with rock and lime mortar to the top of the room vaults. This core fill was visible in Door 3 of A-6 2nd and in an exposed vault at the northwest corner of the structure. Filling the rooms of A-6 2nd was necessary to provide stability for the later building, A-6 1st, that was to be built on top. As mentioned before, the north rooms of A-6 2nd were left open, giving the entire north side a two-story appearance.

This core was also added onto the front of Parrot wall, covering the entire structure on the west side and extending the base for A-6 1st. These extensions were built in several phases, forming two construction walls. The finished wall constructed in this phase was named Violet wall (Figure 3 and 5). It was a limestone block retaining wall that extended up from the floor (Floor 1) of the upper terrace and over the frieze. This wall was battered (at an angle) and had an outset moulding. In Figure 3, both the upper and lower edge of the battered wall are marked. Violet wall did not entirely cover the frieze. The top of the wall abuts the

frieze in approximately the center of the lower band, bisecting some of the elements, and the north face of Violet wall extends only to the south end of the north mask. This would have left the entire upper portion of the frieze exposed, as well as the north mask on the lower band. The reason for the odd placement of this wall is unclear. The north doorway on the west side of A-6 2nd, Door 1, may have been left open for a time, while Doors 2 and 3 had been closed off. Further excavation in the 1994 season will provide more information.

During the next construction phase of A-6 1st, Violet wall was extended to the north and up. This extension, named Red wall, is eroded at the top but probably covered the remaining portions of the frieze and Door 1. Although this phase completely closed off the west side of A-6 2nd, the north side was still exposed. The northwest corner of the frieze was exposed, and some of the design wrapped around the corner to the west side. This remaining portion of the frieze on the west side was finally covered in a third construction phase with the addition of Yellow wall. Yellow wall abutted Parrot wall and extended west, covering the north face of Red wall. Yellow wall was plastered, but is constructed of smaller stones and lacks the battering and moulding that Violet and Red walls had. This may mean that Yellow wall had a slightly different function than Violet and Red walls. Also, since Yellow wall is later than Violet and Red walls, it could have been made with inferior materials and techniques; perhaps larger stones were more difficult to find during later construction.

Yellow wall extended further west than Violet and Red walls, forming a "wing" about two meters wide. The south face of this wing was built in four phases. Orange, Purple, Brown and Black walls (from north to south) are roughly 50 cm apart. These walls appear to represent phases in the construction of the wing wall as a whole. The purpose of this wing is unclear, but two theories have been suggested. The first suggests that this was just a decorative wall, added for symmetry. On the east side of A-6, a staircase is located in a similar position, leading up to the rooms of A-6 1st. Since Yellow wall is in a similar position on the west side, it may have been added to provide architectural symmetry. Another suggestion is that this wall represents a second staircase, leading down. Four floors, about 30 centimeters apart, were found leading down from the level of Floor 1. Each floor ends at a row of stone blocks which lead down to the next floor, giving the area a step-like appearance. At this time, there is little evidence to support or refute either of these

theories. Further excavation in this area will be necessary, although the heavy erosion on the corner of the terrace may make any other interpretation difficult.

The complete picture of the west upper terrace at the time of A-6 1st's construction was a series of three large retaining walls. Violet-Red wall was the uppermost wall. Below this were Peach wall and Puce wall, both limestone block, plastered walls. At the top of each of these walls was a small terrace, making this side appear to have three large steps (Figure 5). Although the base of the lowest wall, Puce wall, had not been reached, each of these walls was about three to five meters high. These walls appear to have been constructed in a similar way as Violet-Red wall, with a series of construction walls built over core to add stability. Figure 6 shows a reconstructed view of how Parrot, Violet-Red, Peach and Puce walls may have gone around the entire structure.

Other Features

Architectural Features

At the base of the terrace, a series of walls and floors indicate several construction phases. These phases have not yet been correlated with the phases associated with A-6 1st and 2nd above. A limestone block wall, Olive wall, extends west from Puce wall at the north end of the terrace. This wall extends up to the moulding of Puce wall and was constructed after it, abutting Puce wall. Olive wall faces south, so there was probably another retaining wall north of it which faced north. It is assumed that Olive wall and Puce wall rest on the same surface. Olive wall would have created an area south of it that was partially or completely blocked from the north side.

In a later construction phase, the area south of Olive wall and west of Puce wall was filled and raised to the top of Olive wall. A new plaster floor, Floor 22, covered the top of Olive wall. A south-facing retaining wall, Verde wall, was built to hold the fill below Floor 22. Verde wall extended above Floor 22 as a partially free-standing wall. Verde wall is not faced on the north side however, so either the fill originally extended higher and was later lowered, or there is another face to the wall. Mint wall is just north of Verde wall and faces north. Both walls are of similar construction, large limestone blocks, so it is quite likely that Mint and Verde represent a two-course wide free-standing wall. This phase would have created a

platform that was possibly exposed to the north, and a lower area to the south that was probably closed from the north.

In the next construction phase, the area south of Mint and Verde walls and west of Puce wall was filled and raised to the top of Puce wall. This fill covered Verde wall and created a raised platform about 1.5 meters above the base of Mint wall. A staircase was built, abutting Puce wall, extending up to this new upper platform. The staircase has eight risers and was built of irregular limestone blocks and cobbles, indicating that it is likely from a later phase than Mint wall.

About 2.5 meters west of Peach wall, a low wall of irregular limestone blocks similar to the stairs was built on the raised platform. This wall, Hazel wall, faces east and formed a north-south alley between it and Peach wall. The wall corners about 1.5 meters south of Mint wall and extends west, parallel to Mint wall. Because this wall was built resting on the platform, it was built after Mint wall and after the area south of Mint wall was filled. Since the stones used in its construction were small and irregular, not the large, well-formed blocks found in Mint and Verde walls, it may be that this wall was built with inferior materials and techniques as mentioned with Yellow wall on the upper terrace.

Although the purposes of the lowest terrace walls (Olive, Verde, Mint, and Hazel) is not certain, they seem to represent a series of construction phases which changed the access on the terrace. Areas were exposed or closed to the north, which was towards the site center and possibly considered a public area. These changes may have been associated with changing functions of the entire structure of A-6.

Structural Damage

While excavating across the west side, five cracks about two to five centimeters wide were found. The cracks were numbered north to south as Cracks 1 to 4. Crack 5 was discovered lower in a construction wall behind Peach wall. These cracks were originally seen extending vertically through Floor 1 at the base of Violet-Red wall. They are not visible in the fill, which is loose and resettles, only in the plaster floors or walls. When more of Floor 1 was exposed, Cracks 1, 3, and 4 extended back across the floor. Crack 4 extended into Door 3 of Parrot wall. The cause of these cracks may be combined earthquakes and heavy rains during the 1970s, or settling caused by the weight of concrete reconstruction on A-6 1st. These

cracks make this structure dangerously unstable. A series of nine plaster tests were placed in the cracks to determine if they were still moving. These tests will be checked in November, 1993, and at the beginning of the 1994 season. Also, some of the concrete material above the doorway of Parrot wall to help improve stability. Efforts were made by Rudy Larios and archaeologists on the project to determine the extent of the damage and to consider possible methods of stabilization. This work will continue into the 1994 season.

Summary

The 1993 season defined the major construction features on the west side of A-6. Much of the A-6 2nd frieze was excavated and consolidated. The construction techniques of A-6 1st were defined. Although a great deal was accomplished, there are new questions that may be asked. During future excavations, the remaining areas of the frieze will be excavated and consolidated, shedding new light on the symbolic and ritual purposes of A-6, and on the lives of the people at Xunantunich. The lower terrace walls must be further defined and their role in the use of A-6 examined. Also, excavation into the superstructure of A-6 2nd will reveal information about the earlier use of A-6.

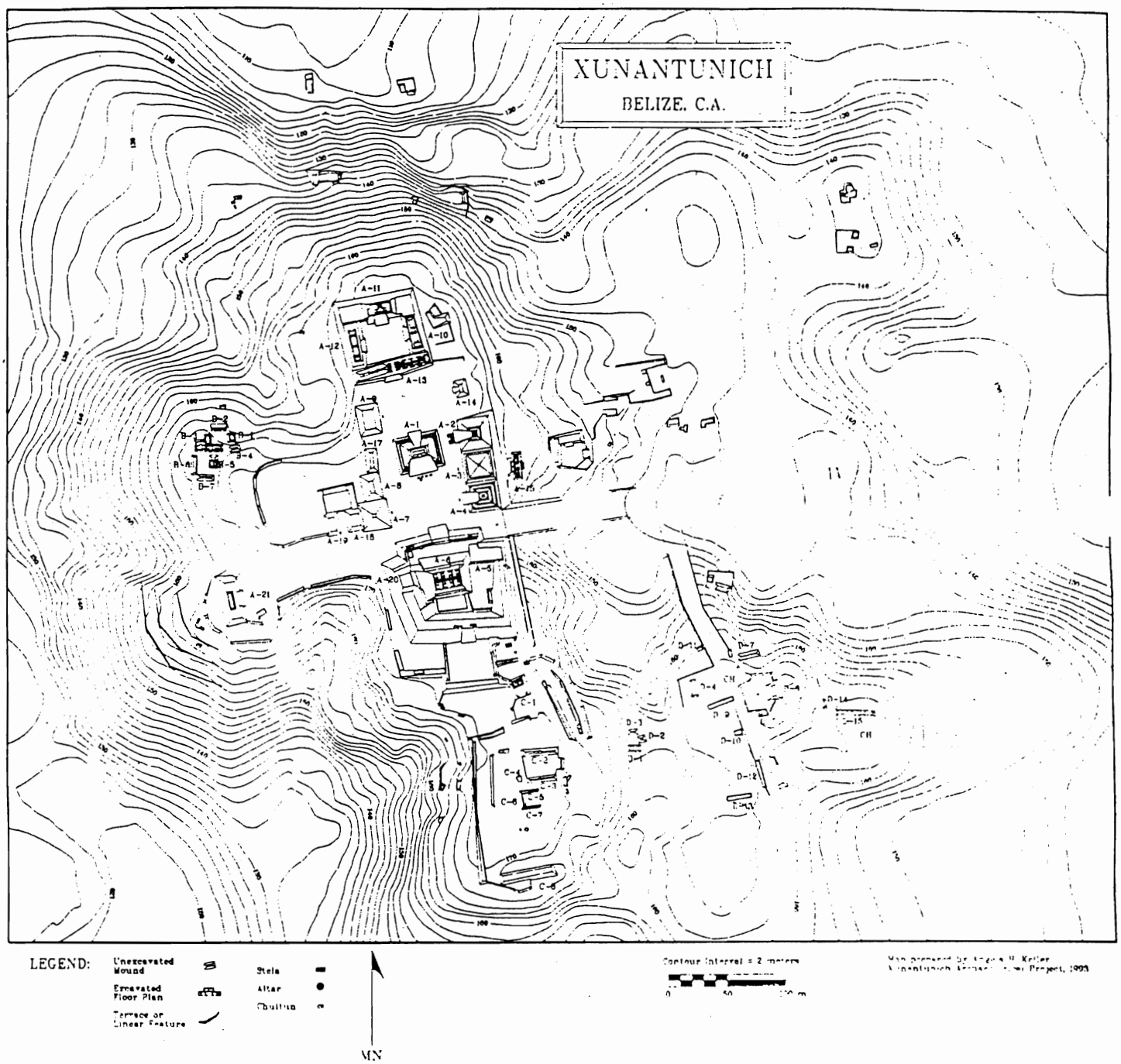
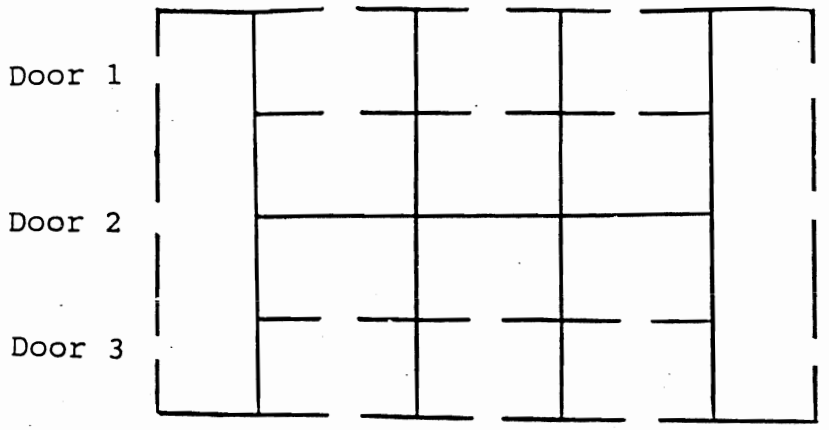
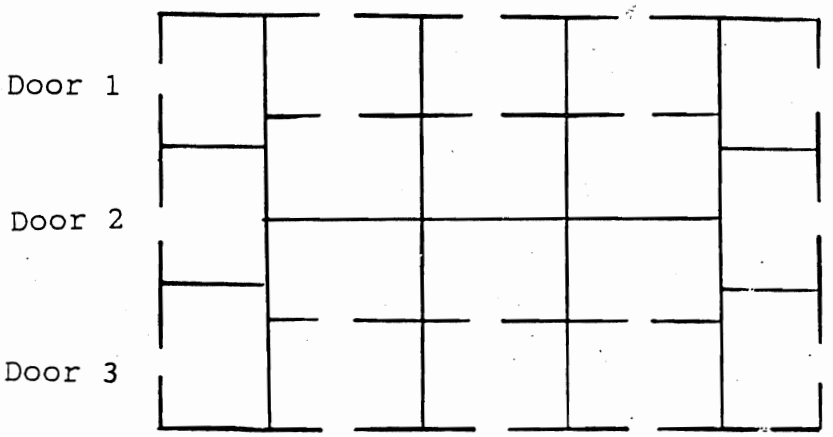


Figure 1. The Ruins of Xunantunich



a. Fourteen rooms.



b. Eighteen rooms.

Figure 2. Possible floor plans of A-6 2nd.

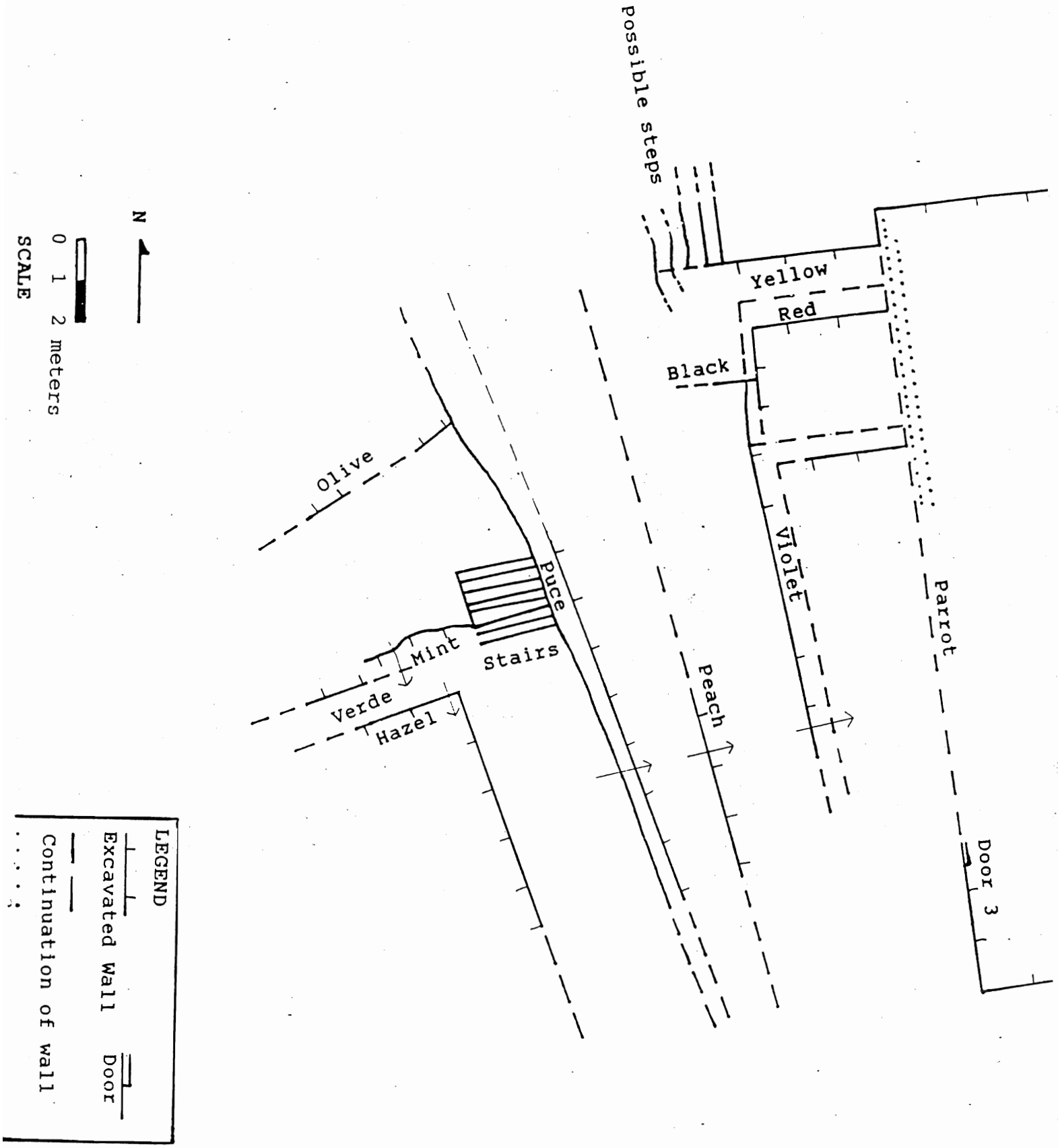


Figure 3. Plan view of excavated features. The names of walls are placed behind the wall. Violet, Red, and Puce are battered (angled) walls, so the top and bottom of these walls are drawn. The wall name of these is placed between the top and bottom lines.

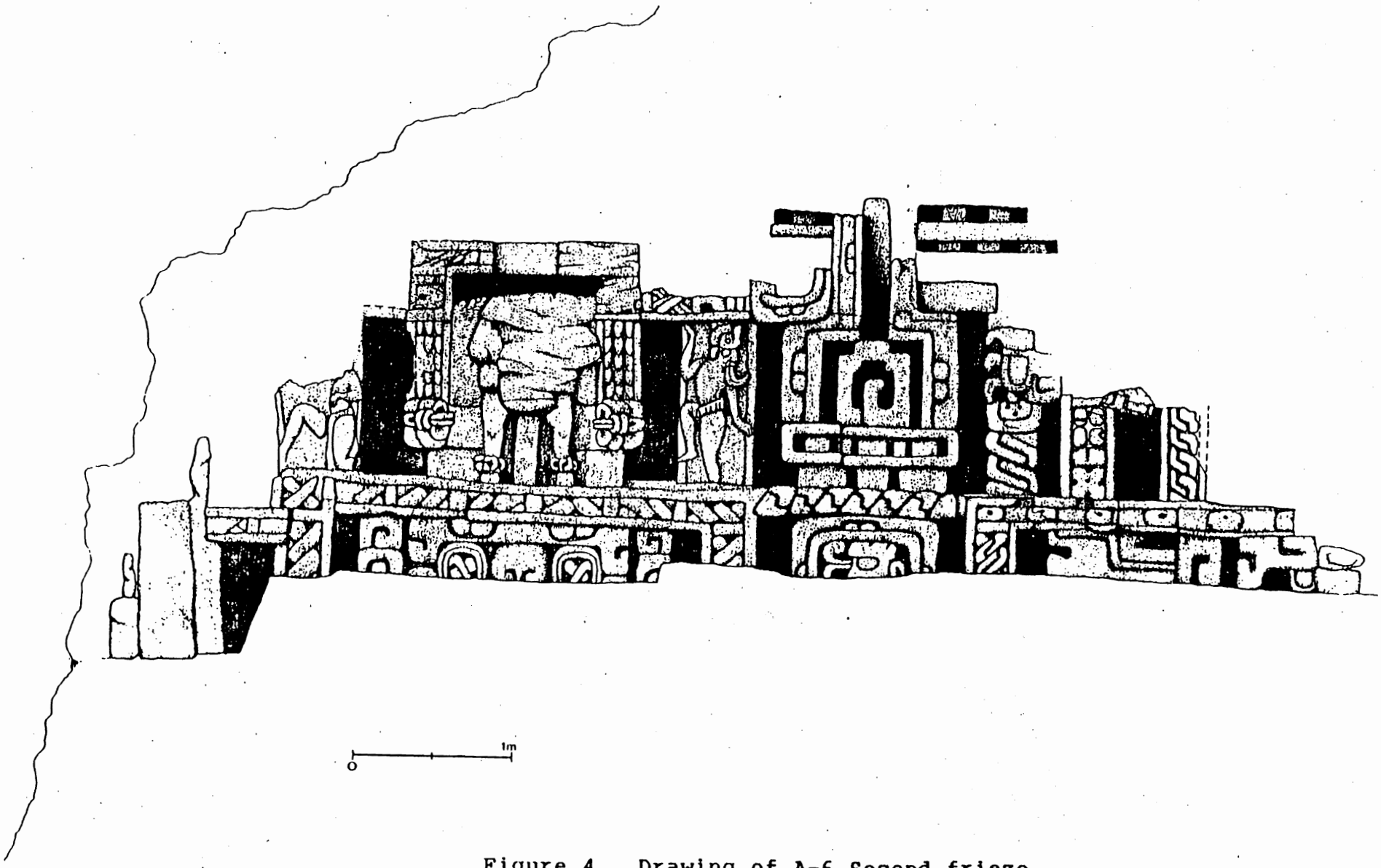


Figure 4. Drawing of A-6 Second frieze.

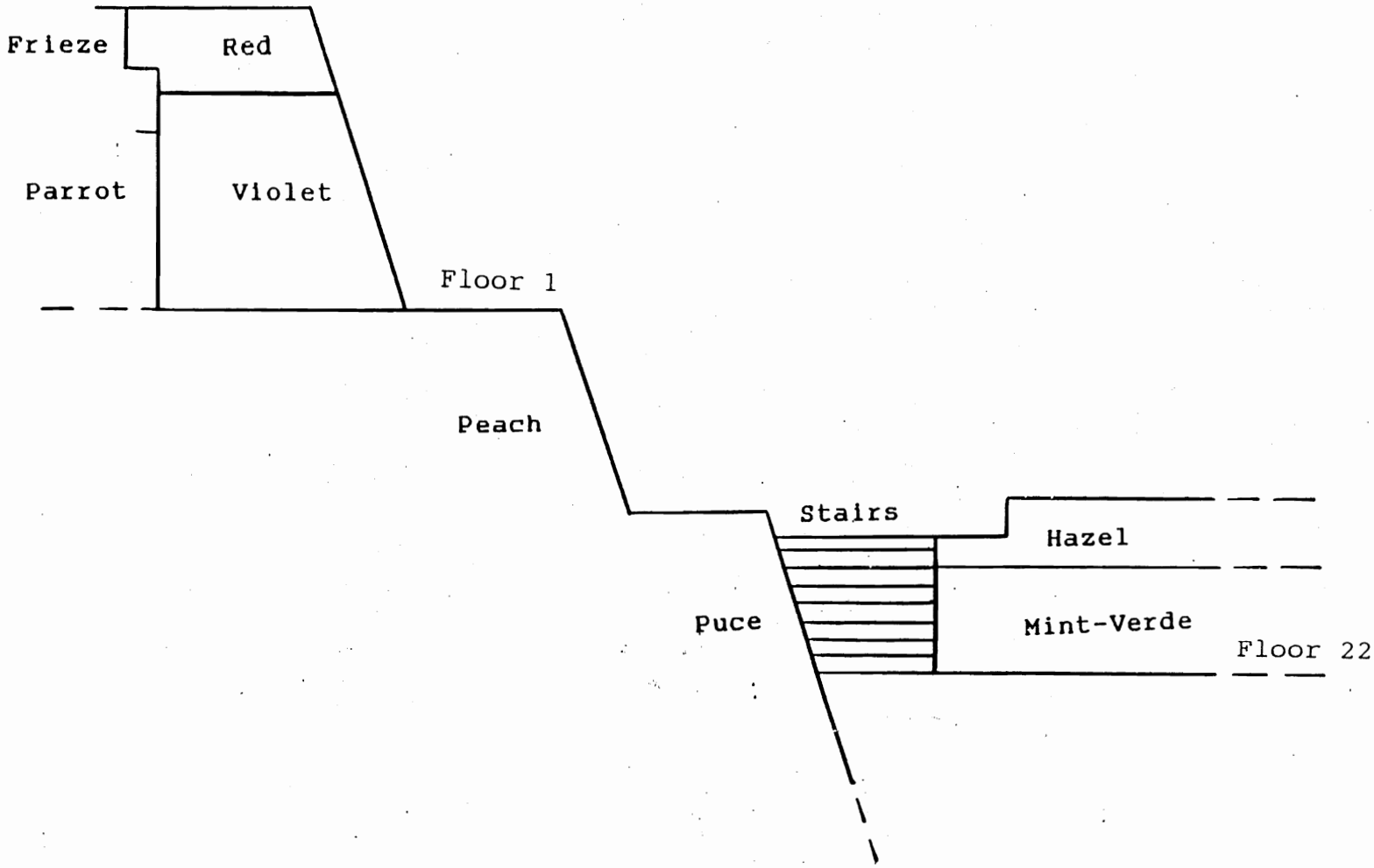


Figure 5. Cross-section view of reconstructed of A-6 terraces, with stairs and lower walls, facing south.

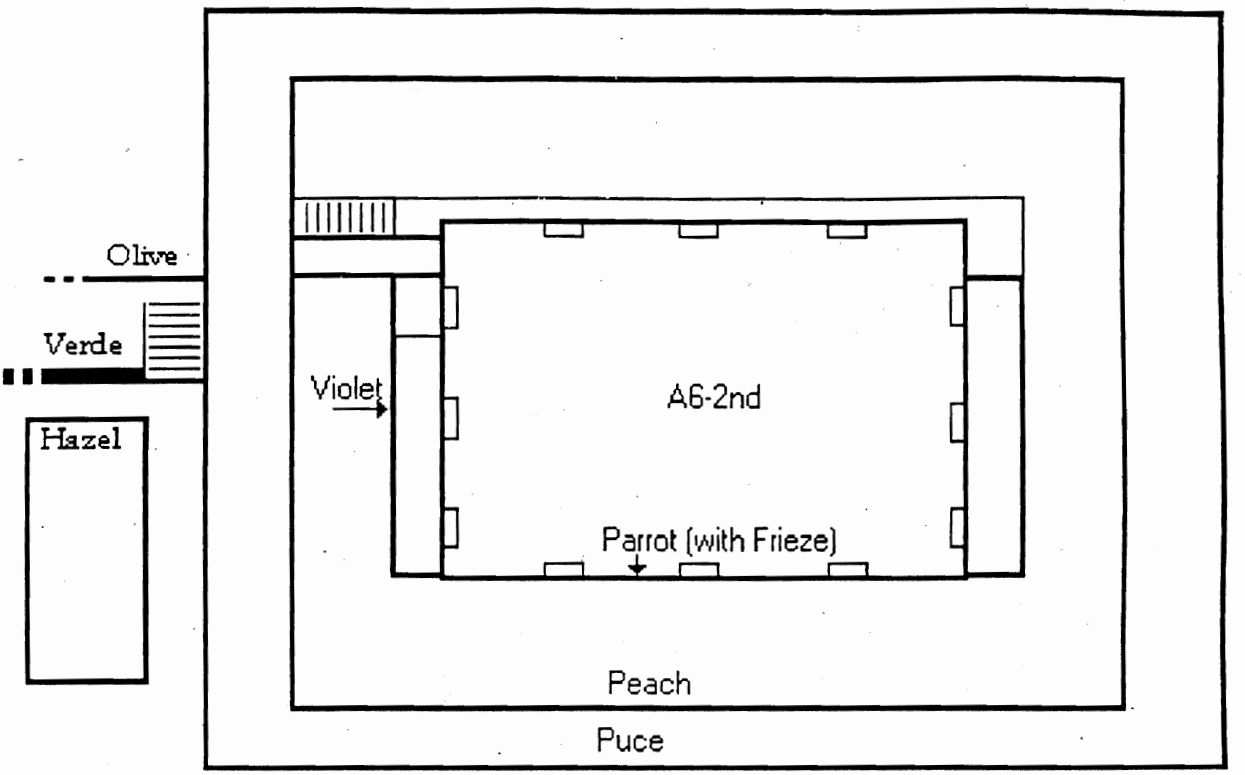


Figure 6. A reconstructed view of A-6. Parrot wall was the outer wall of the superstructure of A-6 2nd. Violet-Red wall covered the frieze on the west side, and a similar wall probably did the same on the east side. Peach and Puce walls were terrace retaining walls that would have supported the base of the structure.

The 1993 Excavations at Group D Xunantunich, Belize:

Defining the Corporate Group

Jennifer Briggs Braswell
Tulane University

Introduction

In an important paper, Hayden and Cannon discuss the residential corporate group as an archaeological unit (Hayden and Cannon 1982). The residential corporate group is a coherent social group of people living together, larger than the household and smaller than the community. Hayden and Cannon argue that archaeological study of the residential corporate group offers benefits that studies of individual households, or of the entire community, lack. They point out that households, corporate groups, and communities are not all equally suitable levels for investigation of archaeological questions, a suggestion supported by DeMontmollin (1988). Research at Group D, Xunantunich, is intended to illustrate that a focus on the residential corporate group allows better comprehension of the integrative social and economic relationships among members of past societies.

Residential corporate groups are the constituent parts of a community. These associations of individuals and families are the building blocks of complex societies. The architectural patio groups of the southern Maya lowlands are the remains of residential corporate groups and are the defining characteristic of Maya polities; the archaeological reflection of the community is the site (DeMontmollin 1988), a central precinct of monumental pyramidal architecture **together with** the mound clusters which surround it. The aim of the Group D subproject is to describe and analyze one elite residential group to begin to understand the integration of Maya society. Integration is how the collectivity is transformed into the community. Integrative connections link parts of a society especially when there is great distance between the elite and the nonelite in terms of material goods and privileges. Neither a household approach nor a study of royal inscriptions detect the integration of communities well, because the pertinent social actions do not take place at either the household nor the royal level. In an integrated complex society, the elite balance the pursuit of their interests and control of social and economic interactions in such a way that the social structure continues to be perceived as "right" or "natural" (Selby 1969), and they do so in their corporate groups.

Study of the residential corporate group at Group D begins with identification of the scale of the group, to be followed by description of the group's complexity of function, and then analysis of the integration of the group (Blanton et al. 1981). The scale of a group is its size, its physical extent and population. Complexity of a group

is the number of different social units that make up the group, and the different types of activities carried out by those units. Complexity is a matter of how widely resources and labor are divided, and includes consideration of wealth and rank differences. Integration is the way the units of the social system are linked or bound together to form a cohesive society. Integration concerns relationships among units of different ranking, the replication or division of economic functions, and the maintenance of the corporate group as a distinct social unit in the community at large.

This report provides preliminary information primarily on the scale of the group based on investigations in 1993. A physical description of the architecture and land, identification of its extent and boundaries, and an estimate of its population is presented. Research was carried out as part of the Xunantunich Archaeological Project (XAP), under the direction of Richard M. Leventhal (UCLA) and Wendy Ashmore (University of Pennsylvania). Dr. Leventhal is the director of site-center investigations including those at Group D. Field research continues in 1994, to be followed by intensive laboratory research, and final appraisal and interpretation of the complexity and integration of the Group D corporate group.

General Orientation to Group D

Group D at Xunantunich is an example of a "group-focused patio cluster" (Ashmore 1981), consisting of 14 mounds arranged around an 8 meter high mound, Str. D-6, constructed on an artificial, raised platform, Str. D-8 (Figure 1). It is one of two large clusters near the site center known as Group A. Group D is located approximately 100 meters southeast of Group A. Group B, the other large group near the center, is located 50 meters west of Group A. Group D has two plain stelae, a tall central pyramid (Str. D-6), and at least twelve structures. Group B has only seven structures and neither stelae nor a large central pyramid. Because Maya scholars have suggested that these central pyramids functioned as ancestral shrines (Becker 1972, Leventhal 1983), the absence in Group B of a tall central pyramid suggests that Group B and Group D were different types of residential groups. The specific functions of the groups, however, have not yet been demonstrated.

The mounds of Group D cover about 200 x 150 meters, not including the plastered causeway or sacbe which runs north from the group. The cluster of mounds which make up the group is isolated from other mounds by areas lacking

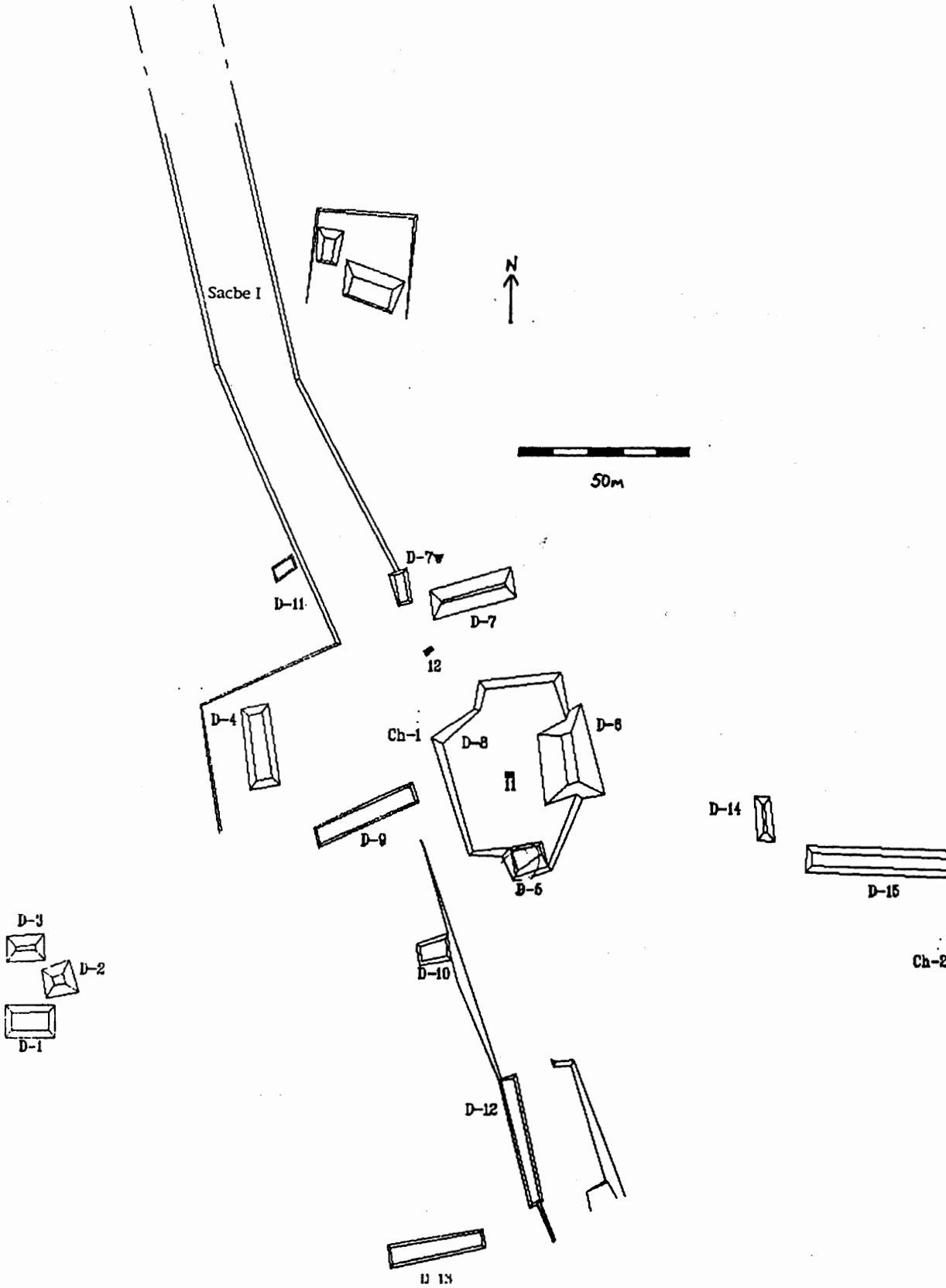


Figure 1. A map of Group D, Yaxchilan, Peli

visible structures. There are 12 mounds organized in four patio-groups (*sensu* Ashmore 1981). In addition, structures D1-3 constitute a "plaza plan 2, a rectangular central patio bordered on three sides by residential units and enclosed by a smaller but often higher-platformed structure on the east side" (Morley, Brainerd, and Sharer 1983:209). The distance of these three buildings from the largest structure in Group D, their more formal configuration among the Group D structures, and their construction at a lower elevation indicate that the trio was not part of the Maya corporate group represented by structures D-4 through D-15. This idea is supported by the discovery of a delimiting wall west of Structure D-4. The wall is continued by means of a quarry-face to form a north-south border at the west side of Group D.

The mounds visible in Group D range in height from 50 cm to 6 m. Based on the results of the 1993 shovel-testing program, it is strongly suspected that very small structures, not currently visible, exist in the southwestern quadrant of Group D.

There is evidence of two main periods of occupation and construction at Group D, principally from excavations at Str. D-6 and D-7, but also from excavations of test pits and structures D-9, D-12, D-4, the platform D-8, and Chultun 1 off the northwest corner of the platform. The presence of small quantities of Mars Orange sherds indicates occupation of the area as early as the Formative period, but there is no evidence of construction or accumulation of refuse from this time. The periods of occupation and construction correspond with Xunantunich ceramic periods Late Classic II and Terminal Classic, identified as A.D. 550-800 and A.D. 800-1000, respectively (LeCount 1992).

Previous Research

Group D appears on previous maps of the site. The most accurate published map is Graham's (1978) presentation of the site center monuments. In 1992, a draft of a new, more complete map was presented (Braswell 1992). The new map showed the locations of previously unrecorded structures D-9 through D-16, and two plain stelae (Xunantunich Stela 11 and Xunantunich Stela 12) not recorded by Graham. The 1992 map is superseded by Figure 1. This year, the structures originally assigned numbers D-11 and D-16 were determined to be natural features. The designation D-11 is now assigned to a small structure on the west side of the sacbe. To the west of Str. D-7, a small structure numbered Str. D-7 West has been mapped. Str. D-9 is no

longer considered to be connected to the platform (Str. D-8). Braswell's (1992) report provides preliminary information on Strs. D-9, D-7, and Chultun 1, as well as results of a test-pitting program.

A Population Estimate for Group D

The completion of an accurate map of structures and topography has provided enough detail to suggest that Group D consists of mound clusters that may represent households. In addition to these mounds, the group includes a quarry later used as a plaza, and flat areas in the southeast and southwest quadrants lacking visible structures. The density of the mounds is low.

The household has been defined as the individual unit of domestic production, consumption, inheritance, biological reproduction and shelter (Wilk 1988:136). Archaeologically, a household has "physical integrity ... its own living area, usually composed of areas for sleeping, cooking and food preparation, and storage of personal goods" (Healan 1993:106), even if some of these aspects are not preserved. The household is a social group of people who reside in houses, the physical structures. In the Maya region, the mounds arranged around patios represent the remains of the houses of extended family households (Wilk and Ashmore, eds. 1988). Tourtellot (1988) and Haviland (1988) have demonstrated that the number and size of structures around a patio and the degree to which a patio is closed at the corners are frequently a function of time, increasing as the number of members in the extended family household increases. At Group D, certain pairs of houses have been identified as the location of households. Each pair of structures occupies two sides of a shared patio. The open pattern suggests that the households in Group D did not have the deep history that more tightly clustered mound groups of the Petén had (such as those described by Haviland [1988] and Bullard [1960]). Only the original outlines of a plaza group existed before abandonment. This is consistent with ceramic evidence indicating that Group D was only occupied during the second half of the Late Classic and in the Terminal Classic period. The length and mass of the platforms, however, represent substantial labor and material investment, suggesting that the inhabitants of Group D structures were wealthy.

In Group D, the four households are numbered counterclockwise around the central platform:

Household 1: Str. D-7 and Str. D-7 west

Household 2: Str. D-4 and D-9
Household 3: Str. D-12 and D-13
Household 4: Str. D-14 and D-15

Two more possible households may be identified: Str. D-10 and the nearby associated but unmapped stone piles, and Strs. D-5 and D-6. Str. D-6 more likely represents a shrine instead of a residential house, for it has characteristics of an ancestral shrine (Becker 1972, Leventhal 1983). That is, it faces west at the east side of an elevated platform, has a room on a large substructure fronted by a wide staircase, a stela in front of it, and at least three construction phases. But Strs. D-6 and D-5 are arranged on two sides of a patio group, the spatial pattern identified with households. Additional households that occupied structures of perishable material presumably existed in the group but have left no visible trace.

The population of Group D can be approximated, disregarding for the time being possible population represented by hidden structures. Four to 5.6 persons per house is accepted by many prominent Maya researchers as a guideline for Maya population estimates (Rice and Culbert 1990:18). The six households in 10 residential structures[1] thus represent a minimum population of 40 to 56 people. Strs. D-4, D-12, D-13, and D-14, however, seem to be more massive than typical house platforms of the Northeast Petén and the Belize Valley, and the enclosed patio space is quite large. For the Postclassic period, much higher figures for the number of individuals per house have been offered based on ethnohistoric data. Puleston (1973:177) and Rice (Rice and Culbert 1990:18) suggest that 10 persons per house is the appropriate population estimate. Since there are many unknown factors, especially possible population associated with hidden structures, the estimated population is 40-100 people, assuming that the pairs of long structures are indeed residential. So far, middens have not been found in close association with these structures, and the subfloor burials commonly associated with Maya domestic structures have not been sought. Future research must therefore be directed at demonstrating the function of these long structures.

Excavations

[1] Strs. D-7, D-7 west, D-4, D-9, D-12, D-13, D-14, D-15, D-10, and D-5

Because information on the architecture and artifacts of all structures in the corporate group is sought, test stripping and test pitting was selected over complete stripping. This strategy allows architectural comparison of all structures in the group in the three years planned for investigation. Descriptive terminology in this report conforms as closely as possible with definitions provided by Loten and Pendergast (1984), except where noted.

Structure D-6 (Op. 74)

Only the northwest corner of the substructure of D-6 was excavated in 1993. Complete excavation and consolidation are planned for 1994. Excavations revealed three phases of construction, including the final configuration of the west side stair. Three construction phases are also evident in the looters' trench in the east side of this structure, investigated as Op. 26 (Figure 2). On the west side (excavated as Op. 74), the earliest substructure is built of small, irregular limestone slabs with oblong faces (Figure 3). The first addition to the substructure has a basal molding created of one course that rises 20 cm above the level of the floor. The molding, visible on the north and west sides, projects about 6 cm from the face of the substructure. The blocks of the second phase addition are approximately 50 x 30 cm x 25 cm and are mortared tightly together. In this second phase the substructure was extended 1.46 m to the north, and the original small-block substructure as well as the northward extension were covered by a series of three plaster surfaces.

During the third construction phase, the front of the substructure was enlarged and a wide stair, now very eroded, was built, extending the substructure farther west into the plaza. The stair is approximately 20 m wide with treads 60 cm wide and risers 25 cm high. Evidence for earlier stairs has not been investigated. After the construction of the third-phase stair the basal molding of the second construction phase still remained exposed in the northwest corner. The stair is built on a one-course addition of large block masonry abutting both the second and first phase constructions. Although there is a high degree of erosion, the visible remains seem to indicate that the stair steps consist of small-block risers retaining a core of rubble and dirt. The treads are made by plastering over the top of the risers and the core material. No evidence of large block construction was found at the center of the mound in the stairway. The presence of a similar small-stone staircase on the north side of D-8 supports the conclusion that no large stone masonry was present. Mackie (1985) suggested from his excavations in 1959-60 that at Xunantunich the

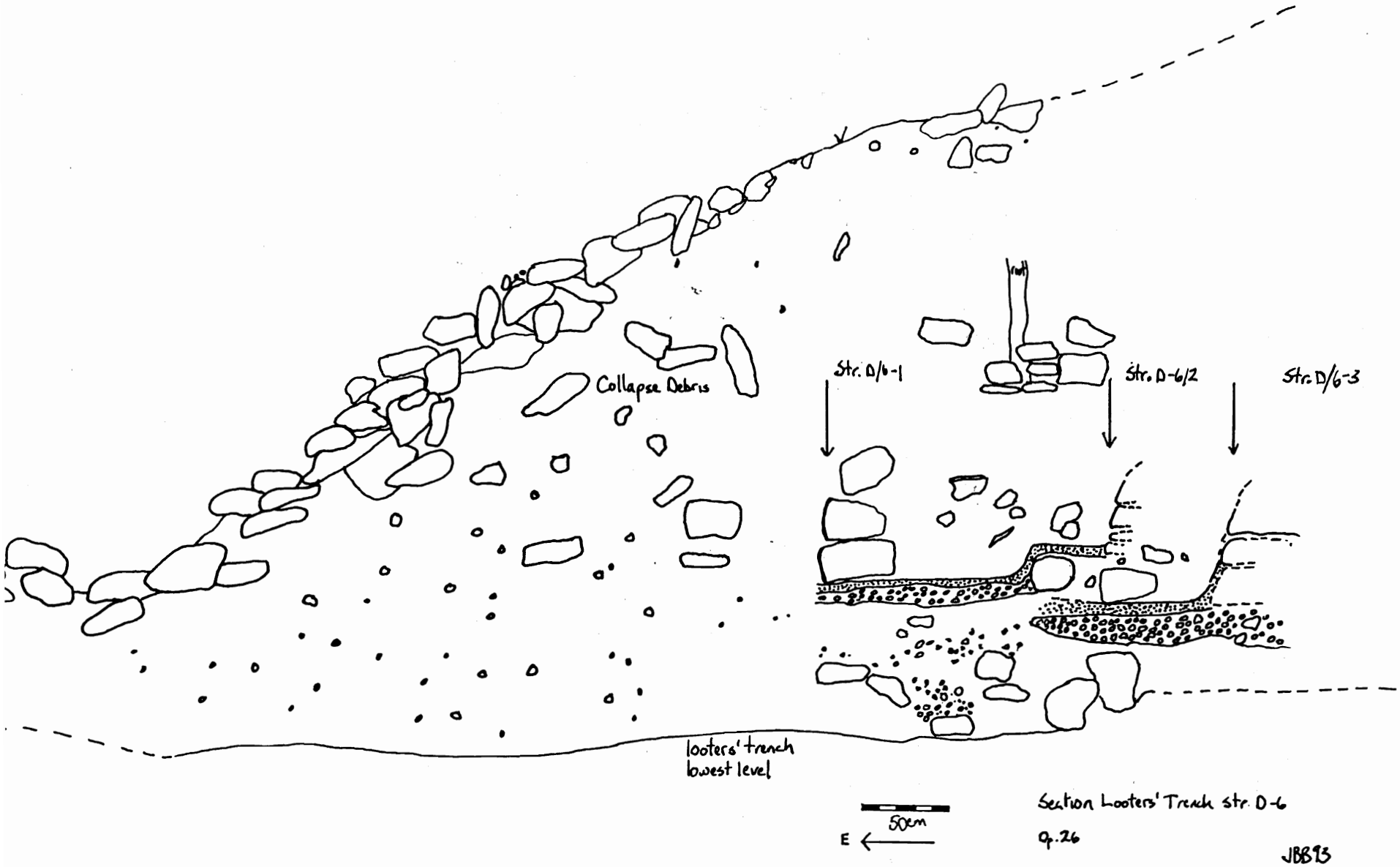


Figure 2. The looters' trench in Str. D-6 (JBB93:55).

Figure 3. Photograph of 1st, 2nd, and 3rd construction phases on NW corner, Str. D-6.

masonry style changed from large block (Ashlar I) to small block (Ashlar II) over time. Excavations on Str. D-6 tend to support this idea, but only very generally. In front of the stair, for example, a low terrace or step protrudes west into the plaza. It is narrower than the stair and built of one course of large construction blocks, and it postdates or is contemporary with the small-block stair. Furthermore, the stair itself rests on a large-block platform addition. Therefore, there is no straightforward chronological relationship between large and small block masonry.

Structure D-7 (Op. 22)

In 1993, a 2 m wide, north-south strip with lateral expansions was excavated across Str. D-7, continuing the excavation of this structure begun in 1992. Excavation in 1994 will investigate earlier phases of construction and possible caches.

Str. D-7 consists of a superstructure with rooms constructed on a substructure of large, cut limestone blocks. On the south side, limestone bedrock was dressed to serve as the base for the upper courses of the substructure. The basal molding on this side consists of an outset, lower, battered member about 45 cm high and a rectangular upper member 25 cm in height (Figure 4). Both members are carved deeply out of the natural limestone, suggesting that some bedrock had already been exposed by quarrying and was used opportunistically in construction. Further evidence of quarrying in Group D can be found in the area west of Str. D-10, east of the platform (D-8), and north of Str. D-12 (Braswell 1992), and all architecture in Group D postdates the quarrying. The periphery of the Xunantunich hilltop contains many other abandoned limestone quarries.

On the north side, the substructure of limestone blocks rests on a light brown clayey soil. The basal molding here is very different than on the south side; it protrudes up to 20 cm from the north wall and is made of two small, rectangular stones whose total height is 22 cm (Figure 5). The base of the structure was found here at 163.92 m asl compared with 165.13 m asl on the south side. A study of bedrock levels suggests that Str. D-7 was set into the side of the steep hill surmounted by Str. D-8 and Str. D-6.

Two rooms of the superstructure of Str. D-7 have been excavated. The west room is closed on the north, west, and south sides, and has a doorway leading east to

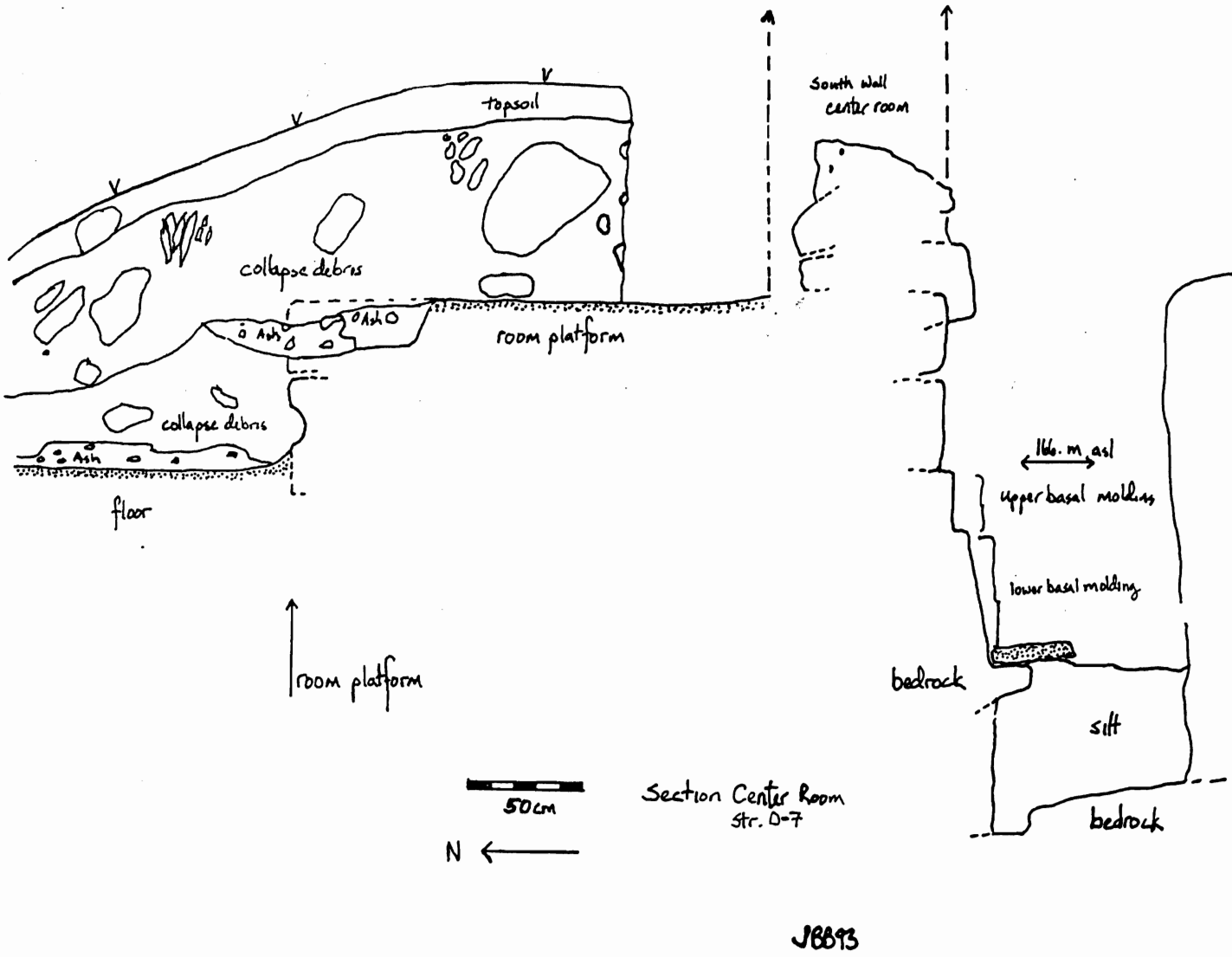


Figure 4. Profile of Str. D-7 showing south side basal moldings.

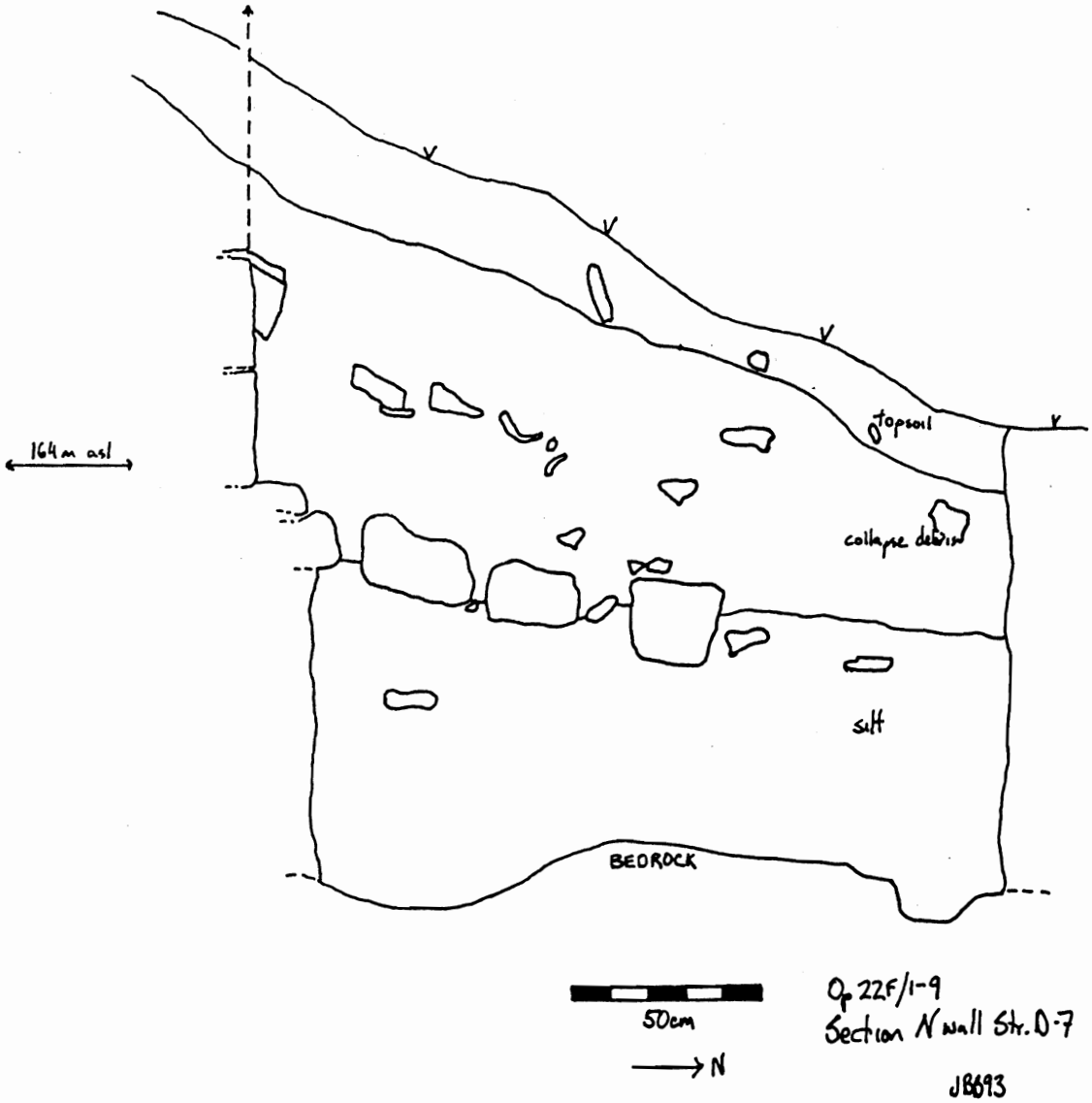


Figure 5. Profile of Str. D-7 showing north side basal molding (from 1992).

a room positioned at the center of the mound. The west room is 1.2 m x 2.7 m; the central room is probably 1.2 m x 3.0 m. A door in this central room opens north. The plan of the two excavated rooms and a presumption of symmetry suggest that one, or more likely three, additional rooms exist in Str. D-7. A room likely exists east of the central room. The shape of the mound, and fragmentary evidence of a doorway visible in the exterior wall farther west than the west wall of the western excavated room suggests that there is a fourth room on the west end of the mound, and a fifth room positioned symmetrically on the east end of the mound.

It is probable that the superstructure was roofed with perishable materials. No beveled vault stones were found. Mackie's (1985) photographs of the fallen "vault" stones on Str. A-15, however, appear to be from a stepped vault, and step vaults have been reconstructed on Str. A-6. Nonetheless, the quantity of debris on Str. D-7 seems insufficient for a collapsed vault. However, since the mound is very steep on the north side and the decomposed blocks may have fallen way down the hill, the possibility of a vault cannot be excluded.

The room and exterior superstructure walls are built of extremely soft, rectangular, local limestone veneer stones, over a thin core of limestone rubble. Veneer stones are at least twice as tall as they are thick and coursing is even. No wall plaster survives. The rear, or south, wall is 70-75 cm thick. Interior walls of the excavated rooms were also probably about 70 cm thick. Masonry corners are not bonded.

A bench, or more properly a "room platform" (Potter 1977:41), fills most of the central room. The face of the room platform, immediately inside the doorway, is plain with no lip molding. The room platform was probably built at the same time as the rest of the superstructure, because the room platform extends into the western room, completely filling that room. The interior wall separating the two rooms is built right upon the room platform surface, so that the room platform surface acts as the floor of the western room. The surface of the room platform is plastered and all exposed areas are stained gray from burning. In the center room, however, a more dramatic ritual act took place before abandonment. At the edge of the room platform, a 25 cm hole was dug into the plaster and filled with burning material. A fire on the floor in front of the door deposited a 5 cm layer of fine ash, sherds, and chert before the ultimate collapse of the structure (Figure 4). Carbon

samples for radiocarbon dating have been collected. In addition, a circle of plaster 75 cm in diameter was removed from the room platform surface near the back wall. These features will be investigated in 1994.

The structure faced north, and in front of the row of rooms was an outside terrace approximately one meter wide. The terrace probably existed in front of all the rooms of superstructure. It was reached by a staircase, the exact size and location of which have been difficult to determine. A deposit of elite household ceramic sherds was found on top of the stairway in 1992. Its stratigraphic position is not exactly clear, but the deposit seems to relate to the final use of the structure. Ceramics of this deposit date to the Terminal Classic period.

Structure D-8 (Op. 23)

Structure D-8 is the platform supporting Str. D-6, Str. D-5, and Stela 11. It was built in the Late Classic period and enlarged by the addition of four wide stairs on the north side. This second construction phase seems to date to the Terminal Classic period. A large terrace to the west of the staircase was also built at this time.

The platform has a three-tiered profile (Figure 6). Its total height above the ground level is approximately 1.5 m. Excavation on the west side of the platform revealed a low, one-course terrace of hard, unshaped limestone rocks set directly on bedrock forming a first tier about 30 cm high. In some places, this outer, lower terrace rests on a thick layer of fine, gray silt. The basal terrace course is filled with core material of irregular cobbles in a loose matrix. The second tier is created by a platform facing of small, oblong limestone cobbles retaining a similar core. This facing rises 50 cm above the low terrace. The third tier is faced with small, oblong limestones, set back from the first platform facing and rising at least 30 cm. The top of this uppermost terrace would have been the original plastered surface of the platform. However, the platform edges are extremely eroded due to the soft quality of the building stone, the small, untenoned blocks used, and the loose, poorly aggregated core. The surface of the platform is also deeply eroded.

The original plan of Str. D-8 was probably rectangular, with an east-west axis and dimensions approximately 5 m x 8 m. The southwest corner is notched. The northwest corner may also have had this shape, but erosion there is severe. The area of the original platform surface is approximately 400 m2.

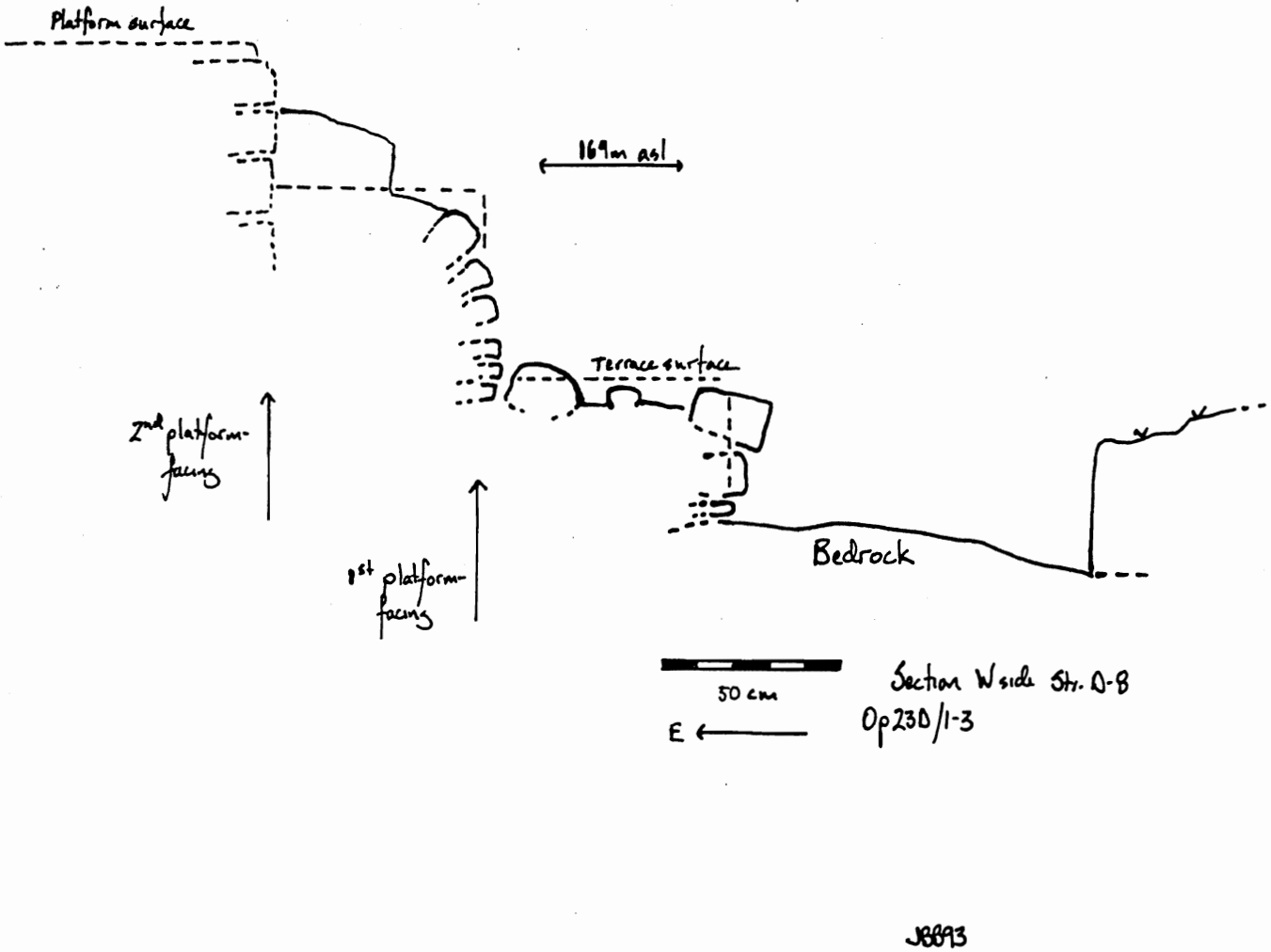


Figure 6. Tiered profile of Str. D-8 (the main platform) from JBB93:85 with dotted-in additions.

The addition of a stair and terrace enlarged the northern edge of the platform. The stair consists of four wide treads approximately 110 cm wide, supported by four short risers 20-40 cm high, creating a wide, low stair to the top of the platform. The stairs are built against the west side of a 90 cm wide balustrade (Figure 7). The stones of the balustrade vary in size but are set in courses. The balustrade is built on a layer of fine gray silt that accumulated on a previous floor that was probably the surface on which the original platform was built. The fill is a loose mixture of small cobbles and silt. The steps are built of single courses of shaped, soft limestone veneer stones retaining a loose fill of cobbles and earth. Step plaster, where it exists, is well-smoothed, but thin (about 5 cm), and laid directly on the fill without gravel ballast or other preparation.

The terrace adjacent to the stair projects north from the platform, and is built against the east side of the balustrade. The east face of the balustrade is made of unworked and roughly shaped limestone cobbles of widely varying size, shape, and hardness. The rough appearance of this face suggests that is was never visible, implying that the stair and the terrace were both constructed during the same phase. The plastered surface of the terrace is about 40 cm lower than the top of the platform. The top riser of the stair is aligned with the platform facing where the terrace abuts it. The terrace addition extends the platform about 4 meters north, creating an additional 80 m2 of space on the platform.

The terrace addition looms high above Str. D-7 to the north. The top of the terrace is about 169.16 m asl, and is built on bedrock at 168.04 m asl. The substructure on the north side of Str. D-7 was exposed at 165.06 m asl, illustrating a drop of 4.10 m from the top of the platform to the base of Str. D-7 approximately ten meters away. This precipitous incline may have been bridged by a wall joining the balustrade of the D-8 stairs to the sacbe to the north. The balustrade appears to be in alignment with the eastern parapet of the sacbe, but excavation is required to confirm this suggestion. The sacbe and stairs thus create northern access to the top of the platform. Significantly, the uncarved Stela 12 lies between the north stairs and the west end of Str. D-7. If this stela, currently completely on the surface, is close to its original location, its position suggests that it served as a marker at the end of the sacbe. Similar entrance stelae can be found at Seibal (stela and altar 32) at the top

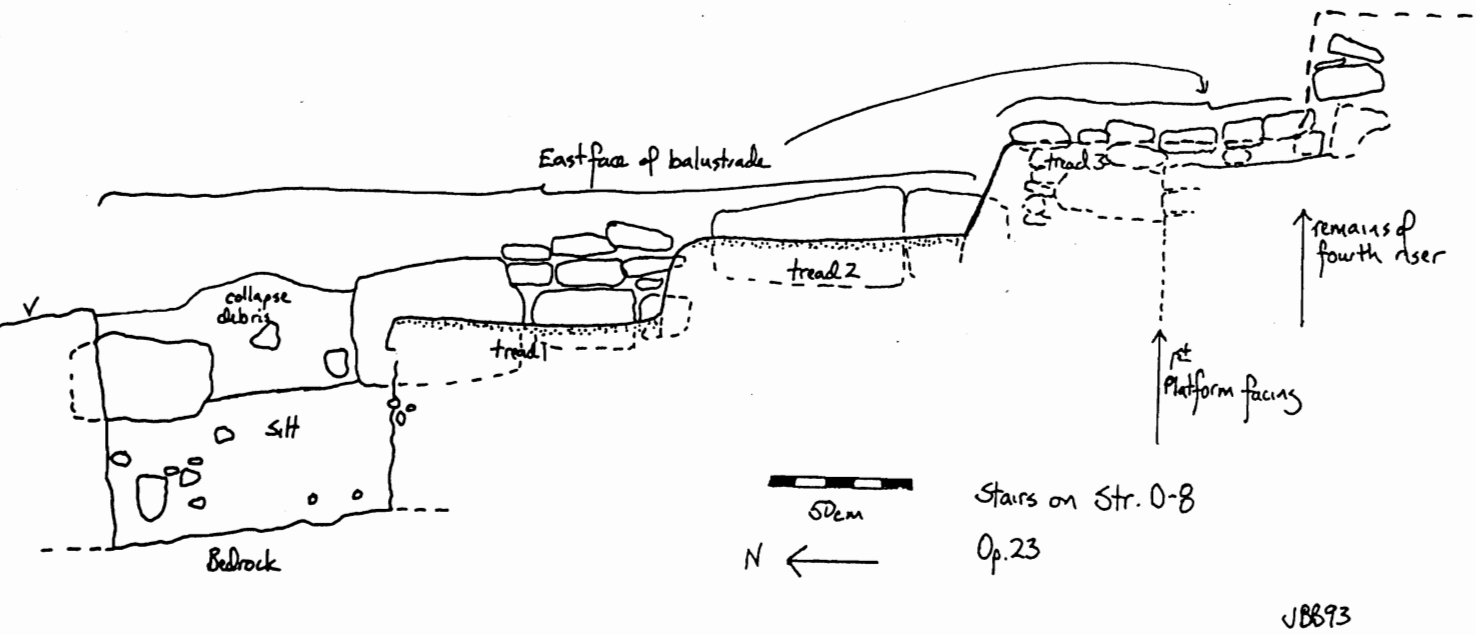


Figure 7. Profile of D-8 stairs showing west side of balustrade.

of Causeway 1 (Smith 1982:8) and at Uaxactun (Stela B3) at the top of the causeway entering Group B (Von Euw and Graham 1984:121).

Structure D-4 (Op. 89)

Structure D-4 is located northwest of the central Str. D-8. Str. D-4 is composed of a large, lower platform and a smaller upper platform with no superstructure. The lower platform is faced with large, subsquare, soft limestone veneer stones, now so eroded that only the basal course on the west side remains. The dimensions of the lower platform are approximately 10 m x 30 m. On top of this platform is a smaller upper platform faced with hard, uncut limestones selected for similar shape (Figure 8). The plan dimensions of the upper platform is approximately 5.4 m x 29 m.The total height of the structure including upper and lower platforms is 2.10 m. The structure core contains large, hard, irregular limestones packed together with little dirt matrix.

A terrace 3.6 m wide was discovered on the west and north sides of Str. D-4. The west side terrace facing is constructed of soft, dressed limestone veneer stones now very eroded. The north side terrace is built of hard, broken, medium-size limestone cobbles of consistent shape. Both terrace walls are set directly on the limestone bedrock or on a very thin layer of dark soil. The height of the terrace is approximately 80 cm above bedrock, making the total height of Str. D-4 construction 2.90 m. The north terrace face runs east and meets the western parapet of the sacbe. The north side of this terrace serves to delimit the north edge of this patio. A patch of plaster discovered on the east side of the structure suggests that a plastered plaza joins Str. D-4 to Str. D-9 to comprise a large patio group. (Excavation of Str. D-9 is described in Braswell 1992). The entrance to Group D, then, from the sacbe, opens on a wide patio on the west side and looks over the steep incline between Str. D-8 and Str. D-7 on the west side (described in the previous section).

The terrace on the west side of Str. D-4 runs south to a position due west of the south end of the mound. There, the bedrock is higher, and the structure is built directly on it. The terrace construction terminates where it meets the higher bedrock. The western limit of Group D is represented by the west edge of this terrace, and continues south by means of a west-facing exposure of quarried bedrock that, like the terrace wall, sets Group D structures at a visibly higher level than Strs. D-1, D-2, and D-3 and the ravine to the west.

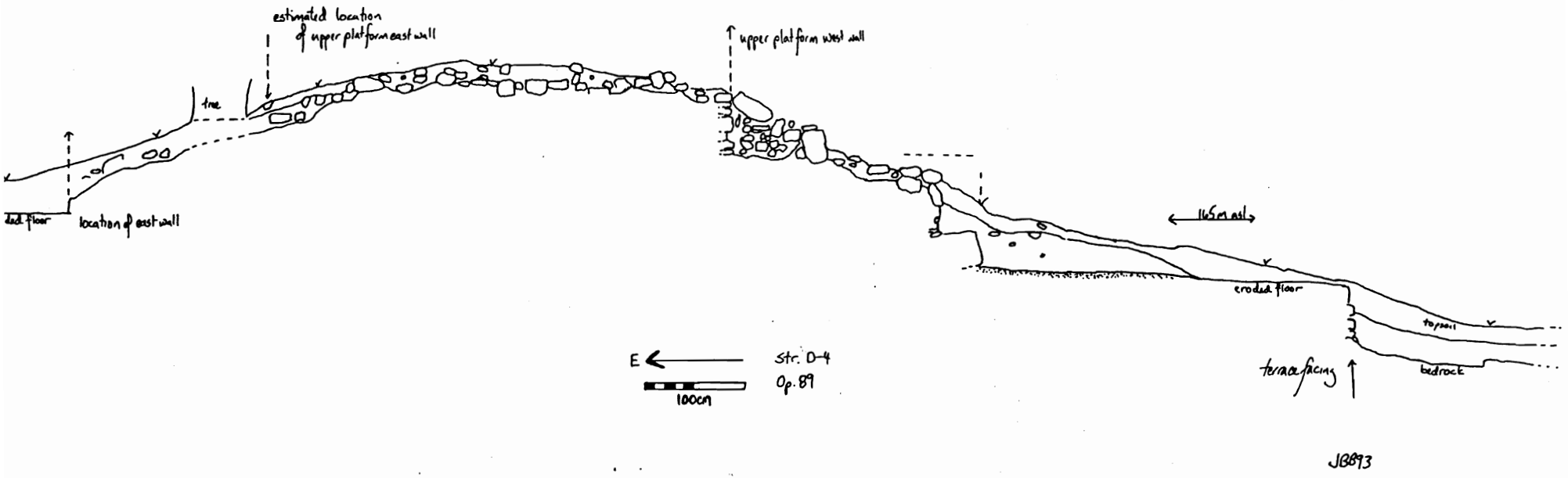


Figure 8. Profile of Str. D-4 (Jbb93:95).

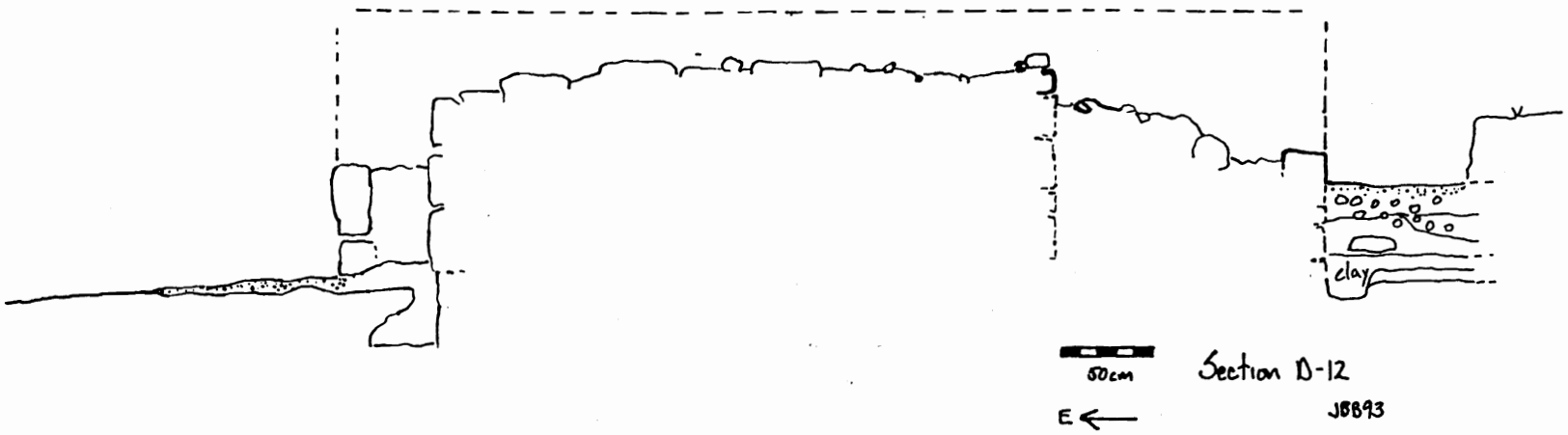


Figure 9. Profile of Str. D-12

Structure D-12 (Op. 81)

Str. D-12 is located southwest of the platform Str. D-8. The shape of Str. D-12 (Figure 9) is similar to that of Str. D-4, a platform without a superstructure. The exterior is faced with large, subsquare, soft limestone veneer stones arranged in even courses on a basal course of water-smoothed hard limestone rocks set directly on bedrock. On the east side, a thin plaster floor (5 cm thick) is laid over a thin layer (3-5 cm) of gray silt covering bedrock. There is no evidence of ballast or of subfloor preparation. The floor was laid after the structure was built, for it lips up to the structure's outside wall, and does not run under the structure. However, the floor has subsided somewhat and thus was encountered at a level below the base of the basal building course.

The floor level on the west side is 45 cm above the floor level on the east side, suggesting that the west side is the front of the structure. The west side basal course, however, was only 10 cm above the level of the east side basal course. The west side floor is built against the second course, and is much better prepared, made of thicker (7 -10 cm) plaster over a well-prepared subfloor ballast of limestone chips. Evidence of the plaster of the patio in front of Str. D-12 extends for four meters west of the structure, and it is proposed that Str. D-12 and Str. D-13 are the east and south sides, respectively, of a shared patio.

An interior or construction facing exists on both sides of Str. D-12, made of very large, hard, unworked limestones, set without mortar to face a core of large to medium size hard cobbles with little matrix. This interior construction was not visible when the building was in use. The purpose of this very heavy, strong core is unknown. The solidly built structure would have supported great weight, but no evidence of a superstructure exists. Although only two courses of exterior facing stones were revealed by excavation, the pattern of fallen core material suggests that the exterior facing stones rose at least to the current height of the mound, completely covering the interior facing on both sides, and creating a rather tall, shoe-box shaped structure, with plan dimensions 40 m x 5.42 m. The total height of the structure above bedrock on the east side is currently 1.30 m. On the western, front side, the structure rises 60 cm above the plastered plaza surface. No stairway for access to the top of the platform has been discovered.

Sacbe I (Op. 97)

Elías Alfaro carried out much of the difficult excavations at Group D in 1992 and 1993, developing the methods for excavating the decomposing block architecture safely from its matrix.

Sacbe I is a wide, plastered causeway with a low wall, or parapet, on each of the west and east sides (Figure 10). Because the causeway was discovered in May, 1993, only selected excavations were undertaken. Evidence for the sacbe on the west side begins at the junction of the terrace north of Str. D-4 and the west parapet wall. There the sacbe parapet is 80 cm high and built of thin veneer stones set directly on bedrock. Evidence for the minimum extent of the west side parapet exists about 50 m north at the bottom of the hill on which Group D is located. The sacbe thus runs from the group down the steep hill on which Group D is built, but the terminus of the sacbe is unknown. At the bottom of the hill, the sacbe west parapet is 85 cm high, and is built on a former soil A horizon. The terrain there is currently in corozo palms, and the appearance of the buried A horizon suggests that the drainage and plant cover were similar at the time the sacbe was built.

Evidence of the east side of the sacbe can be found near Str. D-7 about 15 m east of the junction of the terrace north of Str. D-4 and the west parapet. There, the tops of thin veneer stones can be seen in the ground among the leaf litter and debris. These stone-tops appear to align with the balustrade wall on the east side of the stairs on the north side of Str. D-8. To the north, about 20 m down hill, two excavation units confirm the location of the east side parapet. The eastern parapet is built of small oblong limestone blocks also set on the steeply inclined bedrock of the hillside. The builders took advantage of the shape of the hillside and increased the apparent height of the east parapet by building the sacbe right on the edge of a natural slope. The east parapet wall at this position is 85 cm high. At the base of the hill, the parapet has a basal molding 40 cm high made of four or five variably sized limestone slabs with oblong faces. There, the total height of the parapet exterior wall is 90 cm. Like the west side parapet it is built on a buried A soil horizon. The sacbe is approximately 14 m wide along its known length.

Other Investigations

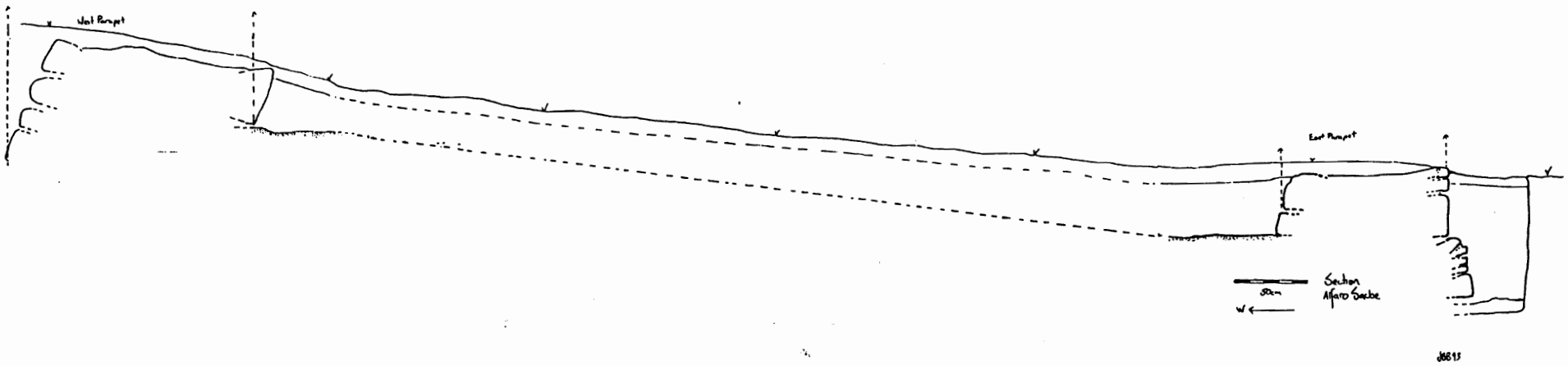


Figure 10. Sacbe I, west and east parapets (JBB93:104 and 136 in composite).

Terrain without mounds (Op. 84)

Preliminary exploration of the terrain without mounds was begun in 1993 with close-interval shovel testing in the southwest quadrant of the group. Soil samples were also collected. Spatial analysis of artifact distribution and measures of total soil phosphorus, when completed, will provide indications about the possibility of hidden structures or the past use of the area for infield gardens. Excavation guided by these results is planned for 1994.

So far, hidden structures are only suspected immediately west of Str. D-10, where shovel tests have produced greater numbers of sherds. Higher sherd counts were also noted near Strs. D-1, D-2 and D-3, as expected and near the slope up to Group C in the west. In the south-central part of the test area, the soil has a very dark color and is deeper than is typical in Group D. This suggests that the planned phosphate tests may reveal the enriched soil characteristic of ancient garden plots in close proximity to Group D structures.

Chultun 1 (Op. 21)

The excavation of Chultun 1, begun in 1992, was completed in 1993. In total, 5 human skeletons were excavated, recorded, and removed for curation in the XAP laboratory. Burials 1 through 3 were described in 1992. The two burials recorded this year lack burial goods of any kind. The lack of burial ceramics makes dating the interments difficult. The lowest burial in the chultun, which was excavated this year, was placed within a ring of chert stones in the northeast quadrant of the chultun, a treatment similar to the dual interment at the base of the chultun to the west excavated in 1992. As there is no evidence of the function of the chultun except as a burial place, the chultun may have been excavated by the Maya as a specially-prepared tomb (see Braswell 1992). The symbolic importance of the chultun as a burial place seems to be emphasized by its position in front of the north side stairway at the top of the sacbe, across from Stela 12.

Ceramics and Site Chronology

Ceramics found in structural fill provide dates which indicate the earliest time period possible for the construction of specific structures. No middens have been found to provide more precise dates for structure use. According to the preliminary results of project ceramicist Lisa LeCount, structures were built no earlier than the following dates:

Str. D-7	Terminal Classic
Str. D-4	Terminal Classic
Str. D-6	Late Classic II
Str. D-8	Late Classic II
Str. D-12	Late Classic II
Sacbe I	Late Classic II

The pattern of these dates suggests that the elaboration of the northern part of the Group, Str. D-4 and D-7, and the Str. D-8 stair took place after the rest of the group had already been established. The sacbe is suspected to date to the Terminal Classic because its construction seems to be related to this northern elaboration of the group, and because of the thin veneer stone and oblong-slab construction which seems to be characteristic of Terminal Classic modifications. Only a handful of artifacts were recovered in sacbe excavations, and the presence of Late Classic sherds does not rule out a Terminal Classic date for sacbe construction. More work is needed to confirm the dates.

The northwest corner architecture of Str. D-6 may date to the same time as Str. D-7 because they are similar in the large block construction and moldings employed. Their construction may date to the Late Classic period, although associated ceramics date the use of these structures to the Terminal Classic period. Str. D-12 also dates to the Late Classic period. The stairs on Str. D-6 are of the same construction technique as both the north side stairs of Str. D-8 and its terrace addition and the low Str. D-9 running east-west immediately west of the platform. These constructions were erected in the Terminal Classic period.

Nonceramic Artifacts

Shell beads, slate, chert, obsidian, and mano and metate fragments of groundstone were recovered in the course of 1993 excavations. Analysis of the chipped lithics by Jon C. Vandenbosch, University of Pittsburgh, has already begun. Interesting items include scores of chert drills, chert blade cores, and the generally small size of tools and debris. Over a dozen pieces of incised slate were recovered from the platform Str. D-8. Small chips of slate were also recovered in 1992 in a test pit near the northeast corner of the platform.

The collections are currently curated in the XAP laboratory where analysis will begin in 1994. In general, there is little exotic material.

Summary and Future Directions

Investigations in 1993 concentrated on defining the structures and clusters which comprise Group D. A population estimate for Group D is 40 to 100 people, resident in mound clusters which represent the remains of four to six households. Continued research will concentrate on more precise construction dates for Sacbe I, investigation of previous construction in Str.s D-6 and D-7, the completion of investigation of terrain without mounds in the southwest quadrant, and excavations of Str.s D-5, D-10, D-13, D-14, and D-15.

Acknowledgements

Thanks are due to the following individuals and institutions who have made it possible to present this report on the 1993 excavations at Group D, Xunantunich: for financial assistance to support excavation, living, and travel expenses, the Xunantunich Archaeological Project, the Middle American Research Institute, and the Graduate School Support Fund of Tulane University. For mapping and computer graphics, Angela H. Keller. For the excavation of Str. D-12, Sabrina M. Chase. For field drawings, Lady R. Harrington, Minette C. Church, Sabrina M. Chase, and Jon C. Vandenbosch. For permission to excavate and carry out research in Belize, Belize Department of Archaeology, Alan Moore, Acting Commissioner. For Project Direction, Dr. Richard M. Leventhal and Dr. Wendy Ashmore.

References cited

Ashmore, Wendy

1981 *Lowland Maya Settlement Patterns.* Albuquerque: University of New Mexico Press.

Becker, Marshall J.

1972 Plaza Plans at Quirigua, Guatemala. *Katunob* 8(2):47-62

Blanton, Richard E., Stephen A. Kowaleski, Gary Feinman, and Jill Appel

1981 *Ancient Mesoamerica: A comparison of change in three regions.* Cambridge University press: London

Braswell, Jennifer Briggs

1992 The Excavations at Group D. In *Xunantunich Archaeological Project: 1992 Field Season*, 56-73. Annual report submitted to the Department of Archaeology, Belmopan, Belize.

Bullard, William R., Jr.

1960 Maya Settlement Patterns in Northeast Petén, Guatemala. *American Antiquity* 25:355-372.

De Montmollin, Olivier

1988 Settlement Scale and Theory in Maya Archaeology. In Recent Studies in Precolumbian Archaeology, part i, edited by Nicholas J. Saunders and Olivier de Montmollin. Pp. 63-104. BAR International series 421(i)

Graham, Ian

1978 *Corpus of Maya Hieroglyphic Inscriptions* 2(2). Cambridge, MA: Peabody Museum of Archaeology and Ethnology.

Haviland, William

1988 Musical Hammocks at Tikal: Problems with Reconstructing Household Composition. In *Household and Community in the Mesoamerican Past*, eds. Richard Wilk and Wendy Ashmore, 121-134. Albuquerque: University of New Mexico Press.

Hayden, Brian and Aubrey Cannon

1982 The Corporate Group as an Archaeological Unit. *Journal of Anthropological Archaeology* 1:132-158

Healan, Dan M.

1993 Urbanism at Tula from the perspective of residential archaeology. In *Prehispanic Domestic Units in Western Mesoamerica*, eds. Robert S. Santley and Kenneth G. Hirth, 105-120. Boca Raton, FL: CRC Press.

LeCount, Lisa

1992 Xunantunich Ceramics -- 1992. In *Xunantunich Archaeological Project: 1992 Field Season*, pp. 127-145. Annual report submitted to the Department of Archaeology, Belmopan, Belize.

Leventhal, Richard M.

1983 Household groups and Classic Maya religion. In *Prehispanic Settlement Patterns: Essays in honor of Gordon R. Willey*, eds. E.Z. Vogt and R.M. Leventhal, 55-76. Albuquerque and Cambridge, MA: University of New Mexico Press and Peabody Museum of Archaeology and Ethnology, Harvard University.

Loten, H. Stanley and David M. Pendergast

1984 *A Lexicon for Maya Architecture.* Archaeology Monograph 8. Toronto: Royal Ontario Museum.

Mackie, Euan W.

1985 Excavations at Xunantunich and Pomona, Belize in 1959-60. *BAR International Series* 251. BAR Publications, Oxford.

Morley, Sylvanus G., George Brainerd, and Robert J. Sharer

1983 *The Ancient Maya, fourth edition.* Stanford: Stanford University Press.

Potter, David F.

1977 *Maya Architecture of the Central Yucatan Peninsula, Mexico.* Middle American Research Institute Publication 44. New Orleans: Middle American Research Institute.

Puleston, Dennis

1973 *Ancient Maya Settlement Patterns and Environment at Tikal, Guatemala: Implications for Subsistence Models.* Unpublished Ph.D. dissertation, University of Pennsylvania, Philadelphia.

Rice, Don S. and T. Patrick Culbert

1990 Historical Contexts for Population Reconstruction in the Maya Lowlands. In *Precolumbian Population History in the Maya Lowlands*, eds. T. Patrick Culbert and Don S. Rice, 1-36. Albuquerque: University of New Mexico Press.

Satterthwaite, Linton
1951 Reconnaissance in British Honduras. *University Museum Bulletin* 16(1).

Selby, Henry
1969 Elite selection and social integration: An anthropologist's view. In *Governing Elites: Studies in Training and Selection*, ed. Rupert Wilkinson, 3-22. New York: Oxford University Press.

Shook, Edwin M. and William R. Coe
1961 Tikal: Numeration, Terminology, and Objectives. Tikal Report No. 5, Museum Monographs. Philadelphia: The University Museum, University of Pennsylvania

Smith, A. Ledyard
1982 *Excavations at Seibal, Guatemala.* Papers of the Peabody Museum of Archaeology and Ethnology.

Tourtellot, Gair
1988 Developmental Cycles of Houses and Households At Seibal. In *Household and Community in the Mesoamerican Past*, eds. Richard Wilk and Wendy Ashmore, 97-120. Albuquerque: University of New Mexico Press.

Von Euw, Eric and Ian Graham
1984 *Corpus of Maya Hieroglyphic Inscriptions*, 5(2). Cambridge, MA: Peabody Museum of Archaeology and Ethnology, Harvard University.

Wilk, Richard R.
1988 Maya household organization: Evidence and Analogies. In *Household and Community In the Mesoamerican Past*, eds. Richard R. Wilk and Wendy Ashmore, 135-151. Albuquerque: University of New Mexico Press.

Wilk, Richard R. and Wendy Ashmore, eds.
1988 *Household and Community In the Mesoamerican Past.* Albuquerque: University of New Mexico Press.

Vision and Revision: The Remapping of Xunantunich

Angela H. Keller
University of Pennsylvania

> Every map shows *this* ... but not *that*, and every map shows what it shows *this way* ... but not *the other*. Not only is this inescapable but it is precisely because of this interested selectivity - this choice of word of sign or aspect of the world *to make a point* -that the map is enabled to work.
>
> From *The Power of Maps* (Wood, 1992:1)

Most archaeologists are surely all too aware of the limitations of our mapping techniques in representing the nature of ancient activity. If our maps truly could show the transcendental 'everything,' not just "this" but also "that," and if they could somehow simultaneously give voice to multiple representations of that 'everything,' depicting not just "this way" but "the other" as well, then archaeologists would have precious little left to do. Of course, a map is only a map.

The revision of the Xunantunich map presented in this report (fig. 1) is an attempt to make our most recent interpretations of the spatial organization of the site core accessible in a format widely intelligible by Mesoamericanists. With the aid of a total station, computer aided drawing software (Generic CADD), and topographic interpolation software (Surfer), we combined the coordinate data from 1992 and 1993 to create this topographic and schematic (Maler) site map. While we feel that the enhanced accuracy furnished by the use of a total station will in the future, under the direction of Virginia Hetrick, allow us to create a more "realistic" three-dimensional picture of the ancient city of Xunantunich, it will, of course, not allow us to see that which we cannot or do not yet recognize as significant. Nor will it change the selective nature of an archaeological map which always shows "this" but not "that," and in a very specific manner.

The XAP 1993 Mapping Program

Expanding upon the mapping and survey work conducted during the 1991 and 1992 XAP field seasons, the 1993 mapping program at Xunantunich headed by the author with substantial assistance from Jim McGovern, Marcelo Torres, Jason Yaeger, and Samuel Connell, has concluded with the creation of the new map of Xunantunich presented here. Our central goals this year were: first, the completion of the mapping of constructions and some human-modified features such as quarries and terraces within the site core (defined as the immediately contiguous

Groups A, B, and C) and its immediate periphery on the ridge top (see fig. 2 for the boundary of this 100% survey area); and second, the initiation of a detailed topographic survey of the Xunantunich ridge. While the form of the contiguous site core, Groups A, B, and C, is relatively unchanged in the XAP 1993 map from that shown in the Graham and Carbis map compiled some 15 years ago (Graham, 1978:120 - here fig. 3), several structures and features have been added to this basic layout, and the overall manner of the XAP map is quite different. In the following pages I will discuss in more detail both the new appearance of the map and the recent additions to the map, specifically the new structures, quarries, and causeways.

Revisioning Xunantunich

Initially, one might notice that the overall style of the new Xunantunich map is less rigidly orthogonal than the Graham and Carbis map (fig. 3). This is a product less of more accurate mapping equipment, than of our own "interested selectivity" - our view of the nature of ancient Maya constructions and their representation. Rather than assuming rectilinearity where our data show otherwise, we have chosen to represent the orientation and basal area of structures as we imagine they were in their ultimate form based on fall patterns and lines of cut stone visible today. Of course, without excavation and even with this aid in some instances, we cannot be sure of our representations. This, then, is our bias, our hope being that the image thus produced may be of greater use to those interested in alignments and spatial relationships between structures and features.

New Structures and Features

Presently, more than fifty (50) new constructions have been located which do not appear on the Graham and Carbis map. Several of the additions, particularly in and around the area designated Group C, are low-lying constructions often utilizing natural topographic relief for added height on at least one side. Some of these features were present in the Graham and Carbis map, and yet were not represented as human constructions, but rather as topographic features or enigmatic straight lines with no 'sides' (see fig. 4 for several comparisons). As the Group C area has already been discussed (Ashmore and Leventhal, 1993), I will not consider it further here, except to note that our preliminary impression of the group as relatively isolated from the rest of the site by both topography and human construction has only been strengthened by this year's research. Beyond adding greater definition to previously unclear low-lying and linear constructions, we have also identified

several new mound structures whose inclusion on the site map begins to place the site core within a richer spatial and social context. Significantly, Group D, discussed in greater detail by Braswell (this volume), has emerged as an areally larger and more complex group with its own entrance and causeway to the north (fig. 5). This group is a fundamentally discrete unit which Braswell now interprets as the residence of a secondary elite (non-regal) "corporate group." Two more similarly discrete elite groups were visited in 1992, but do not appear on the present map as they are further to the southeast on private lands at present inaccessible to us.

To the east of Structure A15, we have mapped one platform plaza group and several low, large constructions of indeterminate function and unusual configuration (fig. 6). All of the constructions in this eastern complex may have some fundamental relationship to the recently identified causeway running east off of the west side of Plaza AI. Presently, the nature and continuation or termination of both the Group A and Group D causeways (about which more will be said below) cannot be determined due to the apparently substantial amount of alluvial deposition in the area marked in figure 6.

Today, this area is a thriving corozal stand, testifying to its relatively wet and swampy condition. We believe that any remains in this area may be buried rather deeply under a dense, clayey soil accumulated since the abandonment of the site. In fact, several pits dug in this vicinity in order to recover clay and earth for the ongoing consolidation of the site core, failed to encounter any substantial amount of cultural material, though the pits were in two instances placed adjacent to known constructions and dug to depths in excess of 1.5 meters. In the upcoming 1994 season, it will be one of the tasks of the author to test this area in order to better define the nature and projection not only of the causeways, but also of the denser constructional activity associated with them.

Continuing in counter-clockwise fashion, another spatially discrete group has been added to the map (fig. 7). This small two-part group sits atop a raised area bounded by sharper slopes to the north, east, and south. Preliminarily, this group appears to be a non-elite, possibly "middle-class," residence comparable to Group B in the size of its constructions but not in the formality of their arrangement. At this point, I must mention again that the survey area for 1993 did not in fact encompass Group F (see fig. 3). The group was encountered last year during preliminary

reconnaissance and is included in the present version of the Xunantunich site map because it is the largest group (and contains the largest mounds) as yet identified within the reserve lands to the northeast. Thus, as it stands, the map may appear somewhat misleading, but further work in 1994 will be aimed initially at filling in this and other areas to the east.

Finally, to the north of the site we encountered some of the densest constructional and quarrying activity on the ridge flanks (quarries will be discussed separately and at greater length below). Three of the structures (fig. 8) appear to be spatially associated with limestone quarries, and may even be partially or wholly constructed of quarry debris or 'waste' (i.e. earth, *sascab*, unusable limestone blocks and fragments, and tool refurbishing debris among other things). Interestingly, just down-slope (to the north) of each of these 'quarry-related' structures, we encountered dense sherd scatters containing both utilitarian and decorated wares generally of a Late Classic date (BV III or Spanish Lookout) as defined by LeCount (this volume).

While most of the hillside, and in fact most of the site, is devoid of obvious surface artifact clusters, below each of these structures the sherds were dense, large in size, and not particularly weathered. Although the nature of these structures awaits further investigation, the association of quarries, mounds and ceramics would most likely suggest either that people were living preferentially in or near quarries on the hillslope, or that rather substantial garbage disposal occurred in these locales resulting in the accumulation of material interpreted today as structures. The other mounds mapped to the north occur on more level terrain and do not at present appear to be intimately related to quarrying activity.

Quarries

This year we also undertook a preliminary investigation of the limestone quarrying activity around Xunantunich. Generally, possible limestone quarrying locales are densest along natural ravines (such as the one between Group D and the site core) and on the steeper slopes of the ridge. Possible quarrying locales were identified initially by George Holley during the 1992 XAP season. Holley found an association of exposed cut bedrock faces, and small depressions bounded downslope by 30 to 200 cm high amorphous mounds of earth and materials such as unused and broken limestone blocks interpreted as quarrying debris. A few of these "pocket-

like" depressions and exposed bedrock were later cleared by the modern consolidation quarrying crew and found to contain ancient cut marks and quarrying grooves.

While these small 'pocket-like' quarries were noted all around the site, only in one test area were they mapped completely and carefully (fig. 9). In this area, each possible quarrying locale was flagged and numbered in the field (numbers on the map correspond to field designations) to facilitate further survey and excavation in the upcoming field seasons. Several of the smaller clustered pockets of cut bedrock might logically be considered one quarrying locale, but until further investigations we felt it wise to map each separately.[1] Within this relatively small sample area (roughly 23,500m^2), 57 discrete cut/quarried bedrock locales were identified. Although the sample area has a somewhat higher density of likely quarrying locales than some of the site, it is comparable in density to the slopes off the rest of the north, east and south of the Xunantunich ridge and the ravine west of Group D.

This unexpectedly high density of quarrying activity may relate to the relatively poor quality of limestone around Xunantunich. In the search today for suitable consolidation stone at Xunantunich, we have found limestone quality to be often quite soft and extremely variable over a relatively short areal distance (see Woods & Titmus, 1993 regarding a similar situation at Tikal and Nakbe). The consolidation quarrying crew will often rapidly test two to four locales before finding stone of sufficient hardness and purity. In ancient times as well several locales may have been cursorily tested before adequate stone sources were encountered. The few larger quarrying locales, identified so far as extensive and contiguous cut bedrock faces associated with large two to five meter depressions, may have been the primary sources of the better building material at Xunantunich. Indeed, one of these larger locales was reopened by the consolidation quarry crew in 1993, and found to have denser, finer stone with minimal inclusions (see fig. 10).

As mentioned above, the recent opportunistic excavations in search of consolidation stone have revealed ancient tool-marks, quarrying channels, and

---

[1] The symbol used to represent possible quarrying locales is schematic and does not represent the actual extent of the specific locale.

unfinished and unused blocks similar to those noted at other Maya quarries (Woods & Titmus, 1993:6; Carr & Hazard, 1961:12). We have also recovered two stone artifacts during the reopening of several ancient quarrying locales to the north of the site. One is a simple 'general utility biface' (fig.11a) with visible battering along the distal end, like those proposed as quarrying tools by Woods and Titmus (1993:3) in their experimental analysis of limestone quarries at Nakbe, Guatemala. The other is an unusual limestone object with a distinctive circumferential groove and 3/4 top groove (fig.11b).

A similarly grooved, dense limestone object (fig.11c) was found last year in the quarrying locale to the east of Structure D-10 in Group D. Both are identically grooved and roughly the same size and density with similar, possibly use-related, breakage and battering. While the groove patterns on these objects suggest that they were once tethered with rope, arguably as counterweights in some quarrying activity, we do not now clearly understand their use and significance. In fact, it is possible that these ground stone objects were used in several contexts, not just quarrying, as a similar circumferentially grooved dense limestone object (without the 3/4 top groove) was recovered from a domestic trash heap excavated in 1993 by Chase (this volume) in the San Lorenzo Group across the river from the Xunantunich core.

Causeways

Finally, one of the most unexpected and exciting products of the 1993 mapping project was the discovery of at least two and possibly three causeways (sacbeob) entering onto the site core and Group D (fig.12). The sacbe attached to Group D was identified and tested this year by Braswell, and her account in this volume is more complete. The sacbe to the east of Group A is clearly visible to either side of and running through the present roadway into the site, while the proposed sacbe south of Structure A21 is still shrouded in dense vegetation and has yet to be confirmed.

At present, analysis of these features is only sketchy, but certain patterns are emerging. Upon the "thresholds" where the sacbeob enter plazas, the Maya erected plain stelae, apparent entrance markers comparable in placement to Stela J at Copan. Additionally, the two confirmed sacbeob appear preliminarily to be, like most southern lowland sacbeob, intrasite roadways connecting the site core, Group D, the

eastern complex structures, and other groups further east on the ridgetop. The sacbe to the south of Structure A21, if it in fact exists, may have been a different kind of roadway as no large groups have yet been identified to the southwest by preliminary and rather opportunistic reconnaissance. As such, this sacbe may have served as an entrance avenue for intersite interactions, possibly ending in a clear ceremonial terminus as does Sacbe 2 at Seibal (Willey, et.al., 1982).

Sacbeob have been suggested to have had quite diverse functions from boundary maintenance to ceremonial performance (Villa Rojas, 1934; Kurjack and Andrews, 1976; Kurjack, 1974 and 1979; Benavides, 1981; Folan, Kintz, and Fletcher, 1983; Folan, 1977 and 1991; Gillespie, 1991; Ringle and Bey, 1992; Ringle, 1993), but very little actual excavation has yet been conducted to support these proposals (Benavides, 1981; Folan, 1983; Willey, et.al., 1983). In the upcoming field seasons, the sacbeob and their associated features will be the focus of intensive survey and excavation headed by the author in an attempt to address the form, function, significance, and development of ancient Maya roadways.

Chronology

Despite the fact that XAP excavations on the ridgetop have been thus far conducted only within the groups previously identified in the Graham and Carbis map of 1978, we do have some sense of the chronology of the new areas from surface observations, and from limited excavations undertaken by Euan MacKie in 1959 and 1960 (MacKie, 1985:50-53). As mentioned above, ceramics examined from north of the site core appear to be of a Late Classic date (BV III or Spanish Lookout). Additionally, most of the surface ceramics observed in the eastern complex (fig. 6) fall easily within the Late Classic time period. While this date is based on field observations by the author and should not by any means be taken as definitive, MacKie also found predominantly Late Classic (BVIIIb) materials in his excavation of a "hut mound" in this same eastern complex (MacKie, 1985:53). MacKie excavated what he felt was a small structure with postholes for perishable walls, and the scars of his trenches can still be seen today in what may actually be a midden. In this area, MacKie recovered only limited amounts of earlier ceramics and he specifically states that no sherds of a Terminal Classic, or BV IV, date were encountered (MacKie, 1985:53).

This situation is strikingly reminiscent of the chronological pattern observed in the excavations south of the Castillo conducted last year principally by Sabrina Chase and Elisa Mendell (Chase, 1992; Ashmore and Leventhal, 1993). There as well, the heaviest occupation appears to have been during the Late Classic with a possible abandonment of the area during the Terminal Classic, at which time the Group A, B and D areas continued to be utilized and modified. While this pattern may indicate a constriction of settlement on the Xunantunich ridge during the Terminal Classic period, we do not now have enough data regarding these outlying areas and their use histories to be definitive.

Summary

Taken as a whole, the new map of Xunantunich reveals several interesting trends. In Group C most dramatically, and throughout the areas outside of the Group A core more generally, we have noticed the consistent use of minimally modified natural topography in the construction of buildings, platforms, and terraces. Many of these natural/human-made features seem impressionistically to be initial constructional efforts, and the dense, layered feeling of repeatedly reused locales is not evident on most of the Xunantunich ridgetop. This seeming 'shallowness' of constructional history may be a product of the proposed late rise of Xunantunich as a major political power in the Belize Valley during the Late Classic - from which time period we find the most artifactual and structural remains (Ashmore and Leventhal, 1993).

Another support for the present interpretation of Xunantunich as a late and short-lived center is the low settlement density on the ridge and its flanks. Jason Yaeger noted this "low structure density" in his initial survey of the Xunantunich reserve lands in 1992 (Yaeger, 1992). As he observed then, the settlement density of the immediate periphery of Xunantunich is considerably lower than the 200 str/km^2 density of the uplands surrounding El Pilar as recorded by Anabel Ford (Ford, 1990). While Yaeger's estimate last year of the structure density of the immediate Xunantunich periphery at roughly 100-120 str/km^2 seems to be fairly accurate if a bit high, many of those structures are quite small. As the situation now appears, the structure density of the Xunantunich ridge is fairly low and mostly localized in spatially discrete groups such as Groups D and B, the new groups identified this year, and at least two more sizable elite groups as yet unmapped (mentioned above). This is not to say that Xunantunich did not oversee a greater

supporting population, for the survey of the larger periphery of the site, begun this year by Jason Yaeger and Samuel Connell, has revealed dense and patterned settlement (Yaeger and Connell, this volume). We have simply noticed that on the Xunantunich ridgetop itself, settlement appears to have been late and limited.

In 1994, the survey of the remainder of the ridge to the east, a more intensive investigation of the ubiquitous quarries, as well as the initiation of excavations focusing on the causeways and related constructions should bring more clarity to our understanding of the organization and chronology of settlement and other activities on the Xunantunich ridge.

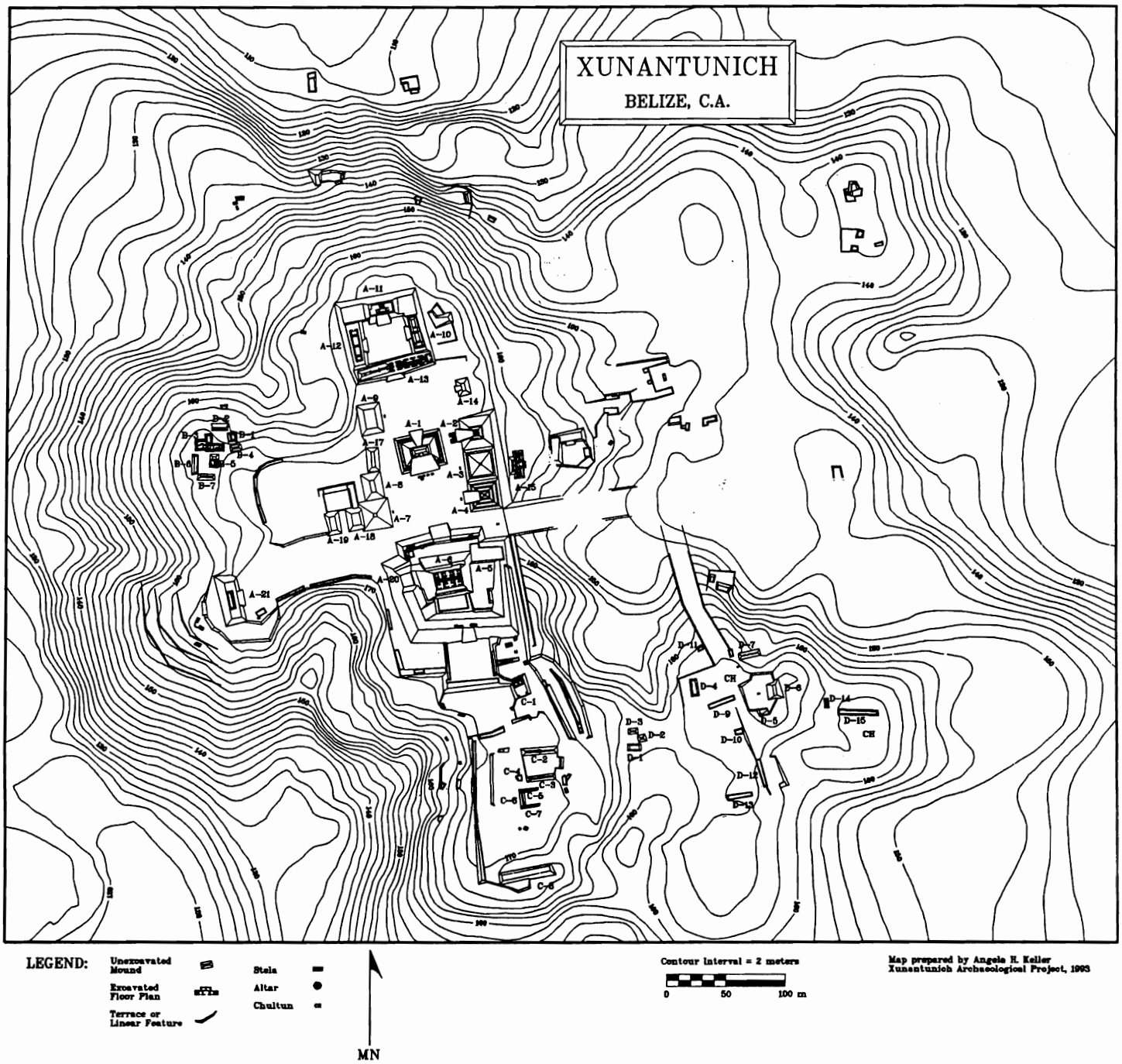


Figure 1. The Ruins of Xunantunich

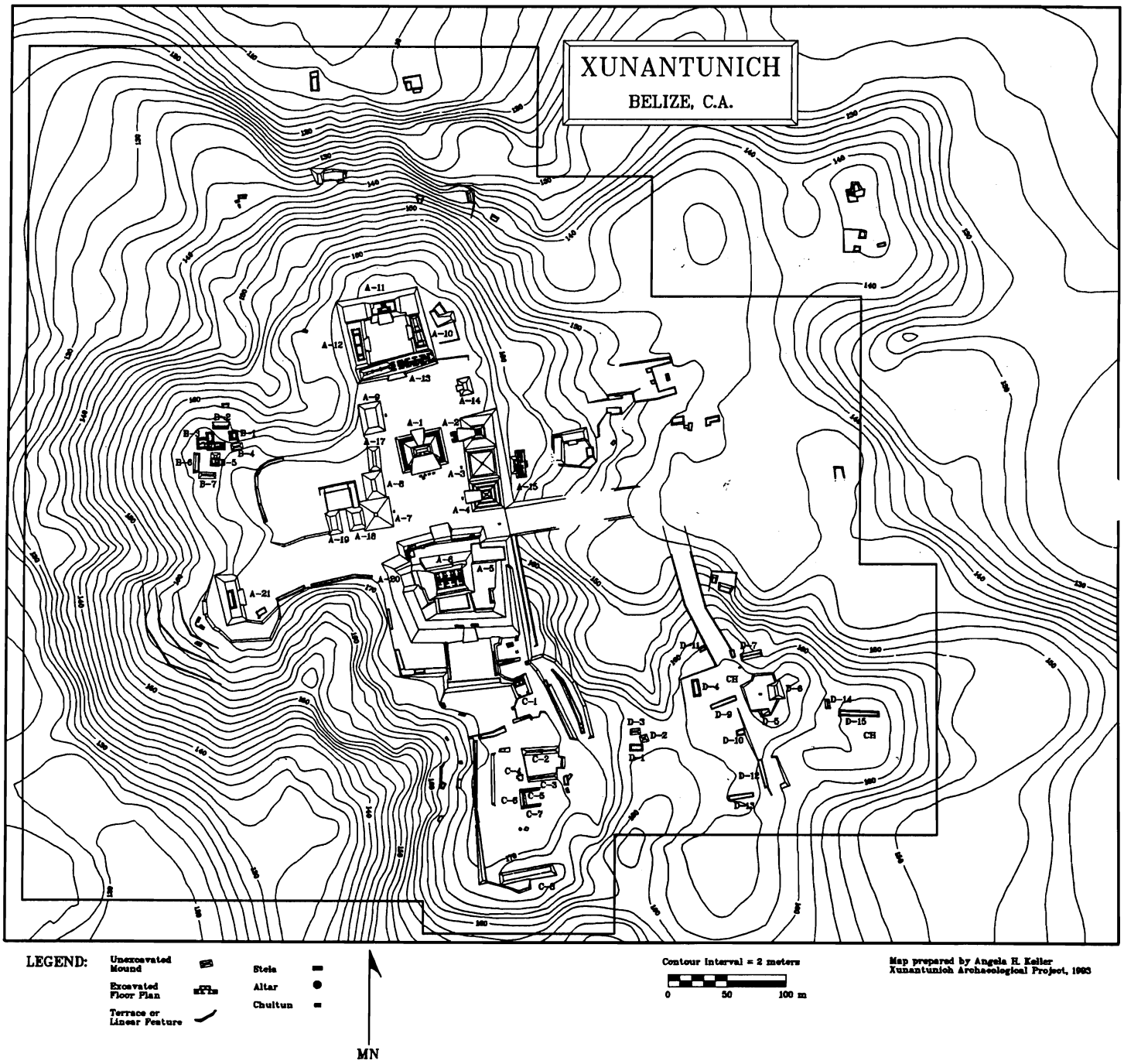


Figure 2. The Ruins of Xunantunich with 1993 survey area marked.

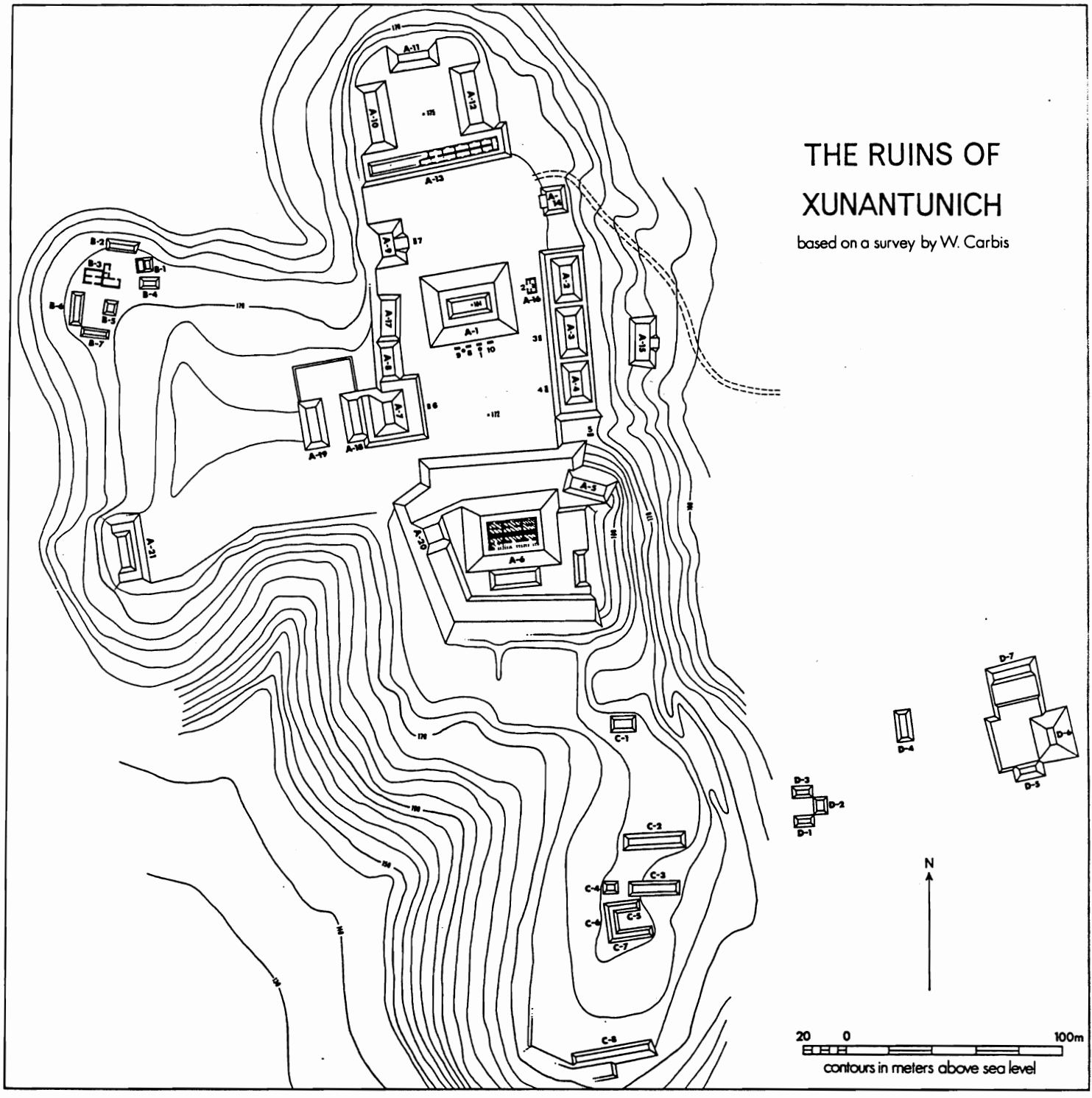
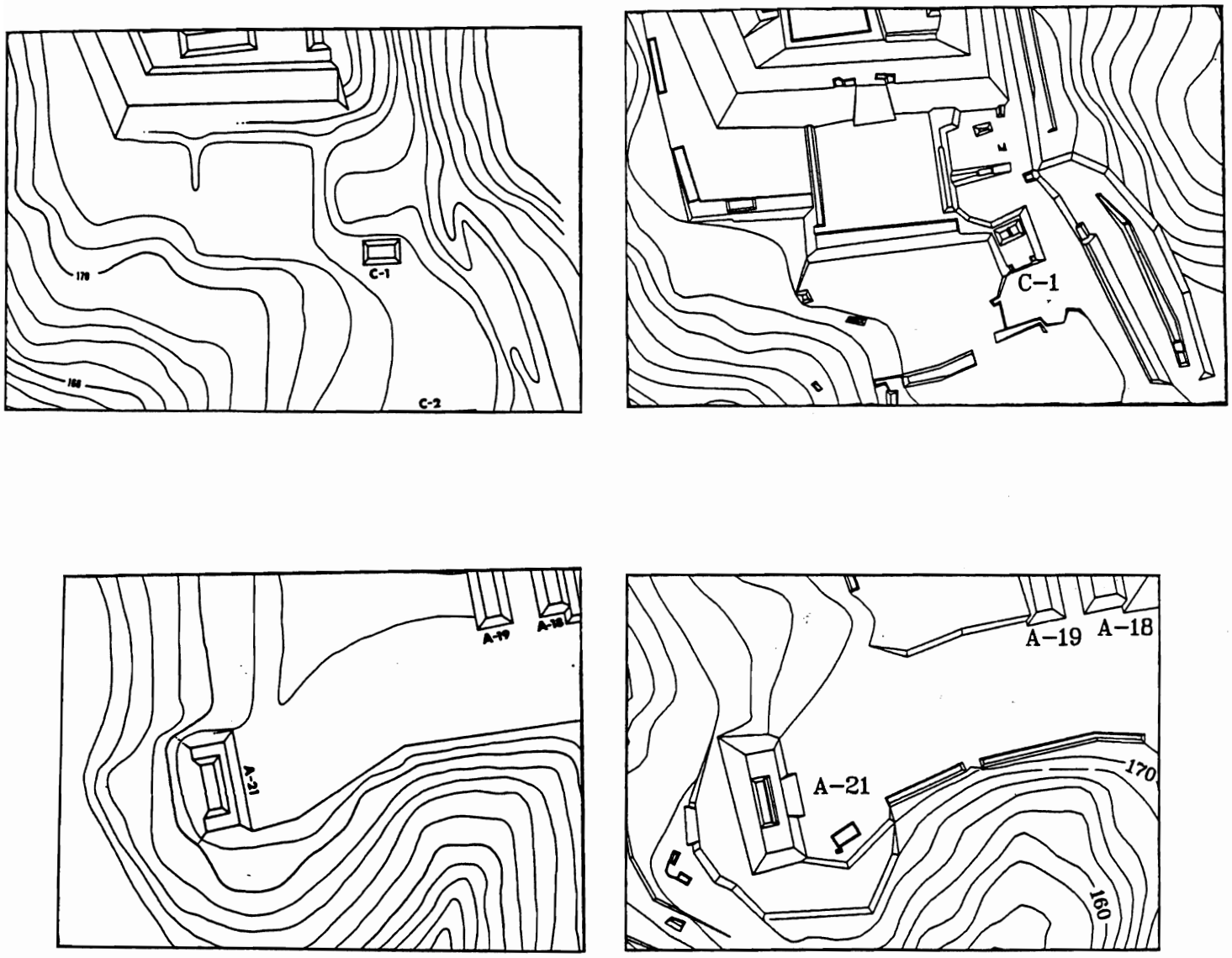


Figure 3. The Ruins of Xunantunich. Map compiled by Graham and Carbis. (from Graham, 1978:120).



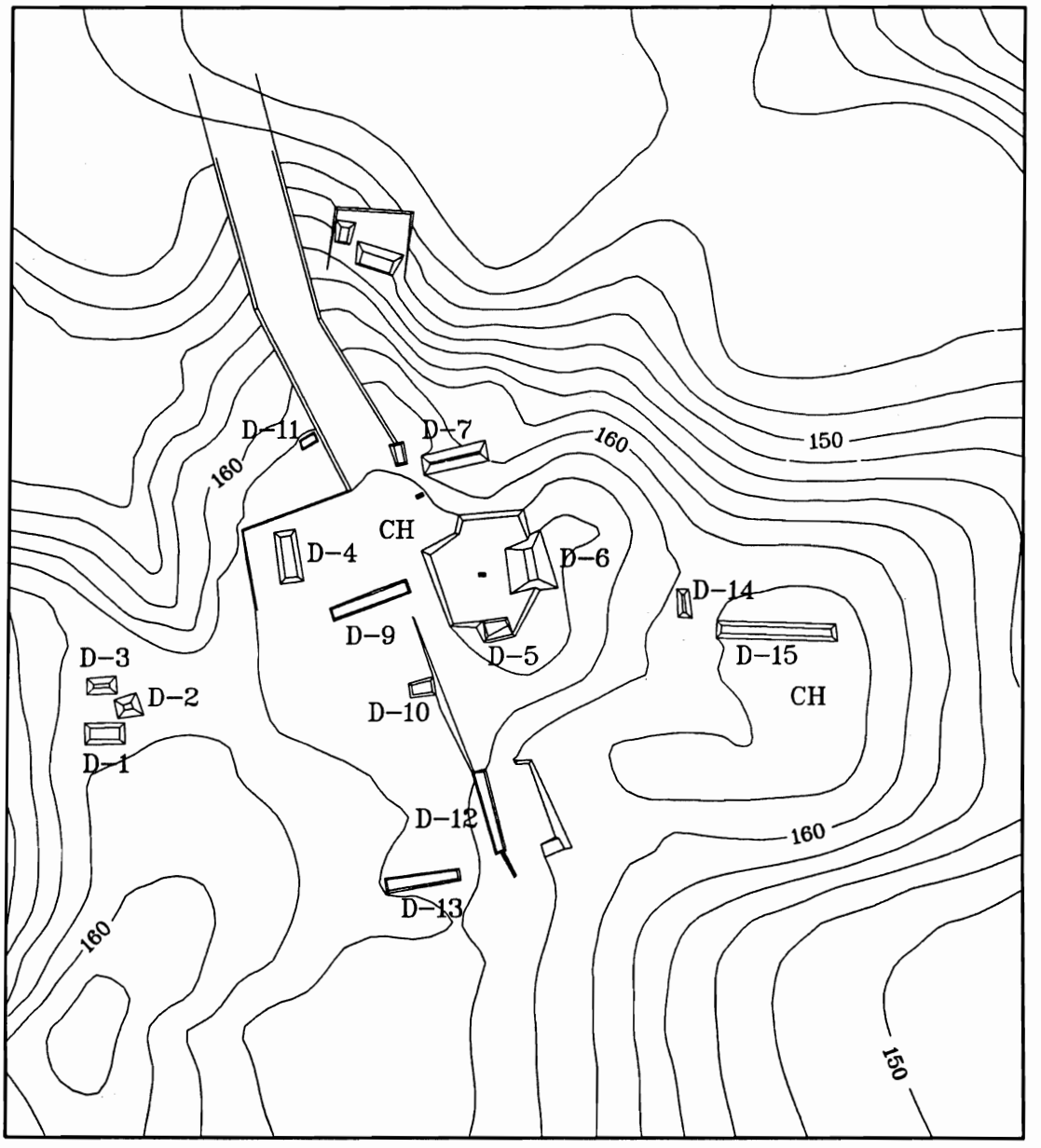
A. Keller / XAP 1993

Contour Interval = 2 meters

0 50 100m

Mag. N

Figure 4. Comparisons between the Graham 1978 map and the Xunantunich Archaeological Project 1993 map.



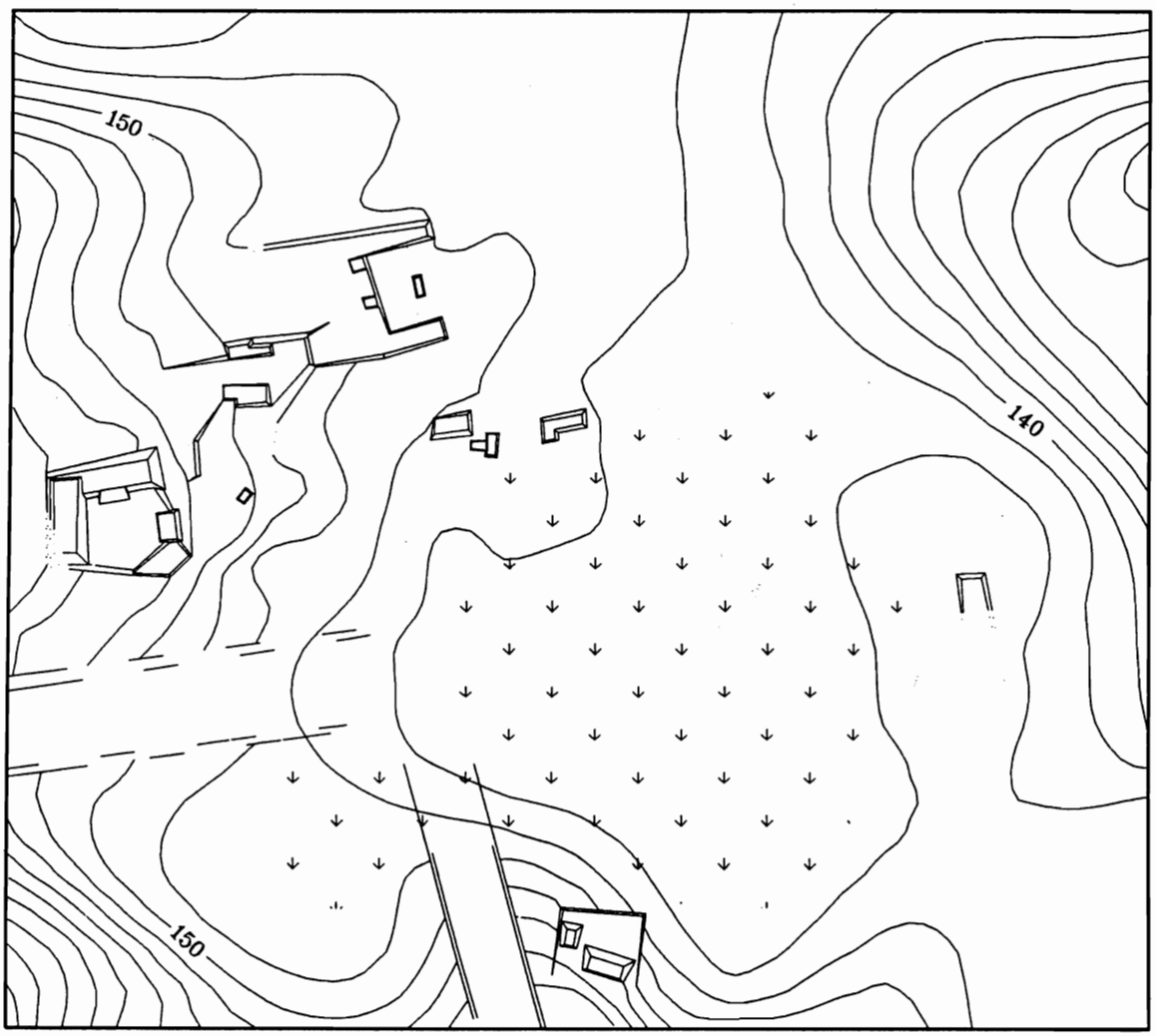
A. Keller / XAP 1993

Contour Interval = 2 meters

0 50 100m

Mag. N

Figure 5. Group D, Xunantunich



A. Keller / XAP 1993

Contour Interval = 2 meters

0 50 100m

Mag. N

Figure 6. Eastern Complex, Xunantunich

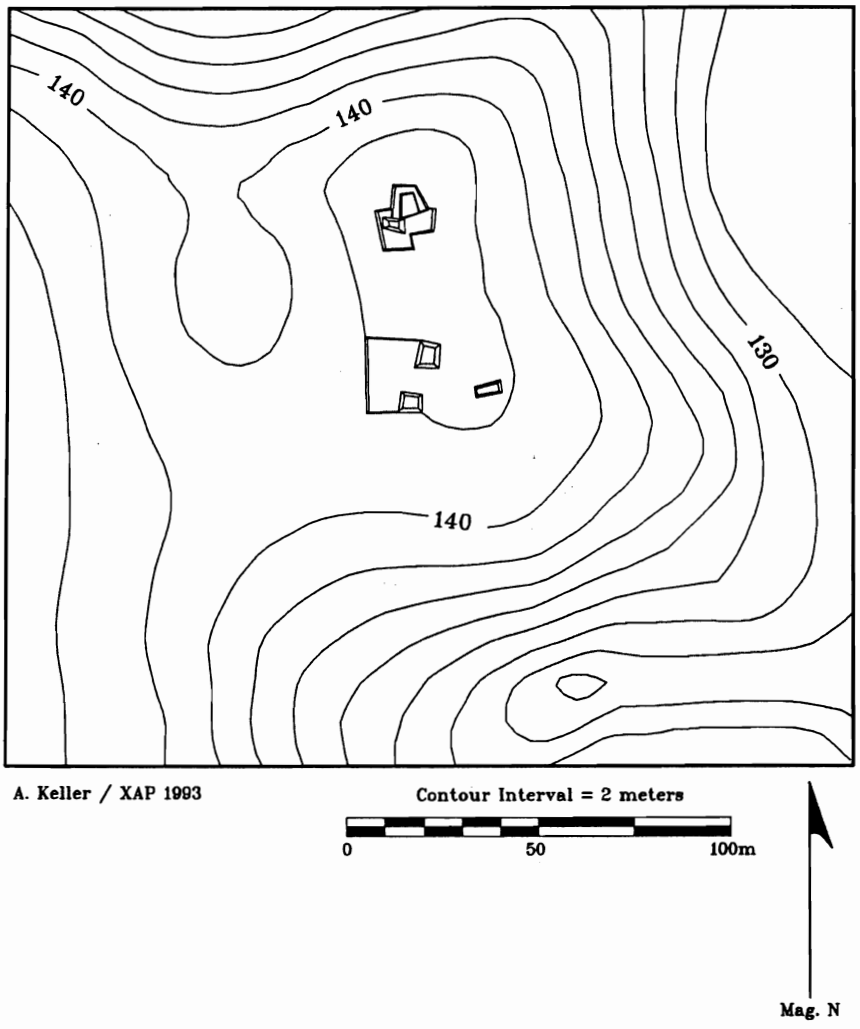


Figure 7. Group F, Xunantunich

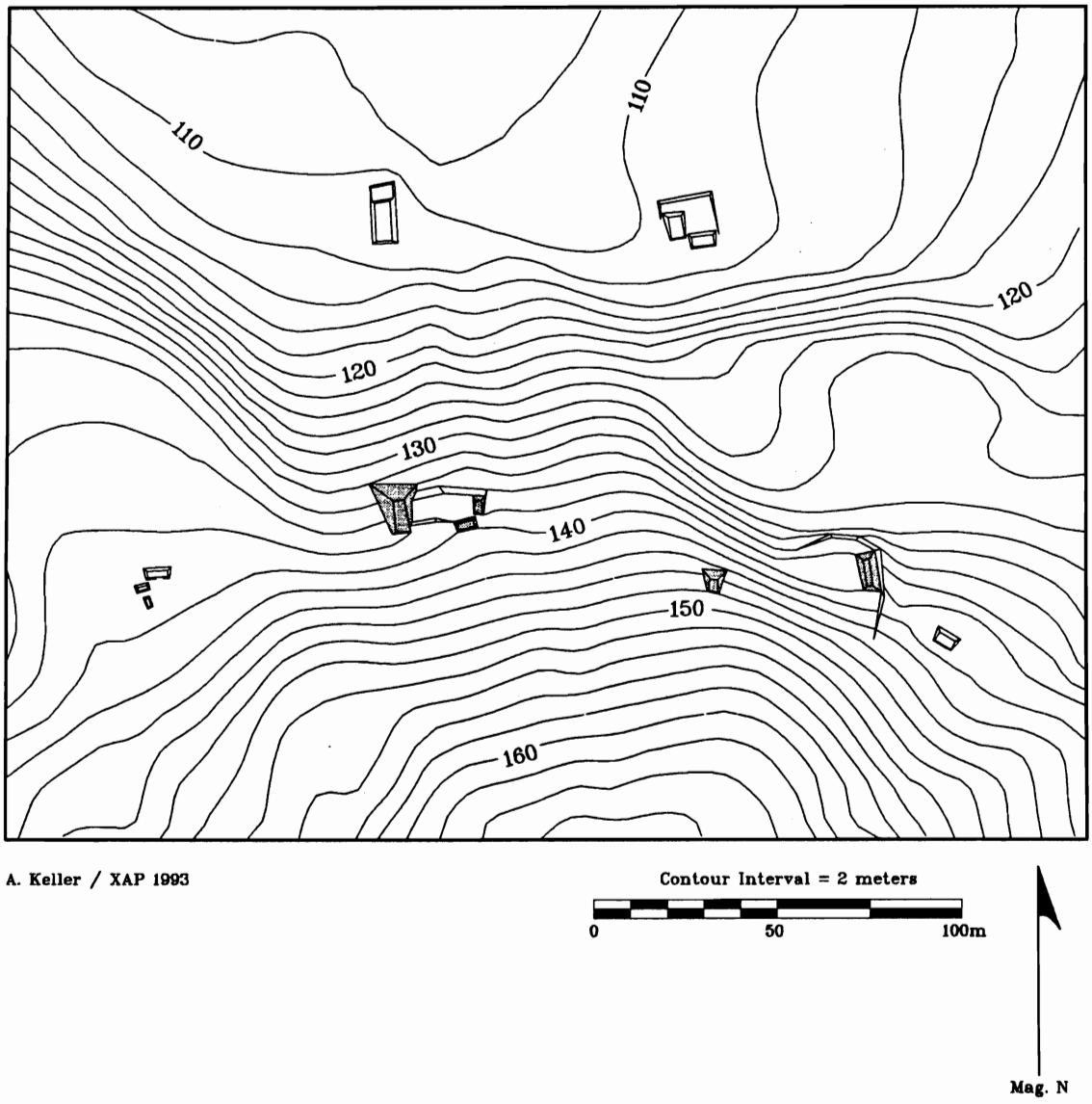
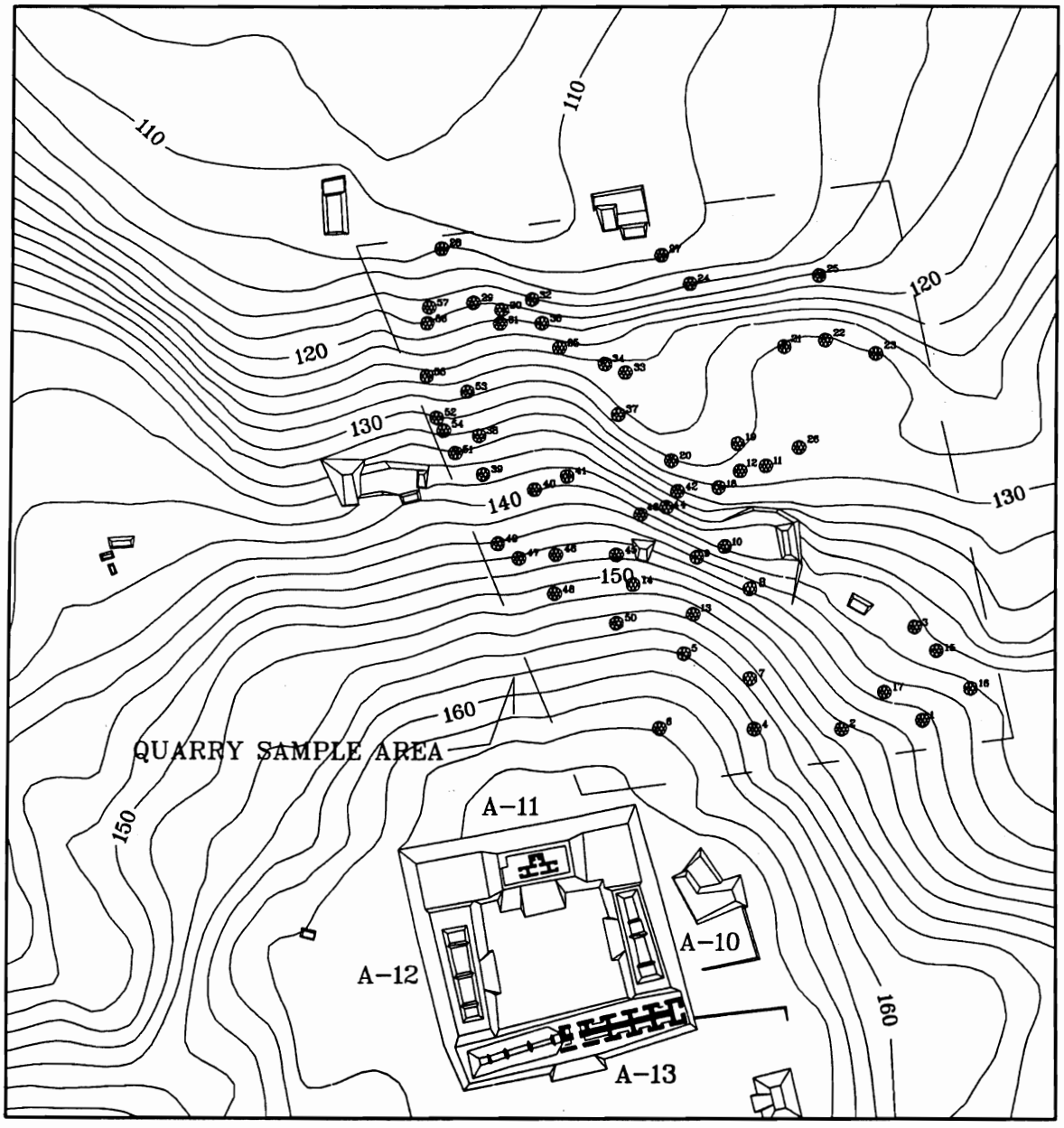


Figure 8. North Slope, Xunantunich



A. Keller / XAP 1993

Contour Interval = 2 meters

0 50 100m

Mag. N

Figure 9. Quarry sample area, Xunantunich

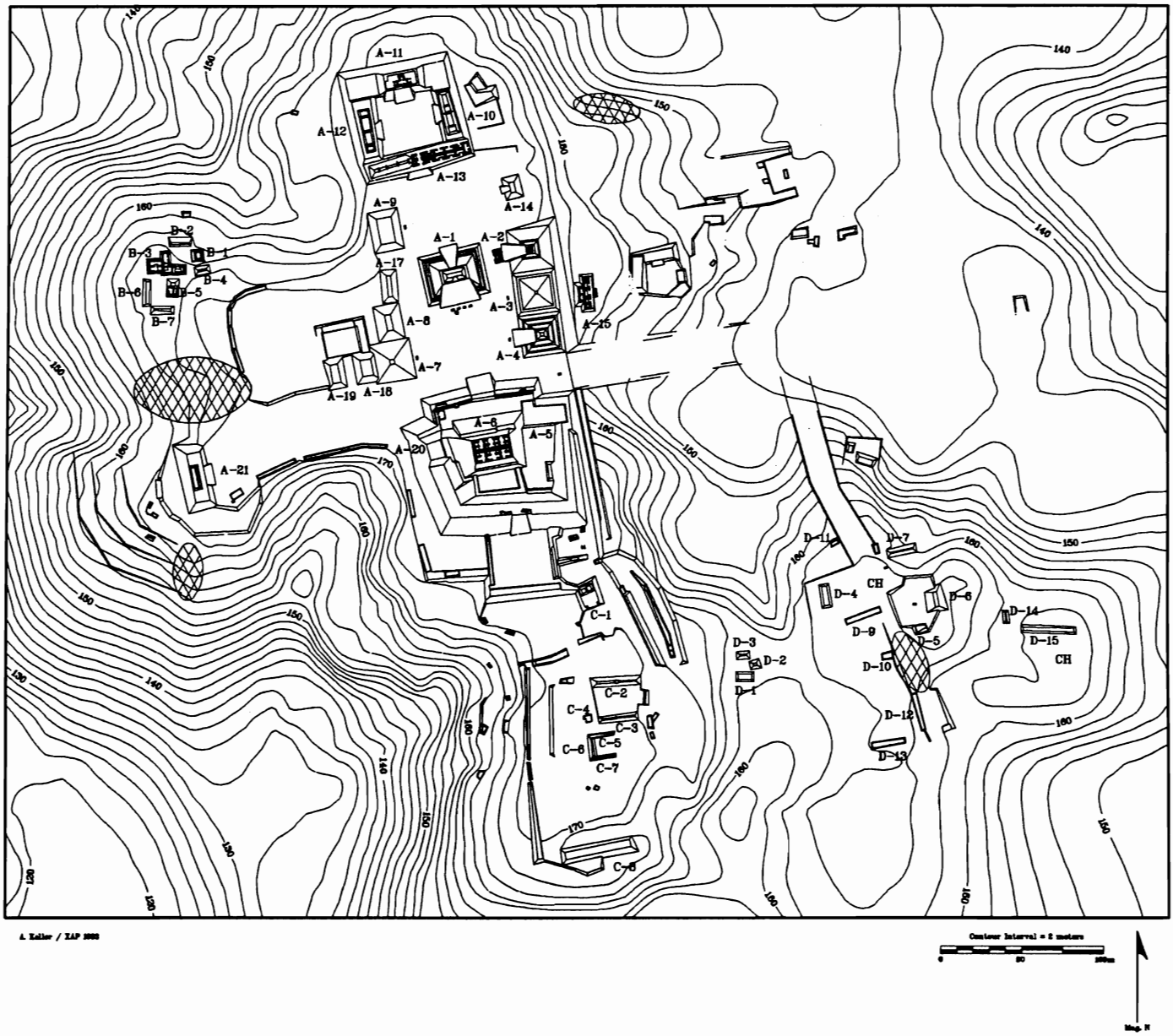


Figure 10. Large quarried areas, Xunantunich

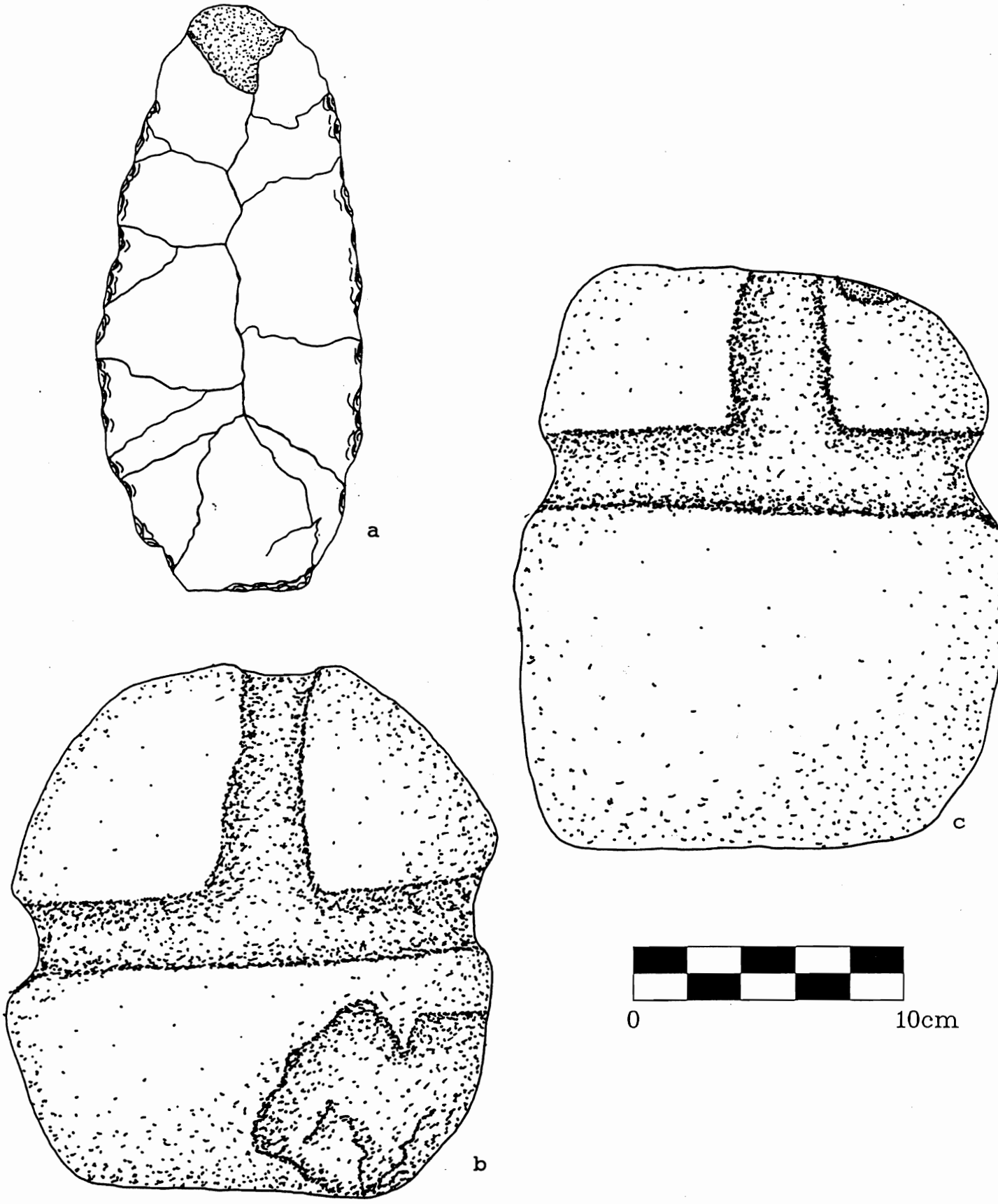


Figure 11. Artifacts found in ancient quarries.
(a) general utility biface, chert (no. 75B/1). (b) grooved weight, limestone (no.75A/1). (c) grooved weight, limestone (no. 5J/4-P1).

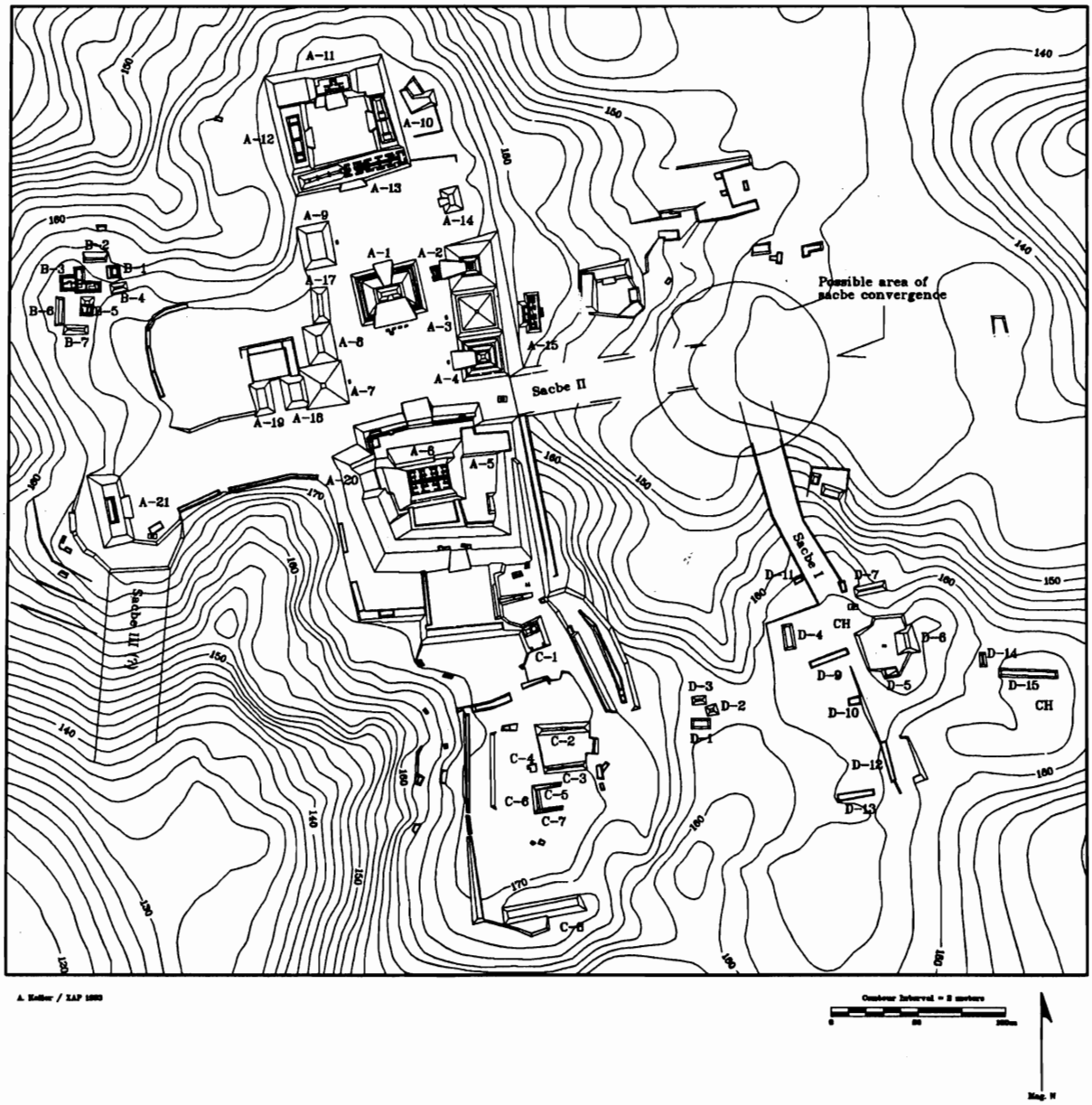


Figure 12. The Casueways of Xunantunich

Acknowledgments

The work summarized here was funded by an award from the University of Pennsylvania, Department of Anthropology Field Funds Program. I wish to thank the Department not only for the award which made my work possible this year, but also for the intellectual support which I have always received from its faculty and students alike. I would also like to thank individually Dr. Wendy Ashmore, Dr. Richard Leventhal, and Dr. John Lucy, without whose kind and patient guidance I would not have even begun the work reported here. Finally, Jim McGovern, Marcelo Torres, Jason Yaeger, and Samuel Connell deserve credit for their significant contributions to the mapping project this year. Each of them made me think more critically, helped me see where I had been blind, and worked with me on some truly mind-numbing tasks without losing their good humor.

References Cited

Ashmore, Wendy and Richard M. Leventhal
1993 *Xunantunich Reconsidered*. Paper presented at the Belize Conference, Univerisity of North Florida, Jacksonville.

Benavides C., Antonio
1981 *Los Caminos de Coba y sus Implicaciones Sociales* (Proyecto Coba). Coleccion Cientifica Arqueologia, Centro Regional Sureste. I.N.A.H., Mexico.

Carr, Robert F. and James E. Hazard
1961 *Map of the Ruins of Tikal, El Petén, Guatemala. Tikal Report Number 11.* Philadelphia: University Museum of the University of Pennsylvania.

Chase, Sabrina
1992 South Group Plaza 1 and Nabitunich Plaza Group. In *Xunantunich Archaeological Project, 1992 Field Season,* edited by Richard M. Leventhal. Department of Anthropology, Belmopan, Belize, C.A.

Folan, William
1977 *El Sacbe Coba-Ixil, un Camino Maya del Pasado.* Nueva Antropologia, 6:31-42.
1991 Sacbes of the Northern Maya. In *Ancient Road Networks and Settlement Hierarchies in the New World,* edited by Charles D. Trombold, pp. 222-229. Cambridge: Cambridge University Press.

Folan, William, Ellen R. Kintz, and Laraine A. Fletcher
1983 *Coba: A Classic Maya Metropolis.* New York: Academic Press.

Ford, Anabel
1990 Maya Settlement in the Belize River Area: Variations in Residence Patterns of the Central Maya Lowlands. In *Precolumbian Population History in the Maya Lowlands,* edited by T. Patrick Culbert and Don S. Rice, pp. 167-181. Albuquerque: University of New Mexico Press.

Gillespie, Susan D.
1991 Ballgames and Boundaries. In *The Mesoamerican Ballgame,* edited by Vernon L. Scarborough and David R. Wilcox, pp. 317-347. Tempe: University of Arizona Press.

Graham, Ian
1978 *Corpus of Maya Hieroglyphic Inscriptions.* Vol. 2(2). Cambridge: Peabody Museum of Archaeology and Ethnology.

Kurjack, Edward B.
1974 *Prehistoric Lowland Maya Community and Social Organization*. Middle American Research Institute, Pub. 38. New Orleans: Tulane University.
1979 *Sacbeob: parentesco y desarrollo de estado Maya, los processos de cambio n Mesoamerica y areas circunvecinas*. Sociedad Mexicana de Antropologia XV Mesa Redonda, Guanajuato.

Kurjack, Edward B. and E. Wyllys Andrews V
1976 Early Boundary Maintenance in Northwest Yucatan, Mexico. *American Antiquity*, 41:318-325.

MacKie, Euan W.
1985 *Excavations at Xunantunich and Pomona, Belize 1959-1960*. BAR International Series, Pub. 251. Oxford.

Ringle, William M.
1993 *Preclassic Cityscapes: Ritual Politics Among the Early Lowland Maya*. Paper presented at the Dumbarton Oaks Symposium on Ritual Behavior, Social Identity, and Cosmology in Pre-Classic Mesoamerica. Washington, D.C.

Ringle, William M. and George J. Bey
1992 *The Center and Segementary State Dynamics: African Models in the Maya Lowlands*. Paper presented at the Wenner-Gren Conference on the Segmentary State and the Classic Maya Lowlands. Cleveland State University.

Turner, Victor W.
1974 Pilgrimages as Social Process. In *Dramas, Fields, and Metaphors: Symbolic Action in Human Society*, pp.166-230. Ithica: Cornell University Press.

Villa Rojas, Alfonso
1934 *The Yaxuna-Coba Causeway*. Carnegie Institution of Washington 9(2):187-208.

Vogt, Evon Z.
1976 *Tortillas for the Gods: A Symbolic Analysis of Zinacanteco Rituals*. Cambridge: Harvard University Press.

Willey, Gordon, et al.
1982 *Excavations at Seibal*. Peabody Musuem of Archaeology and Ethnology Memoirs, No.15(1-2). Cambridge: Harvard University Press.

Wood, Denis
1992 *The Power of Maps*. New York: The Guilford Press.

Woods, James C. and Gene L. Titmus
1993 *Stone on Stone: Perspectives of Maya Civilization from Lithic Studies.* Paper presented at the Aniversario Katun Palenque Mesa Redonda, Palenque, Mexico.

Yaeger, Jason
1992 Xunantunich Settlement Survey. In *Xunantunich Archaeological Project, 1992 Field Season*, edited by Richard M. Leventhal. Department of Anthropology, Belmopan, Belize, C.A.

Survey And Excavation At Actuncan

James O. McGovern
University of California, Los Angeles

Introduction

The second archaeological field season at Actuncan, Belize consisted of two phases, a settlement survey, conducted from February to April 1993, and a test excavation program, conducted from April to June 1993. As in the previous season (McGovern 1992), this work was supported by and carried out under the auspices of the Xunantunich Archaeological Project, directed by Dr. Richard M. Leventhal of the University of California at Los Angeles. Additional support was provided by the UCLA Friends of Archaeology and the UCLA Department of Anthropology.

Objectives Of The 1993 Field Season

There were three primary objectives to the field investigations carried out during the 1993 season. The first objective was to complete a comprehensive settlement survey and map of the Actuncan site core and its immediate environs. This included a detailed exploration of Actuncan's northern precinct (Actuncan North), a portion of the site detected on aerial photographs after the close of the 1992 field season. The second objective was to construct a preliminary chronology for Actuncan North through the use of test excavations. The third objective, which was identified after the start of the 1993 season, was to compare the efficacy of structural stripping excavations with the test pitting of refuse deposits in determining structure functions.

At the close of the 1992 field season, our knowledge of Actuncan ended literally at the edges of the platform supporting the southern precinct's acropolis (the Actuncan South core was transit-mapped during the 1992 field season, see Fig. 1; cf. McGovern 1992, Fig. 1). Although we were aware of the probability of the site continuing for some distance to the north of the platform, we were unable to verify this in 1992 due to the onset of the rainy season.

Our belief that the site extended northward was based on two sources. First, we were told by local landowners and other informants that a number of large mounds were indeed present on the hilltop in that direction. Secondly, Willey et al. (1965:316) noted in their brief commentary on Actuncan that:

> Although no thorough exploration [of Actuncan] has been made to our knowledge, there are said to be two or three courts to the north of the main temple; however, no other large buildings are in evidence.

In October 1992, we received aerial photographs of the upper Belize River Valley. It immediately became apparent upon inspecting them that not only did the site extend northward, but that it was much larger than we had ever suspected. Thus, surveying and testing this newly identified portion of Actuncan became central objectives for the 1993 field season.

As the survey progressed, we realized that not only was Actuncan a relatively large site for the region, but random surface collections suggested that contrary to our conclusions from the previous season, it also possessed a long and continuous occupational history (cf. McGovern 1992). As a result of these discoveries, our perception of the role that the site might have played in the valley's history changed.

We had originally viewed Actuncan as a precocious but short-lived Late Preclassic/Protoclassic (300 B.C - A.D 250) ceremonial center. We believed its brief reoccupation in the Terminal Classic (A.D. 850-1000) was due to its role as the revered "ancestral" shrine for the burgeoning nearby city of Xunantunich (Ashmore and Leventhal 1993; McGovern 1992). Now, however, we have begun to consider the likelihood that Actuncan's presence had a more long-term impact on local social and political development.

In formulating this vision, our thinking benefited greatly from recent work undertaken by Joseph Ball and Jennifer Taschek (1991) at the nearby site of Buenavista del Cayo. Their model of a segmentary political organization at that site, as well as its hypothesized political role in the valley as a whole, served as a starting point for our own complementary investigations into the political character of Actuncan. We ultimately resolved to test and expand upon this earlier work.

From this decision emerged our third objective for the 1993 field season. Ball and Taschek (1991) utilized a methodology of extensive architectural stripping excavations in order to locate and identify use-related artifactual contexts. This artifactual data, in conjunction with architectural attributes, was used to define the

functions of the various structures at Buenavista. These functional assignments were central to the delineation of the site's political organization and structure. Thus, our third ambition this season was to test the practicality of using this same methodology at Actuncan. We also hoped to compare the results obtained in this manner to those procured using a test excavation methodology.

The Settlement Survey

In spite of the fact that our analysis of the aerial photographs of the region prepared us, in the fall of 1992, for a site two to three times the size of our original expectations, actually verifying this fact was probably the most exciting undertaking of the 1993 Actuncan field season. The aim of the initial phase of the settlement survey was merely to locate the mounds that we believed we had identified on the photographs. This exploration was then to be followed by a more formal survey and mapping program.

Relying on a rough sketch map based on the aerial photographs, and starting from the partially cleared Actuncan South platform, we cut trails northward through the jungle along an azimuth calculated to intersect the core of the newly identified precinct of the site. Within a week we had successfully located all of the mounds that we had identified from the photographs, plus a number that were too small to be visible from the air. After clearing a sizable part of the civic core of this portion of the site, which we designated Actuncan North (Fig. 2), we began a formal survey program which consisted of the cutting, exploration, and mapping of a series of transects.

We began by cutting three easily identifiable, roughly parallel, relatively permanent, and very long baseline transects (Fig. 3). These baselines consisted of barbed wire fences along the boundaries of the three major plots of land on which Actuncan is located. After clearing the jungle along these baselines, we transit-mapped them using a Total Station (a computerized laser transit). At the same time, we transit-mapped nine permanent monuments (steel rebar anchored in concrete) that we had placed in strategic locations throughout the Actuncan North civic core. We later cut and transit-mapped a fourth baseline transect, which did not follow a fence line, but was instead oriented toward the site of Xunantunich from the southern edge of the Actuncan South platform. Aside from spatially anchoring our subsequent survey transects (which were not transit-mapped), these baselines

and monuments served as known points for our pace-and-compass mapping program. In addition, the baselines provided excellent (though not all-encompassing) topographic data.

After establishing the baseline transects, we cut survey transects at right angles to them. We spaced the origins of most of the survey transects at 20 m. taped intervals along the baselines. We also attempted to keep the survey transects parallel to each other, and while we were not always successful in this endeavor, we did ensure that the survey transects remained quite straight. This proved a boon for our later pace-and-compass mapping program, as will be discussed below.

Once a survey transect was cut, we would walk along it and, to the best of our abilities, zig-zag between it and its two neighboring transects in an attempt to locate as many cultural features (mounds, modified terraces, lines of rock, sherd and/or rock scatters, etc.) as possible. Although quantitative estimates of our success rates in this enterprise are not available, I can provide a subjective evaluation.

At the time that the aerial photographs of the Actuncan area were taken, in 1977, the entire site, with the exception of the southern 2/3 of Actuncan South, was cleared cattle pasture. Since that time, this area, with the exception of the Galvez parcel of land in the north, has been allowed to revert to jungle (Fig. 4). As a result, Actuncan is presently covered with extremely thick secondary growth, especially on the Ranji parcel of land. We compensated for this in the northern core area by investing more effort in clearing the undergrowth than we otherwise might have done. In the areas outside of the core, however, the coverage provided by our survey transects varied. On the Ranji parcel of land, for example, the secondary growth was so thick that visibility was limited to the open path ahead, the cut plants on the trail beneath our feet, the walls of foliage on either side and, at times, the sky above. In contrast, on the Juan parcel of land there were some stretches where we were able to see the whole intervening 20 m. from one survey transect to the next. Most of the surveyed area, however, fell between these two extremes in terms of underbrush density and concomitant visibility. Thus, it is almost certain that the survey results suffer to some extent from unevenness, with more accurate and inclusive results for those areas with moderate plant cover, and correspondingly less accurate and inclusive results for those areas that were more overgrown.

In evaluating our results, therefore, I am reasonably confident that within the surveyed area we located the overwhelming majority, if not all, of the mounds of 1 m. or more in height. Mounds of less than 1 m. in height and low modified terraces are more problematical. In general, I believe we located most of these, although on the whole of the Ranji parcel of land and on those portions of the Manzanero parcel of land located to the south and west of Actuncan South, it is quite possible that we missed a few in this size range. As the cultural features became less conspicuous (e.g., lines and scatters of rock), the survey was probably less successful. On the Juan parcel of land, in all likelihood, we identified a good percentage of these features, while on the Ranji parcel, unless a survey transect passed directly over them, they were almost certainly missed. Finally, the discovery of sherd scatters in this heavy underbrush was purely serendipitous, rendering any determination of their representativeness impossible.

In conjunction with the exploratory investigations outlined above, we undertook a pace-and-compass mapping program of all identified cultural features. As alluded to earlier, by keeping the survey transects straight and by anchoring their origins and, in many cases, their termini as well, on the transit-mapped baselines, we were able to use them to maintain quite accurate spatial control. The extent to which the topography negatively impacted this control (by hindering our ability to keep the survey transects straight) was, in my opinion, minor, and in any event, it was confined primarily to those areas surveyed to the south and east of the core areas where few features were discovered. Thus, the survey transects served as de facto "known lines", and the greatest source of error was introduced through our bids to determine our locations *along* these lines by pacing. This error, while minor over most of the site, likely increased to the south and east of the core areas as the topographic relief became more extreme.

The 1993 Actuncan Site Map

In introducing the revised Actuncan site map (Fig. 5), it should be noted that for a number of reasons, not the least of which was time, we limited our survey to the Actuncan site cores and their immediate environs. This does not imply, however, that extensive and important settlement associated with Actuncan does not lie outside of the surveyed area. On the contrary, we are aware of at least three dense concentrations of cultural features in very close proximity to the site (Fig. 6). Covering the slope of a low hill located in the bend of the river to the southeast of

Actuncan are a number of relatively large (up to 2 m. high) mounds situated on apparently modified terraces. This area appears to have been an elite residential area. On the flood plain bordering the river to the east and north of Actuncan lies a veritable profusion of cobble mounds. Although larger and more numerous (numbering in the hundreds) than the cobble mounds investigated by Jon VandenBosch (1992 and this volume) on the opposite bank of the river, they nevertheless resemble them in shape and composition. At this time their original functions remain a mystery. Finally, immediately to the west of Actuncan North the land slopes down to a small permanent stream. This hillside, presently functioning as cattle pasture, and thus cleared of brush, is covered with low mounds, arranged singly and in patio groups. These mounds presumably formed a non-elite residential area. This list does not include a number of large (up to 2 m.) platforms and mound clusters located on the river terraces several hundred meters to the north of Actuncan, whose past affiliation with the site is unknown.

The new site map (Fig. 5; cf. McGovern 1992, Fig. 1) reveals Actuncan as a fairly large and complex center. The natural hilltop on which Actuncan is located appears to have been considerably modified, and an aguada is located within the boundaries of the site. Over eighty structures have been identified in the surveyed area. Most of these structures are grouped around six or seven formal plazas. Numerous structures are clustered into courtyard or patio groups, and the southern precinct forms an acropolis. The labor investment in architecture at the site was substantial. Structure (Str.) 4, the main temple-pyramid at Actuncan South and the tallest building at the site, rises to over 27 meters (see Figs. 1 and 2 for structure designations). Str. 23 tops 10 m., five structures (Strs. 5, 6, 15, 19a, 27) fall into the 7 m. to 9 m. range, and numerous others belong to the 4 m. to 6 m. category. One structure, Str. 26, extends for over 140 m. in length. The platform that supports Actuncan South measures approximately 72x120x4 m., for a total volume of over 34,000 cubic meters.

Based on the form (cf. Morley 1983:261-263), spatial arrangement (cf. Ashmore 1981), and size of the various structures at Actuncan, a number of preliminary inferences may be drawn in reference to functional divisions within the site. Plaza C, which is bounded by several temple-pyramids and encloses the site's only ball court, and Actuncan South (Plaza A), an acropolis which supports three major temple-pyramids in a triadic arrangement, both appear to have been major

ceremonial precincts. The visually dominant Actuncan South, however, was probably the more important of the two. Plaza D resembles a high-status elite residential complex, with its closely spaced arrangement of moderately sized mounds and a raised courtyard group. Plazas E and F, on the other hand, exhibit more mixed aspects. Bounded on the west by Str. 26, a long range-type construction, Plaza E seems to combine administrative and elite residential functions. Plaza F, also bordered by Str. 26, faces a large temple-pyramid, Str. 23, and appears to combine administrative and ritual characteristics. Topographic demarcation led us to tentatively define the apparently residential Plaza G in spite of the loose spatial integration of its low mounds and patio groups.

One aspect of the site deserves special comment. Aside from its obviously modified eastern boundary, with its enigmatic chute-like feature, Plaza B seems to be almost devoid of cultural features (Fig. 5). Given the site's overall layout, with Str. 19a (Fig. 2) looking down the ball court alley at the massive Str. 4 (Fig. 1) in the distance, it is quite possible that Plaza B was always open, serving to accentuate the monumentality of Actuncan South. It is also possible that since this parcel of land was the most heavily overgrown, our survey simply missed more cultural features here than in other areas of the site. Unfortunately, a third possible explanation also exists. We were notified by informants that about five years ago much of the parcel of land on which Plaza B is located was bulldozed in preparation for the planting of citrus groves (as it turns out, the groves were never planted). We do have fairly convincing evidence that this occurred on the lower terraces closer to the river. A large square platform with an estimated height of approximately 2 m. is clearly visible on the first river terrace in the 1977 aerial photographs (see Figs. 3 and 6; the structure is indicated with dotted lines). This same location now contains a large scatter of rocks. Whether this same fate befell the topographically higher Plaza B must, for the present, remain speculative. The question is of some interest, however, because of the tantalizing linear form of Str. 11 (Fig. 2), and some enigmatic features visible on the aerial photographs of the site, but not detectable on the ground (see below).

Str. 11 is a very long, straight, level platform extending from the base of Str. 12 toward Actuncan South (Fig. 2). Its eastern edge is a little over a meter above the surface of Plaza C, which it helps to define. The ground surface slopes up to the west beneath Str. 11, so that its western edge is little more than a half a meter above the

surface. This structure was the first one discovered in the northern precinct, and our initial reaction was that it might be a causeway. However, as we cleared its surface to the south, it quickly tapered off and disappeared. We had a similarly disappointing experience trying to find a series of very low mound-like features visible on the aerial photographs. These features, located on the photos to the east of Str. 11 at approximately its present southern extent, are too indistinct to be positively identified as structures from the air. In any case, we could not find them on the ground.

Excavations In the Northern Precinct

We had two excavation-related goals this season. The first goal was to use test pits in an effort to construct a preliminary ceramic-based chronology for the newly discovered Actuncan North. The second goal was to compare the usefulness of structural stripping excavations with the test pitting of refuse deposits for functionally defining structures. These goals were not mutually exclusive; in fact, all of the excavations completed in pursuit of the second goal were also useful in constructing the site chronology. A detailed ceramic analysis was performed by Ellen Bell (this volume), with extensive assistance by Lisa LeCount. While the following discussion draws heavily on this analysis, any errors or omissions are my own.

Table I
1993 Operations

Operation	Location
91	ball court alley, Actuncan North
91A	center of alley
92	Str. 15, Actuncan North
92A	north terrace
92B	north terrace
92C	north terrace
93	Str. 18, Actuncan North
93A	off southern edge of structure
96	Str. 26, Actuncan North
96A	south end, summit (Str. 26a)
96B	southeast corner
96C	south end, summit (Str. 26a)
96D	southwest corner (intersection w/ Str. 29)
96E	south end, summit (Str. 26a)
96F	south face
96G	south end, summit (Str. 26a)
98	Str. 31, Actuncan North
98A	west end, summit
98B	south face
98C	north face
98D	west end, summit
98E	southeast corner (intersection w/ Str. 32)
98F	southeast corner (intersection w/ Str. 32)
98G	southeast corner (intersection w/ Str. 32)
98H	south of structure (Plaza C)
99	Str. 28, Actuncan North
99A	off eastern edge of structure
99B	off eastern edge of structure

Seven excavation operations were defined at Actuncan during the 1993 season (Table I). In keeping with our excavation goals, all were located within the Actuncan North site core. One operation (Op. 91) was placed so as to uncover a series of sealed contexts (ball court alley surfaces), one operation (Op. 92) was sited to reveal a series of construction episodes, three operations (Ops. 93, 99, 100) were specifically placed to uncover refuse deposits, and two operations (Ops. 96, 98) were designed to test the effectiveness of structural clearing excavations.

The Actuncan North Ball court Alley (Operation 91)

To date, only one ball court has been identified at Actuncan. Located in the western portion of Plaza C, Actuncan North, it includes Strs. 13 and 14 (Fig. 2). Exploration of the ball court during the 1993 season was limited to the alley itself (Op. 91). Future excavations, if any, into the individual ball court structures will be defined as separate operations. The work included a single 2x2 m. test unit (Op. 91A) in the center of the ball court alley. The objective of the excavation was to reveal a sequence of superimposed ball court alley surfaces/floors. It was hoped that this series of sealed contexts would prove valuable in constructing a ceramic-based chronology for the site.

The excavations revealed a series of six plaster floors and one plastered platform before reaching sterile clay. In the exact center of the unit we discovered a Late Classic II (A.D. 700-850) cache which intruded through the five earliest floors (Floors 2-6). The cache, which was contemporaneous with the final plastering episode (Floor 1), contained at its base at least two ceramic pots, perhaps heirlooms, which dated to the Late Preclassic/Protoclassic, as well as a single bone which, while not yet identified, may be of marine origin. The five earlier floors dated, in descending order, to the following periods: Floor 2 - Late Classic II; Floor 3 - Late Classic I (A.D. 600-700); Floor 4 - Protoclassic (A.D. 1-250); Floors 5 and 6 - Late Preclassic (300 B.C. - A.D. 1). Below Floor 6 we uncovered a crudely plastered Middle Preclassic (1000-300 B.C.) platform edge. At a depth of approximately 1.6 m. below the surface we encountered sterile clay, and we terminated excavations at 2.2 m. below the surface. Since we did not continue the excavations laterally to the ball court structures, their stratigraphic and temporal relationships to the ball court alley floors are presently unknown.

Structure 15 (Operation 92)

Str. 15, a probable temple-pyramid, defines the southern edge of Plaza C, Actuncan North (Fig. 7). The structure consists of an 8 m. tall central pyramid flanked on the north and south by broad terraces which are elevated 2 m. above the plaza surface. The central pyramid sports a very large looter's pit at its summit. A third, very thin terrace skirts the western edges of the central pyramid and the south terrace, and is elevated 1 m. above the plaza surface. The eastern edge of the north terrace steps down one meter to a 24x32 m. platform. The southern edge of this platform and the eastern face of the central pyramid drop steeply to a lower, artificially modified, occupational terrace.

This season's investigation of Str. 15 (Op. 92) consisted of three suboperations, Ops. 92A-C, which together formed a single 3x1 m. test unit. The unit was placed axially on the north terrace of Str. 15, at the juncture of the terrace surface and the north face of the structure's central pyramid. This unit was semi-experimental in nature. We began with two assumptions; first, that the final form of Str. 15, like that of many Maya buildings, was the result of a series of superimposed construction episodes, and second, that the construction episodes of the terrace roughly mirrored those of the central pyramid. Our objective was to chronologically define the general construction sequence of the structure with as little excavation as possible. The placement of the excavation unit, therefore, was an attempt to avoid a massive and destructive trenching operation into the core of the structure which, in any case, was horribly disturbed by the looter's pit. Happily, we achieved this goal.

Our excavations revealed five construction episodes, and were terminated, not because we encountered sterile levels, but because the unit constricted to a size that made further work impossible. The earliest construction phase we identified (but not necessarily the earliest in the structure) was a platform or terrace faced on the north by a beautifully constructed cut stone retaining wall (Retaining Wall 3). This wall had at least three courses, and was battered at a 19° angle. Our excavations did not penetrate this construction feature, so the only comment that can be made about its temporal position is that it predated the Middle Preclassic construction feature (Retaining Wall 2) beneath which it was sealed.

This later feature consisted of a red and black painted and plastered retaining wall (Retaining Wall 2), which was battered at a 21° angle, and a well preserved

plaster floor (Floor 3) extending northward from its base. All of the diagnostic ceramics discovered in the floor ballast and the underlying dry-laid core dated to the Middle Preclassic. Later in the Middle Preclassic, Floor 3 was buried with the construction of another plastered surface (Floor 2). This floor also concealed the base of Retaining Wall 2, but left its upper half exposed. At some time after the construction of Floor 2, a portion of Retaining Wall 2 was destroyed in order to accommodate the building of Platform Edge 1. The platform edge we uncovered extended northward from the face of the central pyramid, and although our excavations did not penetrate this feature, it obviously postdated the Middle Preclassic Floor 2, on which it rested, and predated the structure's final Late Classic II construction phase, beneath which it was sealed.

This final construction phase consisted of an eroded plaster surface (Floor 1) that abutted a single course of cut blocks (Wall 1). The underlying fill included mixed Middle Preclassic, Late Preclassic, Early Classic (A.D. 250-600), Late Classic I, and Late Classic II ceramics, leading us to assign it a Late Classic II construction date. Levels stratigraphically higher in the sequence than these features exhibited no evidence of a later occupational surface which may have eroded away in antiquity. This possibility can not be completely discounted, however, especially given the condition of the final occupational surfaces discovered on several other buildings we investigated this season (see below). Instead, the lots excavated above Floor 1 appeared to be mixed collapse and looter's debris, and included ceramics dating from the Middle Preclassic through the Late Classic.

In conclusion, the initial construction of Str. 15 took place at least as early as the Middle Preclassic, and the building underwent extensive modification prior to and during the Late Classic II period.

Structure 18 (Operation 93)

Str. 18 is a low mound located on a narrow, artificially modified, occupational terrace to the east of Str. 15, just off the southern edge of the modified hilltop on which the Actuncan North core was built (Fig. 7). Random surface collections indicated a high sherd concentration on the downslope (south) side of the mound. In the hope that the sherd concentration signified the presence of a stratified refuse deposit or midden, we placed a single 2x1 m. test unit (Op. 93A) axially off the

mound to the south (downhill). Our goal was to obtain both chronological and functional information about Str. 18.

We terminated excavations at a depth of 2.5 m. below the surface of the ground, although the final .4 m. of the sequence consisted of nothing more than sterile clay. Above this sterile layer was .6 to .8 m. of hard-packed clay containing a very small quantity of Middle Preclassic and Early Classic sherds. Overlying the clay, however, was a 1 m. thick refuse deposit, the bottom .7 m. of which contained pure Early Classic material. This Early Classic deposit extended beneath a platform edge of two or three courses of roughly cut stone which paralleled the northern edge of the unit. The upper .3 m. of the refuse deposit, which consisted of mixed Middle Preclassic through Late Classic artifacts, abutted and apparently postdated the platform edge. Aside from large numbers of ceramics, the entire refuse deposit sequence also contained numerous chert artifacts, obsidian blades, bones and teeth, and marine and terrestrial shells. The refuse deposit was capped by a layer of collapse debris and overburden.

These findings suggest that this portion of the site was probably not utilized to any great degree until the Early Classic. At that time, refuse began to collect, ostensibly associated with the construction and use of Str. 18. By the Late Classic (A.D. 600-850), the platform whose edge we uncovered was built, perhaps as an addition to Str. 18, and by the Terminal Classic, use of the structure had ceased.

Structure 26 (Operation 96)

Str. 26 is a large range-structure separating Plazas E and F, and defining the northeast boundary of Actuncan North (Fig. 2). At its midpoint stands a 7-8 m. tall pyramid (Str. 27), while its southern end intersects with Str. 29 in an L-shaped configuration. Str. 26 measures 140x17 m., and ranges in height from 2 m. at its southern end to a maximum of 4.5 m. as the topography slopes downward at its northern extreme. The long rectangular summit of the building is remarkably level along its entire length, suggesting that, at least in its final form, it did not support free-standing stone walls.

The purpose of our investigation of Str. 26 was to determine whether we could use artifactual assemblages to define the role performed by the building in ancient times. In conjunction with this goal, we planned to compare the quality and

breadth of the results obtained using two different excavation approaches, clearing operations and test pits, in the hope that this evaluation would permit us to make informed decisions about their usefulness and cost-effectiveness for future work at the site. It eventually became apparent, however, that neither strategy was providing us with the type of data which would permit detailed functional interpretations.

Excavations of Str. 26 (Op. 96), while more extensive than those undertaken on most other buildings at the site this season, were, nevertheless, confined to the very southern end of the building (Fig. 8). Four contiguous 2x1 m. units (Ops. 96A, C, E, G) were opened on the summit of the structure's southern end, while two more 2x1 m. pits were located around its base on the southwest and south (Ops. 96D and F, respectively). Operation 96B, another 2x1 m. unit, was positioned in the interior corner created by the intersection of Str. 26 with Str. 29.

Operations 96A, C, E, and G, the summit excavations, were clearing operations whose goal was to locate use-related contexts associated with the building's final occupation. The excavations revealed, however, that the final occupational surface had been destroyed - the victim of a millennium of erosion. In spite of this discovery, we continued one unit (Op. 96A) to a depth 1.2 m., ceasing excavations upon encountering a plaster floor (Floor 3). This floor was overlain by two later plaster floors (Floors 2 and 1), and a penultimate platform (Platform 1) which had been buried by the final construction phase. All of these construction features except the earliest floor (Floor 3), which we did not penetrate, contained diagnostic Middle Preclassic and Early Classic ceramics in their fill.

In contrast, Ops. 96B, D, and F, were test pits placed in areas where trash was likely to have collected. The lack of refuse uncovered by these operations indicates that these areas must have been regularly swept clean up until the site's abandonment. Op. 96B was located in Plaza E, in an interior corner at the intersection of Strs. 26 and 29. While we did not discover a refuse deposit, we did uncover several construction features. These included a retaining wall on the east side of Str. 26, a retaining wall on the north side of the extension from Str. 29, which abutted Str. 26, a plastered surface which probably formed a terrace on the north side of Str. 29, and Plaza E, Floor 1. Our excavations did not penetrate any of these construction features, but it appeared that the plaza floor was the earliest

construction, that the Str. 26 retaining wall was built subsequently, and that the Str. 29 retaining wall and terrace surface were built simultaneously as the latest construction phase uncovered in this unit.

Op. 96D was placed in Plaza F at the southwest corner of Str. 26 in another attempt to find refuse. Although no refuse was forthcoming, we did expose the remnants of a retaining wall on the west side of Str. 26, and a portion of Plaza F, Floor 1. This floor lipped up onto the wall, suggesting that it either postdated or was contemporaneous with the wall's construction.

Our final attempt to find refuse was Op. 96F, located on the south face of Str. 26. Once again, we discovered an absence of trash. We also uncovered two construction features, Floor (?) 1, a well preserved but unusual (hence the question mark after the word Floor) plaster surface which sloped downward to the south at an 18° angle, and a layer of fill which buried this floor. The occupational surface of this final phase of construction had long since eroded away, but based on the ceramics recovered from its fill, it probably dated to the Late Classic.

In conclusion, it seems apparent that Str. 26 was initially constructed by the Early Classic, at which point it was modified a number of times. Its final modification took place during the Late Classic, and it was probably abandoned by the Terminal Classic. Prior erosional destruction of the structure's final occupational surface stymied attempts to recover use-related contextual material, while the lack of refuse deposits associated with the structure's use indicated that Actuncan North's core occupants disposed of their trash elsewhere.

Structure 31 (Operation 98)

Str. 31 is a 4 m. high pyramidal mound separating Plazas C and F, Actuncan North (Fig. 2). A narrow terrace along its eastern face projects to the southeast and intersects with Str. 32, a low rectangular extension from the Str. 33-35 platform. A small looter's pit on the eastern facade of Str. 31, just below its summit, reveals a masonry wall of cut blocks.

As with the excavation of Str. 26, the objective for our work on this building was to compare the usefulness of stripping excavations with the test pitting of refuse deposits in determining the structure's function. Our results mirrored those

obtained from the aforementioned excavations, to wit: the absence of a final occupational surface and a dearth of refuse around the structure's base.

Op. 98 consisted of eight excavation units on or near Str. 31 (Fig. 9). Two 2x1 m. units (Ops. 98A and D) were placed end-to-end at the western edge of the structure's summit, two units were positioned perpendicularly to the structure's north and south faces (Ops. 98C and B, respectively), three units (Ops. 98E, F, and G) were joined to form a 2x1 m. test pit in an interior corner formed by the intersection of Strs. 31 and 32, and a single 1x1 m. test pit was located in Plaza C to the south of Str. 31.

The summit operations quickly revealed that the structure's final occupational surface no longer existed. Ops. 98A and D consisted entirely of homogeneous structural fill from the building's last phase of construction. Although we continued both units to a depth of over 1 m., the only construction feature we discovered was the end of a buried north-south oriented masonry wall. This wall consisted of three to four courses of cut blocks, and it measured approximately .6 m. thick. It projected into Op. 98D from the south just at the point where the unit abutted Op. 98A. Although it was not obvious from the limited exposure afforded by our excavations whether the wall originally functioned as a construction wall, a retaining wall, or a freestanding structural wall, I favor the final interpretation for a number of reasons. First, the wall appeared too finely built to be a construction wall. Second, the homogeneity of the fill found on both sides of the wall suggested that it was laid as a unit, thus arguing against the wall functioning to retain anything. Finally, the wall terminated at its northern end in a manner quite reminiscent of a door jamb (leading one to speculate whether a bit more excavation to the north would reveal the opposite jamb). On the other hand, an argument could admittedly be made for its functioning as a construction wall, since even though our excavations in Op. 98D continued to the base of the wall, while those of Op. 98A extended deeper still, we failed to uncover any sort of surface on which it might have been erected. Interestingly, however, in spite of the absence of any visible break or stratigraphic layering in the entire mass of fill, the ceramic material recovered at depths lower than that of the base of the wall dated to the Early Classic, while the sherds recovered from higher in the sequence dated to the Late Classic.

The remainder of the Op. 98 units were attempts to locate refuse deposits around the base of Str. 31. Op. 98B, located on the south face of the structure, consisted primarily of collapse debris from the building. We terminated the unit on reaching Plaza C Floor 1, without finding refuse. The base of the unit revealed an east-west oriented line of cut stone blocks cutting across the middle of the unit and defining the southern edge of Str. 31. The upper surface of this line of blocks was level with the plaza floor to the south, which unfortunately was broken just before it intersected with the line of blocks. This rendered unclear the question of whether the plaster abutted or covered the blocks. To the north of the line of blocks, the excavations continued deeper for another .3 m. into what was apparently structural fill, although no trace of a final occupational surface remained. No diagnostic sherds were recovered from the fill, and the diagnostics collected from the collapse debris above it were mixed, dating from the Middle Preclassic through the Late Classic.

Op. 98C was located on the north face of the structure, and while it revealed more construction features than Op. 98B, it also indicated an absence of refuse. The excavations were terminated upon reaching the fragmentary Plaza F Floor 1, approximately 1 m. below the surface. The eastern face of a masonry block wall was uncovered along the western edge of the unit. This wall was constructed of three courses of quite large but finely cut blocks, and it appeared to rest on Plaza C Floor 1. Because only the face of the wall was exposed in the unit, we were not able to determine whether it functioned as a platform retaining wall or as a freestanding feature. The entirety of the material excavated in this unit consisted of collapse debris, and it contained mixed ceramics dating from the Middle Preclassic through the Late Classic.

Ops. 98E, F, and G, placed in the interior corner formed by the intersection of Strs. 31 and 32, terminated upon reaching Plaza C Floor 1. The excavations exposed a somewhat disturbed retaining wall along the south face of Str. 31. The unit consisted entirely of collapse debris, with no evidence of refuse, and it contained Early and Late Classic sherds.

Operation 98H was a shallow 1x1 m. test pit placed in Plaza C, approximately 8 m. south of Str. 31 and 3 m. west of Str. 32. It too indicated an absence of refuse, and it revealed a possible platform edge in the eastern profile of the unit. The

excavations were terminated upon reaching Plaza C Floor 1, approximately .6 m. below the surface. Ceramic material from the excavations dated to the Early and Late Classic periods.

The results of the excavations on and around Str. 31 point to the same conclusions as those obtained through the excavations on Str. 26. Erosion presumably destroyed the final occupational surface of the structure in the distant past, while Actuncan's inhabitants evidently swept refuse out of their plazas. Chronologically, Str. 31 was certainly erected by the Late Classic, and was probably in existence during the Early Classic, although this is more speculative. The structure was modified at least once after its initial construction.

Structure 28 (Operation 99)

Str. 28 is a low mound, approximately 8 m. square, located in the northern portion of Plaza E, Actuncan North (Fig. 2). Its somewhat peripheral location raised the possibility that refuse had been allowed to collect around its base. With this in mind, we placed two contiguous 1x1 m. test units axially off the mound's eastern edge. We excavated the resulting 2x1 m. area to a depth of 1.4 m., at which point we encountered natural soil with artifacts, and terminated operations. Our excavations did not encounter any construction features associated with Str. 28, although we did uncover the plastered Plaza E Floor 1 at a depth of approximately .5 m. below the surface.

Plaza E Floor 1 served to sharply differentiate the material found in the upper .5 m. of Op. 99 from that found in the lower .9 m. of the sequence. The floor capped a refuse deposit of pure Middle Preclassic material, and underlay a refuse deposit of mixed Middle Preclassic through Late Classic material. The floor was only present in the eastern half of the unit, however, while closer to the structure, in the western half of the unit, we discovered a human interment. Had the floor extended this far west, the interment would have been located at a depth of approximately .2 m. below it. Due to time constraints brought about by the onset of the rainy season, we were forced to forego excavation of this burial. We did observe, however, that the burial appeared to be intrusive, and that the material overlying it was identical to the refuse deposit overlying Plaza E Floor 1 a meter to the east.

To conclude, it appears that this portion of Plaza E was first plastered in the Middle Preclassic. By the Late Classic period a burial, probably intrusive into the Middle Preclassic floor, was placed and covered by more refuse, though it is difficult to say whether this refuse was *in situ* or redeposited from another location.

Structure 29 (Operation 100)

Str. 29 is a 20x30 m. mound separating Plazas D and E, Actuncan North (Fig. 2). It stands approximately 2.6 m. above the present ground surface, and it joins the southeast portion of Str. 26 by means of a low saddle-like extension. We placed a single 1x1 m. test pit (Op. 100A) on the eastern face of the mound (Fig. 8) after discovering the lack of refuse around Str. 26. We wished to determine whether the east facade of Str. 29 was near enough to the perimeter of the site to have accumulated trash at its base. The assumption was that more peripheral locations might have been spared the sweeping that evidently took place in the site's more central areas.

Since we began this operation at the very end of the season, we were only able to excavate down a bit over a meter before having to cease work. Thus, our findings from this unit are more tentative than those from other excavations this season. The majority of the sequence consisted of collapse debris from Str. 29, and contained mixed Early and Late Classic material. The final .3 m. of the sequence, however, did consist of refuse. This deposit contained Preclassic and Early Classic sherds. The meager data collected, therefore, suggests that this area of the site was occupied by the Early Classic, and that Str. 29 had been constructed by the Late Classic.

Miscellaneous Operations

One miscellaneous operation (Op. 12) was continued from the 1992 field season, and three (Ops. 78, 83, 88) were started afresh during the 1993 field season at Actuncan. All but one of these operations (Op. 83) were opportunistic surface collections performed in order to give us some idea, superficial though it might be, of the abundance and range of ceramic temporal phases represented in various areas of the site. This information had a minor impact upon the placement of some of our excavation units. In the interest of completeness, these operations are listed in Table II.

Table II
1993 Random Surface Collections

Operation	Location
12	surface grab sample, Actuncan South core
12A	looter's trench, center of N staircase, Str. 4
12B	looter's trench, east edge of N staircase, Str. 4
12C	Plaza A
12D	looter's trench, Str. 1
12E	Str. 1
12F	looter's trench, Str. 2
12G	Str. 2
12H	looter's trench, Str. 3
12I	Str. 3
12J	Str. 7
12K	Str. 5
12L	looter's trench, Str. 5
12M	Str. 6
12N	looter's trench, Str. 6
12O	off SE corner of main platform
12P	N face of main platform
12Q	south wing, Str. 5
78	surface grab sample, Actuncan North core
78A	Str. 11
78B	Str. 17
78C	area between Strs. 17 and 18
78D	Str. 15
78E	looter's pit, summit of Str. 15
78F	Str. 19
78G	southeast base of Str. 23
78H	Plaza C, just west of Str. 24
88	surface grab sample, periphery
88A	SW transect, 60 S, sherd and rock scatter

Table III
Temporal designations for the Str. 4 construction phases (ceramic analysis performed by Lisa LeCount)

Construction Phase Operation	Field Designation	Ceramic Phase(s)
83A	Aerosmith	Preclassic/Early Classic(?)
83B	Bad Company	Late Preclassic(?)/ Early Classic(?)
83C	Cat Stevens	Middle Preclassic
83D	Deep Purple	no diagnostics
83E	Eagles	Middle Preclassic.

Operation 83 was essentially a salvage operation, and consisted of collecting ceramics from the walls of the large looter's trench located in the center of the staircase on the north face of Str. 4, Actuncan South. In the 1992 season we identified at least five phases of construction profiled in the walls of this trench (McGovern 1992, Fig. 3). This season we segregated our ceramic collection by these construction phases. The results of this collection are outlined in Table III. The construction phases were given nonsense names as field designations, and in the table these are listed in order from stratigraphically highest/most recent (Op. 83A) to stratigraphically lowest/oldest (Op. 83E). It should be noted that the fill from which we made this collection contained very few sherds, while fewer still were diagnostic. Thus, the temporal designations assigned to the various construction episodes in Table III are based on only a handful of artifacts and as a result are quite tenuous. Given this rather large caveat, however, it appears that initial construction of Str. 4 took place as early as the Middle Preclassic, and, after a number of modifications and additions, the final form of the building took shape in the Early Classic.

Conclusions

Our work at Actuncan this season has dramatically changed our perceptions of the site. At the close of the 1992 season we viewed Actuncan as a very small

single-component site with an enigmatically large pyramid. We were aware that this picture was in all likelihood flawed, and this spurred our desire to better define the site spatially and temporally. One result of our recent work is that the Actuncan core has exploded in size from nine structures on a 72x120 m. platform to over eighty structures spread out over an area of 25 hectares. Residential zones probably affiliated with the site now include hundreds of mounds spread over an area of at least 2 km2. We now know that Actuncan was inhabited continuously from the Middle Preclassic through Late Classic periods, and that the southern precinct, at least, continued to see use through the Terminal Classic period. Contrary to our expectations after the 1992 season (McGovern 1992), all of these phases are represented ceramically in primary deposits and in construction fill. In short, Actuncan is not the small, short-lived site we thought it was on our initial visit during the summer of 1991.

Our current thinking on the construction and occupational history of Actuncan can be summarized as follows (refer to Figs. 1, 2, and 5 for the following discussion). The founding of the site probably took place in the Middle Preclassic. What little knowledge we have of the site's configuration during this time suggests that by this early date construction activity had taken place in at least three different areas. This activity included the erection and modification of Str. 4 at Actuncan South; the erection and modification of Str. 15 and the construction of a plastered platform (beneath the present ball court) in Plaza C of Actuncan North; and the plastering of the northern portion of Plaza E, also in the northern precinct.

In the Late Preclassic the Actuncan South platform (Plaza A) was built and modified, and Stela 1 was carved and, presumably, erected (McGovern 1992). The surface of Plaza C in the vicinity of the northern ball court alley was plastered in the Late Preclassic and again in the Protoclassic, though whether it functioned as a ball court alley at this early period is unknown.

By the Early Classic Actuncan was certainly growing. Str. 4 was modified twice and assumed its final form at this time, and Str. 26 was constructed at least as early as this. Strs. 29 and 31 probably also date to this period, while the vicinity of Str. 18 evidenced substantial Early Classic occupation.

In the Late Classic Strs. 15 and 26 were both given their final modifications, while construction on Str. 18 also occurred. During this time a burial was placed adjacent to Str. 28, and the Actuncan North ball court alley was resurfaced in both the Late Classic I and II periods. Most of the site, with the exception of Actuncan South, appears to have been abandoned by the Terminal Classic. Excavations into the main southern platform in 1992 (Op. 45) and surface collection completed during both the 1992 and 1993 seasons (Op. 12) revealed a thin Terminal Classic veneer overlying much of this portion of the site.

Obviously, this report is as notable for what we do not yet know about Actuncan's history as for what we do know. Nevertheless, our new awareness of the site's chronology and layout raises important questions and implications in regard to the center's political role during its heyday, and to the development of complex society in the Belize River valley in general. Our findings of significant Middle Preclassic occupation at Actuncan, including very well-built public masonry architecture (Strs. 4 and 15) and plastered plazas, supports recent discussions (Awe 1992) concerning the increasing sociopolitical level of the valley during this period. The chronological data obtained from deep within Str. 4, while sparse, support our contention that early in the valley's history Actuncan was a center of precocious development.

With the Late Preclassic construction of the enormous Actuncan South platform and the adoption of the stela cult (Stela 1), Actuncan appears to have established itself as a regionally preeminent center. It probably shared this status with Cahal Pech (Awe 1992) and, perhaps, with Blackman Eddy as well (Garber *et al.* 1992, 1993).

As evidenced by the abundance of Early Classic polychrome ceramics recovered from refuse and construction fill (Ops. 92 & 93), and by the massive investment in monumental architecture, Actuncan continued to participate in Lowland Maya elite culture well into the Classic period. Actuncan was one of a number of burgeoning centers in this portion of the Belize River valley at the beginning of the Late Classic. These sites included Arenal (Las Ruinas), Buenavista del Cayo, Cahal Pech, Callar Creek, and Nohoch Ek, of which only neighboring Buenavista (ca. 3 km. northeast) rivaled Actuncan in size. A major goal of our

future work at Actuncan is to elucidate the nature of the relationship that these two sites shared.

By the end of the Late Classic, the rise of Xunantunich only 1.6 km. to the south of Actuncan probably caused the cessation of monumental construction at the site. It seems inconceivable that Actuncan did not play a role in the founding of such a large center literally in her backyard, and this, too, will be a major topic of future investigation.

The Terminal Classic witnessed the abandonment of Actuncan, the only exception being the continued use, and perhaps even on-going construction (Strs. 7, 8, 9), of small portions of the southern acropolis during this period. As noted earlier in this paper, this activity might have been the result of Actuncan's role as the revered ancestral shrine for Xunantunich until that site's demise at the end of the Terminal Classic (Ashmore and Leventhal 1993).

In closing, I believe that the successful 1993 field season at Actuncan has furthered our knowledge of the culture history of the Belize River valley and of the processes that led to the sociopolitical development of its inhabitants. Future work at the site promises to contribute even more to these and other topics of inquiry.

Acknowledgments

The success of the 1993 field season at Actuncan is attributable to the efforts of a great many people. I would like to thank Dr. Richard M. Leventhal for his invaluable guidance and support, Dr. Wendy Ashmore for her down to earth advice and indefatigable good spirits, and my fellow graduate students on the XAP crew from whom I continually learn. I would especially note the grueling work performed by Angela Keller and Jason Yaeger in helping to map the site, and the indispensable job performed by Ellen Bell and Lisa LeCount in analyzing the excavated ceramics. The real heroes of this season, however, were the Actuncan crew members from the village of San Jose Succotz, and their captain, Ramiro Mai.

This study would not have been possible without the good graces of the Belizean Department of Archaeology, and the hospitality and forbearance displayed by the Actuncan landowners, Srs. Galvez, Gomez, Juan, Manzanero, Ranji, and Requena. Travel to and from the site was made much easier by the generous loan of a canoe by Sr. Manzanero.

This paper was improved substantially by the comments made by Richard Leventhal, Cheri McGovern, and Jon VandenBosch. Any errors or omissions, of course, remain the author's.

Finally, I personally benefited from the friendship bestowed on me by the Juan and Penados families, and by the love of my wife Cheri and son Owen, which gives it all meaning.

References Cited

Ashmore, Wendy, ed.
1981 *Lowland Maya Settlement Patterns.* University of New Mexico Press, Albuquerque.

Ashmore, Wendy, and Richard M. Leventhal
1993 Xunantunich Reconsidered. Paper presented at the Belize Conference, University of North Florida, Jacksonville.

Awe, Jaime J.
1992 *Dawn in the Land Between the Rivers: Formative Occupation at Cahal Pech, Belize and its Implications for Preclassic Development in the Maya Lowlands.* Unpublished Ph.D. dissertation, University of London.

Ball, Joseph W., and Jennifer T. Taschek
1991 Late Classic Lowland Maya Political Organization and Central-Place Analysis: New Insights from the Upper Belize Valley. *Ancient Mesoamerica,* 2(2):149-165.

Garber, James F., W. David Driver, and Lauren A. Sullivan
1992 *The Blackman Eddy Archaeological Project: Results of the 1992 Field Season.* Southwest Texas State University, El Paso.

Garber, James F., W. David Driver, Lauren A. Sullivan, and Sean Goldsmith
1991 *The Blackman Eddy Archaeological Project: Results of the 1991 Field Season.* Southwest Texas State University, El Paso.

McGovern, James O.
1992 1992 Study of Actuncan (Cahal Xux). In Richard M. Leventhal, ed., *Xunantunich Archaeological Project: 1992 Field Season,* Belmopan and Los Angeles, pp. 74-83.

Morley, Sylvanus G., George W. Brainerd, and Robert J. Sharer
1983 *The Ancient Maya.* Stanford University Press, Stanford.

VandenBosch, Jon C.

1992 Excavation of Rubble Mound Features in the Periphery. In Richard M. Leventhal, ed., *Xunantunich Archaeological Project: 1992 Field Season*, Belmopan and Los Angeles, pp. 84-109.

Willey, Gordon, William Bullard, John Glass, and James Gifford

1965 Prehistoric Maya settlements in the Belize Valley. *Papers of the Peabody Museum of Archaeology and Ethnology, Vol. 54.* Harvard University, Cambridge.

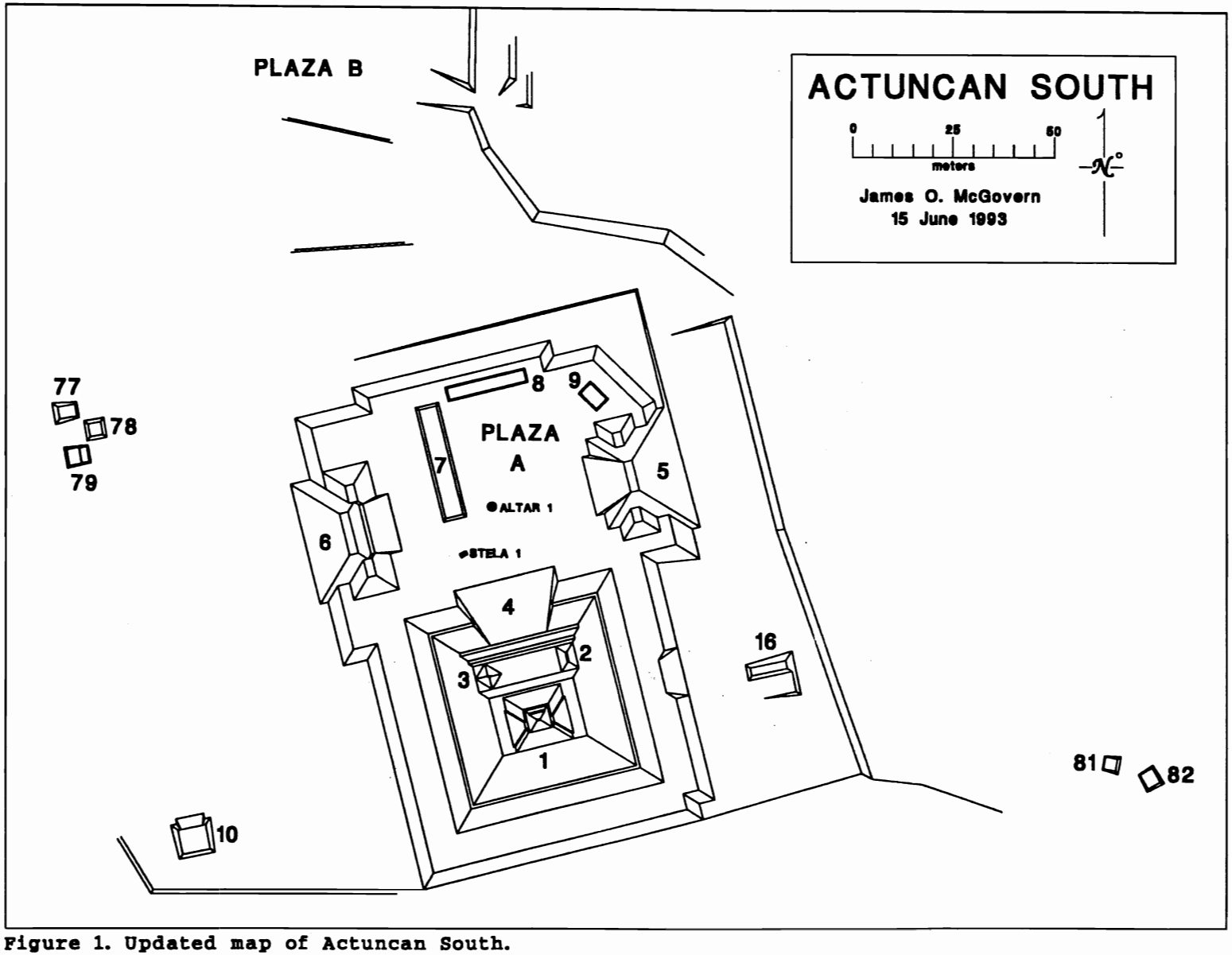


Figure 1. Updated map of Actuncan South.

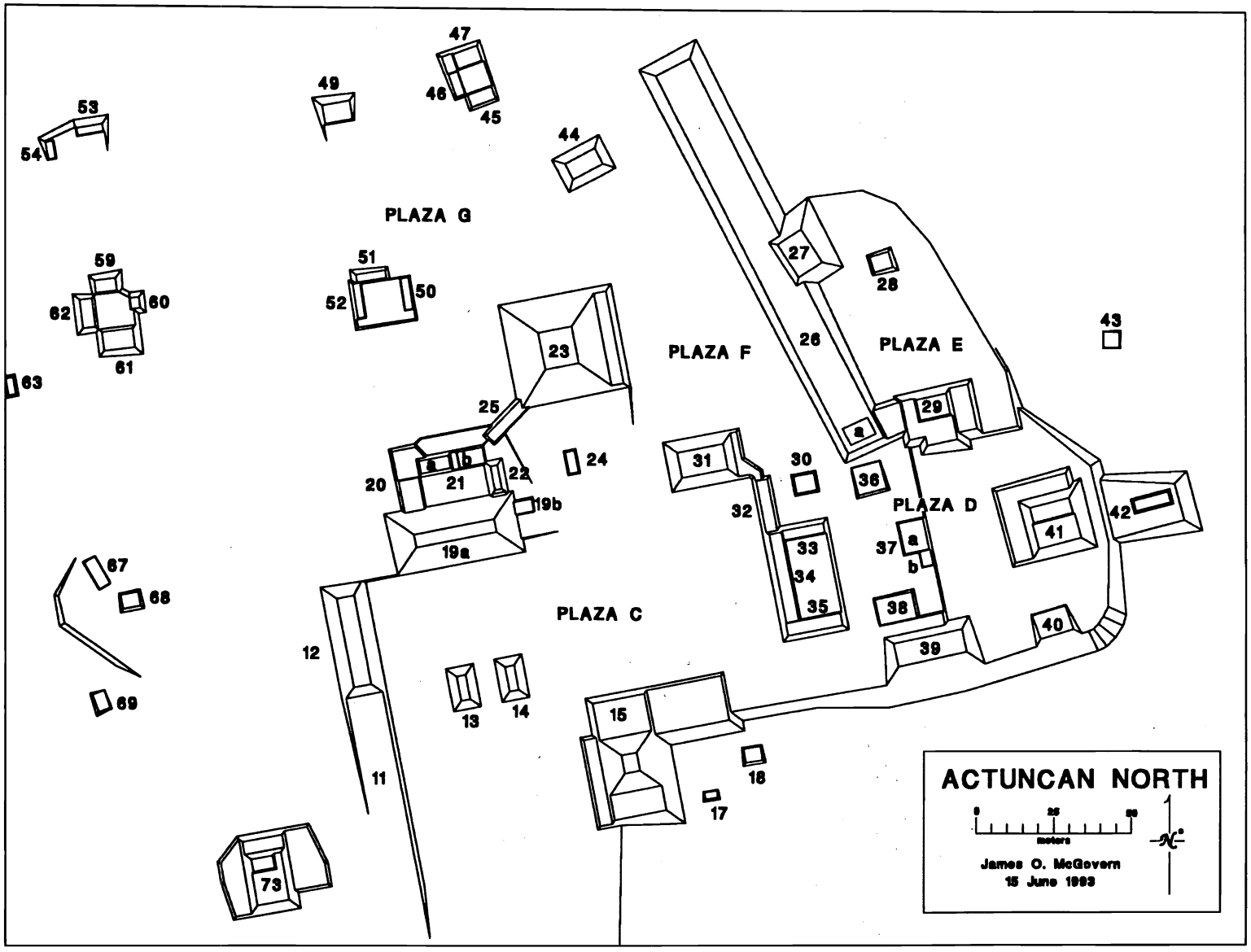


Figure 2. Map of Actuncan North core area.

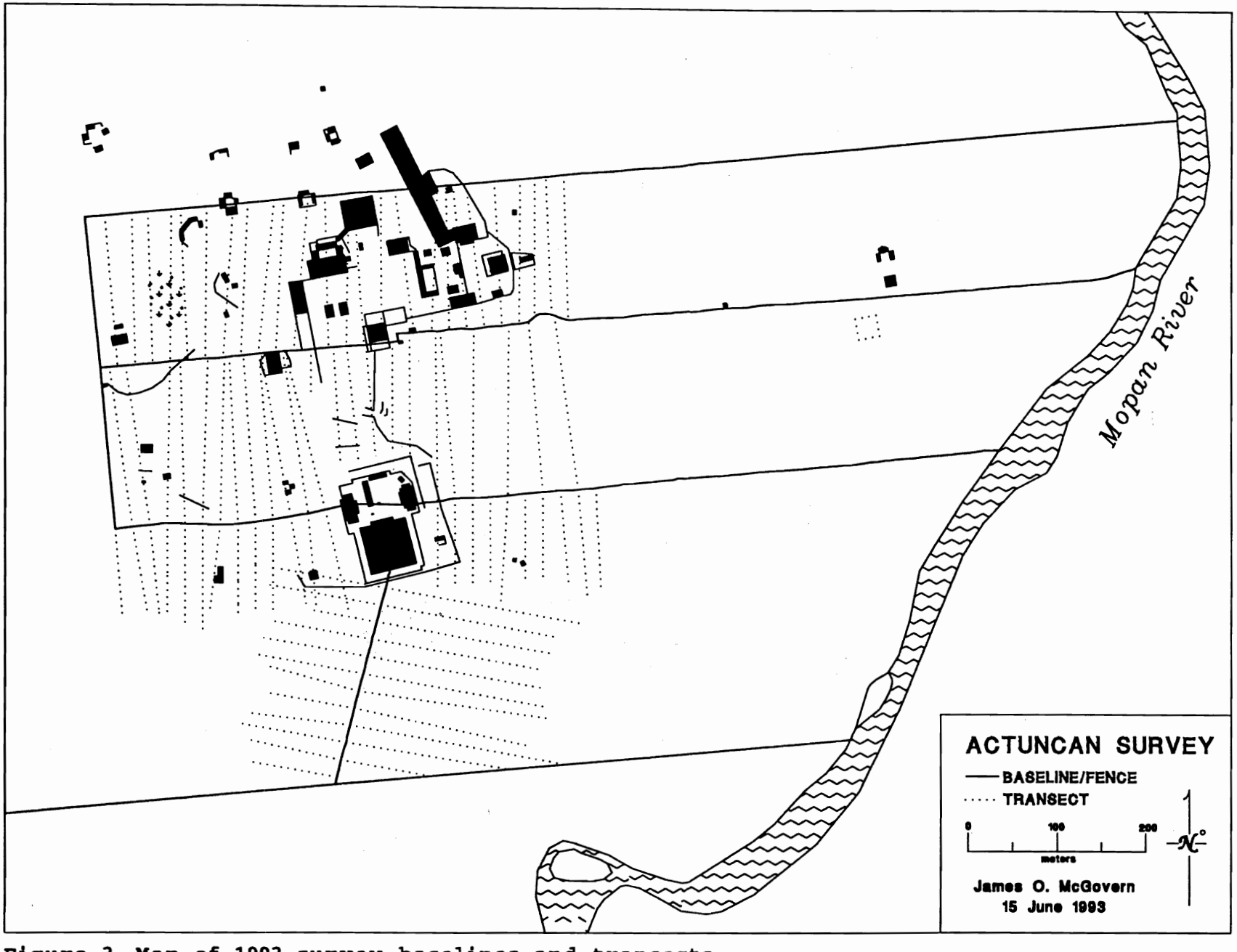


Figure 3. Map of 1993 survey baselines and transects.

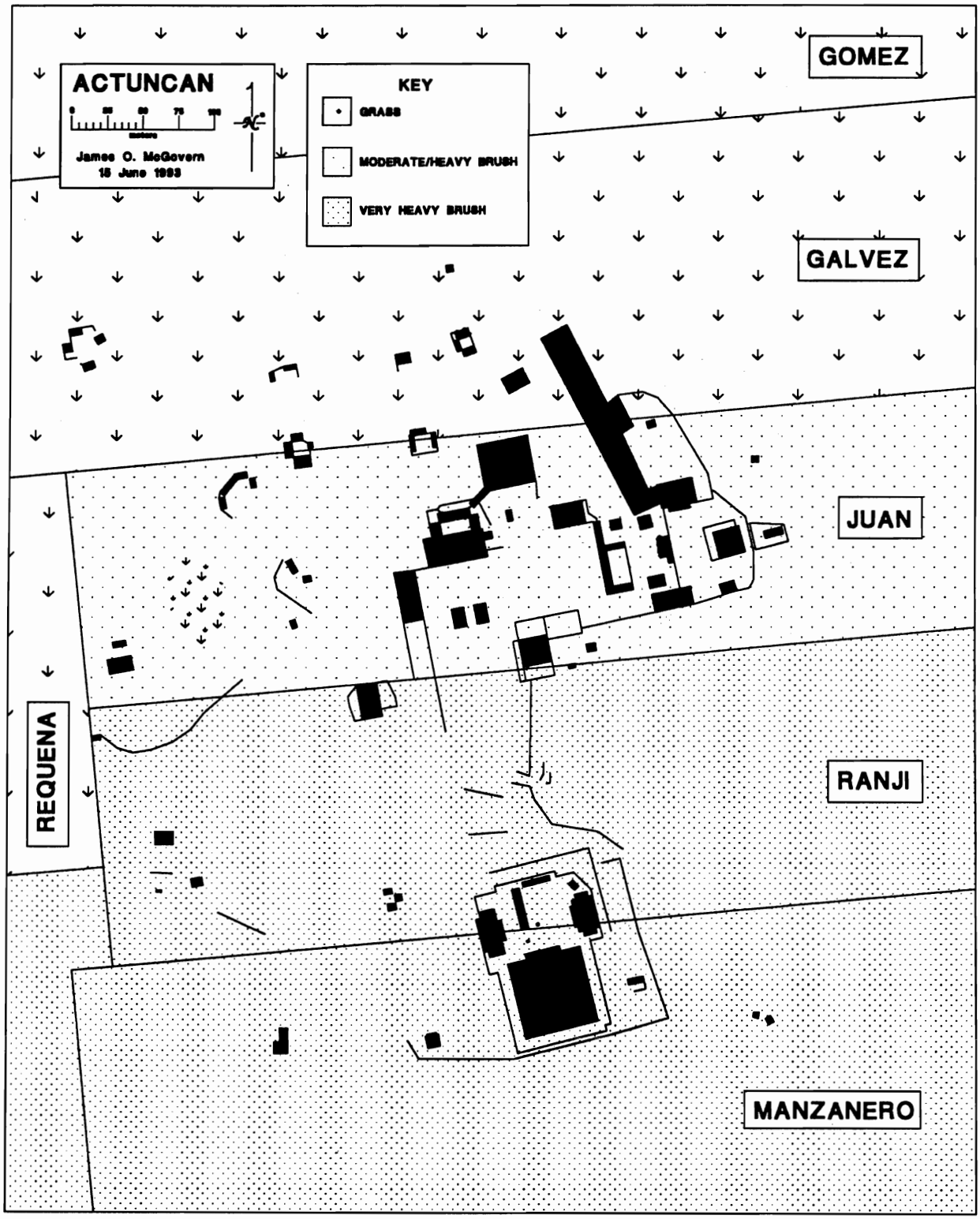


Figure 4. Map detailing land ownership and density of overgrowth at Actuncan during the 1993 season.

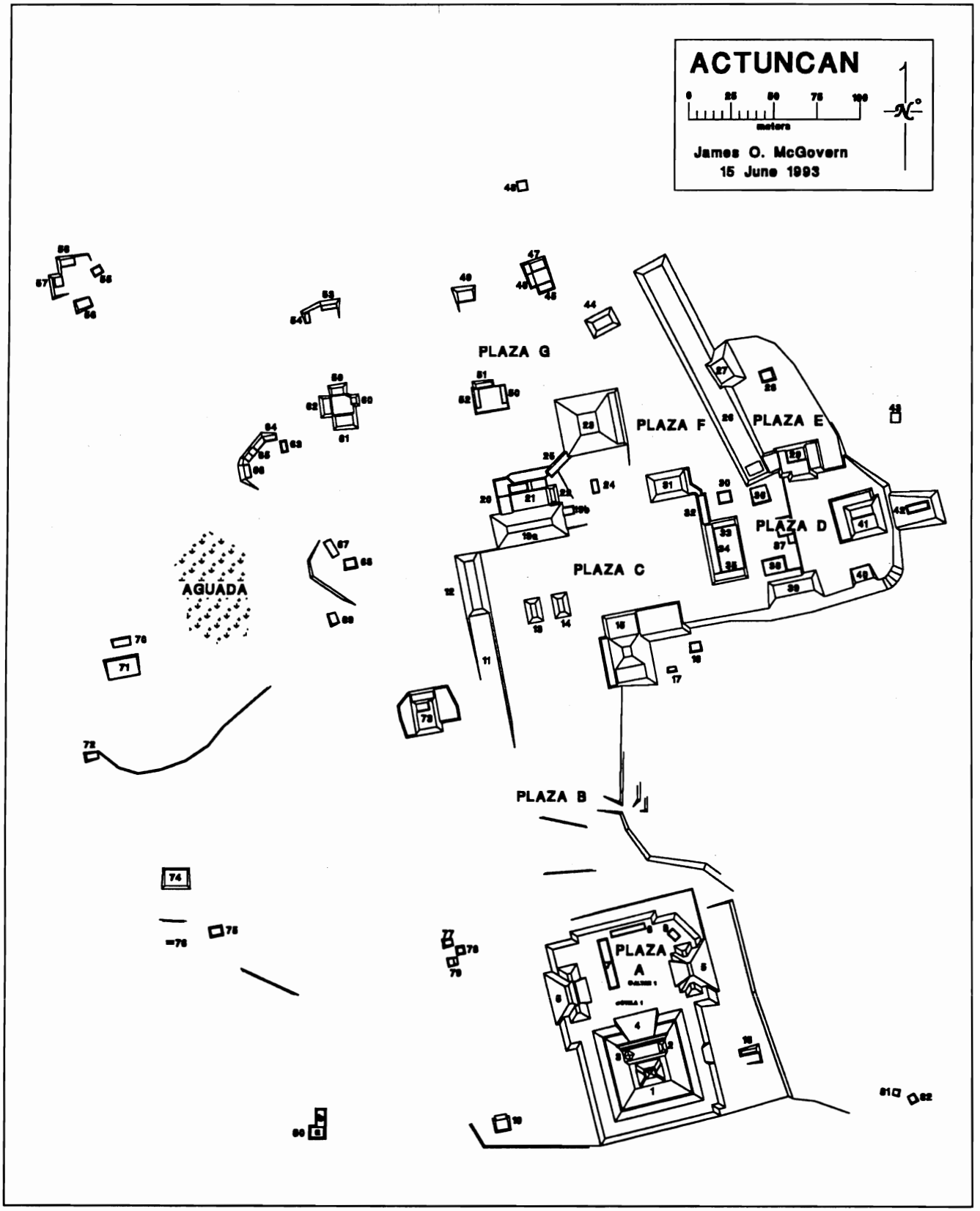


Figure 5. Map of Actuncan.

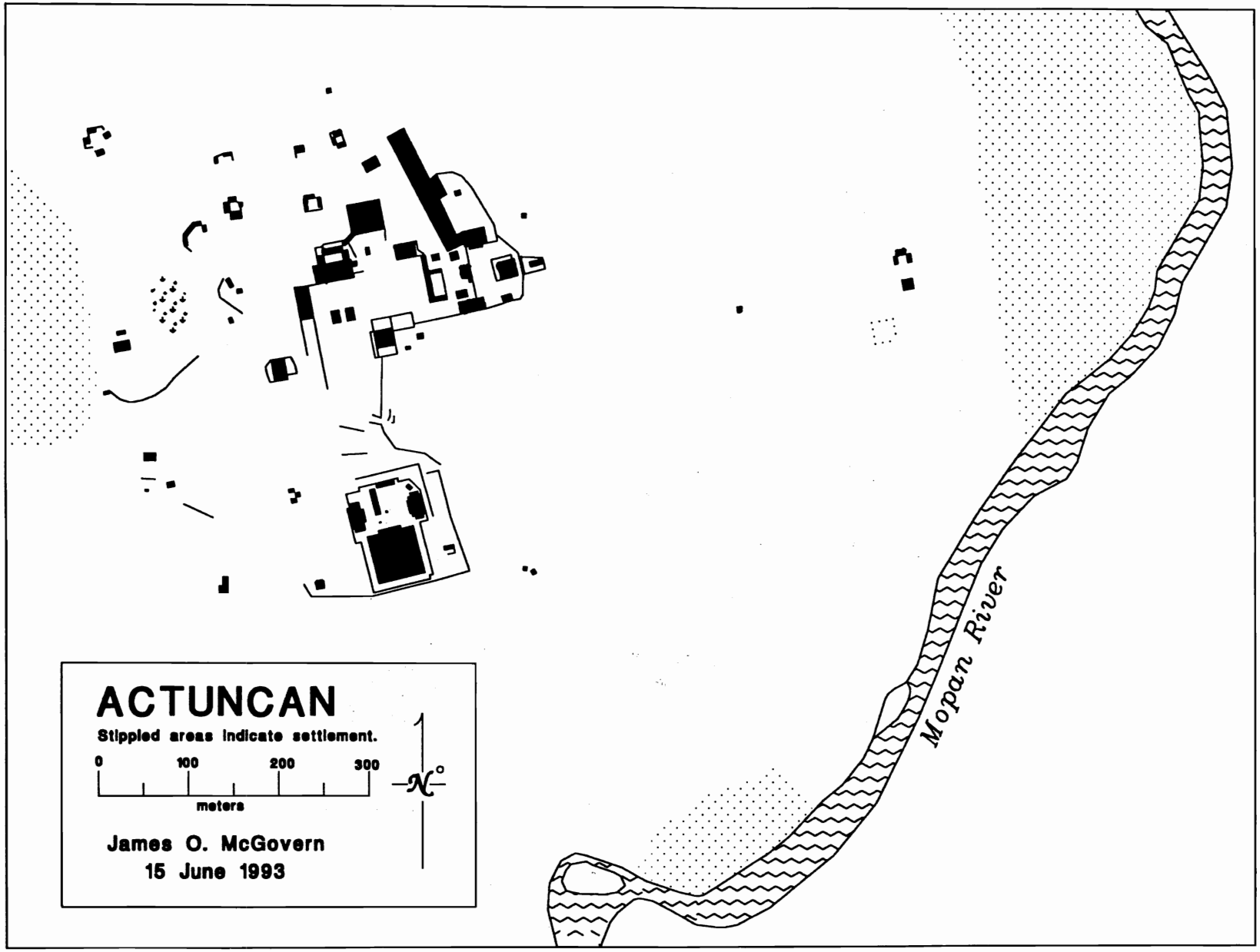


Figure 6. Settlement concentrations in the Actuncan area.

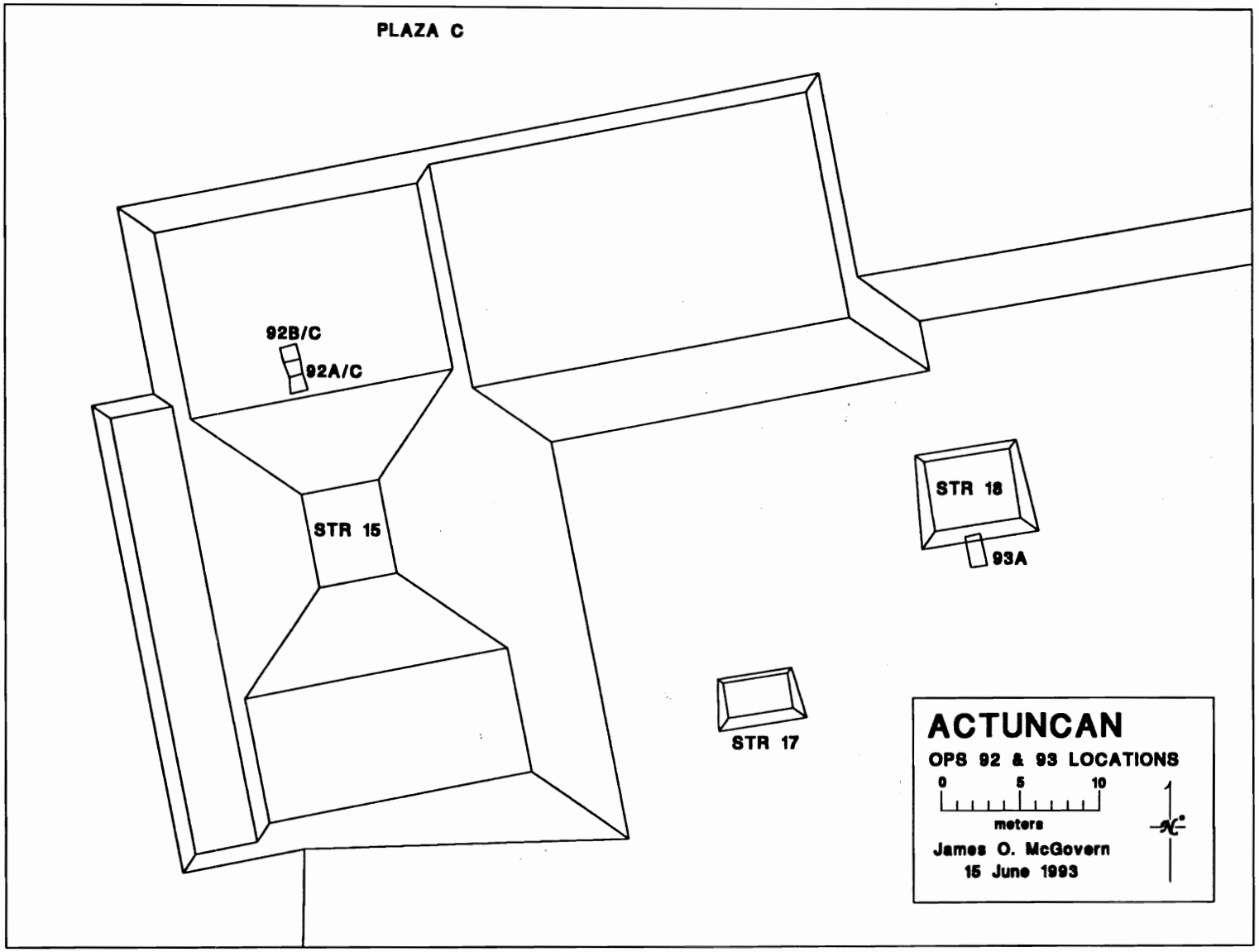


Figure 7. Locations of Operations 92 and 93.

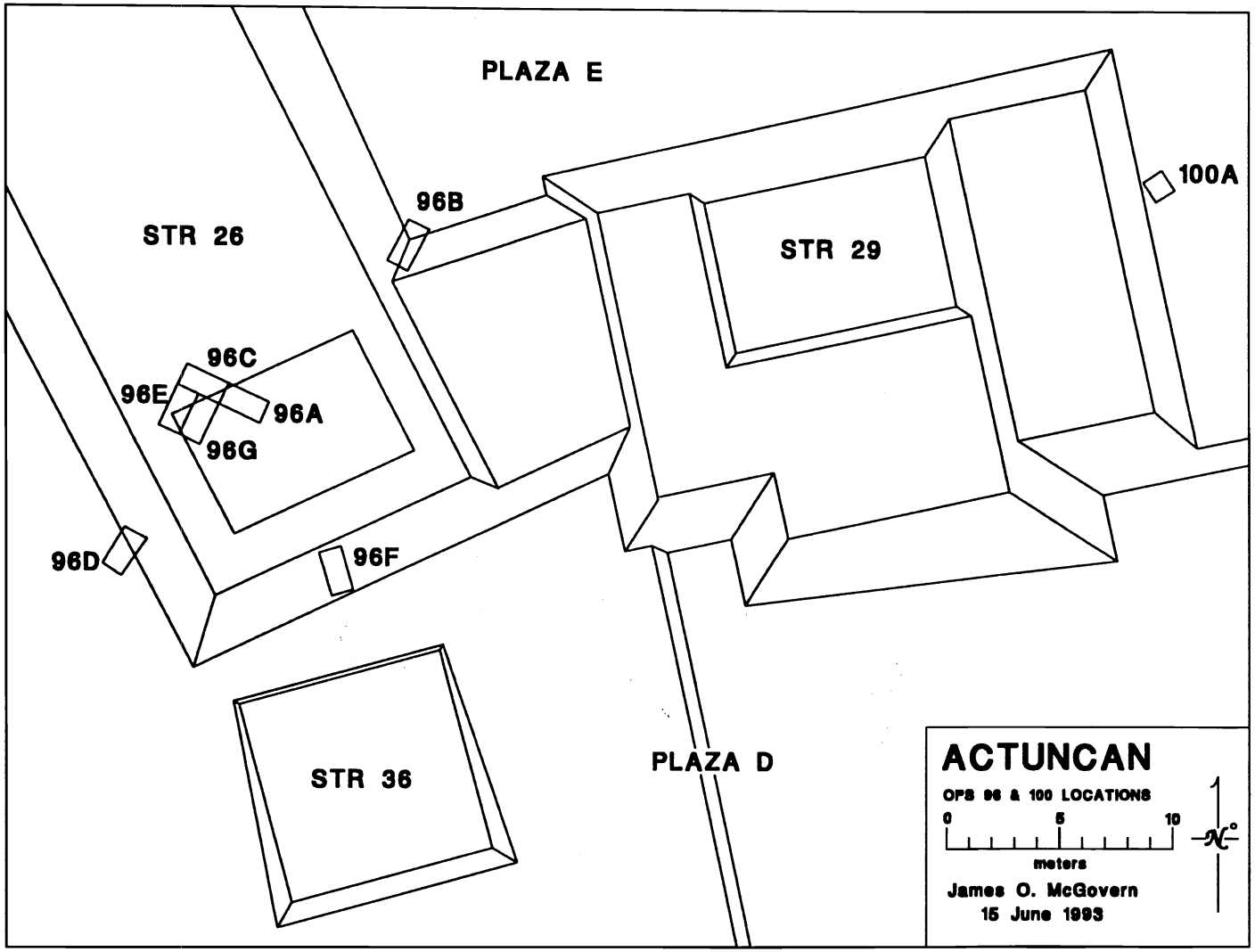


Figure 8. Locations of Operations 96 and 100.

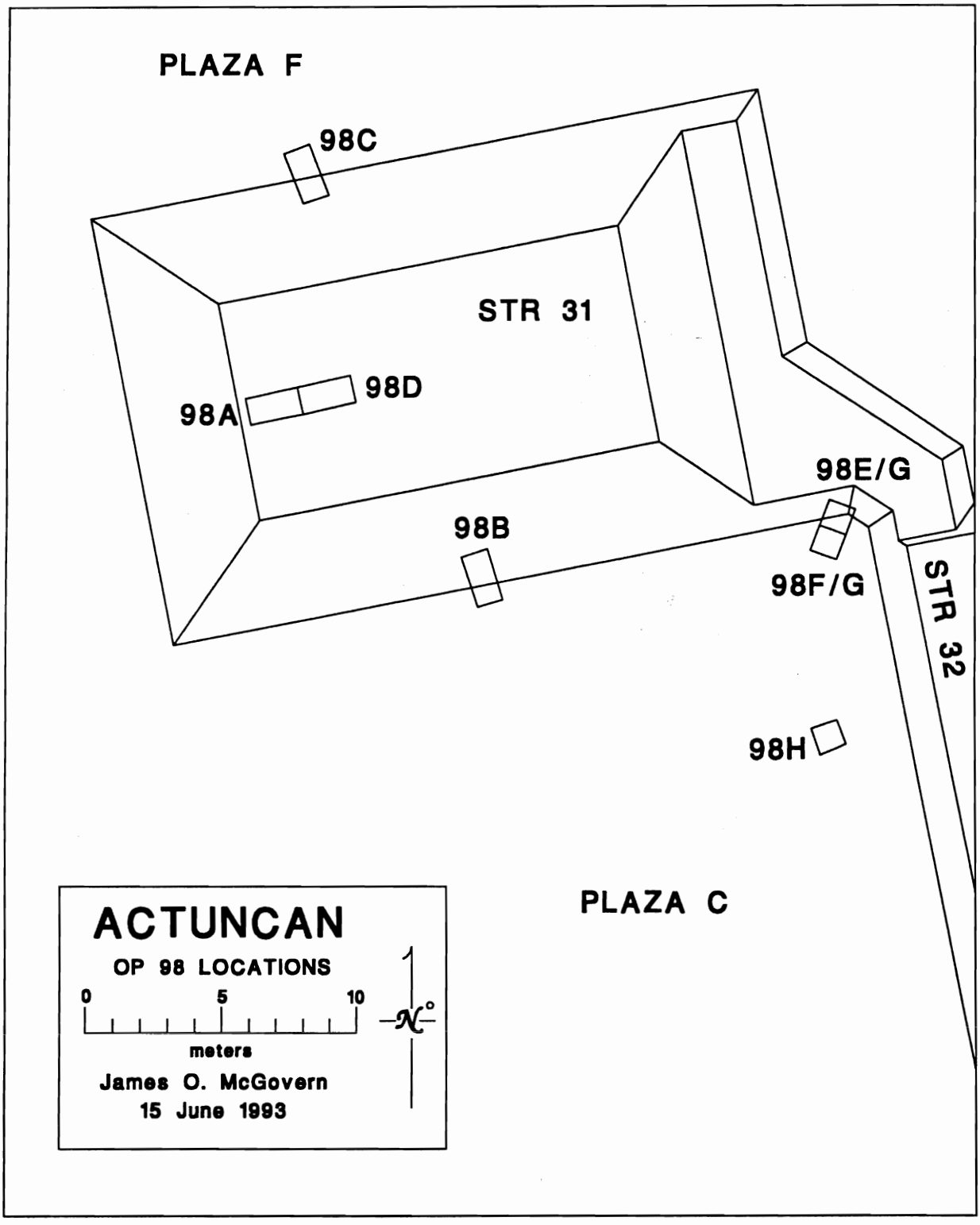


Figure 9. Locations of Operation 98.

Excavations at the San Lorenzo Group: The 1993 Testing Program and Plaza Group I

Sabrina Marie Chase
Rutgers University

Introduction

The Xunantunich Archaeological Project (X.A.P.) initiated its 1993 season of fieldwork by embarking on a substantial group of excavations both within and outside of the site core of Xunantunich. Included in this work was the investigation of a collection of patio groups just outside of the urban center in a complex known as the San Lorenzo Group. The site consists of at least 17 patio groups and isolated structures located on a series of terraces adjacent to the Mopan River. These household groups vary widely in internal complexity and size, suggesting that their inhabitants may have held varying positions within the local social and economic hierarchy.

There were three goals directing the San Lorenzo investigation during the 1993 field season. The first goal was to place midden-seeking test excavations throughout a cross-section of the patio groups and single structures. The second goal was to identify the level of preservation characteristic of the structures themselves. In particular, it was deemed important to determine the general condition of walls and floors within the complex and to establish the morphology of at least one household group within the area in order to examine the architectural techniques employed within this community. The third goal was the identification of plaza activity areas or deposits of residential debris. A testing program was developed to satisfy the first requirement; it utilized a five-category typology to generate a representative sample of the San Lorenzo universe. Under this program a total of ten groups and structures were tested through the excavation of thirteen units. Extensive excavations within Plaza Group I satisfied the requirements of the second and third goals, and the testing program proved useful in evaluating local preservation as well.

In order to examine the San Lorenzo investigations in some detail, the first section will discuss the testing program, Operation 95, while the second section will address the Plaza Group I excavations, designated Operations 85, 86 and 90.

The San Lorenzo Testing Program: A Search for Residential Debris Across the Social Spectrum

Group Classification

In order to understand the diversity of size and complexity found within the San Lorenzo Group a five-category typology was developed. It attempts to categorize the households and structures of this complex primarily on the basis of differential labor investment (size) and internal complexity (number and arrangement of household structures). The amount of labor invested in a household could reflect the wealth and status of its occupants, the longevity of the household or other factors such as stages of a family development cycle (Tourtellot 1988). In this case, the typology created here attempts to capture a range of different levels within the social and economic hierarchy of San Lorenzo as well as sort out non-domestic structures.

The typology was established as follows:

Category:	**Criteria:**	**Characteristic:**
Type I	morphology:	platform and structure height above 3m 4+ constituent structures includes one or more plazas
	landscape orientation:	located on horizontal surface of terrace
	spatial orientation:	relatively isolated from other households
Type II	morphology:	platform and structure height 2-3m 3 or 4 constituent structures formal plazuela group
	landscape:	located on horizontal surface of terrace
	spatial:	aggregated with other households
Type III	morphology:	platform and structure height .75-2m 2-3 constituent structures
	landscape:	located on horizontal surface of terrace
	spatial:	aggregated with other households

Type IV	morphology:	platform and structure height .5-1.5m single structure
	landscape:	located on horizontal surface of terrace
	spatial:	aggregated with other structures
Type V	morphology:	platform and structure height .5-1.5m single structure
	landscape:	located on edge of terrace
	spatial:	either isolated or aggregated

The three criteria used to construct the system were morphology, location on the landscape and spatial relationship to other structures. The most important of these is morphology, which includes both size and arrangement of constituent structures. However, distinctions in the distribution of types across the terraces and in their distance from each other are also noted.

This is most evident in the case of the first type. There is only one Type I structure within the San Lorenzo Group; it is much larger and much more complex than any of the other patio groups and it is also isolated from them. Plaza Group N5 is on the lowest (west) terrace as are seven other Type III and IV groups (see LeCount Figure 1). It is the only group in the entire cluster that is not closely associated with at least one other structure.

The east portion of the complex is made up of Type IV and V structures; there are no patio groups in this area at all. It is in this area that most of the single structures can be found and at least twelve of them have been identified. This contrasts with the number of single structures on the central and east terraces; three have been identified on each one. Unlike the east terrace area, the central terrace area hosts a mix of types and every category but the first is represented.

Operation 95: Placement of Test Units

Operation 95 was the designation assigned to those units within the testing program. Ten patio groups and individual structures were selected from the five previously noted categories. Of these, nine were actually tested. The data from two additional units (units 90F and 90G, from Plaza Group I, a Type II group) were then

included to compile a sample from which cross-category comparisons could be made (see LeCount Figure 1).

One unit, 95H, was placed in Plaza Group N5, the only Type I group in San Lorenzo. Two units, 95A and 95B, were placed in Plaza Group 73, one of the two Type II groups (the other being Plaza Group I). Three Type III groups were tested: 95C and 95D were placed in Group N2 South, 95E was put in Group 6 and 95F was placed in Group 4. Among the Type IV structures in San Lorenzo, three were selected for testing: Structure N2 North (95G), Structure 66 (95I) and Structure 71 (95K). Finally, one Type V structure was investigated: unit 95J was located in Structure N4 South.

Type I Test Excavations

Unit 95H was the only test of group N5, the lone Type I structure. It was placed adjacent to the group's north saddle as good results had been obtained from utilizing this placement in several other tests. Investigation revealed four natural strata excavated in seven lots (Figure 1). The first stratum was a layer of fall; a large amount of cultural material was recovered from it. The second natural stratum was more unusual.

This thick stratum (40 cm.) began with fairly compact rubble intermixed with what appeared to be a sandy mezcla or plaster. As excavation continued the concentration of rubble decreased and the amount of mezcla increased so that at the base of the layer, a thick plaster could be easily discerned, at least along the unit's east half. This plaster or mezcla dissipated as the stratum ran west. Below the plaster no ballast was found, only a sandy clay. The unit's east profile showed that the plaster jutted out 40 cm. north into the unit as well (see Figure 1). Some cultural material was recovered from this level, and the sandy clay beneath the plaster also yielded some small sherds and other artifacts, including Mars Orange ceramics. The final natural stratum was a modeled clay, usually indicating a sterile matrix at San Lorenzo, and excavation ceased when it appeared.

The plaster stratum clearly indicates some type of plastered surface extending out from Group N5. It may actually represent two floors, one highly eroded and destroyed by fall, a central layer of ballast and a lower floor. Unfortunately, the change in concentration of rubble to plaster was so gradual that even a close

examination of the unit's profiles was inconclusive. Although these results proved intriguing, it was concluded that no midden or refuse had been found.

Type II Test Excavations

A total of four test units were placed in Type II groups. One of these was Plaza Group I and the other was Plaza Group 73. These are the only Type II groups at San Lorenzo. Plaza Group I had already been extensively excavated during the first phase of work and two units from locations comparable to those in the testing program were selected for inclusion in the sample. These were units 90F and 90G. The first was placed at the rear northeast corner of Structure 2 (Figure 6) and the second was located at the rear of Structure 2 along the building's central axis.

Units 95A and 95B were located in Group 73, a four-structure patio group. 95A was the first unit of the testing program and it was placed to the rear of Str. 2, along its central axis. The results of this placement were discouraging and the second unit was placed along a saddle between Structure 1 and Structure 2, producing much more useful data. From this point on test units were placed adjacent to raised saddles whenever possible.

Unit 95A was excavated in six lots. It contained four natural strata: a humus layer, clearly fall, with plentiful cultural materials, two strata of sandy loam differing in color, each with fewer cultural materials than the first layer, and a stratum of thick clay with some sand containing few materials. None of these strata contained refuse or midden. In order to compare the results emerging from this unit's placement with those of another placement, unit 95B was put directly adjacent to a raised saddle within the same group.

The results of this change in placement were dramatic: the same four strata were uncovered, but the second and third strata were packed with refuse. A large amount of densely packed sherds, lithics, groundstone, shell and obsidian fragments was recovered from these two strata. Materials were in good condition: large unworn sherds were especially common. Project ceramicist Lisa LeCount identified the debris as a mixture of Late Classic I, Late Classic II and Terminal Classic material. The fourth natural strata, by contrast, contained few artifacts. However, it did reveal a line of cobbles along the west unit boundary.

When the west profile was shaved back, a three course, magnificently preserved limestone wall appeared (Figure 2). The upper two limestone courses were displaced 10 cm. to the west from the edge of the foundation course of large cobbles. The wall also retained remnants of two limestone blocks that had once made up part of a fourth course.

This conjunction of wall and refuse was the first indication of a pattern that appeared several more times throughout the testing program: refuse piles would be found closely adjacent to saddle retaining walls, with the amount of refuse decreasing as one retreated away from the wall itself. Raised saddles also produced better results (a denser accumulation of cultural materials) than low saddles. Additionally, the wall established a pattern of construction that would be encountered again and again throughout the program: a strong foundation course of large river cobbles selected for their regular shape would be laid down, followed by succeeding courses of softer, shaped limestone blocks.

The second natural stratum within unit 95B began at the top of the wall and the bottom of the third stratum coincided with the bottom of the limestone courses (Figure 2). These were the strata filled with debris. The fourth stratum, a thick sandy clay with few artifacts, appeared at the top of the cobble course that made up the base of the wall. This suggests that the cobble course was immediately covered after the saddle wall was built, leaving the more regular limestone blocks exposed. The second and third strata then accumulated over time as soil built up and refuse was tossed behind the saddle during the group's occupation.

Unit 90F in Plaza Group I was selected because its location, the rear northeast corner of Structure 2 (Figure 6), was identical to the preferred placement of the test units in Operation 95. The same was true of unit 95G, placed behind Structure 2. There were five natural strata in unit 95F. Beneath the shallow humus layer were two layers of structure fill primarily made up of small cobbles. The fourth layer, spanning the breadth of the east retaining wall of Structure 2, was the most likely location for refuse. Unfortunately, only a moderate amount of material was removed. This material may represent refuse, but it did not appear in sufficient quantity to suggest that the deposit represented a regular accumulation of discard. Project ceramicist Lisa LeCount found a mix of Late Classic II and Terminal Classic ceramics within this fourth stratum. The fifth stratum was a heavier clay with few

artifacts.

Unit 90G proved to be another surprise. No midden was identified, but evidence that the residence on top of Structure 2 had burned and collapsed was encountered instead. Beneath the top stratum of humus and fall a 30 cm thick layer of burned material was uncovered. Large lumps of daub lay next to portions of limestone block, still retaining areas of burned, bluish plaster. Charred sherds lay intermixed with chunks of charcoal, and a small burned fragment of floor was found as well. Groundstone, worked chert, small rocks, bone, piles of snail shells and other miscellaneous materials (a polishing stone, a chert point and bits of what appeared to be sandstone) were found tumbled together amidst profuse bits of bluish plaster. At first the area was interpreted as a debris pile that included burned substances, but the high number of (burned) plastered limestone fragments and its sheer density suggested otherwise. Project ceramicist Lisa LeCount identified the topmost layer of ceramics in this deposit as Terminal Classic in date, while underlying material was identified as a mixture of Late Classic II and Terminal Classic material. Below the level of burning two mezcla or plaster-covered steps were found. These seemed to be made of packed rubble covered with plaster, and they showed no sign of burning. Their construction echoed the construction of the lower steps on Structure 3 (see discussion of unit 85O below).

While these two units provided valuable data, they did not yield conclusive evidence of normal refuse deposits. In Category II, only unit 95B provided a clear-cut example of refuse.

Type III Test Excavations

Units 95C and 95D were situated in Group N2 South. These two test units uncovered a small refuse pile. 95C was situated at the rear corner of two connected structures; the location was chosen because it resembled the raised saddle that had proved so successful in Group 73.

Originally only one unit (95C) was planned for this group, but when 66 cm. of fall, overburden and collapsed structure fill was removed it became clear that most of the unit was situated inside of the structure and that structure fill was being mixed with a pile of refuse located adjacent to the structure wall. Because of this, a second unit, 95D, was opened up next to 95C. Beneath the overburden and just

above a plastered surface was a collection of sherds, large lumps of unfired clay and a single jute shell. The sherds appeared to be the remains of a few vessels, thus presenting the possibility that the vessels had fallen off of the top of the structure. However, such an interpretation would suggest that a reasonable percentage of each vessel would be present, and this did not appear to be the case. Project ceramicist Lisa LeCount identified this material as Terminal Classic in date. The surface beneath the deposit was a lumpy, thin layer of plaster or mezcla applied directly to small and medium cobbles below. This created an uneven surface of jutting stones to which plaster still clung. Excavation below the floor revealed a dense ballast that was almost bereft of cultural materials.

Group N2 South probably faced south as this was the direction faced by the plaza-like area between its two structures. Units 95C and D were deliberately placed to its rear; the plastered surface along the outside of the group echoes the plastered surface outside of Group N5, San Lorenzo's Type I group. Likewise, the wall uncovered in unit 95C followed the Group 73 pattern of laying down a cobble foundation and constructing succeeding courses of shaped limestone above it.

Plaza Group 6 was the site of unit 95E. This Type III group was made up of three low mounds; its saddles were not raised. The test pit was placed adjacent to the southwest saddle area despite this fact in an attempt to duplicate previous positive results. However, the unit yielded no refuse and it contained very little material at all. Its three strata, a thick humus layer, a layer of sandy clay (possibly eroded ballast?) and a final stratum of thicker clay did not reveal any clear signs of floor plaster, wall stones or refuse.

A more interesting picture emerged in unit 95F. The test pit lay adjacent to the south saddle of Plaza Group 4, this time against a raised saddle as in several previous tests. Group 4, a west-facing three-mound household, sat close to the edge of a terrace. Excavation uncovered four strata and a single-course saddle wall constructed of medium and large cobbles. Although no refuse was located, evidence emerged to show that the terrace edge was actually the artificial extension of a natural slope. The group was built directly over the natural edge of the terrace; this became clear when exposure of the second natural stratum revealed it to be split between two kinds of matrix. Ballast had been added to the natural face of the slope, buttressing it and extending it outward. There were unmistakable differences in

color and matrix between the two halves of this stratum. This discovery raised the question of why the edge of the slope had been selected as a habitation site at all. Apart from the labor requirements of plaza group construction, the additional effort of modifying the slope must have represented a considerable investment of time and energy.

While interesting, this data nevertheless shed no light on patterns of refuse disposal. When testing of Category III was completed, only one group provided strong evidence of such debris: Group N2 South.

Type IV Test Excavations

Three test units were located in Type IV structures: 95G, 95I and 95K. Unit 95G was located along the north side of Structure N2 North. Its three strata showed little evidence of refuse. It was discovered that the unit was situated between two low cobble walls, possibly indicating a stepped platform.

Unit 95I (Figure 4) was placed next to the east flank of Structure 66, and although its top humus layer (Lot 1) was full of cultural material, once below the level of fall fewer artifacts were located. The second stratum was clearly delineated by its hardness and distinct color, however, and it may have represented a floor. A single large fragment from a Mt. Maloney vessel rested on this surface next to the cobble wall.

Structure 71 was the last Type IV structure to be tested. Unit 95K, along its north side, yielded even sparser results than the two previous Type IV test units, with very little cultural material in its two natural strata.

Category IV was explored with perhaps the least success of all the categories in the typology: three test units revealed almost nothing in the way of refuse, and the one strata of 95I that did produce plentiful material was a mix of fall and refuse, if any true refuse was present.

Type V Test Excavations

Only one Type V structure was tested. Structure 95J, at the edge of one of the San Lorenzo terraces, was selected for examination (Figure 5). Unit 95J was placed along what was thought to be the north side of the structure, but excavation showed

the unit to be within the boundaries of the structure itself. It contained a deep layer of dense cobble fill, including many lithic cores and large flakes. Almost no ceramics were found and this in itself may be significant. All previous excavation of structural fill had revealed a heterogeneous mix of cobbles, ceramics and lithics. Throughout this unit, however, perhaps a small handful of ceramics was found while at least six large bags of lithics were removed.

As in the case of Category IV, no evidence of refuse was discovered in this single test of Category V.

Results of the Testing Program

A review of the results of each unit shows that the testing program met with limited success. Of the five categories, only two showed clear evidence of defined refuse dumps. One example of a refuse pile was located within both Type II and Type III plaza groups (in Group 73 and Group N2 South, respectively). The single Type I group, N5, displayed a top stratum densely packed with cultural material but much of it was probably due to fall, as was the case with Type IV Structure 66. While it might be fruitful to compare the latter two data sets with each other, they do not provide data that could be reasonably compared with the occupational debris encountered in Groups 73 and N2 South.

Unexpectedly, however, the testing program did provide numerous examples of wall construction (both saddle retaining walls and structure walls). These ranged from well-preserved walls with carefully shaped, uniformly-sized limestone blocks (Group 73, Group 1) to walls constructed of a less elaborate mix of both small and large limestone blocks (Group N2 South, Structure 66) to walls showing only cobble construction, either due to collapse or simply from a lack of labor investment (Group 4, Structure N2 North, Structure 71). All walls that contained limestone blocks of any size followed the same pattern of construction in one respect, however: the wall's foundation course was always made up of cobbles while succeeding courses were constructed of the limestone. This technique may have been employed to exploit the strengths of each type of stone. The strong but unattractive cobbles provided stability and endurance, while the less durable but easily shaped limestone was used above the level of the floor to create attractive walls of uniformly carved blocks.

Finally, it may prove useful to compare the contents of the structural fill encountered across group types: the unusual lack of ceramics in Type V Structure N4 South can be compared to the cultural contents of the fill of Type II Group 1 and Type III Group N2 South. There are examples of platform fill as well from Type III Group 4 and Structure N2 North that may prove useful for purposes of dating and cross-category comparison.

San Lorenzo Plaza Group I

Extensive clearing excavations were undertaken in Plaza Group I (Figure 6). This work had two goals: to identify the level of preservation of structure walls and floors and to locate any plaza activity areas and/or residential debris. Operations 85 and 86 cleared strips of plaza adjacent to the walls of Str. 1 and Str. 2 and Operation 90 cleared strips along the north and east walls of Str. 2. All operations revealed excellent preservation of walls as well as sections of floor plaster that ranged from well-preserved (OP 86O) to poorly preserved (most of the exposed plaza that extended out further than 50cm from structure walls). In addition, the first two operations uncovered extensive plaza floor deposits.

Operation 86: Excavations South of Structure 1

Operation 86 contained only three units. Units 86A-C cleared an area of just over a meter wide and 3 meters long south of the east half of Str. 1, the lowest and smallest of the three structures making up Plaza Group 1. Excavation uncovered the latest plaster surface south of the structure and did not continue below it. Clearing began at the central axis of the building with unit 86A. From west to east, two other OP 86 units were put in: a 2x2 meter square, 86C, and a 1x1.5 meter unit, 86B.

Unit 86A initially produced a jumble of materials resembling fill and later excavation confirmed this initial impression. Two limestone blocks oriented along a north-south axis were located in the adjacent unit, 86C. One of these was a long block bisecting the unit, suggesting the remnants of an outset of some kind, perhaps a central staircase. West of the limestone block there appeared to be little but packed fill, with no plaster surface ever making an appearance. East of the block, however, the plaza floor was found. On this surface a wide scatter of debris, primarily ceramic but including fragments of obsidian and chert, was found.

Project ceramicist Lisa LeCount did a detailed examination of the OP 86 material and provided a Late Classic II date for the outset fill. The sherd and lithic scatter east of the outset was identifiable only as a Late Classic deposit. Unit 86B, to the east of 86C, also revealed extensive surface deposits dating to the Late Classic.

From the outset to the east boundary of 86B, refuse appeared in scattered patches along the entire excavated strip of plaza. OP 86 stopped at the east edge of unit 86B, 1.3 meters west of Str. 2. This left the inside corner between Str. 1 and Str. 2 to be designated part of OP 85 (Figure 6).

The south wall of Str. 1 was similar to the east wall of Str. 66 in unit 95I (Figure 4) and the north wall uncovered in units 95C and 95D in Plaza Group N2 South. It contained a mix of both large, shaped limestone blocks (30cm x 30cm) and small, irregular limestone blocks (16cm x 4cm). No cobble foundation course was visible because the foundation lay below the latest plaza floor, at which excavation halted.

Operation 85: Excavations West of Structure 2

Operation 85 was the most extensive operation within San Lorenzo Plaza Group 1 (Figure 6). It cleared a 4 x 1 meter strip along the north half of Str. 2 and a 6.5 meter long strip, varying in width, along the south half of Str. 2. The area in front of the central staircase was left intact, in anticipation of further excavations bisecting the structure in 1994.

Four units made up the north section of OP 85 and eight units made up the south section. From the corner of Str. 1 and Str. 2 to the north side of the staircase, units 85J, G and C were placed consecutively from north to south. Between unit 86C and the north side of the central staircase was Operation 72, a three-unit 1992 test of the group (Chase 1992). Unit 85A was a small 1 x 1 meter unit placed at the NW corner of the staircase in order to confirm that it was a set of stairs. The south section of OP 85 was made up of units 85B, D, E, F, H, M, L and O, proceeding roughly from north to south. This group of units cleared a strip from the south side of the staircase to the edge of Str. 3.

Both halves of OP 85 had a great deal in common. Each strip uncovered a

dense scatter of ceramics, lithics and other cultural materials that spread across the surface of the plaza. This scattered debris was arbitrarily divided into thirteen deposits that were designated by the units and lots in which they were uncovered. It was difficult to divide the plaza floor material into unarbitrary, meaningful groupings in the south half of this operation.

Operation 85 North Floor Deposits

The inside corner of Str. 1 and Str. 2 was the site of the largest, densest deposit, designated 85J/4-D1 and 85G/4-D1. The deposit crosscut two units, 85J and 85G, and was designated accordingly. It was a refuse pile that appeared to have been swept into the corner sometime before the plaza group was abandoned. Unlike all other deposits, this one was layered: large sherds were stacked on top of each other and the entire mass was wedged tightly into the corner against the structure walls. Examination of this material by project ceramicist Lisa LeCount showed it to be made up of approximately eight individual vessels, one almost complete, missing only its feet. There were many chert tools in various states of completion represented as well and the majority of these lay around the outskirts of the 1.1 x 1.1 meter deposit. The chert artifacts, being heavier and more compact, may have washed down from the central mass of debris and settled on the level surface surrounding it.

Bone, groundstone, obsidian fragments and a medium-sized, grooved stone ball of a type commonly located in Xunantunich quarries (and thought to be a quarry weight) were also part of the deposit. One large bone was found near a small, almost complete vessel and the "quarry weight" at the outer edges of the scatter. It is very likely that the actual area of the scatter was wider than identified: initial excavation of the area failed to note some of the floor material.

Project ceramicist Lisa LeCount provided a Terminal Classic date for all of the datable ceramic material within this deposit. This date is consistent with almost all of the plaza floor deposits recovered in Plaza Group I, and contrasts with the date of subfloor material recovered from the ballast (see discussion of unit 85L for details). Of the thirteen plaza deposits within the group, all but four were identified as Terminal Classic in date. Closer examination of two of the deposits that do not contain Terminal Classic material show that they do not represent plaza floor deposits. The two remaining non-Terminal Classic deposits both occur in Operation

86, south of Str. 1.

Plaza Floor Deposits and Chronology

Deposits 85L/4-D1 and 85L/5-D2, from the south half of OP 85, were found in the corner formed by the south side of the Str. 1 staircase and the Str. 1 west wall. The first of these, 85L/4-D1, was a full 16 cm above the plaza floor while the second, next to the first and containing only two sherds, was slightly lower. It lay 6 cm above the surface. These two deposits, each containing Late Classic material, probably represent structure fill that tumbled down from the building during the initial stages of its collapse.

All other plaza material was removed directly from the surface of the plaza; all of the Operation 85 plaza floor deposits were identified by LeCount as Terminal Classic deposits. Unit 85L, again in the south half of OP 85, was the site of the only probe beneath the latest plaza floor in Group 1. Lot 8, beneath this plaster surface, yielded only Late Classic I and II material, providing a sharp break in dates between subfloor material and floor deposits within Operation 85.

Deposit 85J/4-D-1, 85G/4-D-1 was the only floor deposit in the north half of Operation 85. It clearly represents a garbage dump within the plaza which may have been created shortly before the abandonment of the group, as it contained so few vessels despite its great bulk. The corner pile probably slumped over time, radiating some materials south along Str. 2 and west along Str. 1. As previously noted, the edges of the deposit are artificial, since some floor material is known to have been removed along the south side of the deposit, and this may be the case along the deposit's western boundary as well. A gradual decline in floor level from east to west, creating a slanted plaza surface, further suggests that this may be the case.

Along the west wall of Str. 2, the plaza floor lies at an absolute elevation of 89.52; this high surface retains much of its original plaster. Seventy centimeters to the west, the surface has dropped to an elevation of 89.46, and at 1.8 meters west the surface has further dropped to 89.44. At 3 meters west of the Str. 2 wall, the surface level sits at 89.37.

The OP 86 scattered surface materials appearing in clusters to the west of the corner deposit (see OP 86 above) and terminating at the Str. 1 outset may be

individual deposits or they may at least partially represent material that was originally deposited with the refuse pile in the corner of Str. 1 and 2. However, the Late Classic date assigned to the ceramics within the Operation 86 deposits, contrasting with the Terminal Classic date of the corner debris deposit, argues in favor of the individual deposit hypothesis.

Operation 85 South Floor Deposits

The south half of Op 85 contained an even wider area of surface deposits than the north half. From the south side of the central staircase moving south, excavation uncovered 4.5 meters of plaza surface deposits. The scatters were arbitrarily divided by unit and lot, but in actuality sherds, lithics (including fragments of obsidian) and a large broken metate were strewn across the surface of the plaza with little to suggest lines of demarcation. One unit, 85L, is reasonably representative of the others (Figure 7).

In unit 85L, the area close to the wall of Str. 2 retained some of its original plaster. Away from the wall, the plaster disappeared and the amount of surface material increased. Numerous clusters of sherds were found throughout the unit intermixed with chert scrapers and other tools. The large metate was not the only example of groundstone in the plaza surface deposits, but it was almost complete, and other deposits contained only small fragments of groundstone tools. As was the case along the north half of Op 85, the plaza surface sloped, dropping in elevation as one moved to the west.

All north OP 85 units contained plaza floor deposits. Units 85B, D and E extended 3.4 meters west into the plaza, and sherds appeared even along the western boundaries of these units. Deposits did not appear to decrease as one receded from the Str. 2 wall. Unit 85O, the southmost unit within OP 85, showed the least concentration of surface materials. This unit bordered on Str. 3, uncovering three steps along its south boundary. Only four sherds and an unidentified stone object appeared on the plaza surface at the base of these steps. Interestingly, LeCount identified these sherds (lot 85O/6) and those making up the bulk of the two preceding lots (4 and 5) as jar fragments. All of these lots were located in the west half of the unit and probably represent fall from Str. 3. This indicates that Str. 3 may have had some storage function previous to abandonment.

Wall Construction

Operation 85 cleared the full length of the west wall of Str. 2. Construction varied slightly between the north and south halves of the wall. On the north side of the central staircase, two courses of the wall were visible. All blocks were made of shaped limestone and their size varied from small (4 x 14 cm) to medium (15 x 20 cm). Most of the blocks were moderately rectangular in shape, and most were placed with the longest side on the plaza floor. Preservation was not as good along this half of the wall as it was along the south half.

The south half of the wall was characterized by larger, better preserved blocks of limestone. These were laid both with the longest side down and with the longest side upright. The southernmost two meters of the Str. 2 wall exposed an abrupt shift to four courses instead of one as it approached a corner with Str. 3: two short courses of small limestone blocks (3 x 12 cm) were laid, topped by a third course of the usual large, shaped limestone and finally by the single remaining fourth course limestone block (3 x 20 cm). This may reflect a particular technique for cornering: the south wall of Str. 1 shifted in exactly the same way for the final 1.8 meters of its length as it cornered with Str. 2. All blocks in both halves of the west wall were made of limestone with the exception of a single small cobble that appeared in the lowest course of the far north half of the wall.

Operation 90: Excavations North of Structure 2

Operation 90 contained seven units, five along the north side of Structure 2 and two placed along its east side. The latter two, units 90F and 90G, were included as part of the testing program sample and have been discussed in the first half of this report. The five north units, 90A-E from west to east, uncovered sections of the raised north saddle between Structures 1 and 2 and revealed sections of the north wall of Structure 2.

Unit 90A exposed the juncture of Structures 1 and 2. This small unit uncovered two lines of stone: the first was a highly eroded mass of limestone that ran east and west (Wall 1) and the second, a parallel line of limestone blocks found approximately 20 cm lower, was part of the Structure 1 south retaining wall (Wall 2). This lower wall was much better preserved than the first. Examination of Wall 1 showed that it had been constructed in the familiar San Lorenzo fashion, with a foundation cobble course supporting succeeding courses of limestone. It also

appeared to be faced on the north side, suggesting that it had originally been part of the Structure 2 north retaining wall. The 10 cm between Wall 1 and 2 were tightly packed with fill, as was the excavated area behind each of the two walls (north of Wall 2 and south of Wall 1). It seemed clear that just as Wall 2 was the continuing south wall of Str. 1, Wall 1 represented the north wall of a later construction, Structure 2 (or its final phase).

Units 90B-E were placed further east of 90A. These units cleared a further section of the north wall of Structure 2 (Wall 1) and confirmed that it was constructed of a cobble foundation course overlaid by limestone. An additional wall appeared in unit 90D: Wall 3 appeared just below Wall 1 and was placed at a 90 degree angle to it. Two large, carefully dressed limestone blocks signaled the presence of this new north-south running wall. It lay directly under Wall 1; one of the Wall 1 foundation cobbles was placed directly on the south block of Wall 3. Excavation showed that the area west of Wall 3 was packed with a dense layer of fill starting at the base of the Wall 3 blocks and stopping at the top of the wallstones.

Construction Phases at Group 1

Operation 90 showed that Structure 1 was already in place before the final phase of Structure 2 was built (and since it is unknown whether there were any prior phases to Structure 2, it may be true that Structure 1 preceded Structure 2 entirely). Wall 3 was probably built to mark the eastern edge of the plaza which was later filled in and covered over to create a raised saddle and Structure 2. In other words, the Group 1 raised saddle was created by filling in what was probably originally part of the group plaza and in addition, the final phase of Structure 2 was built on top of that fill. The newly-created saddle was then at least partially plastered over, as remnants of plaster in unit 90B at the level of the top of Wall 3 reveal.

Operation 85 likewise offered evidence to suggest that Structure 3 preceded the final phase of Structure 2 as well. Unit 850, at the corner of Structure 2 and Structure 3, showed that the juncture between the two buildings had been created by laying Structure 2 wallstones on the pre-existing north steps of Structure 3, interlocking the two buildings. The situation is further clarified by the fact that Structure 2 partially blocks off the east section of Structure 3 (Figure 6). This would prove to be an unusual arrangement if Structure 2 had been built first, but would be understandable if Structure 2 had later been wedged between Structures 1 and 3,

inadvertently blocking access to a portion of the latter building's stairs.

Summary

The 1993 San Lorenzo subproject concentrated on two areas: the search for household refuse across a diverse group of households and an attempt to identify plaza floor deposits in Plaza Group I. The first of these two investigations proved to be only moderately successful, identifying several examples of household refuse but failing to acquire a definitive sample of discard that included debris from all five typological categories. It did produce examples of wall construction from three of the five categories, however, showing that the basic style of construction remained the same while the quality of construction and level of preservation varied across groups. The second investigation was more successful; it uncovered a number of plaza floor deposits containing ceramics, lithics, groundstone, shell and obsidian.

At the close of the 1993 field season, progress had been made, as well, in understanding the order in which Plaza Group I structures had been constructed and in assessing the general level of preservation characteristic of the San Lorenzo site.

Acknowledgments

I would like to extend my thanks to the following individuals and institutions who made this report possible. The Xunantunich Archaeological Project and Sigma Xi provided financial support for travel, excavation and living expenses. The Belize Department of Archaeology gave its permission to carry out this research. Wendy Ashmore and Richard Leventhal provided excellent guidance and direction; Jennifer Briggs-Braswell was generous with her time, knowledge and advice. Thanks also go to James McGovern who shared his considerable computer expertise, Lisa LeCount who provided important insights into the data, Angela Keller who organized and executed the mapping of San Lorenzo, Jason Yaeger who helped with almost everything from mapping to the reading of drafts, and Jon Vandenbosch for assistance with last minute mapping. Finally, thanks go to the entire XAP crew for their support and for the wonderful merriment of the 1993 field season.

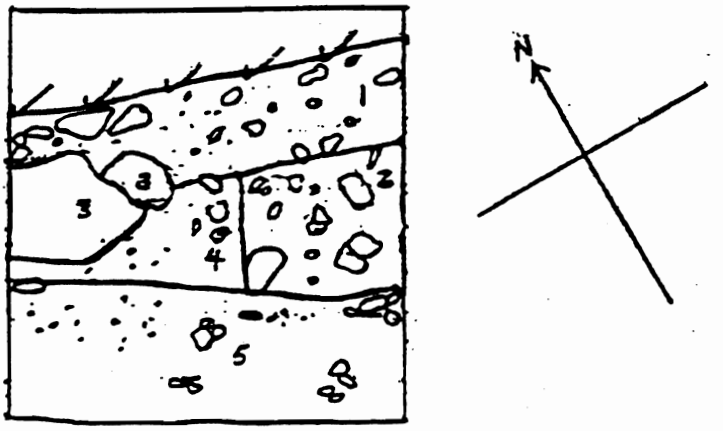
References Cited

Chase, Sabrina M.
1992 South Group Plaza I and Nabitunich Plaza Group. In *Xunantunich Archaeological Project: 1992 Field Season*, ed. R.M. Leventhal, pp. 35-55. Belmopan and Los Angeles.

Tourtellot, Gair
1988 Developmental Cycles of Households and Houses at Seibal. In *Household and Community in the Mesoamerican Past*, eds. R. Wilk and W. Ashmore, pp. 97-120. Albuquerque: University of New Mexico Press.

Figure 1 : East Profile of Unit 95H, adjacent to the N saddle of San Lorenzo Plaza Group N5. Note abrupt termination of mezcla stratum.

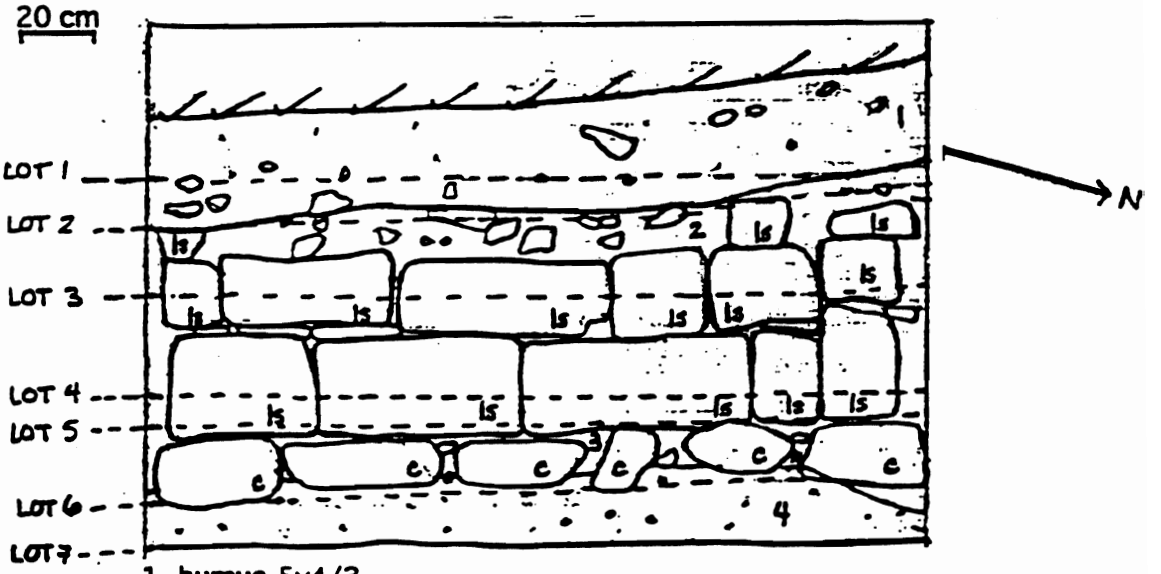
1:20 20 cm



1. humus 5y4/3
2. mezcla: sandy and gritty, many limestone or plaster fragments 10yr7/6
3. limestone block
4. sandy clay 10yr4/6
5. clay 10yr4/6

Figure 2: West Profile of Unit 95B, adjacent to the NE saddle of San Lorenzo Plaza Group 73. The saddle retaining wall's foundation course is constructed of medium-sized cobbles, while succeeding courses are made of carefully shaped limestone blocks.

1:20 20 cm

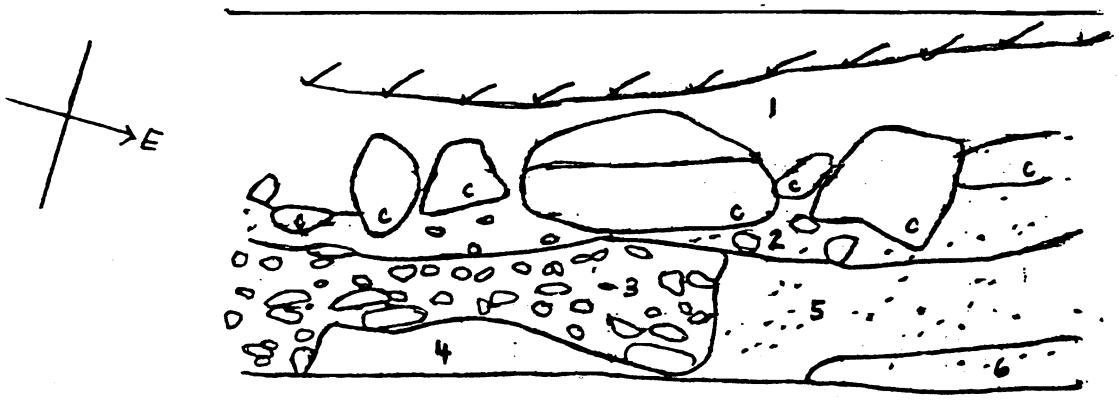


1. humus 5y4/3
2. sandy loam 10yr7/6
3. sandy loam between 10yr7/6 and 10yr7/8
4. clay with some sand 10yr7/8

ls= limestone

c = cobble

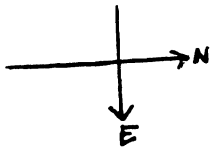
Figure 3 : North Profile of Unit 95F, adjacent to the S saddle of San Lorenzo Plaza Group 4. Note fill (designated 3) abutting stratum 5: the natural slope has been artificially extended.
1:20 20 cm

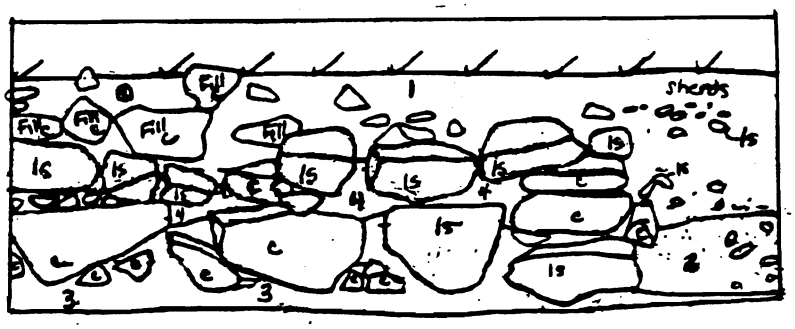


1. humus 5y3/1
2. clay loam mixed with bits of humus and gravel: 5y3/1 and 10yr7/6
3. clay loam and bits of limestone10yr4/6 mixed with fill 10yr7/6
4. clay 10yr4/6
5. sandy clay10yr4/6 with flecks of limestone
6. modeled clay: 10yr4/6 and pale yellow

c= cobbles

Figure 4: West Profile of Unit 95I, adjacent to the E side of San Lorenzo Structure 66. Once again, the wall foundation course is constructed of medium-sized cobbles, while the upper course is made of limestone blocks.
1:20 20 cm



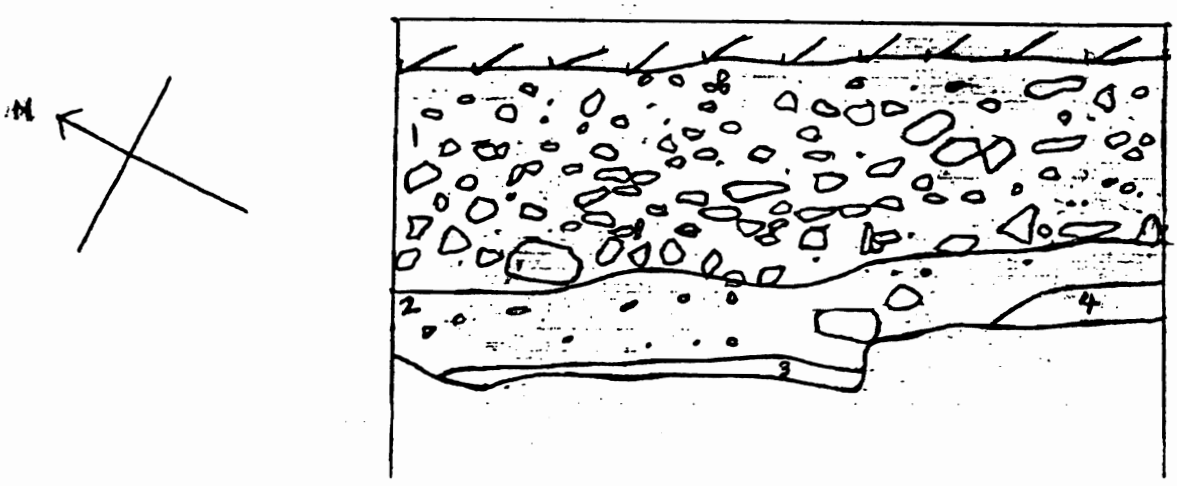


1. humus 5y4/3
2. sandy clay w/limestone or plaster fragments, slightly darker than 10yr4/6
3. clay w/some sand 10yr4/6
4. clay with some sand 10yr7/8

ls= limestone

c = cobble

Figure 5 : East Profile of Unit 95J, along the NE side of San Lorenzo Structure N4 South.
Unit profile shows a thick layer of dense cobble fill.
1:20 20 cm



1. humus and a dark fill matrix 5y3/1
2. clay w/some sand 10yr4/6
3. sandy modeled clay, 10yr4/6 and 10yr7/6
4. very sandy modeled clay, 10yr7/6 with flecks of limestone and pale yellow streaks

Figure 6: Nabitunich Plaza Group 1, showing general location of OPS 85, 86 and 90.
Drawing not to scale.

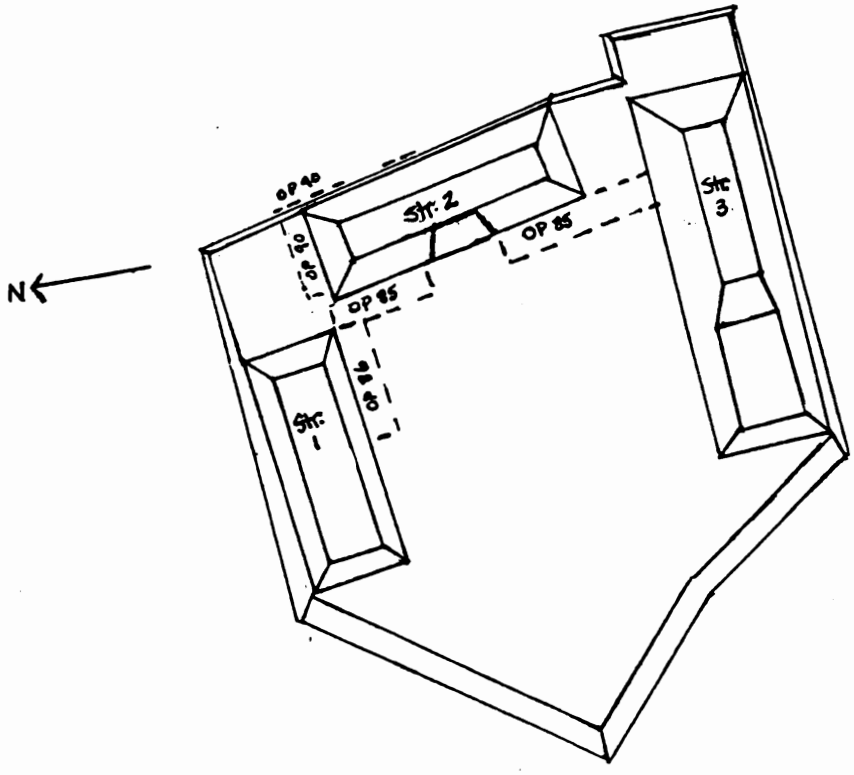
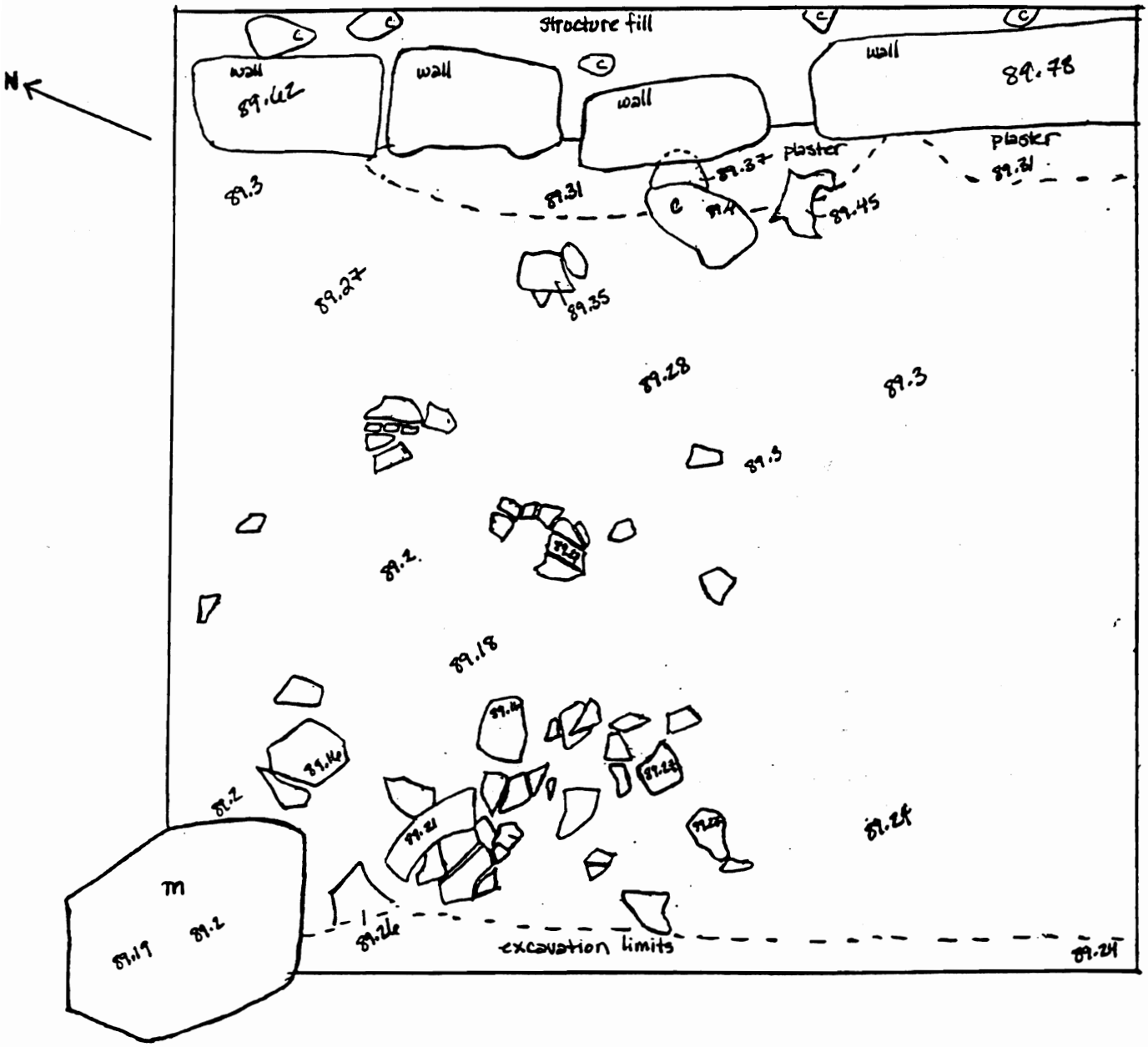


Figure 7 : Plan View of 80L/7-Deposit 1 (at base of Lot 3), along the W side of Str. 2, San Lorenzo Plaza Group 1; unit placed adjacent to structure retaining wall on the south end of the building. Special Deposit 80L/7-D1 was typical of Group 1 plaza deposits in general; it contained the remains of several ceramic vessels, various lithic tools and fragments of groundstone (less common).
1:10 10 cm



c= cobble
m= metate fragment
all other objects are sherds or lithic fragments

Investigations Of San Lorenzo's Linear And Cobble Mounds

Jon C. VandenBosch
University of Pittsburgh

Introduction

This section reports on the second season of investigations at the area of linear cobble mounds northwest of San Lorenzo Group (Figs. 1-2). The site is located on the terrace above the Mopan River and is composed of a series of densely packed cobble mounds, many of which are linear in form. These linear mounds have widths of 2-5m and lengths of up to 50m. Few of the mounds exceed one meter in height. This site drew XAP's attention due the unusual forms of the mounds, and their location near the San Lorenzo Group and the Mopan River. Today, forest of moderate undergrowth covers most of the southern half of the linear mounds, while most of the remaining portions shown on the accompanying map are being used as horse and cattle pasture.

In 1992, XAP conducted investigations in this area in order to determine chronological placement and to make functional assessments for the site. Excavations were done both on and off the mounds in order to define natural and cultural stratigraphy, define construction features and to recover refuse associated with the structures. Additionally, mapping of the open areas surrounding the excavations was begun.

The 1992 excavations indicated that the mapped structures can be confidently dated to the Late Classic Period (LeCount 1992; primarily Benque Viejo III Thompson 1940). These were built on an alluvial deposit of sands, gravels and cobbles. This deposit was up to 1.5m thick, and is indicative of catastrophic flooding of the area. G.Holley and W.Woods (personal communication, 1992) suggest that this may have occurred while the river shifted its course from along the base of the large hill east of the site to its present course to the west. Definitive architectural features and refuse were not commonly found in the 1992 excavations. Based upon last year's work (Ops.50 and 51; VandenBosch 1992), we developed a working hypothesis that this area was used primarily for specialized economic purposes rather than habitation. One of our speculations was that it served as a storage/transshipment point for goods moving along the adjacent Mopan River. An agricultural function for the site was also considered a possibility.

Reconnaissance

Prior to beginning either mapping or excavations, limited reconnaissance was

done along the Mopan River (Fig.1). Other XAP members had located a series of similar cobble mounds below Actuncán and directly across the river from the area discussed in this section of the report (see also: McGovern, this volume).

A short walk-over survey of that area revealed that the mounds resembled those of the San Lorenzo area. The mounds appear to have been similarly constructed of limestone and chert river cobbles, and many of them were linear in form. The area covered by these features is equal to, or even exceeds, that covered by the structures on the east side of the river and is also used as a cattle pasture. Also similar is the location, which is on a broad terrace above the river. Although the reconnaissance was limited to a one hour walk-over, the initial impression is that the mounds in the area are somewhat less well-defined than those of San Lorenzo which are shown on the accompanying map. In fact, some areas actually appear to be disturbed, and in the short time spent viewing them it was often difficult to distinguish constructed features from areas disturbed by (undetermined) natural or cultural agents.

The reconnaissance along the east bank of the Mopan River was conducted to determine if sites composed of cobble mounds situated on river terraces were a common occurrence in the region. The reconnaissance was carried out from the north edge of the mapped area, northward along the east bank of the river and extending about .5-1.0 kilometer from the river's edge. The two and one-half days of reconnaissance reached the Callar Creek Bridge, about 2 straight-line kilometers NNW of the edge of the mapped area. Reconnaissance concentrated on similar appearing geological settings: broad flat flood plains and river terraces. These were not common in the area traversed, with hilly features frequently within 100 m of the riverbank. A little over one-half of the area was open pasture, milpa and lightly settled areas that provided excellent visibility.

Very few mounds were located during the reconnaissance, and no indication of linear mounds was observed. Although the reconnaissance was not highly systematic, it seems unlikely that any sites such as those discussed here are present in the traversed area. However, the extremely limited coverage of the reconnaissance may have precluded identification of such sites. In order to get a better idea of the distribution of such sites, the reconnaissance should be continued northward along the river. It may be profitable to more closely examine the area of

Callar Creek, where the river is deeply downcut into an old meander, and the whole length of the opposite (west) side of the river. From vantage points along the Mopan's east bank it appeared that the west side of the river has a generally broad, flat terrace. Such low elevations above the river may have been "preferred" locations for such sites. Perhaps more importantly, extending the riverside reconnaissance to downstream from Buenavista would determine if such sites were associated with that site as well.

Mapping

The mapping was initiated in order to define the extent of the San Lorenzo linear cobble mounds. Ultimately, mapping was extended well beyond the visible site limits and came to include all surrounding structures to place the linear and cobble mounds in a larger settlement context (Fig.1). The more extensive mapping program was simplified and encouraged by the fact that most of the mapped area is in open pasture.

Mapping was accomplished by pace and compass with elevations determined with a hand-held level and stadia rod. In order to control for errors accumulated in the pace and compass technique, with 12 control points were plotted with the EDM. These control points were spaced such that all structures were within about 100 paces (94m) of one or more control stakes. The structure locations are considered to be accurate, although caution should be used when using the map as a basis of structure comparison since the structures mapped using the Maler convention are quite low. The topographic map is an approximation derived from the same mapping techniques and the SURFER software program, utilizing a limited number of elevation points.

Excavations

Introduction:

The excavation phase of our work on the cobble mounds was designated Operation 101 (Op.101), and was composed of 14 excavation units (see Table 1). The excavation program was designed to locate any refuse associated with the structures and define the mound architecture by horizontal excavation. It was decided that excavations would be more productive if attention was focused on a more restricted area; and since very little artifactual material was recovered in the 1992 excavations,

we decided to shift the focus of our efforts south, towards the central area of the distribution of linear mounds. Eleven of the excavation units were placed on and around Str. 34, and the remaining three units were placed on and around Str. 30.

Table 1: Suboperation Locations
Operation 101

Subop.	Location
A	off west end of Str.34
B	off south edge of Str.34, east of eastern stub-wall
C	off south edge of Str.34, east of western stub-wall
D	off south edge of Str.34, west of western stub-wall
E	off northwest edge of Str.30
F	off north edge of Str.34
G	on Str.34, near mid-point
H	on Str.34, near mid-point
I	on southest side of Str.30
J	on east side of Str.34's western stub-wall
K	on east side of Str.34's western stub-wall
L	on southeast side of Str.30
M	on Str.34, near mid-point

Stratigraphy:

This area appeared to occupy the same terrace as is the area investigated to the north last year, and we were confident that the stratigraphy and depositional sequence of the Op.101 area would be identical to that encountered in 1992 in Ops. 50 and 51. Thus, we initiated excavations without placing a unit explicitly for the purpose of defining stratigraphy. In all but a single case (described below), this assumed identity of depositional sequences were the same in both areas (Ops. 50, 51 and 101) was correct. In brief, excavations indicate that all visible structures were constructed on an alluvial deposit of sands, gravel and cobbles. This major flooding event(s) was determined to have occurred after the Proto-Classic, and probably immediately prior to the Late Classic (VandenBosch 1992).

The single exception to the uniformity of stratigraphy in the area of Op. 101 was found in Op. 101A. This 50cm by 2m unit was placed at the western end of Str.34, and is the westernmost unit excavated to date. After attaining a depth of ca. 70cm below the surface, the sand deposits had not been encountered and the unit was too narrow to continue excavation. There is a very slight slope down to the NW

around Str.34, though there are no obvious surface indications that there are discrete geological deposits. The ground surface in the open area to the WSW is similar to that seen in Ops. 50/51, with short grasses and patches of exposed sandy soil. For these reasons, it seem likely that the sandy sediment seen elsewhere lies close below the limits of excavation in 101A. It is probable that this unit reveals a post-occupation flood deposit such as was seen on the north side of Str.3 in 1992 (Op.50V).

A final comment regarding the stratigraphy seen in this year's excavations is that the A-horizon was of a finer texture than seen to the north in Ops 50/51. The A-horizon seen in Op.101 was much more loamy than sandy in texture, and often felt clayey. This is likely due to the fact that all of Op.101 excavation units were located under forest cover while all of Op.50/51 was in open pasture. This would have exposed the soils to the drying effects of the sun and regular compaction under the hooves of large animals. Thus the differences noted in the A-horizons seen in 1992 and 1993 seasons is more likely due to differences in present and recent land use affecting qualitative textural determinations, than representative of discrete depositional episodes or pedogenic processes of the distant past.

Off-Mound Excavations:

A series of units was excavated off the sides of the mounds in order to search for associated refuse deposits. All off-mound excavation units covered an area of one square meter, though some of them had dimensions of 0.50m X 2.0m. The longer dimension was selected in order to cover as broad an area adjacent to the mounds as quickly as possible without the time-consuming efforts involved with larger units. One unit was placed along the north side of Str.30, near its midpoint, and opposite to where Str.31 approached it from the south (Suboperation E). All other off-mound units (Suboperations B-F) were placed around the edges of Str.34.

The search for refuse deposits produced some positive results. In general, Op.101's off-mound excavations produced somewhat more ceramic artifact material than was recovered from the north in 1992 (Op.50).

Str. 34 Excavations:

The greatest efforts of the structural excavation phase were concentrated on Str.34. In addition to its central location relative to the other cobble mounds, Str.34

was one of the highest mounds in evidence. We believed that its location and larger size made it a better candidate for greater architectural preservation and may have related to higher intensity of artifact-depositing activities in prehistoric times. The form of this mound is linear with at least three distinct changes in surface elevation. Str. 34 also appears to have a connection with Str.30 at its eastern end. Also of interest are two stub wall-like features projecting out from the structure's south side (An excavated example of these is discussed below).

Suboperations G, H and M were placed near the mid-point of Str. 34 and oriented roughly perpendicular to it. These units were excavated by lateral clearing and by approaching the mound from outside. Although excavation was accomplished using picks, as well as trowels, we proceeded slowly and with care. Horizontal excavations attempting to locate occupation surfaces produced negative evidence, and no clear limits to the architecture (e.g: aligned stones) were located.

A series of three soil stains aligned with the mound near its north edge may be remnants of architectural features (Fig.3). These were only visible below the level of cobble construction fill material which was mixed with a dark brown soil matrix. The stains clearly extended down into the yellow-brown sandy sediments. The coarse matrix of the sandy sediments made excavating and cleaning the stains difficult. The stained areas were roughly circular in plan (20-30cm diameter), and two of them extended up to 50cm into the sands. It may be notable that one of the stains exhibited a notched form in section, much like the Proto-Classic structure's postmold seen last year (Op.50 A).

It was not possible to either trace the stains up into the fill or even determine the precise limits of the fill in relation to the slumped or overburden materials. Rather, the limits of these were graded and blurred together above the stains and outside (north) of the mound. However, the location of the stains and their apparent alignment with the mound leads to the probability that they are the remains of architectural elements of perishable materials. If this interpretation of the stains as postmolds is correct, they would not likely be from posts that simply supported a superstructure. Instead, their location, large diameter and depth into the subsoil suggest that they served as posts for retaining the cobble fill of the mound, with possible additional functions of supporting walls and roof of a superstructure.

Linear "Stub Wall" Along Str. 34:

The final mound excavation was on the low ridge extending out from the south side of Str.34. On the surface this feature was indicated by only a slight rise in the ground surface, and the concentrations of visible pebbles and cobbles was lower than that seen on the larger mounded structures. This feature is paired with a similar one to the west on Str.34. To the east, another similar feature was located along Str.32, and Str.16 may also have one on its south side.

Two excavation units (Op.101 J and K) were excavated into this feature. Although excavation was done entirely with trowels and careful hand clearing, no alignments or other defining features were found. The positioning of some of the stones suggested some disturbance from the original placements. The size and apparent attachment of the linear features to Str. 34 may indicate such linear features are functionally equivalent to those on the west side of Str.14 excavated in 1992. (Op.50 C-F and H). However, those along Str.34 were shorter and more elevated, and constructed of somewhat larger stones (Fig. 5).

Str. 30 Excavations:

The second structure to be investigated this year was Str.30. This structure is linear in form, but unusual in that it curves to the northeast rather than being aligned in a single straight direction. Two suboperations (I and L) were excavated on Str. 30. These excavations were placed near the southeast corner of the structure, near the corners formed with Strs.33 and 34. The only unequivocal in-situ architectural element was located in this area. This was a simple alignment of medium sized chert and limestone cobbles which demarcated the southeast edge of the structure (Fig.4). These cobbles had been laid upon the surface of sand and pebbles. This surface rose beneath the mound, but it was unclear whether this was the result of a natural rise or a modification to the original ground surface. Unfortunately, time did not permit following the alignment southwest in order to define the relationship between Structures 30, 33 and 34.

The lack of large or sizable quantities of stone material beyond (east of) this alignment suggests that it probably did not stand much higher in ancient times and that it marks the outermost edge of the structure. If this is the case, the alignment would not have retained the entirety of the cobble fill behind and above it, leaving the original form of the structure in question. The two possibilities that come to

mind are that the alignment represents a step in front of the structure or that the structure's original surface was a sloped mound little more complex than seen today. There were no indications of other architectural elements within or higher up on the structure.

Summary

With the completion of this second season of investigations at San Lorenzo's cobble and linear mounds, we now have better ideas as to the nature of the site as well as its surrounding area.

Artifacts And Chronology:

All ceramic artifacts were analyzed by XAP ceramicists for determination of the chronological placements of excavated contexts (see LeCount 1992 and this volume for methodology). Of the 25 excavated lots, 15 had insufficient quantities of diagnostic materials for providing dates. The occurrence of ceramic dates obtained from the remaining ten lots is shown in Table 2. Seven of the datable lots produced chronologically mixed ceramic materials, but all those dates fall within the Late Classic Period. One Early Classic date and one Terminal Classic date were obtained from mixed contexts. The Early Classic material was found within the fill of Str. 34 (Suboperation M), and the Terminal Classic date came from an excavation off the south side of Str. 34 (Suboperation D). Three mixed lots came from off the south side of Str.34 (101 D/1, Late Classic II, Terminal Classic); Str.30 (101 I/1, Late Classic II, Late Classic I); and from the fill of Str 34 (101 M/1, Early Classic, Late Classic). The only instance of stratified diagnostic ceramic dates came from 101 D, where Late Classic II and Terminal Classic materials overlay undifferentiated Late Classic materials.

Table 2: Occurrence of Ceramic Dates in Ten Dated Lots

	EC	LCI	LCII	LC	TC	Total
EC	-	-	-	1	-	1
LCI	-	1	1	-	-	2
LCII	-	1	2	-	1	4
LC	1	-	-	4	-	5
TC	-	-	1	-	-	1
Total	1	2	4	5	1	13

Despite traces of Early and Terminal Classic materials, the San Lorenzo linear and cobble mounds can be fairly securely dated to Late Classic/ Benque Viejo III times. Although the sample size is small, based on the occurrence of diagnostic ceramics and the single sequential stratified deposit of 101 D/1-2, it would also appear likely that the greatest intensity of site utilization occurred during the Late Classic II/ Benque Viejo IIIb. With the exception of the occurrence of the Terminal Classic materials, this chronology accords with the dates obtained from material excavated in 1992 (see VandenBosch 1992).

The preliminary artifact analysis indicates at least some residential use of the site. Ceramic analysis shows nothing remarkable and no notable frequency differences of types or forms from typical domestic contexts excavated by XAP (LeCount, personal communication 1993). The lithic analysis is notable for the general lack of formal tool categories and later-stage reduction debris. Much of the mound fill consists of this material, but it is not indicative of any form of intensive or specialized lithic production.

Lithic artifacts recovered from Op. 101 are compared to those from Ops. 85 and 86 at San Lorenzo (see: Chase, this volume) in summary Tables 3-5. Artifact tabulations from Ops. 85/86 do not include those from contexts pre-dating the Late Classic or lacking associated dates. Debitage counts do not include pieces of uncertain genesis (i.e., non-diagnostic shatter or angular debris).

Table 3: Tabulation of Lithic Artifacts From Ops. 101 and 85/86

Type	OP. 101 # %	Op. 85/86 # %
Debitage	834 (91.55)	500 (85.32)
Cores	42 (4.61)	32 (5.46)
All Tools	34 (3.73)	51 (8.70)
Blades	26 (2.85)	3 (0.51)
Bifaces	5 (0.55)	33 (5.63)
Unifaces	2 (0.22)	10 (1.71)
Other	1 (0.11)	5 (0.85)
Hammerstones	1 (0.11)	3 (0.51)
Total Artifacts	911	586

Table 4: Pieces of Debitage Per Lithic Type

Type	OP. 101	Op. 85/86
Cores	19.86	15.63
Hammerstones	834.00	166.67
All Tools	24.53	9.80
Bifaces	166.80	15.15

Although Op. 101 has somewhat more debitage, there are proportionally fewer cores hammerstones and formal tool types than Ops. 85/86. Attribute analysis has been conducted on a sample of 106 complete flakes from Op. 101. No attribute analysis has been completed for Ops. 85/86, making definitive comparisons impossible. In the sample from Op. 101, dorsal flake scar counts average 2.35 (s.d.= 1.56), only 13% of the flakes have no cortex remnants, and 44% of the flakes are

covered by 50% or more cortex. Impressionistically, Ops. 85/86's flakes appear to have more dorsal flake scars and fewer cortical flakes. Likewise, Op. 101 flakes have low dorsal scars and high occurrence of cortex in comparison to other debitage collections from the Maya area (e.g.,Hester and Shafer 1991; McAnany 1989; McSwain 1991). The proportions of artifact types and flake attributes suggest an interpretation of reduction by cobble-smashing and expedient tool manufacture in the Op.101 area, especially in relation to the Op.85/86 area at San Lorenzo.

Table 5: Tool Types as % of All Tools

Type	OP. 101	Op. 85/86
Blades	76.47	5.88
Bifaces	14.71	64.71
Unifaces	5.88	19.61
Other Tools	2.94	9.80

Also of interest in the lithic collection from Op. 101 is the high frequency of blades, which account for over three-fourths of the tool forms present. Detailed analysis is in progress, but these blades do not appear to have been produced by specialized or standardized techniques: most are hard hammer flakes with no indication of core preparation, platform preparation or material conservation. Proportionally, Op.101 produced many more blades than did Op.85/86, but no comparisons have been made in blade production techniques between the two areas.

Reconnaissance And Mapping:

The reconnaissance and mapping program served to delimit more clearly the extent of the site. The map clearly shows the site's linear mounds to cover an area of approximately 10 ha. Counting all structures in the 10 ha area, we arrive at a density of 5.8 structures/ha. If only the most densely constructed northern half of the area is considered, the density of structures is 9.6/ha.

Similar mounds across the river near Actuncán may also be a part of this same mapped site complex. It is possible that mounds on both sides of the present river course may have formed a contiguous occupational zone. Unfortunately, we

were not able to begin mapping on the opposite side of the river, and the features which now straddle the river cannot be precisely related in space. This area is well bounded by sparsely occupied terrain which contains more "typical" forms of structures (i.e, plazuela/patio groups). The nearest concentration of plazuela groups is the San Lorenzo Group.

The possible extension of the San Lorenzo cobble and linear mounds to the other side of the river and its proximity to Actuncán suggest that the site is more closely associated with Actuncán than with Xunantunich further upriver. The simple straight-line distance from the central area of Op.101 to Xunantunich's Plaza A-2 (1.8km) as compared to that to Actuncán's main precinct. The average elevation of the linear mounds area is ca. 72.07 msl. Xunantunich's Plaza A-2 is more than 100 m above this elevation, while Actuncán's main precinct is higher than San Lorenzo's linear and cobble mounds. Both of these distances must be factored into considerations of the relative ease of access (i.e, transport/movement costs) between the sites.

Architecturally, structures at the site appear to have been little more elaborate than indicated by their present surface indications. As with last year's excavations, it was not the highest mound which revealed unequivocal evidence of in-situ wall alignments. This year, such an alignment was revealed in Str.30. The soil stains exposed by excavations of Str.34 are similar to those seen in the excavations of Str.23 in 1992 (Ops.51A-E, K). In 1992 these were identified as tree intrusions, now it seems more likely that these stains are indeed cultural, rather than natural, features. Therefore, we present the possibility of a different form of architecture than is usually reported: the use of perishable posts as aids in retaining sub-structural fill material in addition to their use as wall and roof supports of smaller (super-) structures.

External Comparisons:

External comparisons between this site and others is difficult since detailed reports of similar mounds are rare. In part this may be due to the difficulty of identifying such low structures under heavily vegetated conditions or a lack of research focus on extremely small structures. However, such long, linear mounds and cobble mounds are being reported with increasing frequency from the Maya Lowlands, particularly from sites in the North. Linear stone alignments have been

documented at Becan (Thomas 1981), the Central Peten (Rice and Rice 1979), Chicanna (Eaton 1975a, 1975b), Coba (Folan, et.al. 1983), Cozumel (Sabloff and Rathje 1975; Freidel and Sabloff 1984), and Sayil (Sabloff, et.al. 1985; Sabloff and Tourtellot 1991).

The Chicanna features are mentioned briefly, but not described in sufficient detail to make any comparisons. Linear features at Coba have been classified as inter-group sacbes/walkways, as well as field walls and houselot walls. Often, these were retained by cut stones and their association with typical plazuela platform structures indicates that they are not analogous to San Lorenzo's linear cobble mounds. Similarly, stone alignments on Cozumel are associated with domestic structures and clearly define field/houselot areas. The massive size and coverage of the mounds would seem to preclude them from being simple field walls or field stone accumulations (cf., Hayden and Cannon 1983).

Possibly similar Late Classic linear features have been reported for the Central Peten (Rice and Rice 1979), though not in great detail. The San Lorenzo mounds are wider than the width range given for the Peten features, and those that are parallel are spaced somewhat further apart than are the Peten features. In the Peten, the linear mounds are interpreted as walls, fence lines or terraces, and cross gentle slopes in such a manner as to suggest they functioned to collect colluvium or slope run-off. Small, low sub-rectangular mounds in the Peten appear to be similar to San Lorenzo's cobble mounds. In the Peten, there are indications of low intensity, expedient lithic tool production, and the infrequency of artifacts suggests low intensity, short term occupation. However, the low Peten mounds date primarily to the Late Preclassic and Early Classic Periods and are not usually associated with linear features.

The sites of Sayil (Sabloff, et. al,. 1985; Sabloff and Tourtellot 1991) and Becan (Thomas 1981) offer us the most comprehensive data useful for comparative purposes. At Terminal Classic Sayil, similar features were classified as chich mounds (small amorphous mounds of 5-15cm stones), rubble mounds (amorphous mounds of larger stones), and (low) linear platforms. Excavations showed the chich mounds were constructed by systematically laying large stones down and then covering them with smaller stones, which may then have been covered with a tamped earth surface. The sizes of the fill materials of the chich mounds (5-15 cm) is

similar to that found at San Lorenzo. These mounds are found across Sayil; in association with house structures and as isolated features. They are interpreted as ancillary domestic structures and field/store houses. High frequencies of water jars suggested that some of them had some residential functions.

With the exception of their generally much lower profile, the dimensions of the Sayil linear platform mounds (Sabloff, et. al. 1985, Sabloff and Tourtellot 1991) are similar to those of San Lorenzo. An excavated example at Sayil was discovered to be a low platform supporting an open-fronted foundation brace structure. This had low interior benches which were faced with dressed stones. The most striking feature of Sayil's rubble mounds and linear platform mounds is their location which straddles the mid-point of Sayil's intra-site sacbe. The dense concentration of these small structures (ca. 100 structures/ha) in the site's central zone has suggested to some investigators that it served as a centralized marketplace (S. Wurtzburg, personal communication 1988).

At Becan (Thomas 1981), mounds of chert nodules, some of which were tested for workability, were found along bajo edges. These were hypothesized to be collection points for raw material for stone tool manufacture, with subsequent reduction taking place elsewhere. As discussed above, the San Lorenzo linear and cobble mounds are composed of limestone and chert fill and do not indicate collection of raw materials suitable for lithic reduction. W. Woods suggests that the mounds may have served as reservoirs of collected structure fill materials (Ashmore, personal communication 1993). However, it is difficult to reconcile this with the long, linear forms the bulk of this material took.

Long linear mounds are ubiquitous on the outskirts of Becan, and are usually interpreted as agricultural features. These were constructed of limestone pebbles, cut stones, chert and earth. The fill of these was unsorted, and was placed directly on bedrock which had been exposed by erosion or clearing. Only Str.23 (Op.51 A-E and K) of the San Lorenzo cobble mounds has been found to have any size grading of construction material, with a pebble layer within the fill. Like the San Lorenzo linear mounds, Becan's linear mounds also appear to be a Late Classic phenomenon.

Analogies with identified agricultural features may prove enlightening.

Agricultural possibilities for the San Lorenzo mounds include hydraulic devices, mulched fields and terraces. Mulched fields (Maxwell and Anschuetz 1992), seem the least likely possibility, since water loss by evapo-transpiration would not seem to have been a serious problem. The construction and occupation surface would seem to have experienced greater water loss through the downward percolation of water through the coarse sediments of the alluvial sands and cobbles.

Terracing may present a more likely possibility. Though such features are usually thought of in the context of steeper slopes, Sluyter and Siemens (1992), among others, comment on occurrences of soil-retaining stone alignments on very gentle slopes. In some respects, the features they discuss and illustrate are similar to the linear mounds at San Lorenzo in that they are parallel lines of cobbles and pebbles with heights up to half a meter. However, such features appear to be associated with piedmont zones where they serve as catchments for colluvial deposits. Although a more accurate topographic map is needed, collection of colluvial deposits would not likely have been the functions of the San Lorenzo structures due to the lack of soil catchment area (see Fig. 1).

Another possibility is that the linear mounds served as hydraulic devices. Several of them are approximately aligned with the river course. However, their arrangement does not follow a consistent pattern: some mounds would have served to channel water into parts of the site, while others would appear to have acted as diversions to water flows.

It should be noted that the linear structures are located on a ground surface that is slightly higher than the surrounding area. This rise is either not great enough, or too few data points were taken for it to have shown up on the Surfer-generated topographic map. Holley and Woods (personal communication 1992) suggested that the area may have been a sand bar within the river channel before the river had completed its relocation from the base of the hill to the east, to its (approximate) modern course to the west. There is a subtle, yet distinct, decline in surface elevation north of Strs. 1-4, east of Strs. 11 and 20, and again east of Strs. 14 and 16.

If not for the inexplicable presence of the small isolated mounds, we might be on firmer ground in assigning agricultural origins to the linear mounds at the site.

While this could account for the paucity of artifactual remains, more detailed study would be required to account for what appears to be domestic debris. A detailed topographic map and analysis of soils and subsurface sediments would provide us with an accurate picture of the vicinity's hydrology and geomorphological developments over the past millennium.

Conclusions:

The results of this season's investigations have not produced definitive results for identifying the functional nature of the linear and cobble mounds of San Lorenzo, nor have they altered our perceptions obtained after last year's investigations. The structural excavations seem to confirm that the mounds were simply constructed features, with little investment in architectural elaboration. There was no evidence of cut stones or plastered surfaces, and any surface finishing may have been accomplished with tamped earth. With the exception of the mound fill, construction materials appear to have been entirely perishable. This includes the posts for retaining the fill (Strs.23 and 34), as well as any surface finish (tamped earth?) and superstructure constructions (e.g., walls, roof). It should be reiterated that no evidence for the latter types of architectural elements has been recovered.

The infrequency of recovered artifacts makes functional assessments difficult at present, though domestic activities appear to have been present to some degree. The rarity of artifacts suggests that domestic utilization of the site was of short duration and of low intensity. Equally, it suggests that probably not all structures were residential or domestic in nature. This is also supported by the "non-standard" forms of the linear structures.

Agricultural functions for the site have not been completely ruled out, but no precise analogs have been unambiguously identified. None of the previously cited reconstruction have been an entirely good fit for the San Lorenzo linear and cobble mounds. There is no evidence to support any type of specialized production activities. It is clear that the cobble mounds did not serve as repositories for lithic raw materials or result from intensive production of lithic tools.

Control of trade and communication routes (rather than raw material sources or labor) has been implicated in theories for cultural developments of the ancient Maya (e.g., Freidel 1981, 1986; Rathje 1972). The possibility exists that the site served

as a transshipment point for goods moving through the region, though it is difficult to identify such a function with archaeological evidence. These goods may have been moving along the Mopan River, as speculated last year. However, the possible extension of the site to the Mopan's west bank and its proximity to Actuncán suggest that it may be more directly related to that site than to Xunantunich. Contemporaneous with the Late Classic occupation of San Lorenzo's linear and cobble mounds, the closer northern area of Actuncán appears to witness continued occupation while the more distant southern area may have been experiencing decreased utilization (J. McGovern personal communication 1993, this volume).

An additional possibility for the transshipment hypothesis for the San Lorenzo linear and cobble mounds is their use as parts of overland, in addition to, or instead of, riverine transportation networks. S. Connell (personal communication 1993, this volume), suggests that the area may lie along an overland route linking the Chaa Creek sites on the Macal River with Actuncán. This postulated route appears to have less topographic relief than surrounding areas, and there are clear lines of site between Xunantunich, Actuncán, Chaa Creek and the San Lorenzo sites. Ashmore (1993) suggests that such an overland route may have been easier to monitor visually. This would have been an important consideration if the region's Late Classic Period was characterized by political and military factionalism.

Acknowledgments

Not having the opportunity to acknowledge the assistance I received in the 1992 season, acknowledgments for both the 1992 and 1993 seasons are provided below.

XAP Director Dr. Richard M. Leventhal provided financial, intellectual and logistical support for my work, thus making it possible, in both the 1992 and 1993 seasons. In addition to his regular advice and guidance, Dr. Jeremy A. Sabloff provided additional financial support for the 1992 season. A Graduate Student Field Research Grant from the University of Pittsburgh's Center for Latin American Studies provided financial support for the 1993 season.

Many of the interpretations here would not have been possible without the help of ceramicists Lisa LeCount (1992-93) and Jennifer Ehret (1993). Valuable

geomorphological information was provided by Drs. George Holley and William Woods in 1992. Assistance with this year's mapping was provided by Angela Keller. Dr. Wendy Ashmore provided valuable consultations in 1992 and 1993.

At the Univ. of Pittsburgh, the Dept. of Anthropology provided facilities for the preparation of this report, and Dr. David R. Bush has allowed me to conduct the ongoing lithic analyses at the Center for Cultural Resources Research's facilities.

Many individuals in Belize ensured the fulfillment of this investigation and this report. I appreciate the assistance of the Department of Archaeology, particularly Commissioner Allan Moore for granting permission to bring a sample of lithic artifacts to the U.S. for analysis.

Thanks are also extended to Mr. Rudy Juan and his family for graciously allowing me to conduct excavations on their property and for acting as hosts since 1992.

The workers from the village of Succotz must also be thanked for their assistance, hard work and endurance through both field seasons. None of this would have been possible without their invaluable contributions.

References Cited

Ashmore, Wendy

1981 "Some Issues of Method and Theory in Lowland Maya Settlement Archaeology" in: *Lowland Maya Settlement Patterns*. W. Ashmore, ed. pp.37-69. Univ. of New Mexico Press: Albuquerque.

1993 "Settlement Archaeology at Xunantunich, Belize, Central America" Proposal submitted to the National Science Foundation, Aug. 1993.

Eaton, Jack D.

1975a"Chicanna: An Elite Center in the Rio Bec Region" Middle American Research Institute, No.31 Tulane University: New Orleans.

1975b"Ancient Agricultural Farmsteads in the Rio Bec Region, Mexico" *Contributions of the University of California Archaeological Research Facility, no.27:* Berkeley.

Folan, William J, E.Kintz and L.Fletcher

1983 *Coba: A Classic Maya Metropolis*. Academic Press: New York.

Freidel, David A.

1981 "Terminal Classic Maya: Successes and Failures" in: *Late Lowland Maya Civilization: Classic to Postclassic*. J. Sabloff and E. Andrews, eds. pp.409-30. Univ. of New Mexico Press: Albuquerque.

1986 "The Political Economy of Residential Dispersion Among the Lowland Maya" in: *Lowland Maya Settlement Patterns*. W. Ashmore, ed. pp.371-82. Univ. of New Mexico Press: Albuquerque.

Freidel, David A. and J. Sabloff

1984 *Cozumel: Late Maya Settlement Patterns* Academic Press: New York.

Hayden, Brian and A. Cannon

1983 "Where the Garbage Goes: Refuse Disposal in the Maya Highlands" *Journal of Anthropological Archaeology* 2:117-63.

Hester, Thomas R. and H. Shafer (eds)

1991 *Maya Stone Tools: Selected Papers From the Second Maya Lithic Conference*. Prehistory Press: Madison.

Maxwell, Timothy D. and K. Anschuetz
1992 "The Southwest Ethnographic Record and Prehistoric Agricultural Diversity " in: *Gardens of Prehistory: The Archaeology of Settlement Agriculture in Greater Mesoamerica*. T.R.Killion, ed. Univ. of Alabama Press: Tuscaloosa.

McAnany, Patricia A.
1989 "Stone Tool Production and Exchange in the Eastern Maya Lowlands: The Consumer Perspective From Pulltrouser Swamp" *American Antiquity* 54(2):333-46.

McSwain, Rebecca
1991 "A Comparative Evaluation of the Producer-Consumer Model for Lithic Exchange in Northern Belize, Central America" *Latin American Antiquity* 2(4):337-51.

Rathje, William L.
1972 "Praise the Gods and Pass the Metates: A Hypothesis of the Development of Lowland Rainforest Civilizations" in: *Contemporary Archaeology: A Guide to Theory and Contributions*. M. Leone, ed. pp.365-92. Southern Illinois Univ. Press: Carbondale.

Rice Prudence M. and D.S. Rice
1979 "Home on the Range: Aboriginal Settlement in the Central Peten Savannas" *Archaeology* 32(6):16-25.

Sabloff, Jeremy A and W. Rathje (eds)
1975 *Changing Precolumbian Commercial Systems: The 1972-73 Seasons at Cozumel, Mexico*. Monographs of the Peabody Museum, No.3. Harvard Univ.: Cambridge.

Sabloff, Jeremy A. and G.Tourtellot
1991 *The Ancient Maya City of Sayil: The Mapping of a Puuc Region Center*.

Middle American Research Institute, No.60. Tulane University: New Orleans.

Sabloff, Jeremy A., G. Tourtellot, B.Beyer, P.McAnany, D.Christensen, S.Boucher and T. Killion

1985 *Settlement and Community Patterns at Sayil, Yucatan, Mexico: The 1984 Season*. Latin American Institute, Research Paper no.17. University of New Mexico: Albuquerque.

Sluyter, Andrew and A. Siemens

1992 "Vestiges of Prehispanic, Sloping Field Terraces on the Piedmont of Central Veracruz, Mexico" *Latin American Antiquity* 3(2):148-59.

Thomas, Prentice M.

1981 *Prehistoric Maya Settlement Patterns at Becan, Campeche, Mexico.* Middle American Research Institute, No.60. Tulane University: New Orleans.

VandenBosch, Jon C.

1992 "Excavation of Rubble Mound Features in the Periphery" in: *Xunantunich Archaeological Project, 1992 Field Season*. R.M. Leventhal, ed. pp.84-109. Report submitted to the Dept. of Archaeology, Belmopan and on file at the Institute of Archaeology, U.C.L.A.

Figure Legends

Figure 3 (101 H postmold profiles)

I black to very dark brown clay with cobbles and pebbles
II dark brown clay with cobbles
III dark yellow-brown sandy clay with cobbles and pebbles

Figure 4 (101 I profile)

I black to very dark brown fine sandy clay with cobbles
II very dark brown sandy clay with pebbles and cobbles (construction fill)
III dark yellow-brown clayey sand with pebbles and cobbles
IV yellow-brown medium sand with pebbles, gravel and cobbles

Figure 5 (101 J profile)

I black to very dark brown clay with cobbles
II very dark brown clay with cobbles and pebbles (construction fill)
III dark yellow-brown clayey sand with pebbles, cobbles and gravel
IV yellow-brown medium to coarse sand with pebbles, gravel and cobbles

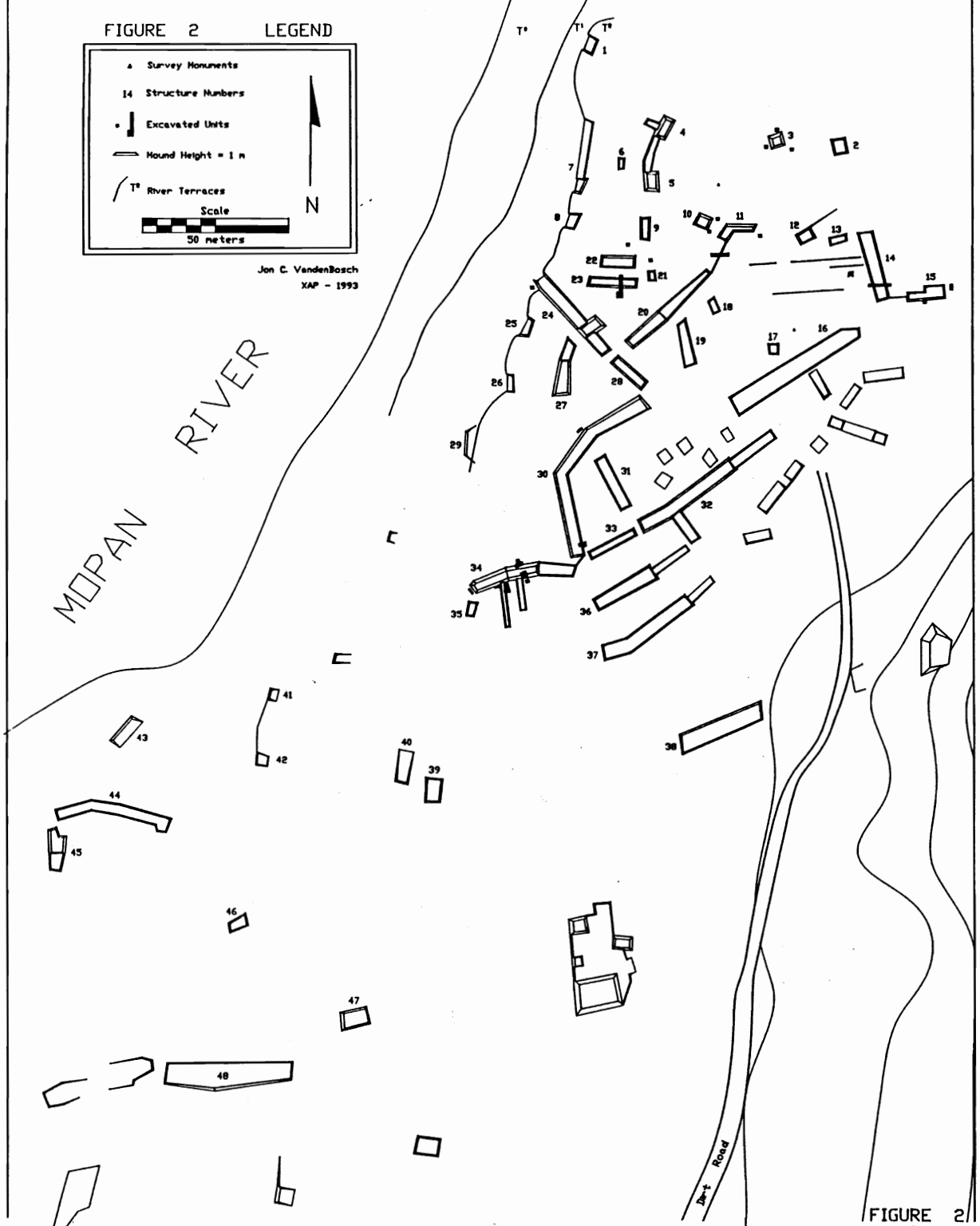


FIGURE 2 LEGEND
Survey Monuments
14 Structure Numbers
Excavated Units
Mound Height = 1 m
T# River Terraces
Scale
50 meters
N
Jon C. VandenBosch
XAP - 1993
MOPAN RIVER
Dirt Road

FIGURE 2

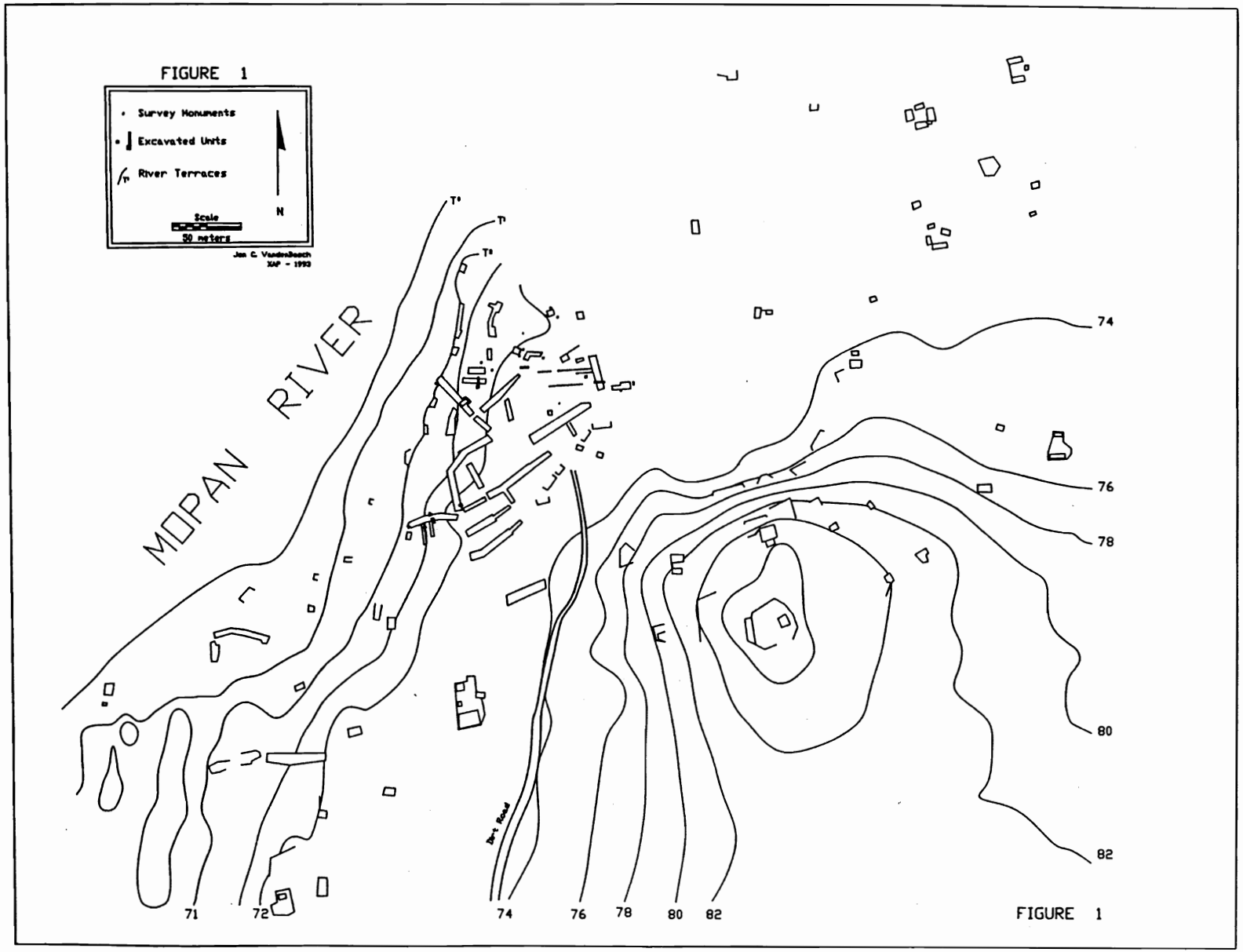
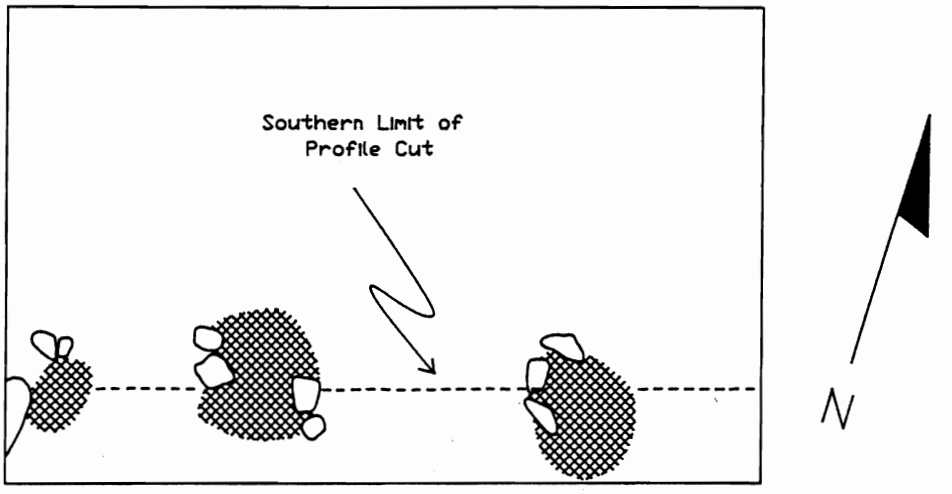


FIGURE 1
Survey Monuments
Excavated Units
River Terraces
Scale
50 meters
N
Jan C. VandenBosch
XAP - 1993
MOPAN RIVER
T1
T2
T3
Dirt Road
71
72
74
76
78
80
82
74
76
78
80
82
FIGURE 1

FIG. 3 Op. 101 H



Scale = 1:20

50 cm

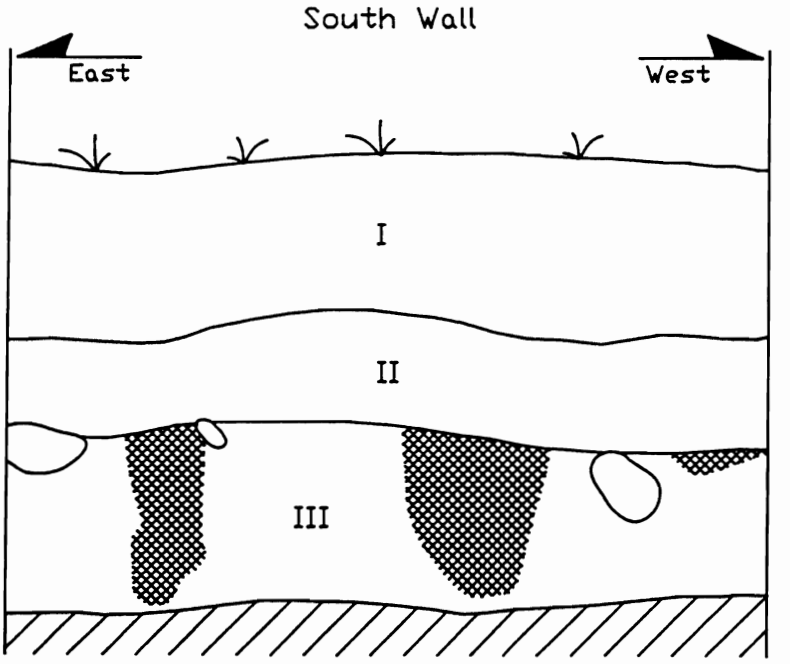
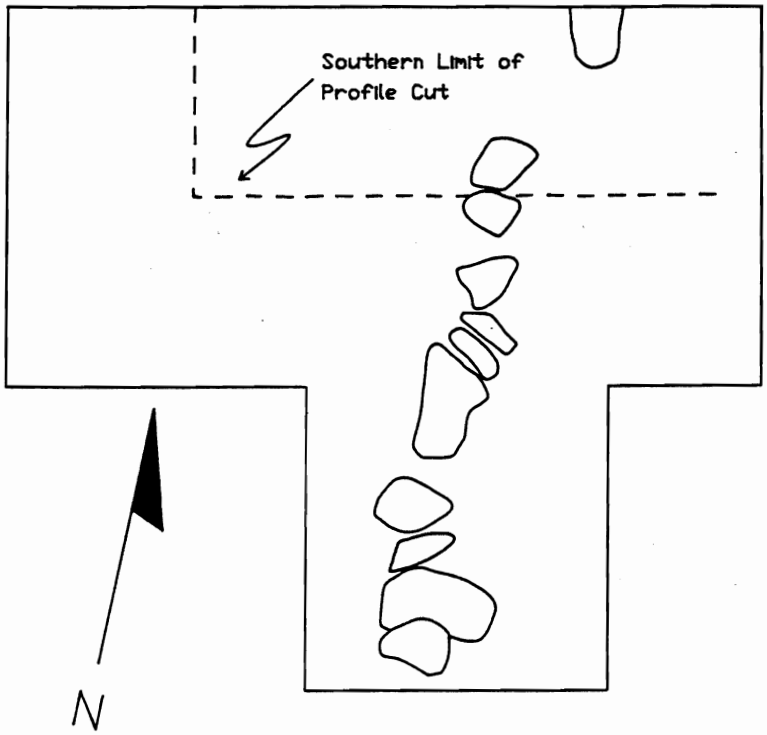


FIG. 4 Op. 101 I/L



Scale = 1:20

50 cm

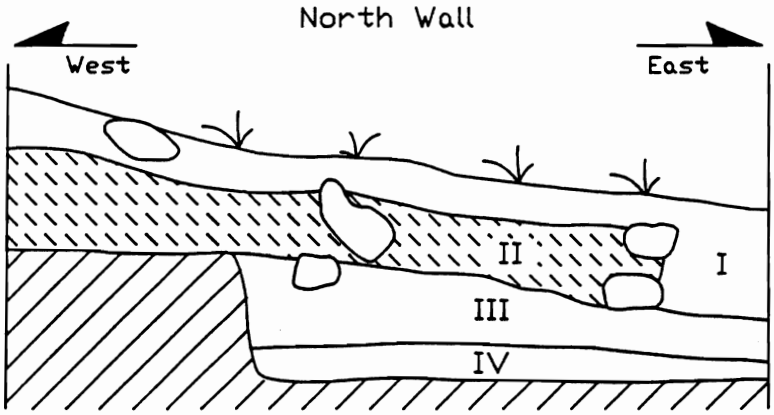
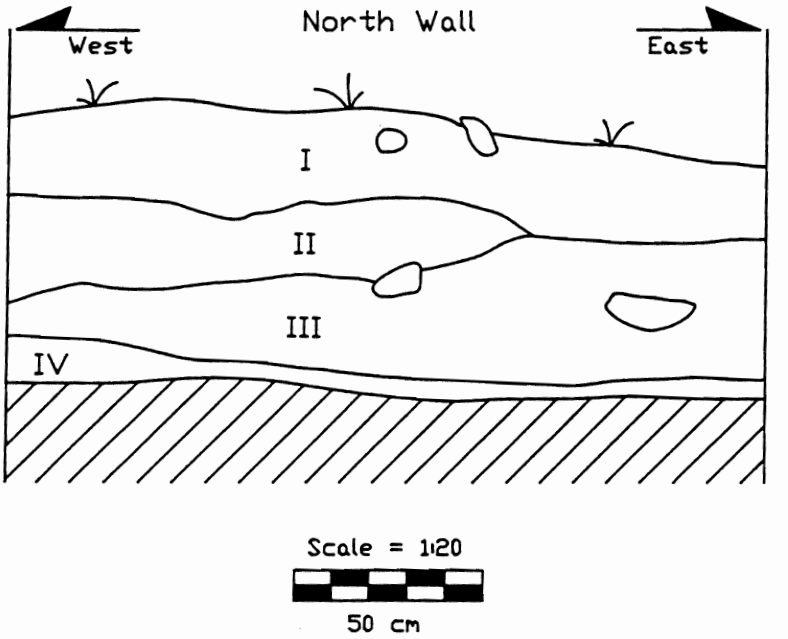


FIG. 5 Op. 101 J



Xunantunich Settlement Survey

Jason Yaeger
University of Pennsylvania

Sam V. Connell
University of California, Los Angeles

Introduction

In 1991 the Xunantunich Archaeological Project (XAP) began its investigation of the ancient Maya city of Xunantunich. Many archaeologists have sunk their spades into Xunantunich, but their work has focused almost exclusively on the monumental architecture of the site core and has rarely been guided by a broad, integrated set of research questions. The comprehensive understanding of Xunantunich as an ancient Maya community - the goal to which XAP aspires - demands expanding the area of archaeological inquiry out from the site core to encompass the hinterland which surrounds it. Recognition of this fact led the director, Richard M. Leventhal, to invite Wendy Ashmore to design and implement a settlement survey program to investigate Xunantunich's hinterland. That program began with a pilot season in 1992 (Yaeger 1992) and continued in 1993.

Two broad and interrelated goals have characterized the Xunantunich settlement survey since its inception. These are: 1) to understand the ancient community of Xunantunich in and of itself, and 2) to place that community into a larger context. Survey and detailed mapping of what has been traditionally defined as the "site core," Groups A through D, began in 1991 and was completed in 1993 (Leventhal et al. 1992; Keller, this volume). Yet the community of Xunantunich clearly extended beyond the "site core", and in 1992 Yaeger conducted a preliminary survey of the entire 43-ha parcel of government-owned reserve which surrounds Groups A through D (Yaeger 1992); Angela H. Keller carried out a more detailed survey of this area in 1993, amplifying and refining our picture of the community of Xunantunich and its organization (Keller, this volume). We plan to expand this "community survey" outward in future years.

In contrast to the above-mentioned work, the settlement survey of Xunantunich's hinterland is still in the beginning stages. Several papers have discussed the aims of the settlement survey in some depth (Ashmore et al. 1993; Yaeger and Ashmore 1993; see also Ashmore 1993). Here we will only briefly summarize the larger research goals of the survey program. As mentioned above, we wish to place Xunantunich in a broader social, political, and economic context: Can we identify the limits of the polity and how they changed? How many people might have been part of the larger Xunantunich community? How did the development of the civic center effect regional political and social organization and

vice versa? A full picture of the larger settlement patterns will clearly allow us to better understand the reasons for and effects of the late florescence of Xunantunich (Ashmore and Leventhal 1993; Leventhal et al. 1992). Yet the Xunantunich settlement survey also has goals which go beyond the study of the site of Xunantunich.

In the last 10 years, the upper Belize valley has witnessed a great amount of in archaeological investigation. The major projects that have conducted some survey in the region (Figure 1) are the Belize River Archaeological Settlement Survey, or BRASS (e.g. Ford and Fedick 1992); the Mopan-Macal Triangle Project (e.g. Ball and Taschek 1991); the Belize Valley Archaeological Research Project, or BVAR (e.g. Awe ed. 1993); the Macal-Tipu Project (e.g. Graham, Jones and Kautz 1985); the Blackman Eddy Project (e.g. Garber et al. 1992); and the Valle de Dolores Project (e.g. Laporte and Escobedo 1992). This work has generated a rich set of settlement data that complements and augments that of the first survey in this area, directed by Gordon R. Willey (Willey et al. 1965). The different research questions and different theoretical and epistemological frameworks that the various scholars have brought into the field have resulted in a series of data sets that are rarely directly comparable, but which have nonetheless provided a great deal of intellectual stimulation for our project. Two salient research questions have emerged out of this cumulative research: 1) What is the relationship between ancient settlement and different ecological contexts, especially the riverine environment (see especially Fedick and Ford 1990; Ford and Fedick 1992; Muhs, Kautz, and MacKinnon 1985; Willey et al. 1965), and 2) what is the nature and degree of socio-political integration beyond the site level (see especially Awe ed. 1993; Ball and Taschek 1991; Ford and Fedick 1990; Willey et al. 1965).

The Xunantunich settlement survey is sampling the area around Xunantunich using a series of four transects, three linear and one more quadrat in shape (Figure 2). Their placement is intended to allow us to address the two issues mentioned above. The three linear transects will each be 400m wide, providing us with a controlled sample area broadly comparable to that obtained by the BRASS project. These three transects further sample as broad a spectrum of the regional ecology as possible: T/A1 (Transect/Archaeological 1) runs from the site core of Xunantunich east across the Mopan river, continuing through the hilly interfluvial area to the Macal river. T/A2 will run north from Xunantunich through the

Mopan river valley, while T/A3 will extend north from T/A1 through the Macal river valley. These three transects will allow us to address differences in density and organization between upland/non-riverine settlement and riverine settlement and provide comparative settlement data for the two major river valleys in the region. Soil samples taken while surveying the transects and subsequent detailed soil pits will allow us to assess settlement distribution vis-a-vis soil fertility and productivity (see Fedick 1988) while geomorphological transects (T/G's) along the alluvial transects will provide the data to outline the changes that the river valleys experienced in the past and the effects of those changes on the human population. The importance of this kind of geomorphological work for understanding ancient settlement has been shown by Arthur Joyce (Joyce 1991; Joyce and Mueller 1992), and preliminary work near Xunantunich along the Mopan valley suggests it will be crucial for our work as well (Woods, Holley and Dalan 1993).

In addition to the three linear transects just described, we plan one squarish transect, T/A4. It will be located just west of Xunantunich, extending from the site core to the Guatemalan border (ca. 750m) and will be approximately 1km long. Parts of this transect have already been reconnoitered while surveying the immediate periphery of Xunantunich (Keller, this volume; Yaeger 1992). A controlled sample area similar to T/A4 is the survey area around the Chaa Creek. Preliminary work by Sam Connell has shown that this informal transect will provide interesting data for comparison with that from T/A1 to A4 (Connell, this volume).

The three linear transects are situated so as to terminate at ancient Maya sites whose size and organization suggest that they were ancient foci of political power, while the two quadrat transects focus on the sites of Xunantunich and Chaa Creek. The distribution of settlement in relation to these and other minor sites in the region will permit us to analyze the distribution of population around these foci and its implications. Our transects will also provide us with a larger sample of Maya sites with which to construct a scheme for classifying sites, allowing us to assess the nature of regional sociopolitical organization, both hierarchical and heterarchical (Crumley 1987). Because we wish to focus our study on ancient Maya communities, we extend our survey out beyond the 400 meter minimum width of the transects when clusters of mounds extend beyond their limits. Excavation of a sample of the sites in the survey is planned for future seasons to test our preliminary conclusions about the economic, social, and political organization of the area and its

development (see Ashmore 1993).

We hoped that the 1993 season would allow us to test and become comfortable with our proposed methodology, as well as give us a sense of the pace of the survey. We did not expect the results of the 1993 season to definitively answer the research questions we set out in our research design. However, we did want to obtain a preliminary assessment of the formal organization, density and distribution of local settlement, especially in relation to political foci and to local environmental contexts. We also planned to amplify our picture of the environment - based largely on visual inspection of the topography and vegetation - with a series of soil samples taken along the transect. These goals were largely met, and an evaluation and discussion of this season's results follows a presentation of our field methodology.

Methodology

Our methodology consisted of five groups of tasks: 1) cutting the central brecha of the transect, 2) cutting the picados that run perpendicular to the brecha, 3) surveying the brecha and the picados, 4) mapping all sites with a tape and compass, and 5) shooting in the central brecha and site datums with a total station and taking soil samples. These groups of tasks were necessarily performed sequentially: for example, you cannot map sites unless you have already found them by surveying the picados. However, by dividing the survey crew into multiple teams, we were able to have one crew cutting the picados and brecha while another crew followed them, completing the remaining tasks. This element of flexibility allowed us to make efficient use of the time and energy of the entire survey crew, and we plan to proceed with this methodology in future years.

Our goal for the 1993 season was to complete as much of T/A1 as possible. Using a Total Station and checking the results with an optical transit, we obtained a bearing of 113° 46' 20" East of North from the roof of Structure A-6 (the "Castillo") at Xunantunich to the highest pyramid of the site at the eastern terminus of T/A1, Dos Chombitos. Because the owner of the land between the site core of Xunantunich and the Mopan river had not given us permission to work on his property, we began our survey of T/A1 on the east bank of the Mopan; unfortunately, the centerline of our transect passed through the middle of Succotz (Figure 3). We decided to bypass Succotz in 1993 and have not yet carried out a systematic survey within the town limits. The data from Succotz will be problematic because we are

fairly certain that modern human activity has destroyed many of the mounds that once existed there. Modern development continues on the southeast edge of Succotz, where one site we mapped (field designation T/A1-2) consisted of a single 10m long mound that, according to the property owner, had been twice as long before it was bulldozed. Another nearby site (T/A1-3) was bulldozed a few weeks after we recorded it, leveling three mounds and several terraces. Given our desire to obtain as full a preliminary data set as possible with which to formulate hypotheses about settlement in the area, we decided to postpone surveying Succotz. Furthermore, the destruction of archaeological data is still occurring around the edge of town, making the recording of the threatened sites just outside of Succotz more of a priority than those in town. As one moves east from Succotz, modern development is less of a threat, but there is still the occasional reservoir or cattle pond dug by bulldozer, and work continues on the road that roughly parallels T/A1.

Having obtained our bearing from Structure A-6 to Dos Chombitos, we located the point where the centerline of the transect bisected the southern edge of Succotz; this point was marked with a wooden stake, and we began our survey of T/A1 from that point (again, refer to Figure 3). Because our transect and the southern edge of Succotz met obliquely, Succotz occupied only part of the transect between our staked point and the Mopan River. We wanted to record the triangle of undeveloped land to the south of Succotz that lay within our transect boundaries, but could not cut a central baseline back to the west -- it ran through the middle of Succotz, and cutting a line through town was clearly impossible. Instead, we cut a controlled 200m long line perpendicular to our baseline from the stake we originally set out on the edge of Succotz. After 200m, we turned 90° toward the west and cut a line to the Mopan; this second line marked the southern edge of the transect. Together, these two lines provided us with a sound spatial control over the southwest triangle of the transect. In retrospect it is good that we surveyed this area, since part of T/A1-3 was destroyed shortly thereafter, as mentioned above. After surveying this small area, we turned our attention eastward toward Dos Chombitos.

Cutting the brecha and picados: Using a Brunton compass mounted on a tripod, we began to lay down the central baseline for T/A1. Using machetes, our crew cut a brecha to mark the baseline. This brecha consisted of a 1-2 meter swath cut through the vegetation and served as a baseline for the survey. As we extended the baseline, we moved the Brunton frequently because of problems of visibility in

the hills east of Succotz and also to attempt to limit possible compass error by sighting over short distances. Where possible, we would check our bearing back to Structure A-6 at Xunantunich to verify our course.

We decided to keep the brecha relatively narrow, although it might have been more convenient to cut it wider. Most of the land east of Succotz is important to the local economy, being used for milpa, fruit and vegetable gardens, orchards, cattle pasture, or lying fallow in the milpa cycle. Cutting a wider brecha would have had a definite impact on fields. Furthermore, brechas such as these become convenient footpaths, and many property owners do not want their lands converted into ipso facto right-of-ways. Consequently our crew cut the brecha to a sufficient width, while trying to minimize its impact on the landscape.

After we had extended the central brecha a kilometer or so to the east, we began to cut the picados. Using a compass, the capitan of our crew laid out the picados perpendicular to the baseline, placing them approximately every 18m (25 of his paces). He also paced the picado lengths to make sure they ended at least 200m out from the baseline. Our crew cut the picados somewhat narrower than the central brecha (ca. .5m-1m) and cleared any sites they found along the picados.

Surveying the Picados: While the crew was cutting picados, the two authors numbered and paced along each picado, recording the topography, vegetation, land ownership, cultural features, and of course, all archaeological remains found. While we proceeded down each picado, a Belizean crew member would survey the area between the picados to one side of the paced picado looking for important natural or cultural features. In areas of pasture or relatively open woods, it was not necessary to have somebody walking between picados. However, in many areas the brush was so dense that it was impossible to see even to the middle of the area between picados and another pair of eyes was definitely needed (the issue of visibility and vegetation is discussed more below). Any features found on the central brecha were recorded with the nearest picado.

We recorded all of the information about the picados in fieldbooks (Figure 4). The topography was recorded using a set of slope classifiers (flat, very gentle, gentle, moderate, steep, very steep; shown by circled letters in Figure 4) which were standardized by comparing assessments made by each of the investigators. The true

perpendicular direction of slopes were noted with an arrow. Also, at the end of each picado, a profile of the picado was drawn to show the changes in slope along the length of the picado. These two types of notes later served as an ancillary data set in creating the 2-meter interval contour map (discussed below, also see Figure 9). Of course topography alone does not reveal ecology, and we also recorded vegetation patterns and changes in vegetation. This data will allow us to plot the distribution of blocks of different vegetation across the transect. Vegetation patterns, with few exceptions, were closely related to recent use-history of the land.

The vegetation records also allowed us to construct a standardized scale to indicate the effect of vegetation on visibility (the VIS scale). The VIS scale we designed has a scale of 1 to 5, the score reflecting three non-independent variables: the type of vegetation (i.e., milpa, pasture, scrub/secondary growth, new forest, medium forest), the density of undergrowth or scrub (i.e., saplings, large bushes, briars, meter-high grass), and the density of groundcover (i.e., low grass, dead leaves, low bushes). Table 1 provides some examples of the VIS scale. We hope to compare the survey data we record in areas of different VIS in order to determine how vegetation effects the visibility and recording of different kinds archaeological features, and we plan to re-survey areas of dense brush as they become cleared for milpa planting.

Another type of information we felt was worth recording was land ownership and changes in land ownership. The boundary between two parcels of land often corresponds with a change in vegetation, since different farmers will be on different fallow cycles or using their land for different purposes. These clues, along with information from our crew and from a property map obtained from the San Ignacio office of the Department of Lands, allowed us to keep fairly close track of land boundaries. Accurately recording the location of cement survey stakes at the corners of properties provided us with a further means of integrating land maps with our survey data. Furthermore, knowing the boundaries of plots of lands and the names of their owners will aid in re-locating sites and confirming that we have permission to work on the land.

The central reason for walking the picados was of course to record any archaeological remains, a procedure that depended on their nature. The most common archaeological feature was ancient terraces, usually not directly associated

with any mounds. Identifying terraces was often problematic; in contrast to more formal terraces of some areas of the Maya lowlands such as around Caracol (Healey et al. 1983), terraces around Xunantunich are constructed of rough stones and cobbles. Because soil depth on hillsides is often less than 35cm, it is often difficult to distinguish alignments of protruding bedrock and loose limestone rocks from constructed features of limestone rocks. Problems of identification are exacerbated greatly in areas of dense groundcover and where the picados run across the slope of hills (i.e., parallel to the terraces). We mapped the terraces directly into our fieldbooks. We knew their paced distances from the transect baseline, and we paced along them to determine their lengths and used a Brunton to determine their orientation. We have considered but not yet formalized a typology of terraces in terms of height, length, and composition/form.

We treated other non-habitational features such as ancient quarries in a similar manner when they were not associated with mounds. Their locations are based on paced distances, and they are recorded only in the field books. We do not deny the importance of these non-habitational features by recording them in this manner. However, we do feel that the accuracy achieved by locating them using paces relative to the central baseline is quite sufficient; if an isolated quarry is located with a precision of two meters or even 10m, the interpretations of that feature will remain the same and its re-location will not be greatly hampered. We used a different procedure for recording mounds and their associated features.

The basic criterion for defining a "site" was the presence of mounds. When we encountered mounds, we cleared the brush from them if our picado cutting crew had not already done so; we again tried to minimize our impact on the environment, removing only the brush and trees that obstructed our recording of the site. We sketched the sites in our fieldbooks and noted their positions on the picados, giving each a field designation (e.g. T/A1-14, or "Transect/Archaeological #1 - Site 14"). However, all sites with mounds were later mapped in detail with a tape and compass. Defining sites was a flexible process based on the spatial organization of the mounds and other ancient features, their proximity to one another (within 30m or so, depending upon the topography), and local topography. De Montmollin (1985) employed a similar set of flexible criteria to define site boundaries in his survey in the Rosario Valley, Chiapas, which proved quite useful. In some cases, we felt that large groups of mounds should be broken down into

more manageable sections for recording and mapping. In such instances, we gave each subgroup a letter designation (e.g. T/A1-16a, T/A1-16b, etc.) and treated it as a site. It should be pointed out that these field designations are not meant to be definitive interpretations of the social organization of the ancient population but are pragmatic labels for use in the field.

Mapping and Recording Sites: After we had located a number of sites, we would return to these sites and map them in detail with tape and compass. We made a sketch map of the site, marking the points to record for each structure. Then, driving a central datum stake for a reference point, a Brunton compass on a tripod and a metal tape were used to map each point. Contrary to the common practice of taking two points on a structure, measuring another side, and assuming that the structure is rectangular, we recorded all corners of structures. This occasionally results in odd-looking structures, but we feel that it is a more realistic portrayal of the remains we encountered in the field. All mounds were mapped, as well as all associated cultural features (chultuns, quarries, reservoirs, sherd/rock scatters, terraces). When features of a site extended beyond the edge of the transect, we continued to record them until we reached the end of the site. We also recorded nearby modern features, including many looters' pits. This process resulted in a sketch map and a list of distances and bearings from datum points to points on features. This information was converted into the final maps using GenericCADD 6.0. All mounds were depicted using the standard Maler convention of showing the vertical difference between two ostensibly horizontal planes by the horizontal difference between their edges, using the same scale as the horizontal scale (e.g. Figure 5).

We described each site on a standard form, paying special attention to topography, vegetation, soils, spatial relationships to other sites, and of course all ancient cultural features (Figure 6). We also recorded other details such as the name of the property owner(s), related picados, relevant maps and photos, etc. In order to get some idea of the date of occupation of the site, we noted any temporally diagnostic sherds recognized either on the surface or in looters' pits. However, these opportunistic finds would not allow us to develop a fuller and more systematic picture of the settlement history of the region. To accomplish this, we made intensive surface collections and excavated shovel tests.

Pilot studies in 1992 had shown that digging shovel tests was a relatively quick and easy way to obtain some indication of the chronology of these sites. We excavated the shovel tests to a maximum depth of 50cm, although many of the tests hit bedrock before 50cm; each test was 50cm in diameter. While many of the shovel tests produced diagnostic sherds, some did not. In this case, we would dig another test until encountering diagnostic materials. We also put multiple tests into larger sites. Where there were many sherds on the surface, we conducted an careful search for diagnostic sherds.

The shovel tests and the surface collections were designated Operation 82, and we employed a very useful form designed by XAP ceramicist Lisa J. LeCount to record all artifacts found (Figures 7 and 8). Since the focus was on temporally diagnostic ceramics, the bulk of the form is devoted to ceramics. However, we recorded other types of artifacts as well, which proved useful in identifying a probable locus of specialized stone tool manufacture (T/A1-3, discussed below). The shovel test form records information about surface treatment and slip, decorative motifs, formal attributes, and ware categories, all of which can be important in determining the date of a deposit. Drawing on Gifford (1976) and LeCount (1992, this volume), we compiled the list of common diagnostics shown in Table 2 (note the combination of attributes of form, paste, and surface treatment). Because these forms allowed us to record diagnostic sherds in the field, we were able to leave the recorded artifacts either on the surface of the sites or in the bottom of the tests from which they came. Some of the possible biases of the methodology and diagnostic set we used are discussed below with our results.

Shooting in the Brecha and Site Datums and Taking Soil Samples: Generally we walked picados for a week or so and then mapped each of the sites we had located. The final phase of the survey was pinpointing the location of each site by mapping in each site datum with a Total Station, thereby providing that datum with a three-dimensional set of coordinates in the XAP grid. Prior to beginning the survey, we placed two permanent cement survey datums in the grassy yard just west of the Succotz school. These monuments were shot in from the roof of Structure. A-6 at Xunantunich, establishing their coordinates relative to the site core. Using these as a base, we advanced down the central brecha. The intersection of each picado with the baseline was shot in, as well as any significant cultural or natural features (roads, streams, vegetation changes, property lines). We shot down every picado that

contained a site, shooting in the datum stake for the site and any salient features along the picado, as well as points approximately every 10m for elevations with which to make the contour map. In areas where there were no sites, we chose certain picados to shoot down for elevation data, and points in open areas around the baseline were also recorded.

Entering the coordinates for the site datums into GenericCADD and then importing the final site maps and overlaying them on their datum points provided a computerized and easily manipulated map of the whole survey area. Unfortunately, it is too large to reproduce in its entirety here. The total station data also allowed us to create a 2-meter contour map of the transect. The elevation data obtained along the brecha and selected picados provided the fundamental information for this map, supplemented by the contour and slope data recorded in the fieldbooks for each picado. A great improvement over the 20-meter interval government map, our map allows us to examine the relationship between local topography and settlement distribution (see Figure 9). We will import the contour data into GenericCADD to construct a master contour and archaeological map of the transect, which can be subsequently modified by adding layers for vegetation, property owners, or other information of interest. While shooting in the central brecha and site datums, we took preliminary soil samples every 100m. We collected samples from both the A and the B horizons and recorded the locations of the tests with the Total Station, providing very accurate spatial control over our samples. These samples have been analyzed by Rock River Laboratory in Wisconsin to determine the soil pH, the percentage of organic carbon and concentration of several other elements including phosphorus, calcium and zinc. William I. Woods has provided crucial guidance in developing the soil testing program and suggesting the kinds of tests to run on the samples, and with his continued support and years of analytical experience, we hope to add measures of soil fertility and productivity to our analysis of the ancient settlement distribution along the transect.

Results and Discussion

The 1993 season was quite successful. Although several years of research remain before we will have the comprehensive set of data needed to answer the questions set out in the Introduction, the data from this year allow us to evaluate our working models of settlement organization and dynamics in the area around Xunantunich. We systematically surveyed .75km2 of Transect T/A1 using the

methodology outlined above. The survey area extends from the east bank of the Mopan river, up the eroded alluvial terraces, over a set of hills just east of Succotz, then down into a large flat area -- parts of which are seasonally inundated -- and back up the next set of hills. The sample area includes a fair amount of the environmental and topographical diversity of the area, including steep hills, lower hummocks, and low flat areas. The transect is just beginning to enter a higher flatter area, but we have not yet surveyed this systematically.

Types of Remains: We located and mapped at total of 115 structures within the transect boundaries, yielding a density of 152 strs/km2. Outside the transect edges, we mapped an additional 15 structures that were parts of sites that extended beyond the transect. These structures are grouped into 41 sites, some of which seem spatially related and may in the future be combined into larger analytical units. Most sites consisted of multiple mounds and associated features, although nine sites were composed of single mounds, some with associated terraces. The majority of the structures were low mounds of limestone rocks and earthen matrix (modally around 3m x 5m in area and .5m high); from their form (Wauchope 1934) and abundance (Haviland 1966), we assumed that most mounds of this type are the remains of ancient residences. Some structures remained only as ground-level clusters of rocks and sherds. We found ten of these rock and artifact scatters, but only in areas of high visibility since they are easily masked by ground cover. A few sites such as the Succotz Mound and the Chan Site, both associated with the transect but the former lying beyond its borders and the latter not yet surveyed, contain pyramidal structures with small summits and in excess of 5m in height, suggesting that some sites were venues for local ceremonies and foci of political power (de Montmollin 1985).

We are not yet prepared to present a formal site typology, although some categories are beginning to emerge. The following characterizations summarize our impressions to date. First, there are some sites that consist of one or more mounds, informally arranged (e.g. T/A1-18, see Figure 10). The mounds are usually quite low and often associated with terraces. The size of the mounds, as mentioned above, makes it likely that these sites were residential in character, with one or more residences facing a common open work area. Several formal types are contained within this category. We found several sites with two parallel mounds, one up-slope from the other (e.g. T/A1-11b, see Figure 11). It might be prudent to also

distinguish those sites consisting of isolated mounds which might have had a different functions, perhaps field houses or other specialized structures.

The next category contains sites with mounds more formally arranged around a patio or on a raised platform, sometimes with associated mounds and terraces nearby. These sites fit well into the categories of "homogeneous patio cluster" and "structure-focused patio cluster" as defined by Ashmore (1981:51). The most common form consists of three or four mounds face a common patio (e.g. T/A1-30, see Figure 12). Although the structures in most of these groups all appear to be residential given their size and form, there is a great deal of variability in both size and layout of groups in this category that needs to be sorted out. It may be useful to distinguish sites with structures organized around a ground-level patio from those with elevated patios or platforms, and for analytical purposes we may want to further divide these categories. For example, there was one site (T/A1-28, see Figure 5) that seemed residential in layout and form, consisting of four low mounds organized around a patio on a platform, but whose construction clearly involved considerably more labor than most patio groups, since the platform was over 2.5m high. This could of course be a function of either length of occupation or the residents ability to secure labor (Arnold and Ford 1980; Ford and Arnold 1982; Haviland 1982). Regardless, it seems appropriate to consider breaking a category defined by the presence of platforms into two sub-categories based on platform height.

As noted above, a few sites contained what appear to be non-residential structures. These clearly represent another type of site (see Ashmore's "structure-focused patio cluster" [Ashmore 1981:51]), if not two types. Some of these sites (e.g. the pyramid on the Church of the Nazarene lands, ca. 100m south of the transect edge) consists of a lone pyramid with a height in the 4-6m range. Others (the Chan Site and the Itza site, also located outside of the transect boundaries) have pyramids in that same height range, but on a patio associated with several residential mounds. The significance of these differences is questionable, however, since the sites that consist of lone pyramids are in areas that have been heavily disturbed by bulldozing, probably effacing most smaller mounds. A difference that is probably significant is one of scale. All of the sites discussed above contain only one pyramidal structure and relatively low (1-2m high) residential mounds. The Chan Site is unique in possessing two pyramids, higher and longer residential mounds,

and closely associated subsidiary patio groups.

This site typology is clearly based on limited information and cannot begin to address the complex issues of differences in site function and social organization. One significant problem with the data set is that it does not yet coherently include temporal variability, and it would be problematic to assume that the heuristic typology outlined above had some synchronic existence on the ancient Maya landscape. Suffice to say that although we observe a great deal of variability across dimensions of form/organization and size, we have not yet examined this variability with respect to time, soil characteristics, topographic and geographic features, site function, and larger patterns of settlement and site distribution.

Although many of the archaeological features that we recorded were mounds, there were several other types of features that we recorded in association with sites. Several sites contained quarries, and Keller (this volume) has amply demonstrated the quantity of quarries around the site core of Xunantunich. The common pattern we found in the survey area is of quarried faces on rock outcrops near ancient mounds, the latter presumably products of those quarries. The quarries we have found are generally not large, and size often seems to correlate roughly with the amount and size of nearby architecture (compare the Succotz Mound and T/A1-5, see Figures 13 and 14).

We found chultuns with 5 sites, These ancient features are usually interpreted as food or water storage chambers. Chultuns were sometimes used secondarily for burials as at Group D of Xunantunich (Braswell 1992); the frequency of looted chultuns implies that their use as burial chambers was common. In our survey, we found chultuns in several contexts, suggesting to us that they had multiple uses in the past. Some are associated with patio groups (e.g. T/A1-30, see Figure 12) where they were probably were used primarily for household food storage (Puleston 1965). However, we also found chultuns at sites to which we assign possible ritual functions. The Succotz Mound (Figure 13), located on a hill overlooking Succotz, the Mopan River, and Benque Viejo, is a 6m-high pyramid associated with several chultuns, possibly used here as storage for ritual paraphernalia or ritual foodstuffs. More intriguing is Site T/A1-6, located on another high, flat hilltop overlooking both the Mopan valley and the next low pocket to the east. In the center of T/A1-6 is a patio group with two chultuns (Figure

15); if this group were found in isolation, we would probably interpret the chultuns as household storage. Just to the west of this patio group, however, is a series of very low platforms, many of modified bedrock, associated with 3 more chultuns and a large concentration of sherds, mostly pieces of large jars and very large (>45cm rim diameter) Mt. Maloney bowls. It seems quite possible that this area was in part a locus of ritual activity that including feasting. The site is situated below and approximately 100m distant from the Succotz Mound discussed above. East of the patio are several more mounds on the gently sloping hillside, and there is one chultun located between these mounds and the patio group which lies at the end of a quarried out bedrock channel, possibly serving as a water capture mechanism. These examples should suffice to demonstrate the multiple contexts in which chultuns appear and suggest the potential value of interpreting chultuns as part of a larger landscape.

Terraces were much more common in the survey area than we had expected. However, it appears that the zone of terracing that has been identified in the southeastern Peten (e.g. around Caracol [Healey et al. 1983]) extends into the Xunantunich area and north past the Belize River (Scott Fedick, pers. com. 1992). Although it is difficult to confidently quantify the number of terraces given the problems of identifying them discussed above, our data show a density of 227 terraces/km2. Terraces sometimes occurred closely associated with mounds groups and isolated mounds. However, the majority of terraces were fairly removed from mound groups. Because of their frequency and multiple contexts of their occurrence, we feel that it would be problematic to assume that all terraces had a single function. At this point, we can only develop working hypotheses based on such variables as form, construction techniques, location relative to other cultural features, and topography form and location; for example, terraces directly associated with platforms and structures seem more likely to have been loci of many different kinds of behavior, while those located farther away from structures probably had a more restricted agricultural function. In future seasons, further refining of these variables and subsequent excavations of terraces, soil chemistry tests, and flotation sampling should allow us to form and evaluate more precise hypotheses regarding terraces and their functions.

Distribution with Respect to Topography: The survey data from T/A1 support some of our expectations about the distribution of the Classic Maya

population. Around Cahal Pech, the BVAR project has found that sites tend to cluster on hilltops (Awe ed. 1993), and we expected a similar distribution in T/A1, located between 5km and 8km south of Cahal Pech. While most hilltops we surveyed in T/A1 do in fact contain structures, there is also settlement on the flanks of hills and on low flat rises. There are some obvious reasons to prefer living on hilltops as opposed to lower areas. The hilltops receive more breeze, making it cooler and reducing the number of insects. Furthermore, they have a better view of the surrounding countryside and are better drained. In contrast, the one broad low area we surveyed contained almost no indication of settlement. We assume this land was reserved for agriculture, since many structures cluster around the edges of the area; our soil samples from this area should tell us about the fertility of the soil here. However, since there is some water movement in this area, it is possible that there are structures here that were buried by later colluvial action. A shovel test at one site on the edge of this low area (T/A1-18) did in fact reveal a 15cm-deep layer of clayey colluvial deposit overlaying cultural material. The hillsides were occasionally inhabited. However their main use was apparently growing crops, as attested to by the many terraces we found, generally located on hillsides with a gentle to medium slope (less than 20% incline).

The source of water for the inhabitants of T/A1 is problematic. Although there are several streams in the area we surveyed, today they are all dry for part of the year. The only permanent water source we found, besides the Mopan river, was a seep in one of the stream beds which fed a few pools and produced clean, cool water. Today this water source easily supplies the demands of the Jenkins family and the guests at their hotel, usually 5 to 10 people. Not surprisingly, site T/A1-28 is located within 100m of the seep. This site consists of a patio group of four low mounds with a few low mounds associated with it (see Figure 5). Despite its rather simple composition, the patio group is located on a platform over 2.5m high, probably indicative of a long span of occupation near this important water source.

This seep, however, would not have supplied the whole area. Today, many farmers in the area dig small ponds to catch rainwater and run-off during the wet season, and these often contain water until the end of the dry season. The use of a similar technique to catch water at some sites is attested to by the remains of aguadas or reservoirs on 2 hilltop sites (T/A1-15, T/A1-30). It is probable that aguadas were also dug in lower areas, where digging would be easier and there would be more

run-off. However, that run-off would also contain sediments that would fill the ponds in, requiring more labor to maintain them and erasing them from the landscape relatively shortly after abandonment.

Chronology: We were able to derive chronological assessments for 29 of the sites mapped using both shovel tests and surface collections (see Table 3). We must stress that these assessments are preliminary and are based on data obtained from methodologies that tend to sample deposits located on or near the ground surface and are thereby biased toward later time periods. Furthermore, the assessments are also often based on small sample sizes, often with only a sherd or two that is diagnostic of a certain time period (see Table 2). Probably the most problematic diagnostic was the orange-brown pastes we used to identify the Preclassic period, since we did not have a very large type-collection of Jocote Orange-Brown or Mars Orange with which to familiarize ourselves; it is likely that we mis-identified some non-Preclassic sherds as Preclassic sherds, and therefore that the number of Preclassic sites is over-estimated. Assigning ash wares to the Late Classic period is also somewhat misleading, since they do occur, albeit in smaller frequencies both before and after the Late Classic period (LeCount 1992).

The best temporal diagnostic type for the Xunantunich region is the Mt. Maloney bowl which has three distinct rim morphologies that can be linked to the Late Classic I, Late Classic II, and Terminal Classic periods (LeCount 1992). The Mt. Maloney bowl is a utilitarian type that makes up approximately 30% of the Late and Terminal Classic assemblages (LeCount 1992) and is common at all levels of the socio-economic scale. In this it contrasts with the most recognized Early Classic diagnostic, the basal flange bowl, which is a higher status vessel, possibly leading to the non-identification of Early Classic traces of non-elite settlement (Lincoln 1985).

The most obvious conclusion to draw from Table 3 is that every group that was dated contained Late Classic (either General Late Classic, Late Classic I, or Late Classic II) diagnostics, suggesting that this was the period of densest occupation in the area. In contrast, only 17% of the groups showed evidence of Terminal Classic occupation. We had expected a larger Terminal Classic occupation in the area around Xunantunich, given that the site core appears to reach its florescence during the Late Classic II and Terminal Classic periods (Ashmore and Leventhal 1993; Leventhal et al. 1992). Several hypotheses might be advanced to explain why the

settlement area seems to be declining in population while Xunantunich reaches the apex of its power. One obvious possibility is that the growth of Xunantunich involved a centralization of population -- whether imposed or voluntary -- that resulted in a reduction of population in the settlement areas. However, the settlement density in the area immediately surrounding the site core is actually slightly less than that in the survey area (see below; also, Keller this volume; Yaeger 1992). Another possibility is that the ceramic traits we use for Terminal Classic diagnostics are biased, perhaps in terms of status differences such as discussed for the Early Classic, or perhaps spatially (that is, cultural conservatism resulted in the continued use of Late Classic II forms in the settlement area during the Terminal Classic.) A third possibility is that the fortunes of the population of the site core of Xunantunich and the fortunes of those living in the settlement area were not tightly bound. Further work both inside the Xunantunich site core and in the hinterland settlement will allow us to address these possible hypotheses.

Settlement Density and Organization: As mentioned above, at Xunantunich we see no apparent decline in the density of structures as one moves out from the site core. At many larger sites such as Tikal, there is a noticeable drop in structure density as one moves out from the site core (Ford 1986, Puleston 1973). At Xunantunich, however, the structure density directly around the site core is slightly lower than that of the section of T/A1 surveyed to date. The government owned 43-ha parcel around the site core has a structure density of 100-120 Structure/km2, compared with 152 Structure/km2 in T/A1. This suggests a form of centralization and organization quite different from that at the larger Peten centers (Culbert et al. 1990, Tourtellot 1988; see also Rice and Culbert 1990) and at the Postclassic centers of the Yucatan such as Mayapan (Pollock et al. 1962). It is of course possible that the shorter occupation history of Xunantunich accounts for some of these differences -- and more detailed excavations of groups in the settlement area such as San Lorenzo (Chase 1992, this volume) and Actuncan (McGovern 1992, this volume) are needed to clarify the chronology outside the site core -- but similar patterns at Cahal Pech and Buenavista suggest this might be a pattern common to the region and/or to smaller centers.

Another important aspect of settlement organization is the distribution of specialized producers. It seems probable that some specialized craft activities were taking placing in the site core of Xunantunich (see Ball 1993 for good evidence of

attached specialists at nearby Buenavista). In the settlement area, the only data to indicate intensive craft production was found approximately 1km from Xunantunich on the opposite bank of the Mopan River. A group of adjacent sites (T/A1-1, T/A1-2, and T/A1-3) contained mounds apparently composed almost entirely of chert flakes, mostly debris from tool making, although some finished tools were noted at T/A1-1. At T/A1-3, we found a concentration of large chert cobbles which appear to have been obtained from the nearby Mopan River. Some cobbles were unworked, and others had flakes removed. The presence in this area of raw materials (some utilized), production debris, and finished tools suggests that the inhabitants of these sites were specializing in chert tool manufacture, probably from the initial procurement of materials from the river to the final tool manufacture (see Brumfiel and Earle 1987). Furthermore, the size of these mounds, some over one meter high and over 3m x 5m in basal area, suggest that the intensity of tool manufacture was far beyond the level of household production (Costin 1992; cf. Clark 1986). The data certainly suggest that the inhabitants of these sites were full-time specialists (but see Welbourn 1985). Only further investigation will clarify issues of craft specialization, especially the degree to which it was under centralized control (Costin 1992).

The pattern of relatively little population centralization around the site core of Xunantunich and other regional centers is also evident at smaller centers in T/A1. The largest center we have found along T/A1, the Chan Site, was not formally surveyed this year, but we did carry out some reconnaissance. The Chan site consists of four structures around a plaza with two associated patio groups to the east, but otherwise appears not to have been a focus of settlement nucleation. This implies to us that there were not strong political or social links requiring the ancient Maya to settle around these sites. Our working model to be tested is that this is indicative of a social and political organization with loose connections between different nodes of society, i.e., between the site that controlled the region (Xunantunich) and smaller centers in the region (Chan Site, Actuncan, etc.), and between these smaller centers and the agrarian hamlets that dotted the landscape (Ashmore 1993).

In an earlier paper, the members of the Xunantunich settlement survey provided a preliminary interpretation of the predominate pattern of clustering of structures we find in the survey area (Ashmore et al. 1993). Fairly dispersed

structures do seem to cluster into smaller discrete groups, often patio-focused groups that may represent the residences of small kin-based social groups. Slightly larger arrangements of mounds and other features around several patio groups akin to Ashmore's "group-focused patio cluster (Ashmore 1981:51) (e.g. T/A1-16) appear similar to the hamlets called pet kah in Yucatecan colonial records (Marcus 1983).

Summary

The 1993 season of the Xunantunich settlement survey accomplished several important goals. First, it field tested a methodology for the transect survey that will, with minor improvements, continue to be used in future seasons. The results of the 1993 research have also proven interesting. Four salient observations bear repeating here. First, sites tend to be located on hilltops and hillsides, the lower flatter areas presumably reserved for agricultural use. Second, there is a fair degree of variability in form and organization of sites; this promises to be a very rich avenue for future analysis. Third, there is relatively little nucleation of population around secondary centers in the hinterland, mirroring the lack of centralization of population around the Xunantunich site core. Fourth, preliminary chronological assessments suggest that population levels may have peaked just prior to Xunantunich's florescence at the end of the Late Classic and Terminal Classic periods. Further work will clarify and amplify these preliminary observations, expanding our understanding not only of the Xunantunich hinterland, but of the larger Xunantunich community and the processes that contributed to its florescence and decline.

Acknowledgments

The authors would like to thank the directors of the Xunantunich Archaeological Project, Wendy Ashmore and Richard M. Leventhal, for their intellectual and practical support during the 1993 field season. Dr. Ashmore's extensive comments on a draft of this report were extremely helpful, although the authors remain responsible for any errors. William I. Woods provided invaluable advice and logistical support in developing and implementing the strategy to collect

and analyze the soil samples. Our investigation was carried out under a permit from the Belize Department of Archaeology, represented by Allan Moore and John Morris; the Department was especially helpful in granting an export permit for our soil samples on relatively short notice. Our thanks are also due to the many landowners who graciously allowed us to enter their properties and often their back yards! Finally, the data presented in this paper would never have been collected without the hard work of our Belizean crew, Oscar Gonzalez, Domingo Mesh, Nicasio Chan, and Pedro Ku, and the help of XAP foreman Florentin Penados, as well as Eduardo Alfaro and Osvaldo Lopez. Yaeger's participation in the 1993 season of XAP was funded in part by a NSF Fellowship Travel Grant and a Sigma Xi Grant-in-Aid of Research.

References Cited

Arnold, J. E. and A. Ford

1980 A Statistical Examination of Settlement Patterns at Tikal, Guatemala. *American Antiquity* 45:713-26.

Ashmore, W.

1981 Some Issues of Method and Theory in Lowland Maya Settlement Archaeology. In *Lowland Maya Settlement Patterns*, ed. W. Ashmore, pp. 37-69. Albuquerque: University of New Mexico Press.

1993 Settlement Archaeology at Xunantunich, Belize, Central America. Proposal submitted to the National Science Foundation, August 1993, in possession of author.

Ashmore, W., and R. M. Leventhal

1993 Xunantunich Reconsidered. Paper presented at the Belize Conference, University of North Florida, in Jacksonville, FL, March 1993.

Ashmore, W., J. Yaeger, S. M. Chase, J. VandenBosch, A. H. Keller, and S. V. Connell

1993 The Immediate Settlement Context of Xunantunich, Belize. Paper presented at the Mesa Redonda de Palenque, Katun Aniversario, in Palenque, Chiapas, Mexico, 10 June 1993.

Awe, J. J., ed.

1993 Belize Valley Archaeological Reconnaissance Project: Progress Report of the 1992 Field Season. Peterborough, Ontario: Department of Anthropology, Trent University.

Ball, J. W.

1993 Pottery, Potters, Palaces, and Polities: Some Socioeconomic and Political Implications of Late

Classic Maya Ceramic Industries. In *The Peak of Lowland Maya Civilization: New Understandings of Eighth Century Maya Development*, eds. J. A. Sabloff and J. S. Henderson, pp. 243-72. Washington, DC: Dumbarton Oaks.

Ball, J. W. and J. T. Taschek
1991 Late Classic Lowland Maya Political Organization and Central-Place Analysis. *Ancient Mesoamerica* 2:149-65.

Braswell, J. B.
1992 The Excavations at Group D. In Xunantunich Archaeological Project: 1992 Field Season, ed. R. M. Leventhal, pp. 56-73. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Brumfiel, E. M. and T. K. Earle
1987 Specialization, Exchange, and Complex Societies: An Introduction. In *Specialization, Exchange, and Complex Societies*, eds. E. M. Brumfiel and T. K. Earle, pp. 1-9. Cambridge: Cambridge University Press.

Chase, S. M.
1992 South Group Plaza 1 and Nabitunich Plaza Group. In Xunantunich Archaeological Project: 1992 Field Season, ed. R. M. Leventhal, pp. 35-55. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Clark, J.
1986 From Mountains to Molehills: A Critical Review of Teotihuacan's Obsidian Industry. In *Economic Aspects of Prehispanic Highland Mexico*, ed. B. L. Isaac, pp. 23-74. Research in Economic Anthropology, Supplement 2. Greenwich, CN: JAI Press.

Costin, C. L.
1991 Craft Specialization: Issues in Defining, Documenting, and Explaining the Organization of Production. In *Archaeological Method and Theory*, Volume 3, ed. M. B. Schiffer, pp. 1-56. Tuscon, AZ: University of Arizona Press.

Crumley, C.
1987 A Dialectic Critique of Hierarchy. In *Power Relations and State Formation*, eds. T. C. Patterson and C. W. Gailey. Washington, DC: American Anthropological Association.

Culbert, T. P., L. J. Kosakowsky, R. E. Fry and W. A. Haviland
1990 The Population of Tikal, Guatemala. In *Precolumbian Population History in the Maya Lowlands*, eds. T. P. Culbert and D. S. Rice, pp. 103-21. Albuquerque: University of New Mexico Press.

de Montmollin, O.
1985 *Settlement Pattern Survey in the Rosario Valley, Chiapas, Mexico*. Centre of Latin American Studies, Working Papers No. 41. Cambridge: Centre of Latin American Studies.

Fedick, S. L.
1988 Prehistoric Maya Settlement and Land Use Patterns in the Upper Belize River Valley Area, Belize, Central America. Ph.D. dissertation, Arizona State University.

Fedick, S. and A. Ford
1990 The Prehistoric Agricultural Landscape of the Central

Maya Lowlands: An Examination of Local Variability in a Regional Context. *World Archaeology* 22:18-33.

Ford, A.
1986 Population Growth and Social Complexity: An Examination of Settlement and Environment in the Central Maya Lowlands. Anthropological Research Paper, No. 35. Tempe: Arizona State University.

Ford, A. and J. A. Arnold
1982 A Reexamination of Labor Investments at Tikal: A Reply to Haviland and Folan et al. *American Antiquity* 47:436-40.

Ford, A. and S. Fedick
1992 Prehistoric Maya Settlement Patterns in the Upper Belize River Area: Initial Results of the Belize River Archaeological Settlement Survey. *Journal of Field Archaeology* 19:35-59.

Garber, J. W., W. D. Driver, L. A. Sullivan and S. Goldsmith
1992 The Blackman Eddy Archaeological Project: Results of the 1991 Field Season. San Marcos, TX: Southwestern Texas State University.

Gifford, J. C.
1976 *Prehistoric Pottery Analysis and the Ceramics of Barton Ramie in the Belize Valley*. Memoirs of the Peabody Museum, Vol. 18. Cambridge, MA: Peabody Museum of Archaeology and Ethnology.

Graham, E., G. D. Jones and R. R. Kautz

1985 Archaeology and Ethnohistory on a Spanish Colonial Frontier: The Macal-Tipu Project in Western Belize. In *The Lowland Maya Postclassic*, eds. A. F. Chase and P. M. Rice, pp. 206-14. Austin: University of Texas Press.

Haviland, W. A.

1966 Maya Settlement Patterns: A Critical Review. In Middle American Research Institute Publication 26, pp. 21-47. New Orleans: Tulane University.

1982 Where the Rich Folks Lived: Deranging Factors in the Statistical Analysis of Tikal Settlement. *American Antiquity* 47:427-9.

Healey, P. F., D. H. Lambert, J. T. Arnason and R. J. Hebda

1983 Caracol, Belize: Evidence of Ancient Maya Agricultural Terraces. *Journal of Field Archaeology* 10:397-410.

Joyce, A. A.

1991 Formative Period Occupation in the Lower R°o Verde Valley, Oaxaca, Mexico: Interregional Interaction and Social Change. Ph.D. dissertation, Rutgers University.

Joyce, A. A. and R. G. Mueller

1992 The Social Impact of Anthropogenic Landscape Modification in the Rio Verde Drainage Basin, Oaxaca, Mexico. *Geoarchaeology* 7(6):503-26.

Laporte, J. P. and H. L. Escobedo

1992 Ixtutz, centro rector al oeste del valle de Dolores, Peten. Mexicon 14:90-8.

LeCount, L.

1992 Xunantunich Ceramics - 1992. In Xunantunich Archaeological Project: 1992 Field Season, ed. R. M. Leventhal, pp. 127-44. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Leventhal, R. M., ed.
1992 Xunantunich Archaeological Project: 1992 Field Season. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Leventhal, R. M., W. Ashmore, L. LeCount, V. Hetrick and T. Jamison
1992 American Anthropological Association Paper. In Xunantunich Archaeological Project: 1992 Field Season, ed. R. M. Leventhal, pp. 8-21. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Lincoln, C. E.
1985 Maya Early Classic Monuments and Inscriptions. In *A Consideration of the Early Classic Period in the Maya Lowlands*, eds. G. R. Willey and P. Mathews, pp. 55-94. SUNY Albany Institute for Mesoamerican Studies, Publication No. 10. Albany: Institute for Mesoamerican Studies.

Marcus, J.
1983 Lowland Maya Archaeology at the Crossroads. *American Antiquity* 48(3):454-88.

McGovern, J. O.
1992 1992 Study of Actuncan (Cahal Xux). In Xunantunich Archaeological Project: 1992 Field Season, ed. R. M. Leventhal, pp. 74-83. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Muhs, D. R., R. R. Kautz and J. J. MacKinnon
1985 Soils and the Location of Cacao Orchards at a Maya Site in Western Belize. *Journal of Archaeological Sciences* 12:121-37.

Pollock, H. E. D., R. L. Roys, T. Proskouriakoff and A. L. Smith
1962 *Mayapan, Yucatan, Mexico.* Carnegie Institution of Washington, Publication No. 619. Washington, DC: Carnegie Institution.

Puleston, D. E.
1965 The Chultuns of Tikal. *Expedition* 7(3): 24-9.
1973 Ancient Maya Settlement Patterns and Environment at Tikal, Guatemala: Implications for Subsistence Methods. Ph.D. dissertation, University of Pennsylvania.

Rice, D. and T. P. Culbert
1990 Historical Context for Population Reconstruction in the Maya Lowlands. In *Precolumbian Population History in the Maya Lowlands,* eds. T. P. Culbert and D. S. Rice, pp. 1-36. Albuquerque: University of New Mexico Press.

Tourtellot, G.
1988 *Excavations at Seibal, Department of PetÇn, Guatemala: Peripheral Survey and Excavation.* Memoirs of the Peabody Museum of Archaeology and Ethnology Vol. 16. Cambridge, MA: Peabody Museum of Archaeology and Ethnology.

Wauchope, R.
1934 *Housemounds of Uaxact£n, Guatemala.* Publication 436, Contribution 7. Washington, DC: Carnegie Institution of Washington.

Welbourn, D. A.
1985 Craft Specialization and Complex Societies: A Critique. In *Settlement and Society: Aspects of West European Prehistory in the First Millennium B.C.,* eds. T. C.

Champion and J. V. S. Megaw, pp. 123-31. Leicester: Leicester University Press.

Willey, G. R., W. R. Bullard, J. B. Glass and J. C. Gifford
1965 *Prehistoric Maya Settlement in the Belize Valley*. Papers of the Peabody Museum of Archaeology and Ethnology Vol. 54. Cambridge: Peabody Museum of Archaeology and Ethnology.

Woods, W. I., G. R. Holley and R. A. Dalan
1993 Dynamic Geomorphology and Prehistoric Settlement within a Rio Mopan Study Area, Western Belize. Paper presented at the Belize Conference, University of North Florida, in Jacksonville, FL, March 1993.

Yaeger, J.
1992 Xunantunich Settlement Survey: Preliminary Report. In Xunantunich Archaeological Project: 1992 Field Season, ed. R. M. Leventhal, pp. 110-26. Belmopan and Los Angeles: Department of Anthropology, UCLA, and Belize Department of Archaeology.

Yaeger, J., and W. Ashmore
1993 Xunantunich at the End of the Classic: Dynamics of Settlement in a Time of Crisis. Paper presented at the 58th Annual Meeting of the Society for American Archaeology, in St. Louis, MO, 17 April 1993.

VIS	Vegetation Description:
1.0	recently burned milpa; a plowed field
1.5	cattle pasture with low grass (light groundcover)
2.0	pasture with medium-height grass (moderate groundcover); medium forest with little undergrowth and light groundcover
2.5	sparse 1-2m secondary growth with light groundcover
3.0	new forest with medium undergrowth and moderate groundcover; moderately dense 2-3m high secondary growth with light groundcover
3.5	dense 2-3m high secondary growth with moderate groundcover
4.0	dense 2-3m high secondary growth with heavy groundcover
4.5	very dense 2-3m high secondary growth with heavy groundcover
5.0	has not been assigned yet

Table 1: VIS Scale and Examples

Time Period:	Diagnostic Features and Types:
Preclassic	orange-brown paste (*e.g* Mars Orange)
Early Classic	bowls with basal flanges; bowls with Z-angle shoulders; polychrome slip
Late Classic I	smooth-rimmed Mt. Maloney bowls; lateral-ridge dishes
Late Classic II	bevelled-rimmed Mt. Maloney bowls; punctated and incised dishes (*e.g.* McRae Impressed, Planton Punctated-Incised)
Undif. Late Classic	ash temper; polychrome slip
Terminal Classic	flat-rimmed Mt. Maloney bowls; spiked Miseria incensarios; jars with pie-crust rims; jars with flaring rims

Table 2: Temporally Diagnostic Features of Ceramics

N=29 Groups	Pre-classic	Early Classic	Late Classic I	Late Classic II	Gen. Late Classic	Terminal Classic
#	6	4	13	15	19	5
%	21%	14%	45%	52%	66%	17%

Table 3: Chronological Assessments for Groups on T/A1

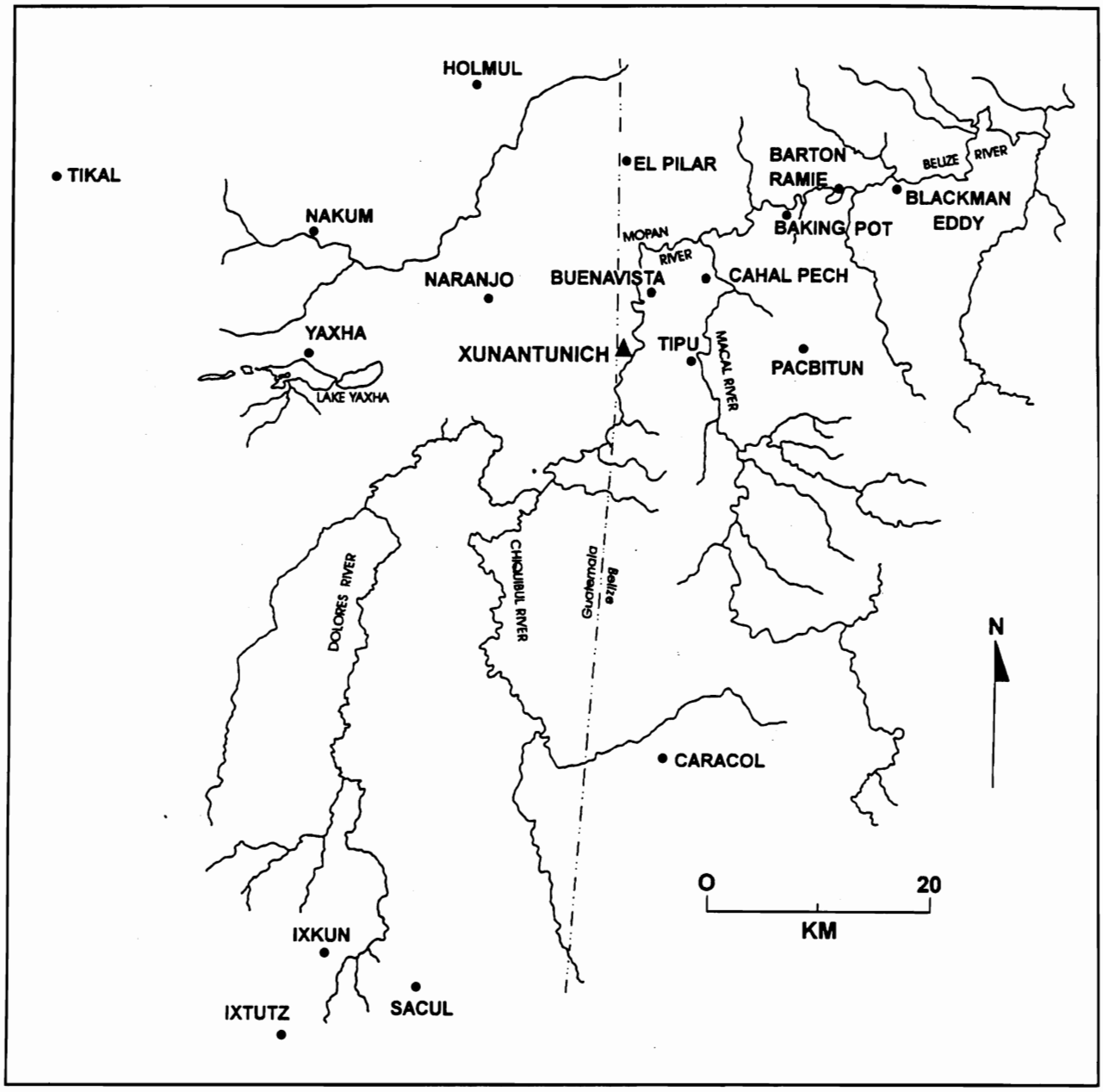


Figure 1: Map of Upper Belize River and Tributaries

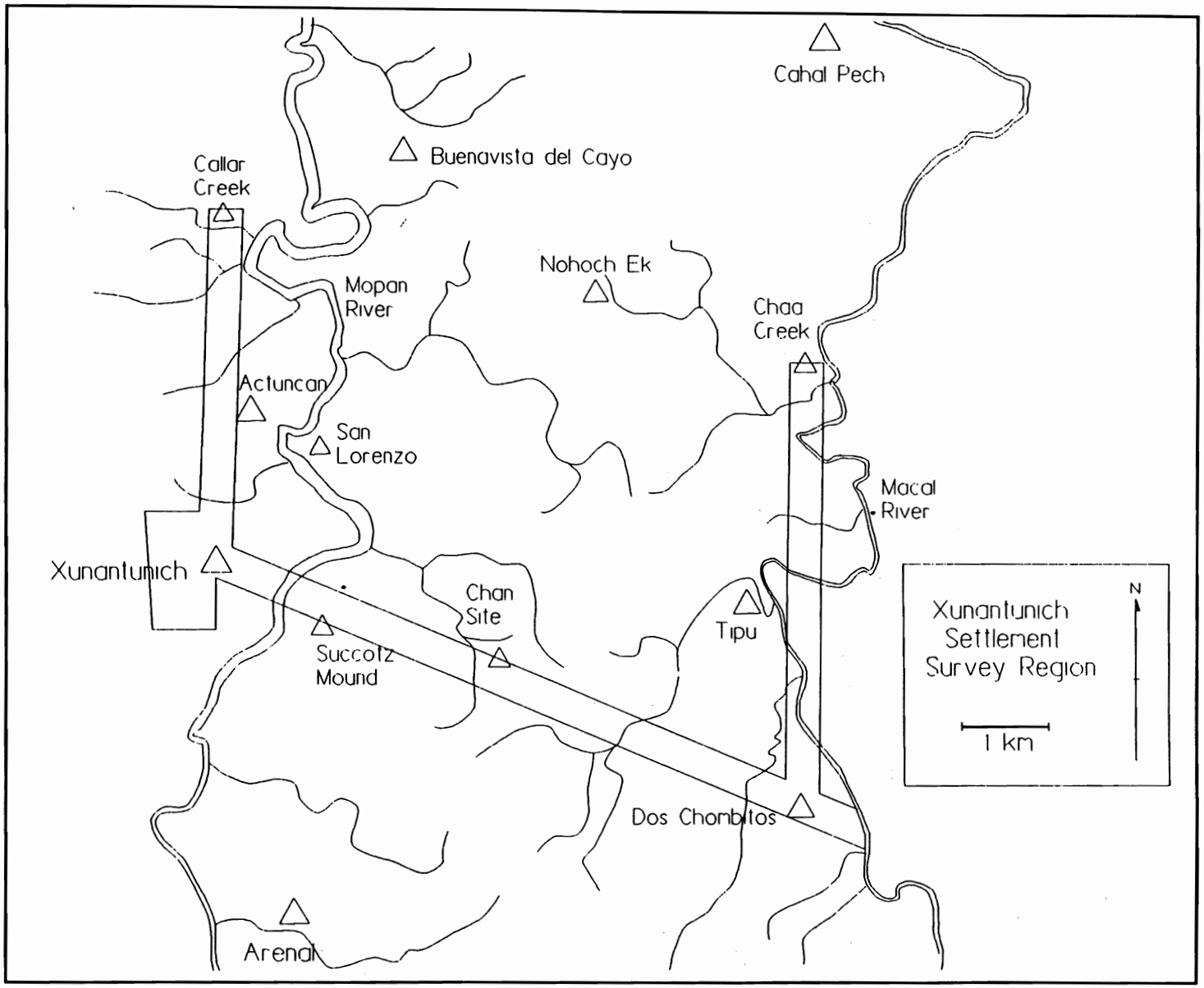


Figure 2: Xunantunich Settlement Survey Transects and Nearby Sites

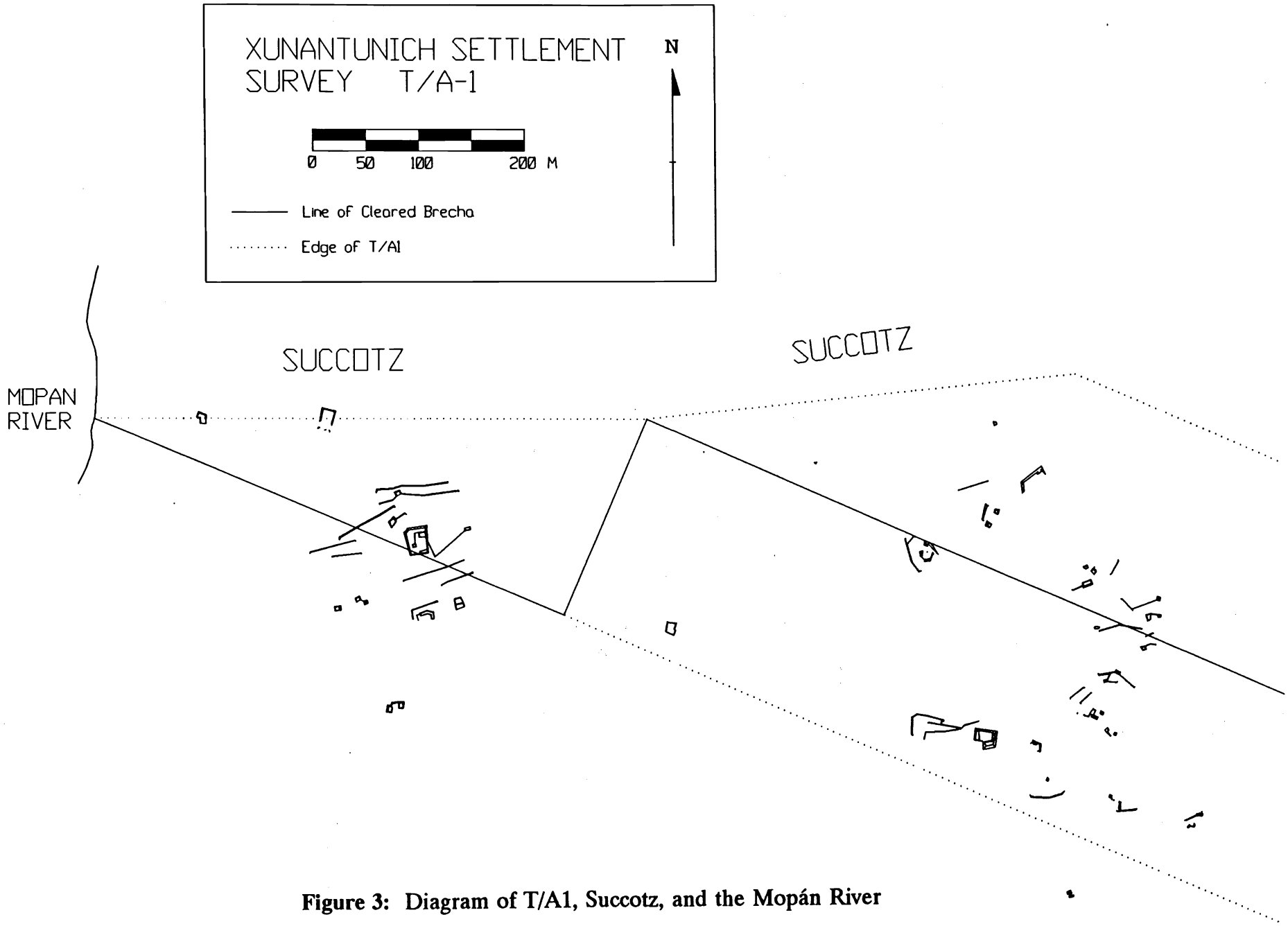


Figure 3: Diagram of T/A1, Succotz, and the Mopán River

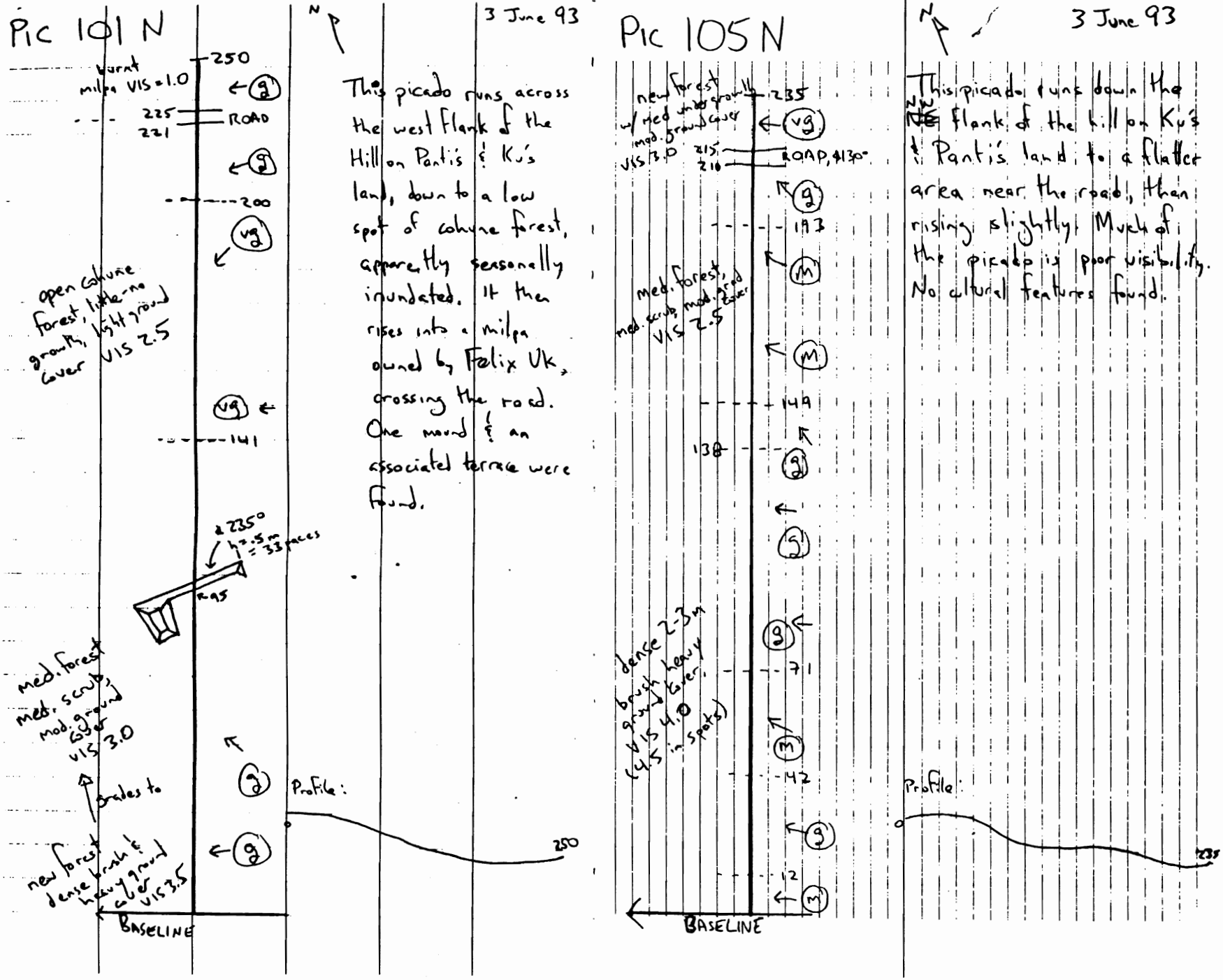


Figure 4: Two Example Fieldbook Pages

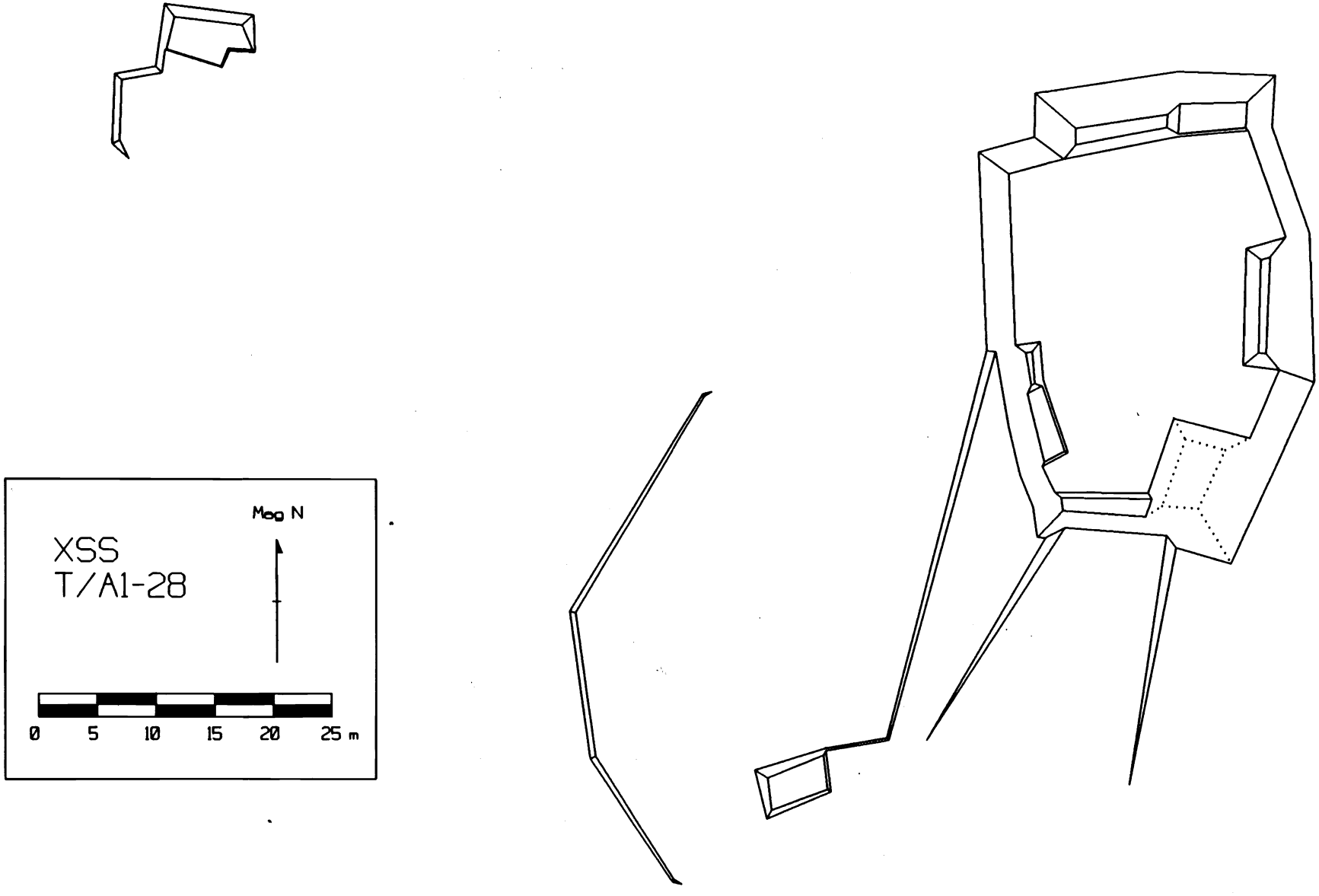


Figure 5: Site T/A1-28

1993 XAP SURVEY -- SITE/GROUP FORM

Site Name (Number): T/A1-30
Picados Datum: 109 at baseline
Other
Shovel Test Ops: 82 66/1
Plot/Prop: / F. Panti

Date Mapped: 21 June 93
Mapper/Desc: JRY / JRY
Datum: N
Pt 587 E
El

Cultural Remains (mounds and features [terraces, chultuns, sherd scatters, etc.], looted?):

This site consists of 3 mounds organized around a patio, slightly raised on some edges, esp. the west edge. The patio is open to the E/NE, facing the Chan Site; indicative of socio-political affiliation? Just off the NW corner of the largest mound (str 3) is a collapsed and looted chultun. The looting extends into the the NW corner of Str 3. Cut stones are present. The size of Str 3 is > 1m high, making me surprised it hasn't been looted more.

Topography (Soils, hydrology, slope):

The site is on the west edge of a fairly long E-W ridge (>200m) overlooking Jenkins' arroyo to the west. A shoulder of the slope, SW of here, has a site on it. Slope to N & W is moderate, flat to E, gentle then moderate to S. Slope is quite rocky, but hilltop has deeper soil which is brown loam & loamy clay.

Vegetation (type, VIS, ground cover, land use):

Medium forest w/ light scrub & moderate ground cover. VIS 3.0. It was milpa once, perhaps 20-25 yrs. ago; never been plowed.

Related Sites/Context:

Probably related to the small site on the hillside to the SW, and to the site at the foot of the hill. The site does face the Chan Site. T/A1-30 is the most formal site on this ridge.

References: Photos: none
Maps: Looseleaf point map
pt list in JRY 93:1

Figure 6: An Example Site Form

1993 XAP SURVEY ARTIFACT CATALOGUE

Site T/A1-28
Provenience 82EE/1
Date 21 June 93

	Bodies	Bowls/Dishes	Jars	Other
Non-diagnostic sherds				
Calcite/Sand ware	41	2	1	
Ashware				
Orangeware	1			

Diagnostic Surface (specify quantity)	
Ash monochrome	
Calcite monochrome	
Ash bichrome	
Calcite bichrome	
Ash polychrome	
Calcite polychrome	
Glossy Ware	
Waxy Ware	
TOTAL:	

Diagnostic Decoration (specify quantity)	
Carving	
Incising	
Punctating	
Notching	
Notched-incised applique	
Impressing	
Impressed filleting	
Striating	
Other (describe)	

Mount Maloney incurving bowls	
Unknown lip	
Square lip	1
Beveled lip	
Smooth lip	

Known type-varieties:

Mt Maloney

Sherds collected: yes / no (circle)

Figure 7: An Example Shovel Test Form, Front Page

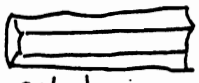
Site T/A1-28
Provenience 82/EE/1
Date 21 June 93

OTHER ARTIFACTS
(Range: 0, 1-5, 6-25, 26-50, 50-100. 100+)

Groundstone	Ø
Shell	Ø
Bone	Ø
Other	Ø

Lithic:	flakes/debitage	tools	cores
Chert	Ø	Ø	Ø
Obsidian	Ø	1 prismatic blade frag.	Ø

COMMENTS:


actual size

Shovel test placed just off NE corner of platform on the edge of a moderate slope down to the arroyo to the east. Most sherds came from the upper stratum. One terminal classic Mt. Maloney and one piece of Preclassic Orangeware.

Stratigraphy:

0-35cm clayey loam, very dark brown; calcite cobbles, most < 5 cm³ but some 10 cm³, present; organics in top 10cm

35-49cm loamy clay, grey-brown; similar calcite inclusions

49cm calcite/limestone bedrock

Figure 8: An Example Shovel Test Form, Back Page

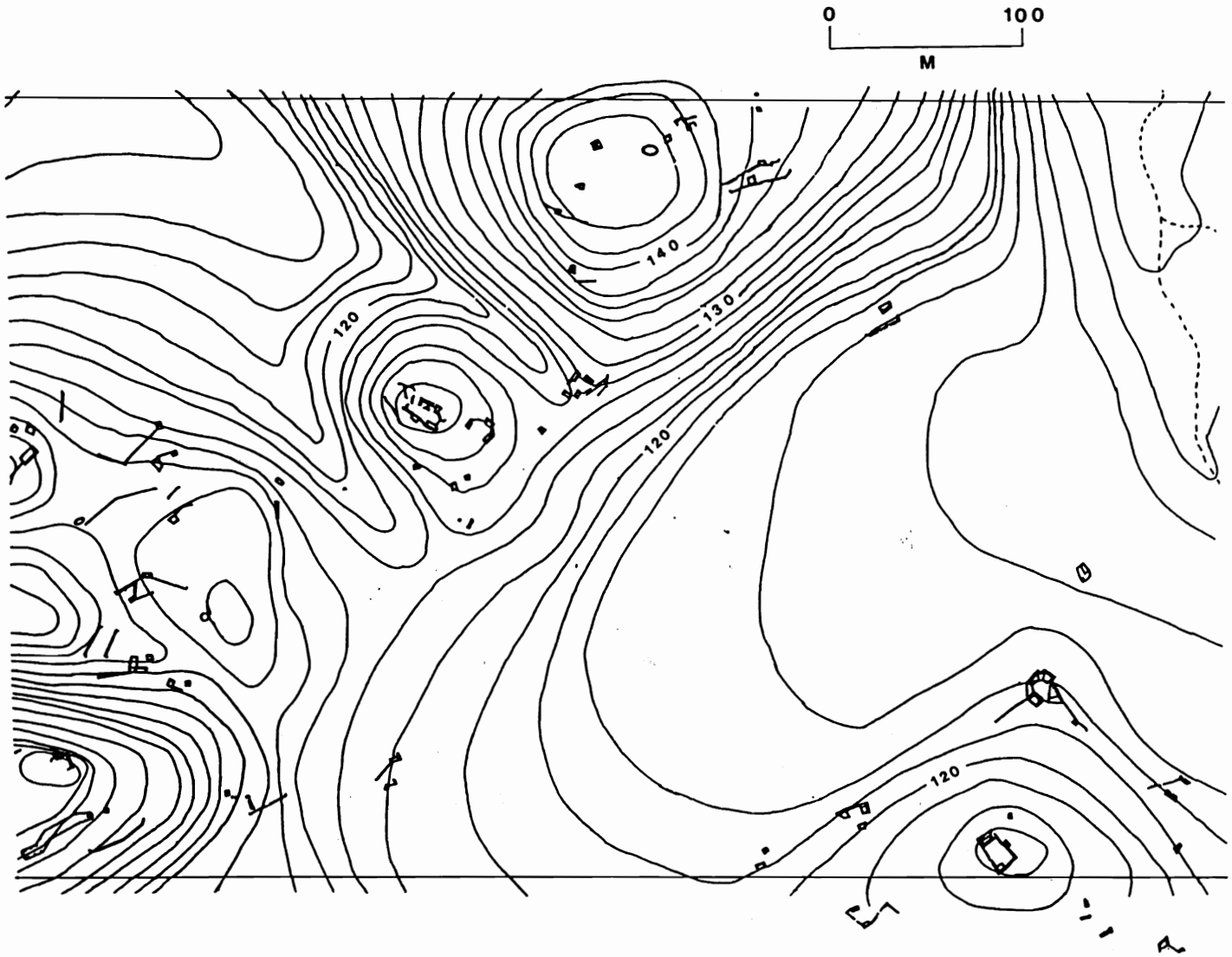
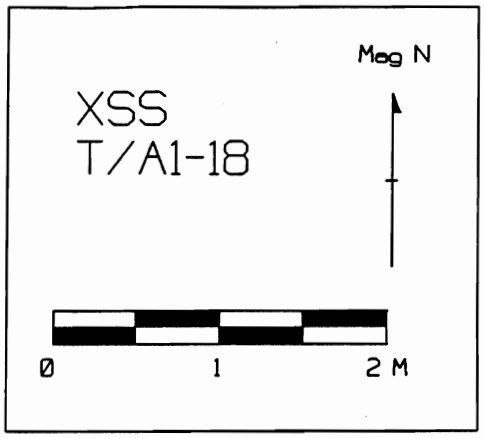


Figure 9: Contour Map of a Section of T/A1 Showing Archaeological Features



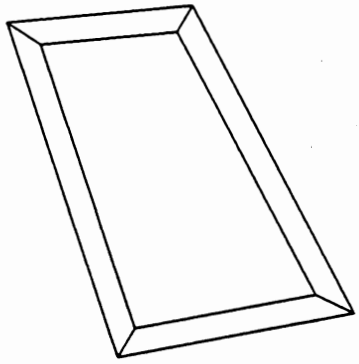


Figure 10: Site T/A1-18

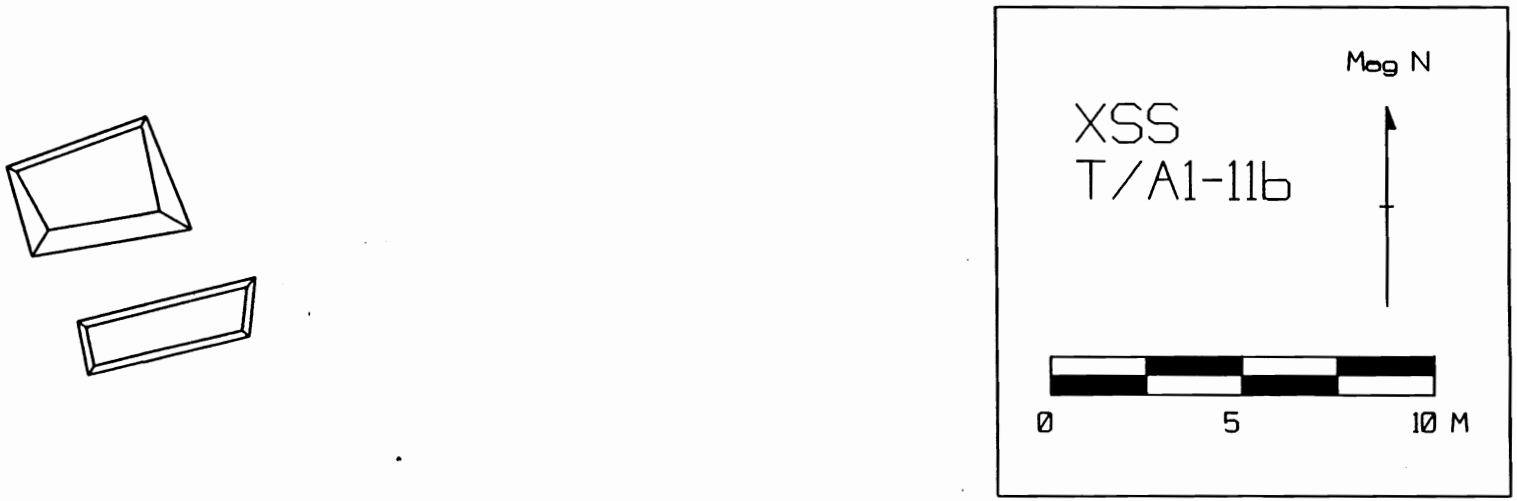
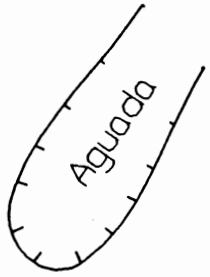
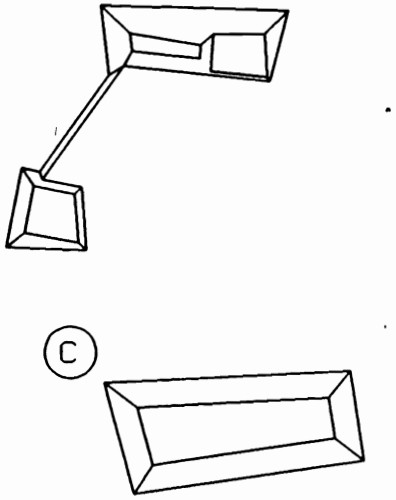


Figure 11: Site T/A1-11b





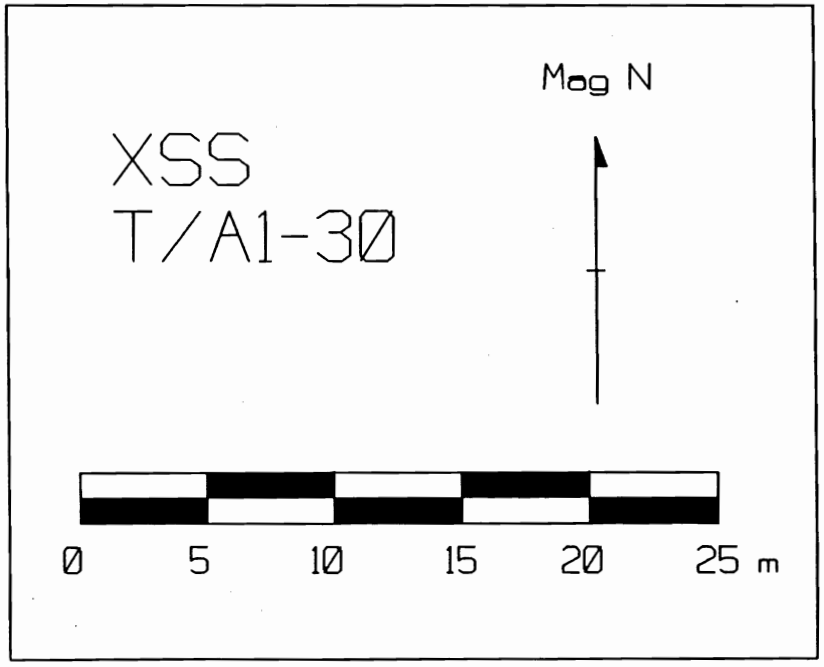
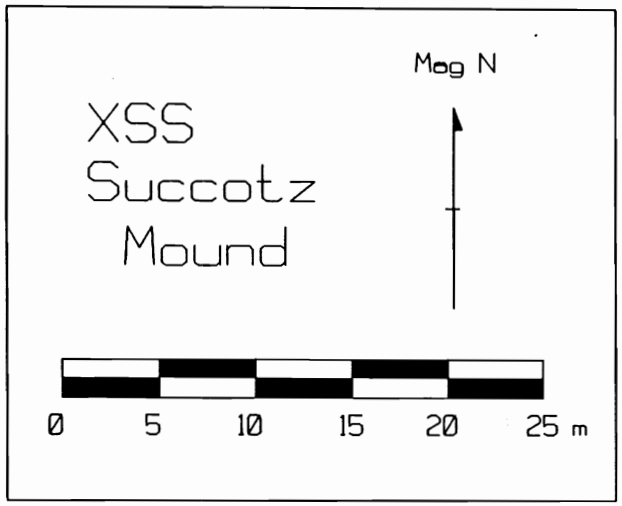
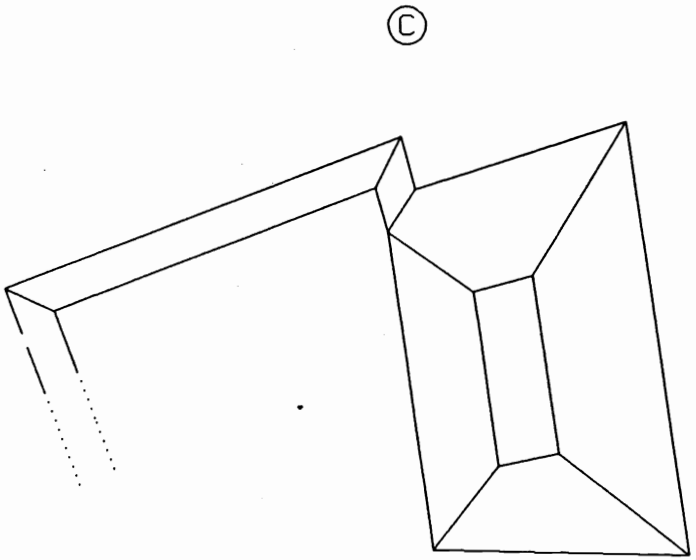


Figure 12: Site T/A1-30





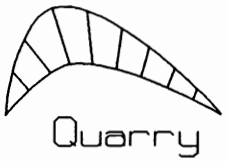
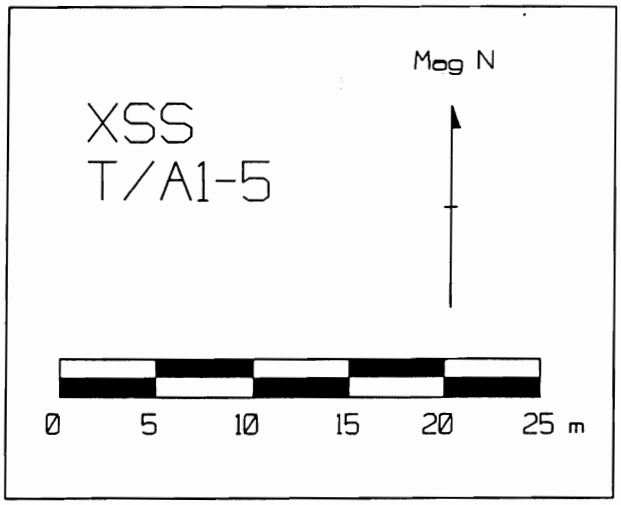


Figure 13: Succotz Mound



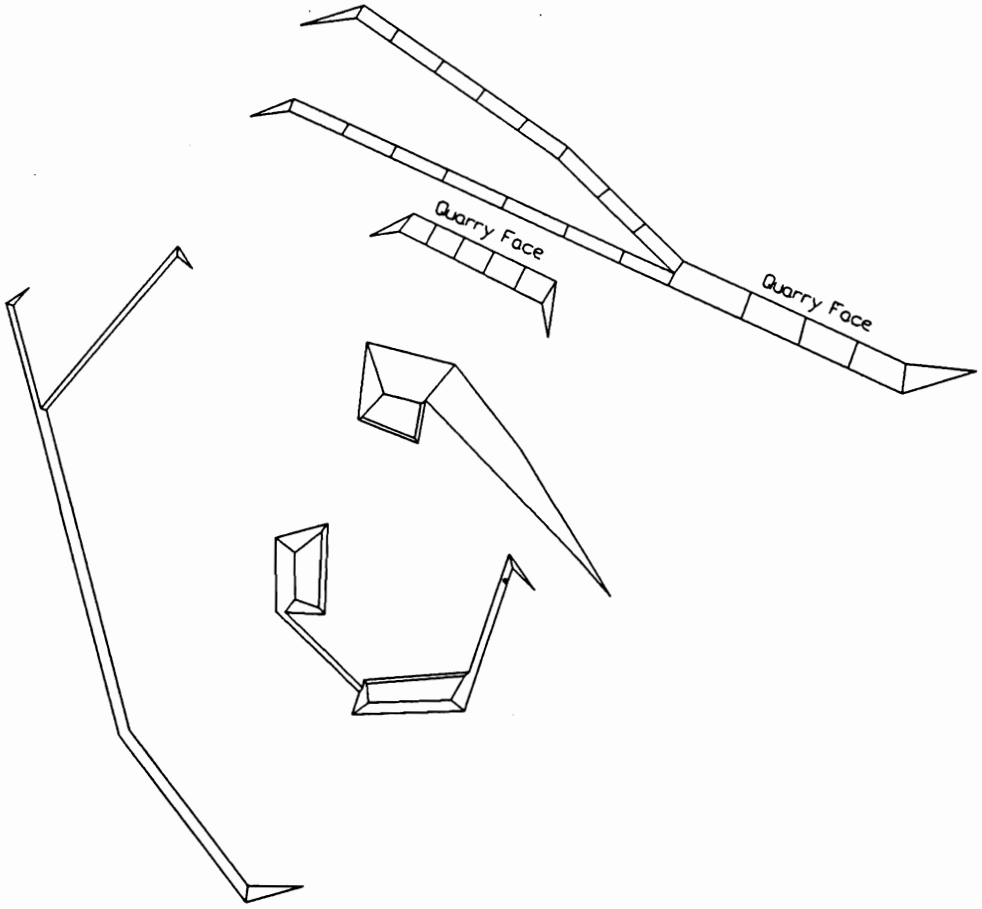


Figure 14: Site T/A1-5

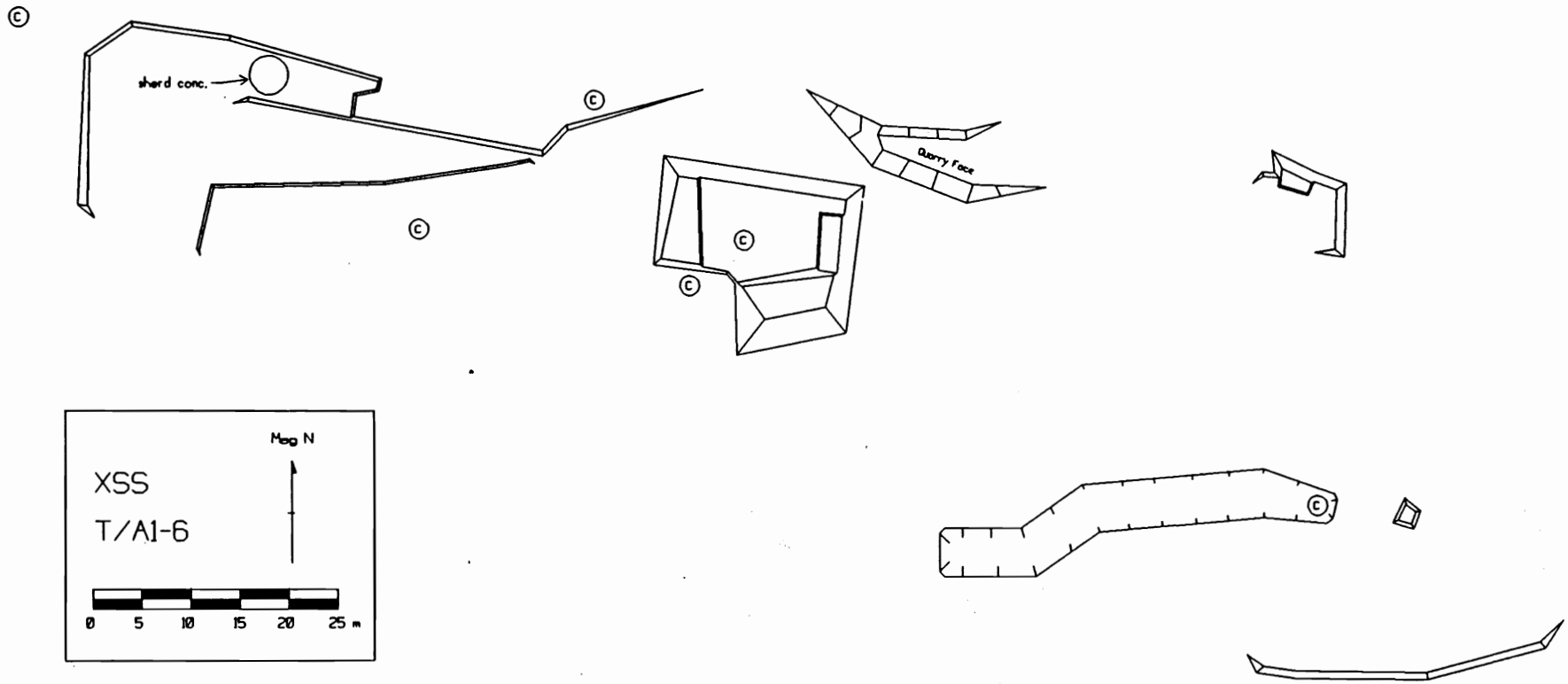


Figure 15: Site T/A1-6

Chaa Creek: Reconnaissance

Sam V. Connell
University of California, Los Angeles

A reconnaissance was conducted in the Chaa Creek zone (see below) as part of the Xunantunich Archaeological Project's (XAP) ongoing efforts to explore the Xunantunich periphery. (Yaeger 1992; Ashmore et al. 1993). The reconnaissance accomplished three objectives: 1) it provided a comparable data set for further analysis of patterning identified in the 1993 XAP settlement transect work; 2) it contributed to a preliminary framework of what might be encountered in XAP Transect #2 (T/A2), which will terminate at the Chaa Creek zone; and 3) it stimulated a developing model which argues that the Chaa Creek settlement zone be viewed as a semi-autonomous secondary center playing a dynamic role in the upper Belize River valley's regional socio-political matrix. The model contains three separate parts which concentrate on the perceived locational importance of Chaa Creek in terms of a large associated tract of land. Research will concentrate on the hypotheses that: **1.** Chaa Creek is located adjacent to and controlled this tract of land; **2.** Chaa Creek served as a boundary community at the edge of the Xunantunich polity; and **3.** Chaa Creek served as a central node in a portage system that existed between the Mopan and the Macal rivers, operating as part of a larger regional trade network.

Background and Working Model

The "Chaa Creek zone" is presently defined as the properties of Mick and Lucy Fleming and Rosita Arvigo, who each own thriving tourism businesses. Our reconnaissance consisted of a 1x2 km transect through these properties running from the western bank of the Macal river and stretching west approximately 2 kms. The zone intersects with a long stretch of flat land which extends east from the Western Highway and is presently farmed by the Mennonites (see Figures #1 and #2). Topographically, the Chaa Creek zone consists of a series of west-to-east oriented limestone ridges intersected by deep seasonal creek beds, such as the Chaa creek, that drain into the Macal river. Vegetation on the ridges is generally medium forest and medium brush, accounting for an average visibility factor of three (VIS 3) on the XAP standardized scale (see Yaeger and Connell, this volume). Meadows and open fields cover the lower flanks of every ridge. In the very low zones, through which the creeks flow, the vegetation consists of high stands of cohune palms. As expected, no settlement remains were found in these wet "bajo" zones (Yaeger 1993).

Three main types of soil were prevalent within the Chaa Creek zone.

Brownish red silty-clay to pure clay was the common soil in the low areas, where, again, no settlement was found. The Chaa creek runs at this low elevation and not coincidentally, the name Chaa derives from the Maya word "Chak" meaning red. On the ridge flanks and in the flat areas, such as the Mennonite land, the soil is a dark brown clay loam. This soil is apparently good for agriculture, since all areas where this soil was found are presently under cultivation. The third soil type was found on top of the ridges where settlement is concentrated (see below). This soil is a very dark brown loam with calcite inclusions, and bedrock does not appear to be more than 50cm below ground level. These soils are mentioned here because they may provide a barometer of settlement distribution. Fedick (1989) has proposed settlement on the basis of soil quality, a model which is highly relevant for the working model of settlement in the Chaa Creek zone.

Mapping in the Chaa Creek zone in 1992 documented four "mid-sized" and plausibly interconnected sites (Carpenter et al. 1993). These four sites have features distinguishing them from standard household groups, yet even in the aggregate they plainly do not belong in the same category with larger valley centers like Xunantunich. This section will begin to outline the "mid-sized" nature of the groups as it pertains to the semi-autonomous character of the Chaa Creek zone. In 1992, each site was bushed, sketched and mapped with an EDM. The four sites were named Stela Group (#CC1a), Plantain Group (#CC5a), Blow-Out Group (#CC18) and Banana Group (#CC19)(see Table #1). The "mid-sized" groups are located within one square kilometer, and lie at the western ends of three ridges (see Figure #3).

At Stela Group (Figure #4) a small fragmented, uncarved stela was identified, as well as a circular arrangement of stones that tentatively resembles altars identified at many Classic Maya centers, such as the Ahau altars at Caracol. In addition, at Stela Group a ramp was discovered leading east. At the head of the ramp there is a large square limestone slab which resembles, in form and positioning, the entrance monuments recently documented at Xunantunich (Keller, this volume). Plantain Group consists of a 3m high range structure arranged in an L-shape that encloses the north and east sides of a platform with stairs to the south. Extensive looting in the east building exposed one meter thick walls that divide the range structure into four rooms and may indicate corbeled vaulting (Figure #5; see artist's representation). Ongoing structural erosion was readily apparent at Plantain and has become an immediate concern. Banana Group is another L-shaped group

on a platform with a southern stairway and is noteworthy because it remains unscathed by looters. Blow-Out Group is characterized by a platform 3.17 meters high with an associated structure set in the back that rises 5.52 meters above the plaza floor (Figure #6; see artist's representation). A cross-section of stratigraphy evident in a looters' trench, drawn by Gregg Cestaro (U. of Oklahoma), indicates three occupation phases. The Blow-Out platform consists of five other structures and two lower platforms to the north and west that appear to be formed from quarrying episodes. One area of the west escarpment resembles a quarry. The area appears to be mined, and a few partially shaped blocks lie nearby. Blow-Out Group also has an entrance ramp entering the plaza from the northeast.

The different groups have common features reflecting our model of a semi-autonomous, "mid-level" Chaa Creek zone integrated into a regional matrix. First, Blow-Out and Stela Group have direct lines of sight to both Xunantunich and Actuncan. This line of sight might be indicative of a connection to these larger centers. Second, at both Stela and Plantain Groups the architectural walls visible in looters' trenches are finely constructed with small limestone blocks that resemble modern bricks. This type of construction has not been observed at the main site of Xunantunich in previous work by XAP. Comparative analyses of architecture at other nearby archaeological sites will be necessary to determine the significance of this architectural feature in terms of regional connections. Lastly, the groups are arranged with entrance ramps, stairways and "temple" architecture (Yaeger 1993), and one group contains a stela. These significant features could be representations of centralized authority and control and, therefore, semi-autonomy, as well as simultaneously indicating administrative functioning and ties to elite centers. It was on the basis of the 1992 pilot mapping season that research in the Chaa Creek zone expanded to the 1993 reconnaissance phase.

The 1993 field proposal suggested that surrounding settlement data would further uncover the role that these four groups might have played in regional dynamics between the local, less formal settlement and the larger valley centers of Xunantunich (Leventhal et al. 1992), Actuncan (McGovern 1992), Buenavista (Ball and Taschek 1991) and Cahal Pech (Awe et al. 1993). In this sense, the occupants of the Chaa Creek zone would have interacted within a regional socio-political matrix, as well as within their own immediate settlement area. As a result of these intermediary relationships middle-level settlements are "<u>the</u> most dynamic" and

therefore the most useful units of study (Awe et al. 1993; Iannone 1993:14). Through survey and excavations the Belize River Archaeological Research Project (BVAR), directed by Dr. Jaime Awe, is studying proposed middle-level centers of the Cahal Pech periphery. With comparable data the Xunantunich Settlement Survey (XSS) wishes to test Awe and G. Iannone's ongoing theory of social interaction.

More specifically, I wanted to begin to address the ways in which a perceived locational importance of Chaa Creek would affect these relationships vis-a-vis the three parts of the working model (see Ashmore's NSF proposal 1993, and Leventhal, Ashmore and Connell's Kaplan Fund proposal 1993). Concisely, the model states that:

1. The first part of the model proposes control of a 2.5 square kilometer block of land by the residents of the Chaa Creek zone. This long flat stretch of rich agricultural land, which extends approximately two kilometers farther east than any other part of the Mopan valley, is the only place that bypasses the rough, hilly terrain between the two rivers (Figure #1). In addition, it is the only land in the area which the Mennonite farmers actively cultivate using state of the art modern equipment. Both Stela Group (CC1a) and Blow-Out Group (CC5a) strategically overlook the tract of land. I propose that as the need for food resources escalates it becomes necessary to have settlements adjacent to agricultural land in order to control food production. This fits the model used for growth and expansion at Copan (Fash 1983; Leventhal and Fash 1981) and has been noted throughout Mesoamerica (Grove 1984). In addition, ethnohistoric sources claim the growth of cash crops such as cacao was evident at Negroman/Tipu, along the Macal (Jones 1989; Muhs et al. 1985).

2. The second part of the model proposes that the Chaa Creek zone may have defined the limits of a Xunantunich polity and/or an Actuncan polity. During times of social and political unrest within the valley, this zone might have defined an edge of Actuncan's and, subsequently, Xunantunich's sphere of direct control. Archaeological evidence suggests a long occupation span at Chaa Creek that is contemporaneous with other centers in the valley and, therefore, sanctions the study of sociopolitical connections between the Chaa Creek zone and these larger site centers. In addition, the clear line of sight between the Chaa Creek groups and the Castillo at Xunantunich and Actuncan might indicate a necessary communication link between the regional centers and a boundary zone. A central-

place analysis performed by Ball and Taschek (1991) places Chaa Creek close to the intersection of three hexagonal "segementary-state" nodes. I hope to diachronically document the role of Chaa Creek as a boundary center over time, as archaeologists accumulate more temporally significant data on regional socio-political dynamics.

3. Due to the topographical characteristics of the tract of land above which the Chaa Creek sites loom, travel between the Mopan and Macal rivers, and, consequently, between Xunantunich and the Chaa Creek groups is more accessible. Even today, the road skirts the southern edge of the block of land before passing between Stela Group and Plantain Group. The Chaa Creek sites are located at what appears to be the nexus of a natural route of communication between the Macal River valley and the wider Mopan drainage, a position referred to in the literature as a "gateway" (Hirth 1978). In support of the model, I propose a functional connection between a series of chert cobble mounds in the Chaa Creek zone, discovered on the northern ridge; and the enigmatic cobble platforms located along the Mopan river at San Lorenzo (see VandenBosch this volume). Both VandenBosch and I believe these mounds to be associated with river-based transshipment of goods, and now, possibly, the inter-riverine flow of goods. We would expect to find evidence for trade activity along this locally optimal portage route in the form of a wide variety of different types of artifacts located at the Chaa Creek zone.

The 1993 reconnaissance attempts to address these models by revealing an integrated yet distinct Chaa Creek zone interacting with the rest of the valley in a variety of contexts.

Reconnaissance Methodology

The 1993 aim was to locate and map all additional structures and associated features in the Chaa Creek zone. Mapping this year employed a Brunton compass, a tape measure, and standardized paces. To date, Maler representations of all the groups have been input onto a CADD system. A CADD topographic reconnaissance map representing the entire zone of surveyed settlement has been constructed (Figure #6: see Schortman and Urban et al. 1988, 1992 for examples of horizontal site placement using topographic maps only).

During the reconnaissance the sites were located by systematically dividing up

geographic areas in terms of the arbitrary property boundaries and different topographic zones, and then identifying topographic features such as ridges, fields, or bajo areas. Each area was walked over looking for cultural features and artifact scatters. For example, a ridge would be walked by two or three people, first along the summit, and then along the flanks. Each mound or group of mounds was given a site number, while collections of associated groups were subdivided with alphabetical suffixes. The XAP 1993 SITE/GROUP form was used to record the appropriate information on the cultural remains, topography, and vegetation. William Feld (Tulane University) plotted current fence lines and property boundaries on the official government topographic map (published at 1:50,000 scale; see Figure #8), thereby allowing for horizontal control of survey data with an estimated 50m error factor even in areas of dense vegetation (VIS 5).

Surface artifacts were examined at sites where such remains were easily visible. Artifacts were identified in the field or temporarily brought into the XAP laboratory for examination by laboratory director, Lisa LeCount and staff member, Ellen Bell. The 1993 XSS SURVEY ARTIFACT CATALOGUE form was used for recording the chronological diagnostics, as well as the provenience of each collection (see example: Figure #9). The 24 collection samples consisted on the average of 50 or more sherds. Collections were made from eroded or disturbed surfaces and the backdirt of looter's trenches. These types of samples yield specific kinds of data. For example, surface deposits are generally from later settlement, while looters' trench deposits are usually a mixture of fill and trash from earlier occupation phases. Without good context we can do little more than make presence/absence temporal statements, but these chronological inferences give a working sense of occupation spans.

Angela Matusik (UCF) and Curtis Campaigne (Denver) catalogued, drew and photographed significant artifacts collected during reconnaissance and those previously collected by the Flemings. These artifacts are in the process of being registered with the Department of Archaeology in Belize. A small Information Center is planned for the Chaa Creek resort, which will explain the function of the different artifact types.

Ceramic Temporal Data and the Working Model

As part of the reconnaissance we tried to make preliminary temporal

assessments of settlement in the Chaa Creek zone (Table #2). XAP laboratory director Lisa LeCount graciously helped with the identification of surface-collected artifacts (LeCount 1992). On the whole there were few diagnostics, but some preliminary trends were identified. A higher percentage of red-wares, such as Vaca Falls and Garbutt Creek, were found in this zone than in excavations around Xunantunich. As I will outline below, this is a possible indication of increased contact with other ceramic producing areas and supports the model of extensive interregional contacts, probably to the east.

While 94% of the collections had Late Classic ceramics, LeCount noticed substantial Early Classic and Early Late Classic (LC I) components in looter's trench samples (56% - Groups #CC1a and #CC5a among others). Some Late Preclassic medial-flanged bowl sherds were also found on the surface at Group #CC1c. Initial occupation in the Chaa Creek zone possibly, then, predated the proposed height of construction at Xunantunich in the Late Late Classic (LC II). The Chaa Creek zone's occupation span includes a Preclassic phase which corresponds with the phases of valley political domination proposed for Actuncan (McGovern 1992) and Cahal Pech (Awe et al. 1993); an Early Late Classic phase which is accepted as the epoch of prominence for Buenavista (Ball and Taschek 1991); and, lastly, the largest sites at Chaa Creek had evidence of Terminal Classic diagnostic ceramics which is the proposed height of political domination for the Xunantunich elite (Groups #CC1a and #CC5a - see figure of selected ceramic profiles). This supports the hypothesis that peoples might have massed in centralized locations for safety and protection during this period of upheaval. Such centralized locations might not only be the large elite centers, such as Xunantunich, but could also conceivably be important middle-level platform groups such as Chaa Creek (Leventhal, pers. comm. 1993; see T/A1 data for the lack of Terminal Classic, Yaeger and Connell, this volume). It must be emphasized that these temporal assessments are preliminary and should be considered with caution. Yet, the occupational time span does stretch from the Late Preclassic up to the Terminal Classic. This length of occupation allows us to test our model of Chaa Creek's locational importance in terms of upper Belize River valley socio-political changes.

Settlement Data, XAP 1993 Transect #1 and the Working Model

The observed patterning of settlement in the Chaa Creek zone supported trends identified by XSS in T/A1 (Yaeger and Connell, this volume). Seventy-four

percent of the sites discovered were located along the ridge tops, and the other 26% were found on ridge flanks (Awe et al. 1993; Ashmore et al. 1993). The tract of ploughed land mentioned earlier as a key player in our model is located to the west and has structures along its edges. 1994 research will focus on this as yet unsurveyed important area. The structures which are visible on the land are intriguing because T/A1 data does not support a model of extensive field settlement.

Of the sites in the Chaa Creek zone not destroyed beyond recognition, 36 or (88%) were constructed with elevated platforms. Yaeger and Connell (this volume) document a lower percentage of platform groups in T/A1. Sites appear to be built with platforms or without, and those with platforms are either multiple mound groups or single mounds (Table #1; also see Yaeger and Connell this volume, for discussion of XSS settlement typology). Even at this very preliminary stage of analysis there is a continuing pattern, initially identified in XSS survey, of single structure platforms. Thirteen (32%) of the sites located in the Chaa Creek zone were of this type. Usually single structure platforms are located on gentle slopes with a patio stretching around the downhill side and are believed to be early-stage multiple household platform groups (Tourtellot 1988). The two surface collections at single mound platforms indicate Early Late Classic (LCI) to Late Late Classic (LCII) occupation. Though extremely preliminary, I propose a transitional LCI - LCII population expansion in the area, which may have involved extended families moving away from pre-existing platform groups or more likely an influx to the area of an immigrant population. Due to the number of platform groups, I also suggest a higher relative wealth for the area settlement.

In addition to the proposed population increase, our model of Chaa Creek's positional significance is also supported by the fact that very few agricultural terrace systems were located in the area. Gentle to medium-grade slopes in T/A1 yielded terrace densities of 227 per square kilometer. Terraces apparently become necessary when the available lands are not able to support the population. It is evident that the people living in the area of T/A1 deemed it necessary to construct extensive terrace systems for agriculture. At Chaa Creek, where there are no terraces, it is apparent that the surrounding agricultural lands were sufficient for subsistence or that the population was exchanging for agricultural goods from other areas, yet another indication of the relative wealth of the area.

Chultunes are common in this limestone bedrock area and 11 of the 43 sites (26%) contained a total of 17 chultunes. Group #CC18 (Blow-Out) had four open chultunes. Similar to T/A1 they are found in association with mounds or grouped together on low lying platforms or terraces. Yaeger and Connell (this volume) suggest the possibility of groupings of chultunes as storage for feasting on open platforms (see T/A1-6).

The reconnaissance found quarries in approximately the same density as T/A1 (Yaeger and Connell this volume). In other words, for what was constructed we found the appropriate amount of quarries. At Chaa Creek, limestone bedrock was not only used for sublevel platform construction, but also ten groups (23%) appear to have utilized bedrock for the construction of exposed or visible walls. Xunantunich's 1993 excavations at Group D found similar construction practices at the base of the north structure (D-7), where the outlines of blocks were carved into the bedrock (Braswell, this volume). In fact, I believe that the entire east side of the Xunantunich central platform was created by extracting a large amount of bedrock and then treating the extant surface. At Chaa Creek's site #CC15, the limestone bedrock is cut and cornered in order to form the front section of the platform. At #CC1b and #CC5c entire platforms/structures appear to have been carved out of bedrock. Though bedrock modification is not unusual in the Maya area, the construction technique appears to be integral to both Chaa Creek and Xunantunich architecture.

By contrasting the 1993 Chaa Creek reconnaissance data with 1993 T/A1 survey data, we can begin to make comparative statements about different zones of peripheral settlement around Xunantunich. In both areas we see many of the same features in varying intensities. The relative differences possibly demonstrate that the Chaa Creek zone was an area of wealth, and thus greater socio-political importance. In the Chaa Creek zone there are a higher percentage of platform groups, a greater number of single structure platforms, fewer agricultural terraces, a higher percentage of chultuns, and a higher percentage of cut-block construction (18 sites or 42%). Future research will allow for a more comprehensive analysis.

In terms of the developing model it is important to note the lack of terracing as a possible indicator of relative wealth and reliance on a strong agricultural source, ie. the tract of Mennonite land. In addition, the proposed connection of the Chaa

Creek zone with Xunantunich in terms of architectural styles and quarrying patterns suggests a level of interaction at Chaa Creek representative of a regional political boundary **and** a gateway of trade between points west and the Macal River valley.

Settlement Data, XAP Transect #2 and the Working Model

The Chaa Creek reconnaissance serves as a partial preview for 1994 XAP Transect #2 (T/A2) survey. T/A2 extends to the Chaa Creek zone after heading north along the banks of the Macal from the eastern terminus of T/A1.

Riverine settlement was remarkably limited at Chaa Creek. Less than 10% of all groups found were within 500m of the river, an area between one-quarter to one-third of the entire reconnaissance (see Figure #7). The reasons for the low settlement are a combination of: (1) the 20th-century casualties of human traffic -- at Chaa Creek there are remnants of decimated mounds; (2) the irregular and often rough topography; and (3) the prehistoric social, political, and economic factors which dictated concentration of settlement away from the river.

Throughout Mesoamerica the history of the Maya is rapidly vanishing as acts of looting and wanton destruction destroy what little survives of the glorious precolumbian civilization. The lack of settlement near the Macal river is in part due to site destruction. Construction along the river has increased as the area is developed for tourism. At Chaa Creek, 6 mound areas have been demolished and 17 looters' trenches in 13 sites have been identified. Notwithstanding, the architectural preservation observed in the exposed looters' trenches is exceptional and will provide valuable information about growth sequences and construction techniques in the affected buildings and platforms. Further destruction is occurring on the adjacent Mennonite farmland. Annual ploughing of the large tract of arable land has flattened many mounds, reducing them to a concentration of cobble rubble. Settlement survey will be conducted on this tract of land in 1994. The model expects to find evidence of expanding settlement in the Late Classic as the zone became a valuable agricultural area within a proposed "safe" area of the Xunantunich polity. Possibly, earlier settlement will denote the use of the area as a portage route.

There is a lack of settlement in every topographic zone located near the Macal river. East to west running steep ridges cover most of the area and intersect with the Macal. Within 500m of the Macal these ridges have no structures on them. For

example, one ridge with no settlement comprises approximately 80% Rosita Arvigo's land (block #56 on Figure #10). The highest hill in the Chaa Creek zone, is located approximately 500m west of the Macal on the north edge of the Fleming property. This hill is devoid of cultural material, as is the area stretching from the hill and the Macal (Figure #10). Additionally, the areas of gentle slope that run off the high ridges and down to the river were also relatively empty. Most interestingly, some elaborate artifacts were found here, including a greenstone celt and a chalcedony biface (see Figure #11). Overall, despite the rough and irregular topography there are many areas within 500m of the river that could have settlement, but do not.

Other areas along the Macal river do not have such a scarcity of settlement. To the south we found dense settlement on both sides of the Macal. The reconnaissance team sketch-mapped a large platform complex at Macaw Bank, which is situated above the eastern banks of the Macal. The Macaw Bank site overlooks the point where the Macal river flows out of the Negroman/Tipu zone (Figure #1). The point is strategic in terms of controlling a vital interregional communicative link. Deep looters' trenches cut into the platform unmasking earlier walls constructed in the same manner as those exposed at Plantain and Stela Groups. Since this type of construction is characterized by cut limestone blocks that resemble modern red-bricks, it might suggest a riverine connection between the Chaa Creek zone and Macaw Bank. Another complex which is not yet mapped lies along the river approximately one kilometer south of Macaw Bank. This site also overlooks the Negroman/Tipu zone from a ridge on the east side of the river.

Despite models indicating that valuable agricultural lands tend to be practically devoid of cultural material (Fedick 1989), at Negroman/Tipu there are numerous patio groups located on rich, flat, agricultural lands which today are modern orange groves. The Negroman/Tipu zone has been identified in the ethnohistoric records as an area of cash crop cultivation (Jones 1989; Muhs et al. 1985). Negroman/Tipu does not apparently conform with XSS expected settlement patterning, but we await the soil sample chemical analyses for verifications of soil quality (Yaeger and Connell, this volume). Similar to the sites of Chaa Creek, at Negroman/Tipu two large groups appear to be in a position of control as they strategically overlook agricultural lands. The valuable land could explain why settlement at Tipu is focused along the river and why Chaa Creek settlement is

concentrated away from the river.

In both the Chaa Creek zone and the Negroman/Tipu zone, the political and economic dynamics may have been similar due to the higher value of lands adjacent to the sites. The Negroman/Tipu zone will be surveyed as part of T/A2, as XSS pursues the implications of land value in terms of the placement and growth of secondary-centers (Fedick 1989; de Montmillon 1989).

Conclusion -- A Secondary Center and the Working Model

In the above sections I have repeatedly made reference to a working model which views Chaa Creek as a semi-autonomous secondary center integrated into a regional socio-political and economic framework. In particular, this model emphasizes the zone's ties to a large adjacent tract of land.

The 1993 reconnaissance of the Chaa Creek zone was limited to a specific area in which settlement appears to have been concentrated. The survey team also reconnoitered, but did not specifically map, all the areas around the Chaa Creek zone, including the Negroman/Tipu zone located approximately 2 km up the Macal river to the south. On the basis of this reconnaissance, I suggest that the Chaa Creek zone represents a bounded and cohesive unit of settlement. Settlement tapers off to the north, south and east of the zone. To the west, in the direction of Xunantunich, mounds are visible along the edges of the Mennonite lands. Moreover, there are no other sites in the area comparable in size to the original four large platform groups mapped in 1992 (Carpenter et al. 1993). We can assume, then, that the zone was a unit of settlement larger than the proposed aldeas or hamlets identified in the T/A1 research (Ashmore et al. 1993; Yaeger and Connell this volume).

Within the Chaa Creek zone, I believe that the settlement around each large group appears to be related to that specific larger group, as each large group, in turn, appears related or connected to the other large groups. For example, the Stela Group has accompanying settlement to the east and west along the ridge. In turn, the Stela Group appears to be related to both the Blow-Out Group and the Plantain Group which are located on nearby ridges to the northeast and south respectively. I have also suggested that the large groups were functioning on a social level beyond household activity, as evidenced by markers such as entranceway ramps, the stela, the large open plazas and the line of sight to Actuncan and Xunantunich. These

point to an intermediary role that the larger sites at Chaa Creek could have played between the local commoners and the elites of important political centers such as Xunantunich.

In conclusion, the three reasons why the evidence could point to the Chaa Creek zone as a secondary center settlement locus are: 1) its suggested hold over an associated block of rich agricultural land; 2) its possible position on the boundary of local polities; and 3) its proposed placement at the eastern end of a locally optimal portage route. The data from the preliminary reconnaissance performed this year supports these claims.

I have touched on various observations from the reconnaissance which do not preclude systematic investigations, but do provide a basis for conjecture. Hence it is possible to assert that research at the Chaa Creek zone fits into and will contribute to XAP's developing model of interregional and intraregional interaction (see Leventhal et al. 1993; Ashmore et al. 1993; Leventhal this volume).

Acknowledgments

I would like to thank Curtis Campaigne and Angela Matusik for their collaboration in the field this year. William Feld, Maureen Carpenter and Gregg Cestaro also gave their much needed support both this year and in 1992. In addition, I want to thank Richard M. Leventhal and Wendy Ashmore for lending their patience and help. Overall, without the support of Mick and Lucy Fleming of Chaa Creek, and the gracious permission from the Department of Archaeology in Belize (under the direction of Allan Moore) there would be no project. Thank you also to Jason Yaeger and Kathryn (Leroy) Maurer. And one final great big thank you to Lisa LeCount for her assistance.

References Cited

Ashmore, W., J. Yaeger, S.M. Chase, J. VandenBosch, A.H. Keller, and S.V. Connell.
1993 "The Immediate Settlement Context of Xunantunich, Belize," Paper presented at Aniversario Katun Mesa Redonda de Palenque, Palenque.

Awe, J. (ed.)
1993 Belize valley Archaeological Reconnaissance Project: Progress Report of the 1992 Field Season. Trent University, Peterborough.

Ball, J.W., and J.T. Taschek
1991 "Late Classic lowland Maya political organization and central-place analysis: New insights from the upper Belize valley," in *Ancient Mesoamerica* 2:149-165.

Carpenter, M., S. Connell, G. Cestaro, C. Campaigne, M. Eck, and B. Feld.
1992 The Chaa Creek Site Report 1992. Manuscript on file, Xunantunich Archaeological Project, Belmopan and Los Angeles.

de Montmollin, O.
1989 *The Archaeology of Political Structure: Settlement Analysis in a Classic Maya Polity*. Cambridge University Press, Cambridge.

Fash, W. L.
1983 Maya State Formation: A Case Study and its ImplicationsPh.D. dissertation, Department of Anthropology, Harvard University.

Fedick, Scott
1989 "The Economics of Agricultural Land Use and Settlement in the Upper Belize River Valley," in *Research in Economic Anthropology, Supplement 4*. Edited by P. McAnany and B. Isaac, JAI Press.

Fox, J.W.
1977 *Urban Anthropology*. Prentice-Hall, Engelwood Cliffs.

Grove, D.C.
1984 *Chalcatzingo: Excavations on the Olmec Frontier*. Thames and Hudson, London.

Hirth, K.G.
1978 "Interregional Trade and the Formationof Prehistoric Gateway Communities. In *American Antiquity* 43:35-45.

Iannone, G.
1992 "Time among the thorns: Results of the 1992 filed season at Zubin, Cayo District, Belize," In Belize Valley Archaeological Reconnaissance Project: Progress Report of the 1992 Field Season, ed. J. Awe, pp. 10-44. Trent University, Peterborough.

Jones, G.D.
1989 *Maya Resistance to Spanish Rule: Time and History on a Colonial Frontier*. University of New Mexico Press, Albuquerque.

LeCount, L.
1992 "Xunantunich Ceramics - 1992," In Xunantunich Archaeological Project: 1992 Field Season, ed. R.M. Leventhal, pp. 127-144. Belmopan and Los Angeles.

Leventhal, Richard M. (ed.)
1993 Xunantunich Archaeological Project: 1992 Field Season. Belmopan and Los Angeles.

McGovern, J.
1992 "1992 Study of Actuncan (Cahal Xux). In Xunantunich Archaeological Project: 1992 Field Season, ed. R.M. Leventhal, pp. 74-83.

Belmopan and Los Angeles.

Muhs, D.R., R.R. Kautz, and J.J. MacKinnon.
1985 "Soils and the location of cacao orchards at a Maya site in western Belize," In *Journal of Archeological Science* 12:121-137.

Schortman, E., P. Urban, M. Ausec, E. Bell, S. Connell, D. Schafer, and S. Smith
1992 "Sociopolitical Hierarchy and Craft Production: The Economic Bases of Elite Power in a Southeast Mesoamerican Polity, Part II." Ms. on file in the archives of the Instituto Hondureno de Antropologia e Historia, Tegucigalpa and distributed to granting agencies and interested professionals.

Tourtellot, G.
1988 "Developmental Cycles of households and Houses at Seibal," In *Household and Community in the Mesoamerican Past*, edited by R.R. Wilk and W. Ashmore. UNiversity of New Mexico Press.

Urban, P., E. Schortman, S. Smith, J. Miller, L. Neff, L. True, M. Ausec, S. Kane, H. Mahan, M. Dall, D. Schafer, L. Collins, P. Reed, P. Whooley, N. Condon, and R. Goebels
1988 "Sociopolitical Developments in Northwestern Honduras: The 1988 Naco Valley Archaeological Project." Ms. on file in the archives of the Instituto de Antropolgia e Historia, Tegucigalpa, Honduras and distributed to granting agencies and intersted professionals.

Yaeger, J.
1992 "Xunantunich Settlement Survey," In Xunantunich Archaeological Project: 1992 Field Season, edited by R.M. Leventhal, pp. 110-126. Belmopan and Los Angeles.

Figure 1. Upper Belize River Valley

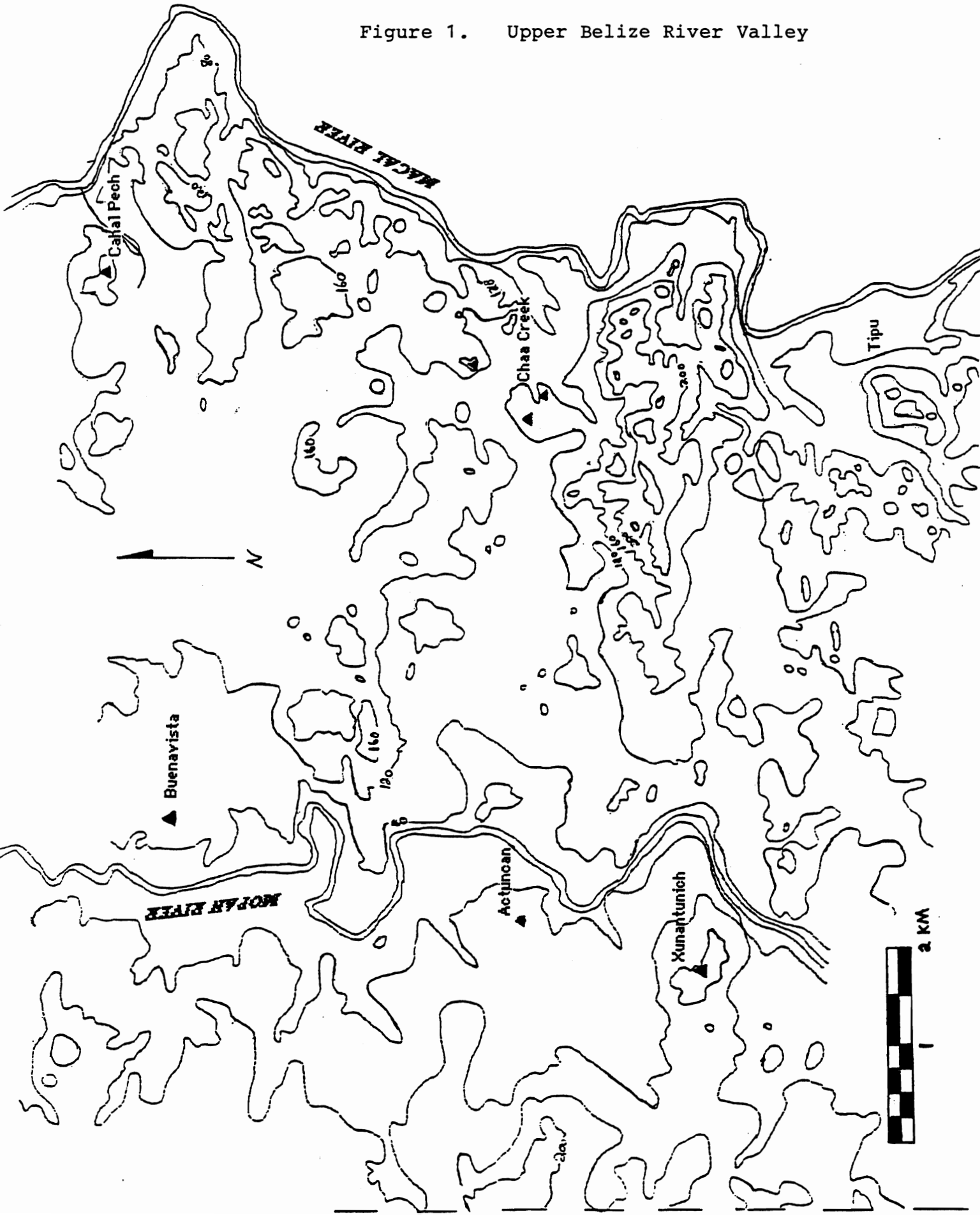


Figure 2. Chaa Creek Zone

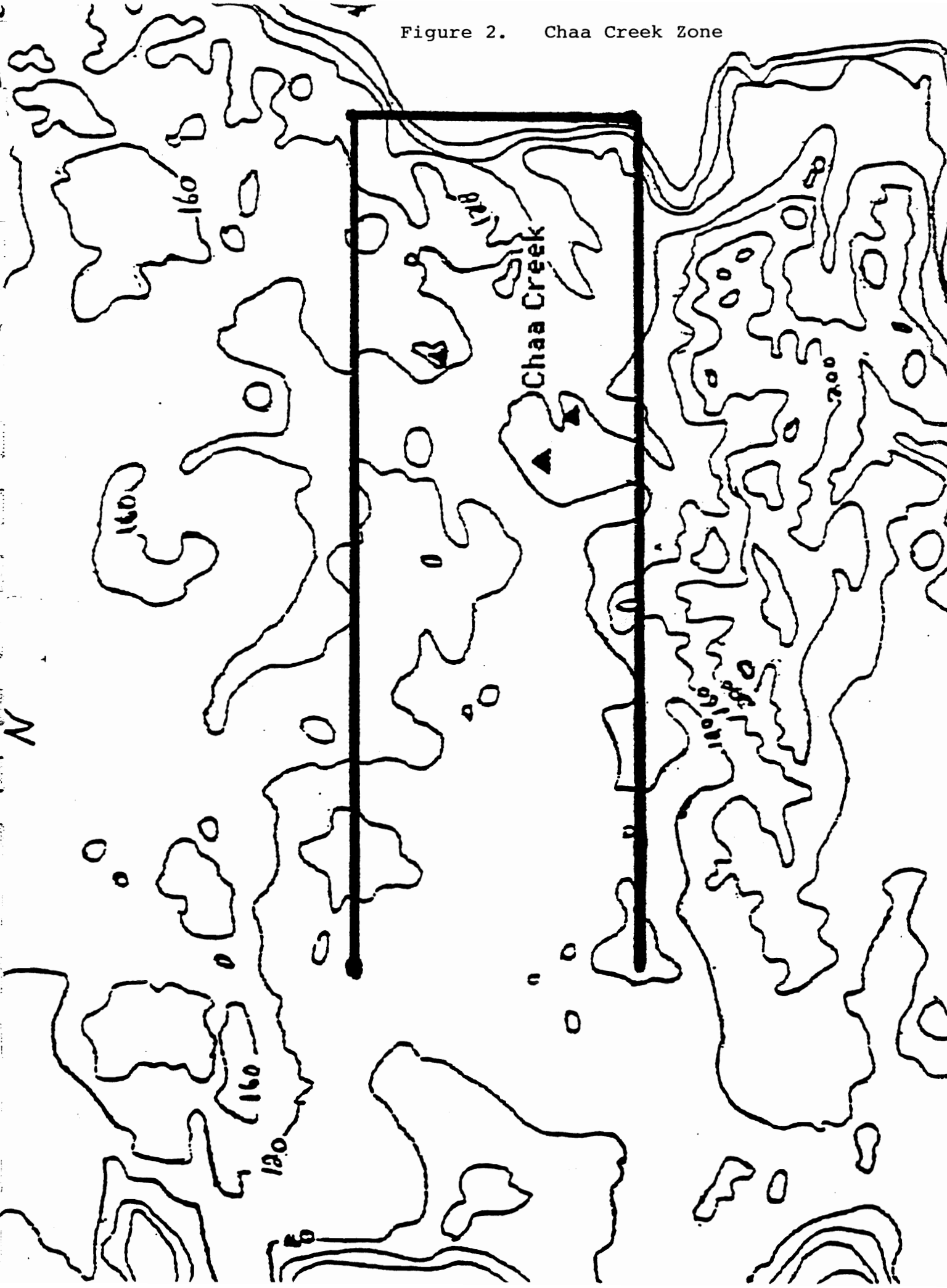


TABLE 1: Chaa Creek Sites

Site #	Name(if applicable)	Prelim Group Type	Location	
CC1a	Stela Group	MMP	R top	Key:
CC1b		MMP	R top	SMP = single mound platform
CC1c		MMP	R top	MMP = multiple mound platform
CC1d		MMP	R top	NP = no platform
CC1e		NP	R top	? = mound destroyed
CC1f		MMP	R top	
CC1g		MMP	R top	
CC2		SMP	R flank	
CC3		NP	R flank	11 flank = 26%
CC4		NP	R top	32 ridge top = 74%
CC5a	Plantain Group	MMP	R top	
CC5b		MMP	R top	
CC5c		MMP	R top	13 SMP = 32%
CC6		?	R flank	23 MMP =56%
CC7		MMP	R top	5 NP = 12%
CC8		?	R flank	
CC9		SMP	R flank	
CC10		SMP	R flank	
CC11		SMP	R flank	
CC12		NP	R flank	
CC13		MMP	R top	
CC14		2 SMP	R top	
CC15		?	R flank	
CC16a-c		MMP,SMP,?	R top	
CC17a		SMP	R top	
CC17b		?	R flank	
CC18	Blow-Out Group	MMP	R top	
CC19a	Plantain Group	MMP	R top	
CC19b		SMP	R top	
CC20		SMP	Rtop	
CC21		SMP	R top	
CC22		MMP	R top	
CC23		MMP	R top	
CC24		MMP	R top	
CC25		SMP	R top	
CC26		MMP	R top	
CC27		MMP	R top	
CC28		MMP	R top	
CC29		NP	R top	
CC30		MMP	R top	
CC31		MMP	R top	
CC32		MMP	R top	
CC33		SMP	R top	
CC34		?	R flank	

Figure 3.

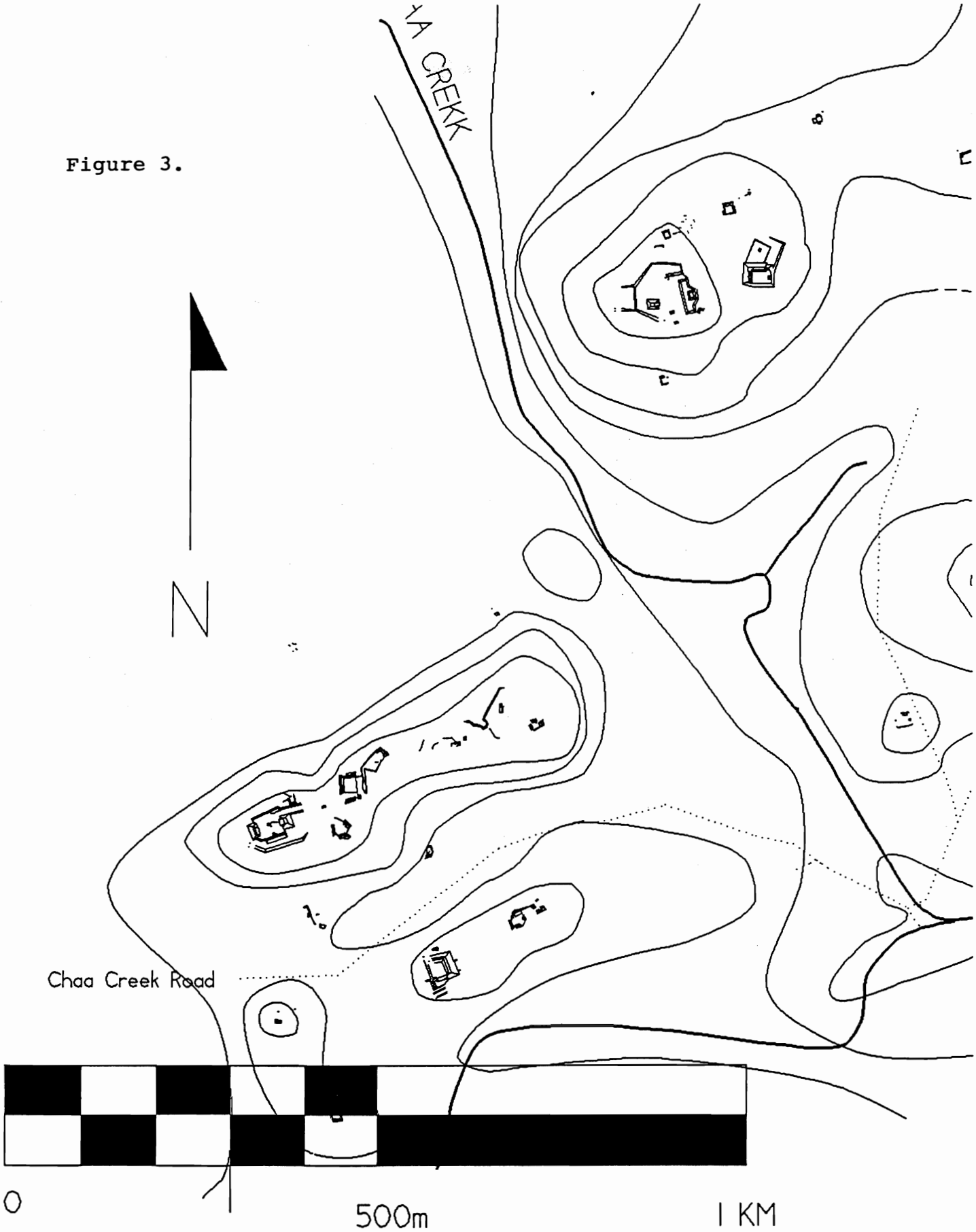


Figure 4.

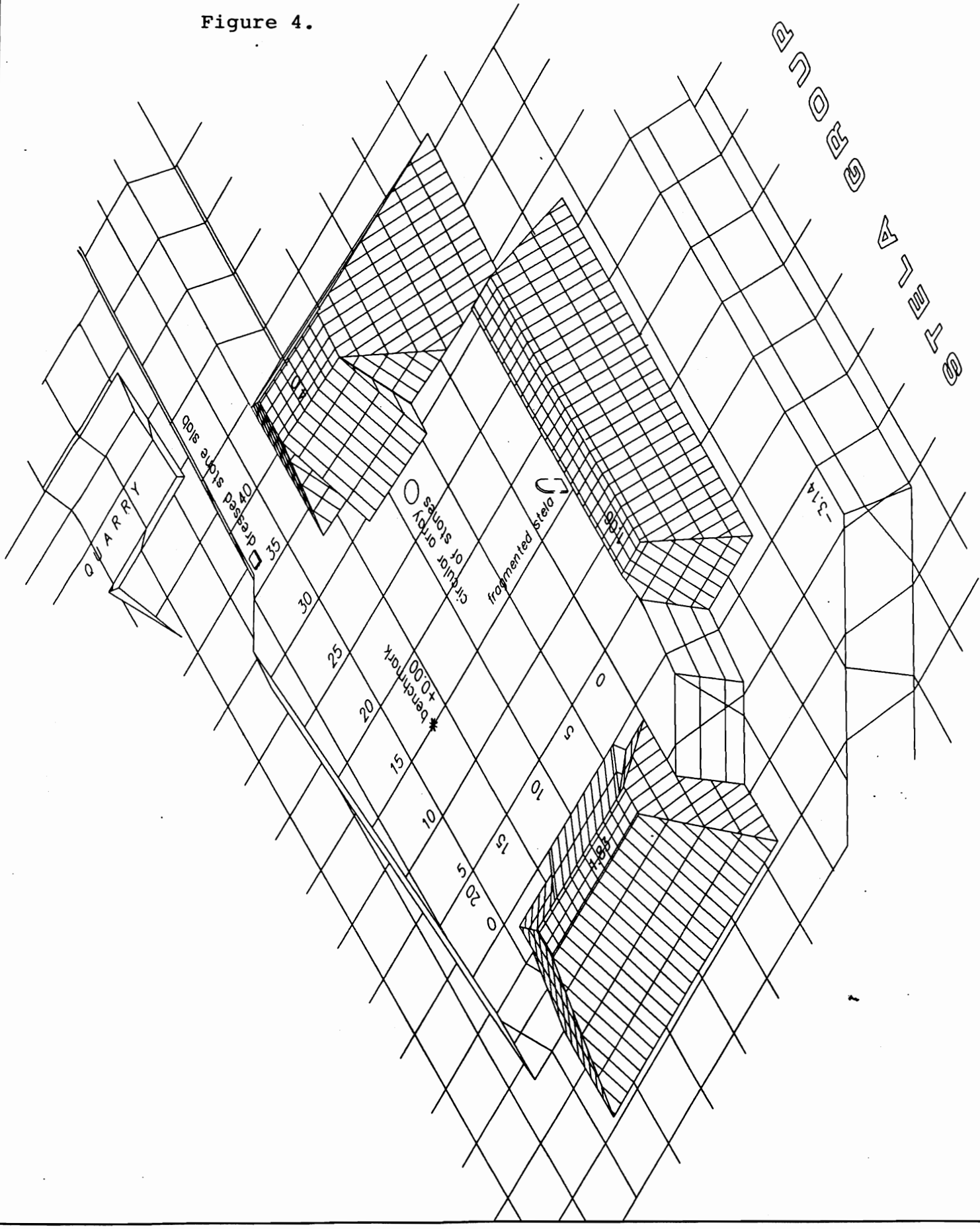

Q U A R R Y
dressed stone slab
35
30
25
20
15
10
5
0
20
15
10
5
0
benchmark
+0.00
circular array
or stones
fragmented stela
+1.95
-3.14

Figure 5.

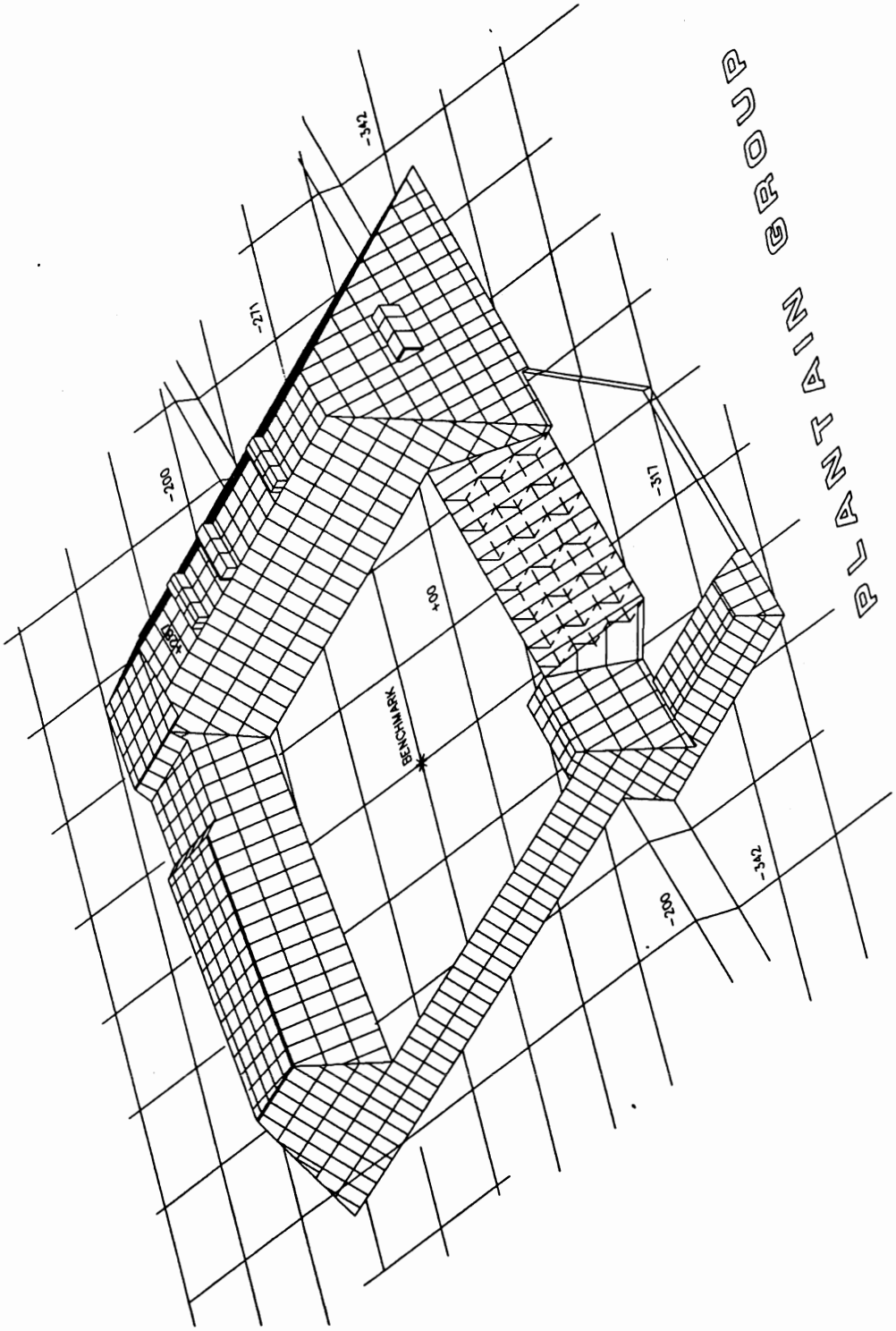


Figure 6.

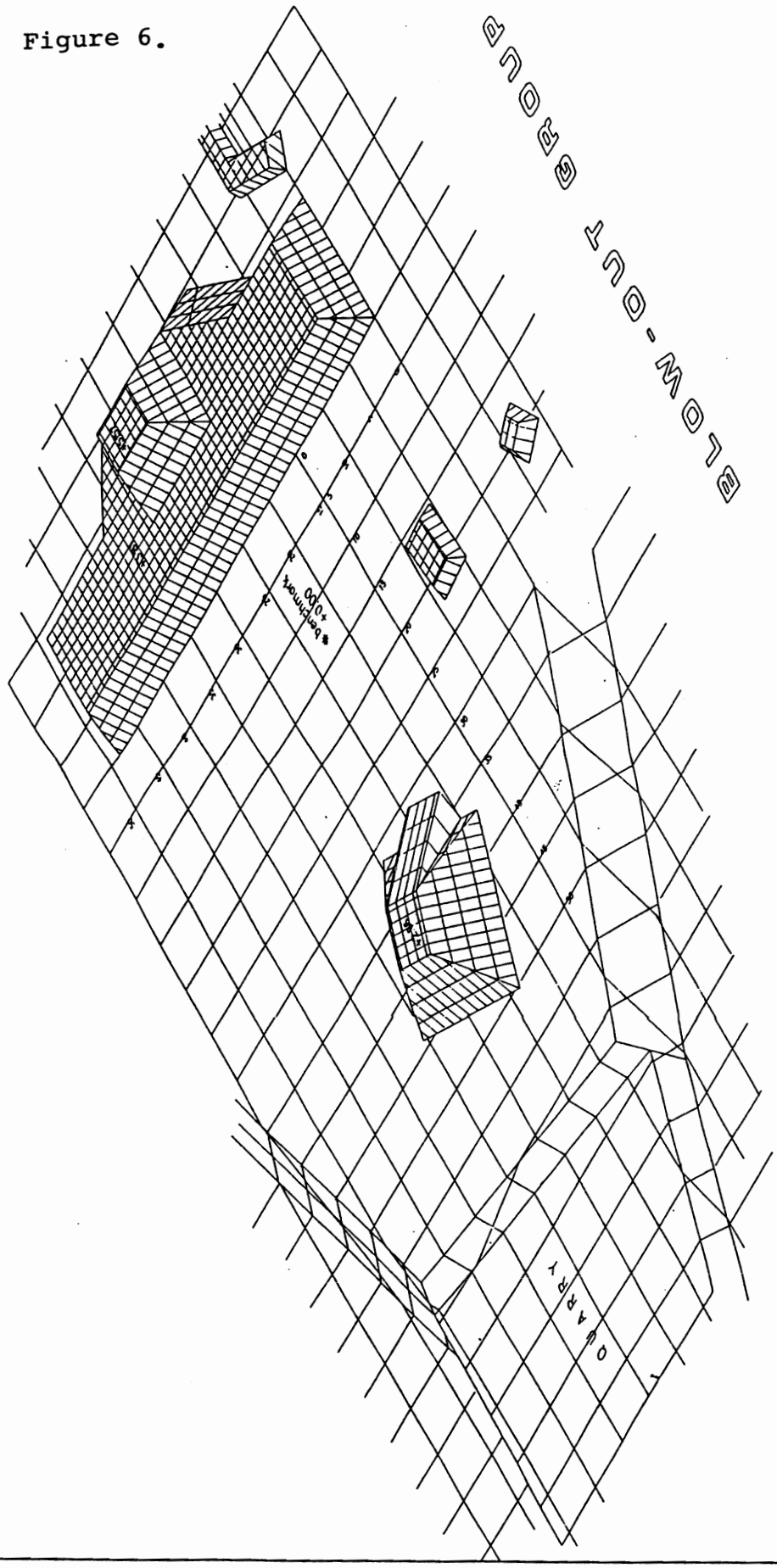
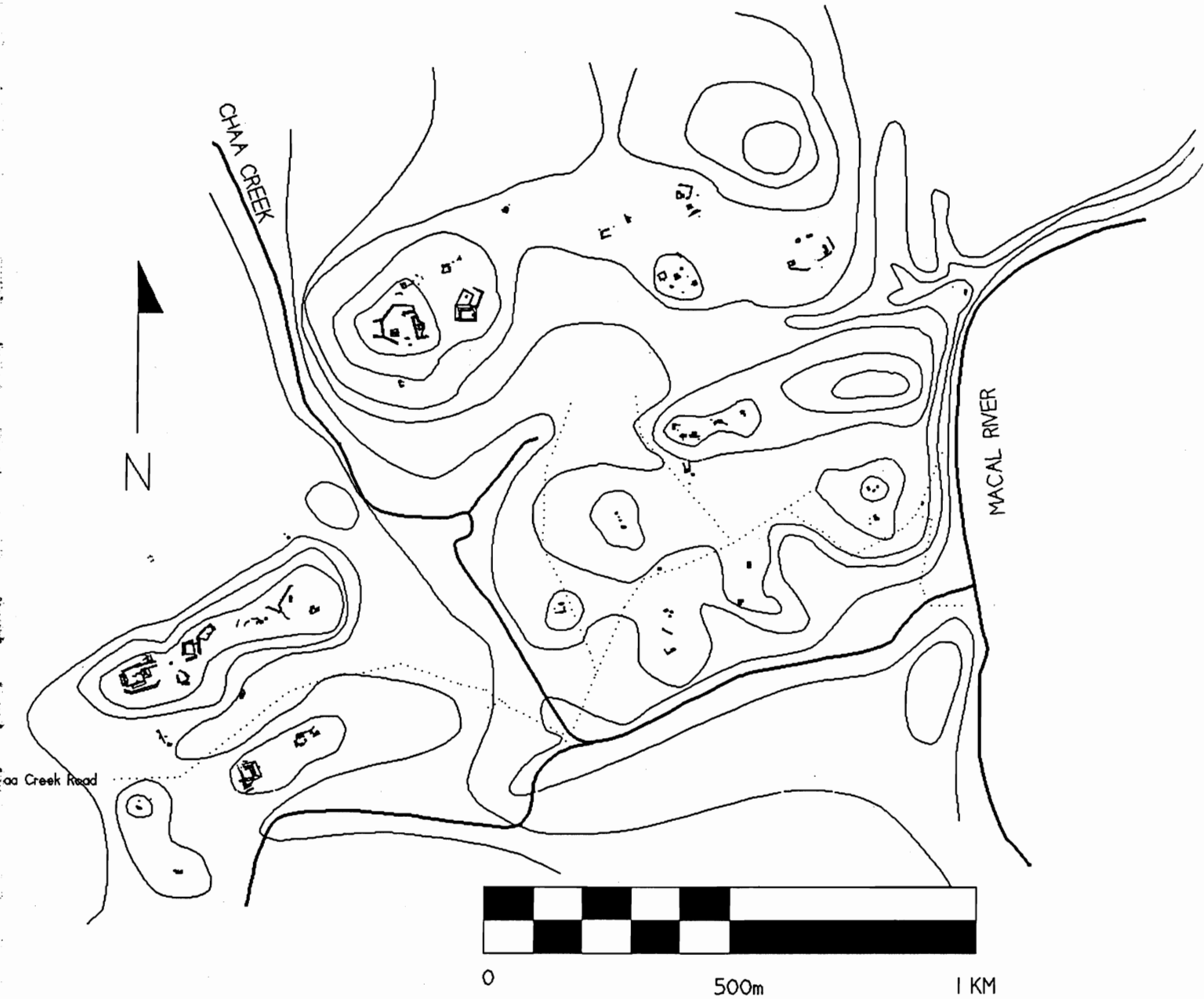


Figure 7.



1993 Chaa Creek Reconnaissance

Figure 8. Property boundaries and government topographic map

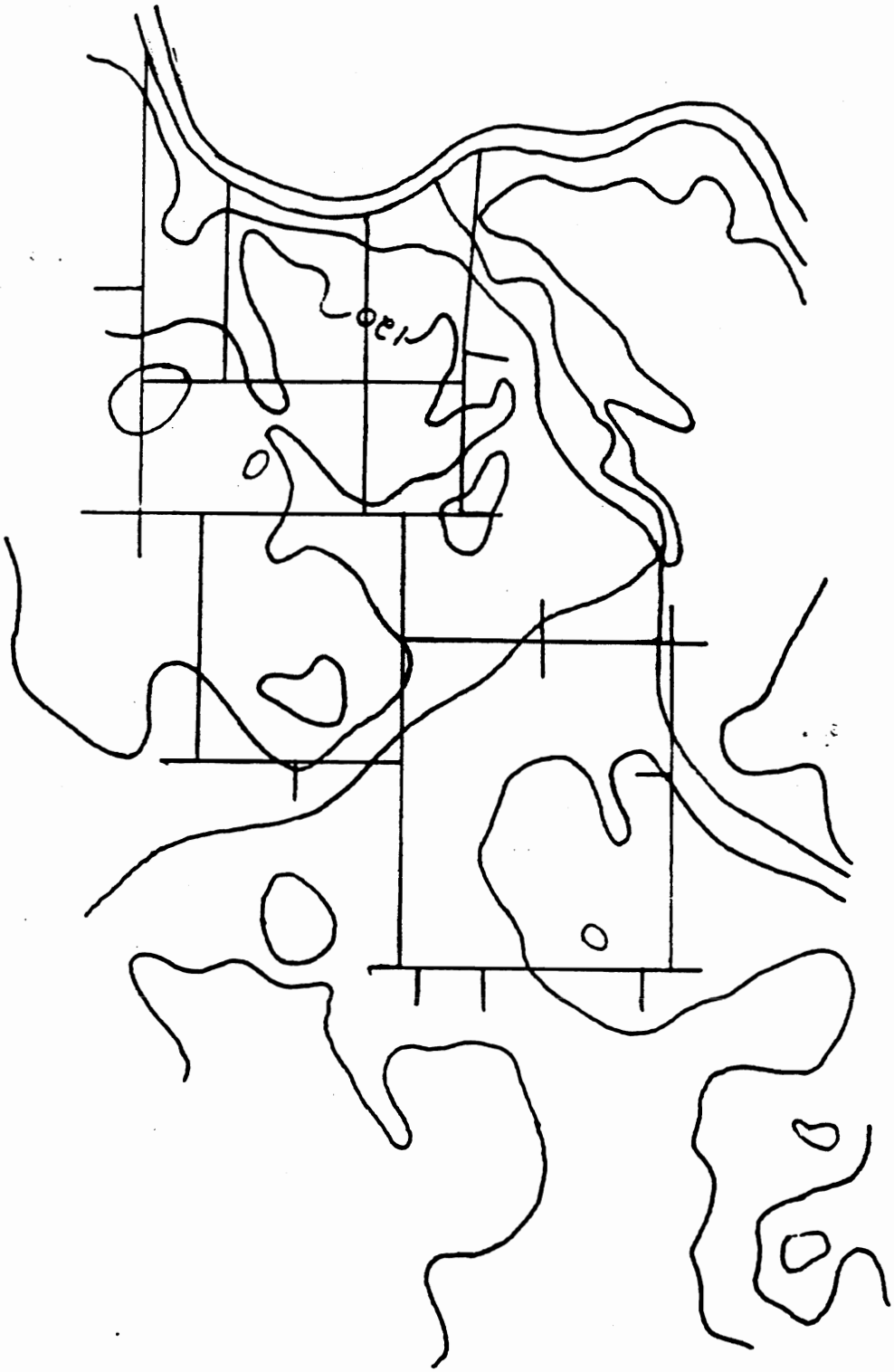


Figure 9.

1993 MAP SURVEY ARTIFACT CATALOGUE

Site CC5c
Provenience 207A/2
Date 7/12/93

	Bodies	Bowls/Dishes	Jars	Other
Non-diagnostic sherds				
Calcite/sand ware	121	3	18	
Ashware	8	3	1	
Orangeware	1			
Vaca Falls	4			
Diagnostic surface				
Ash monochrome				
Calcite monochrome				
Ash Bichrome				
Calcite Bichrome				
Ash Polychrome				
Calcite Polychrome				
Gloss Ware				
Waxy Ware				
~~TOTAL~~ Vaca Falls Monochrome	1			
TOTAL	133	6	19	

Diagnostic forms	
Pie crust rim	
Flaring lips on jars w/o Piecrust	
Flange or Z-angle	
Lateral ridge	
Tau-shaped feet	
Oven feet	
Mammiform feet	
Flanged Incensario	
Spiked Incensario	
Other (describe)	
Diagnostic Decoration (specify quantity)	
Carving	
Incising	
Punctating	
Notching	
Notched incised applique	
Impressing	
Impressed filleting	
Striating	
Other (describe)	
Mount Maloney incurving bowls	
Unknown lip	
Square lip	
Beveled lip	4
Smooth lip	3

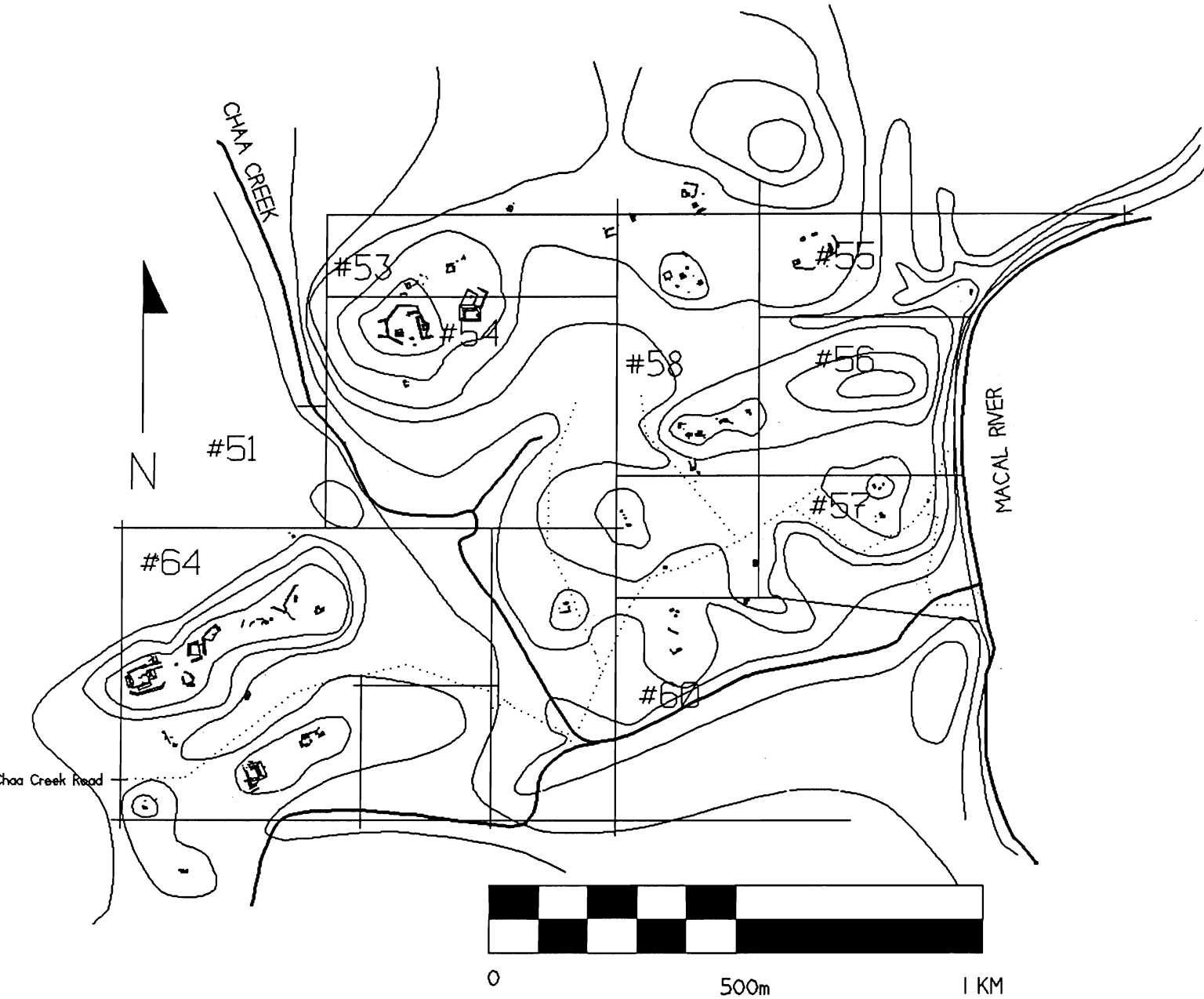
Known type-varieties

Sherds collected yes / no (circle)

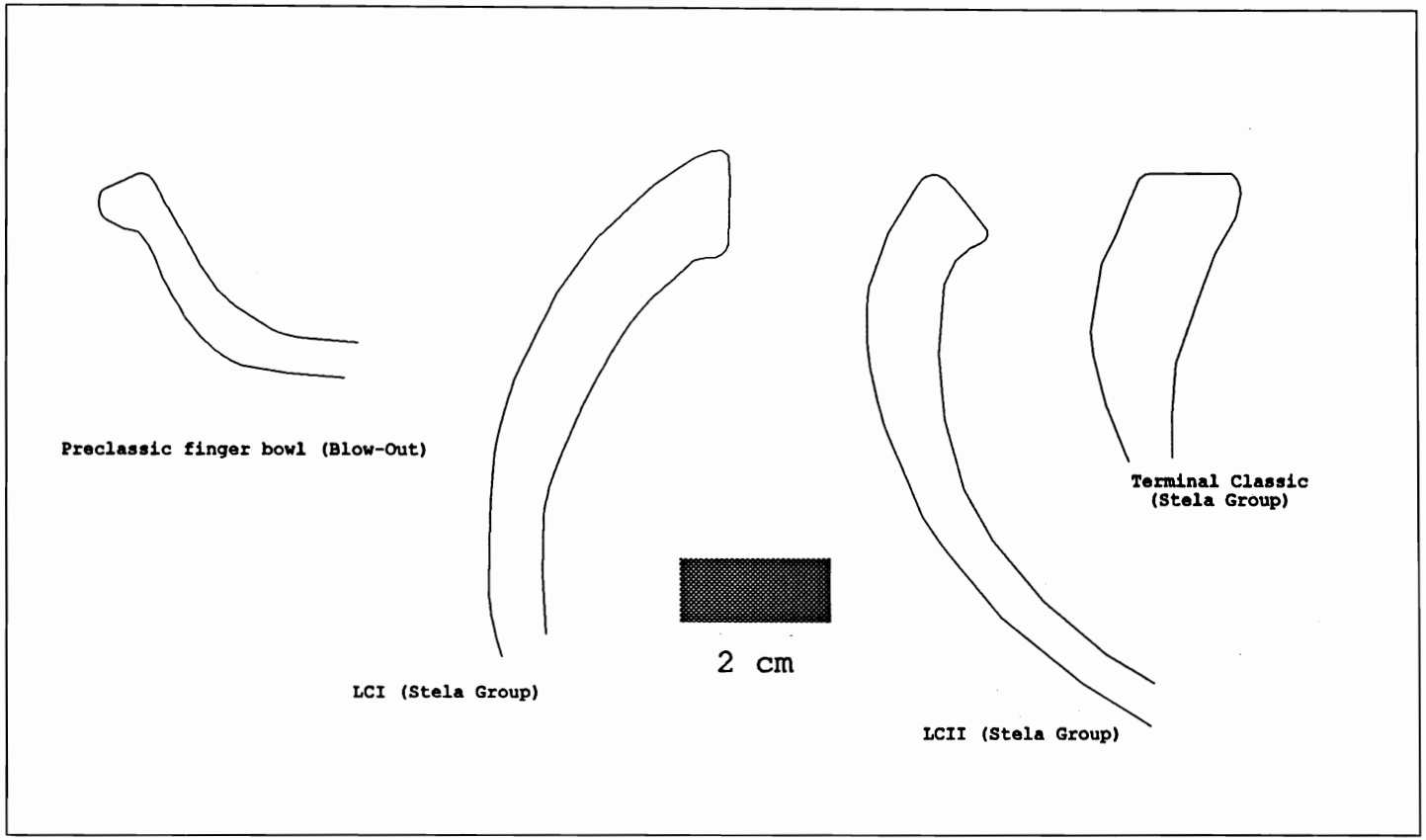
1 meter radius surface collection of dense surface scatter – see Map for provenience

Lisa LCI – LCII

Figure 10.

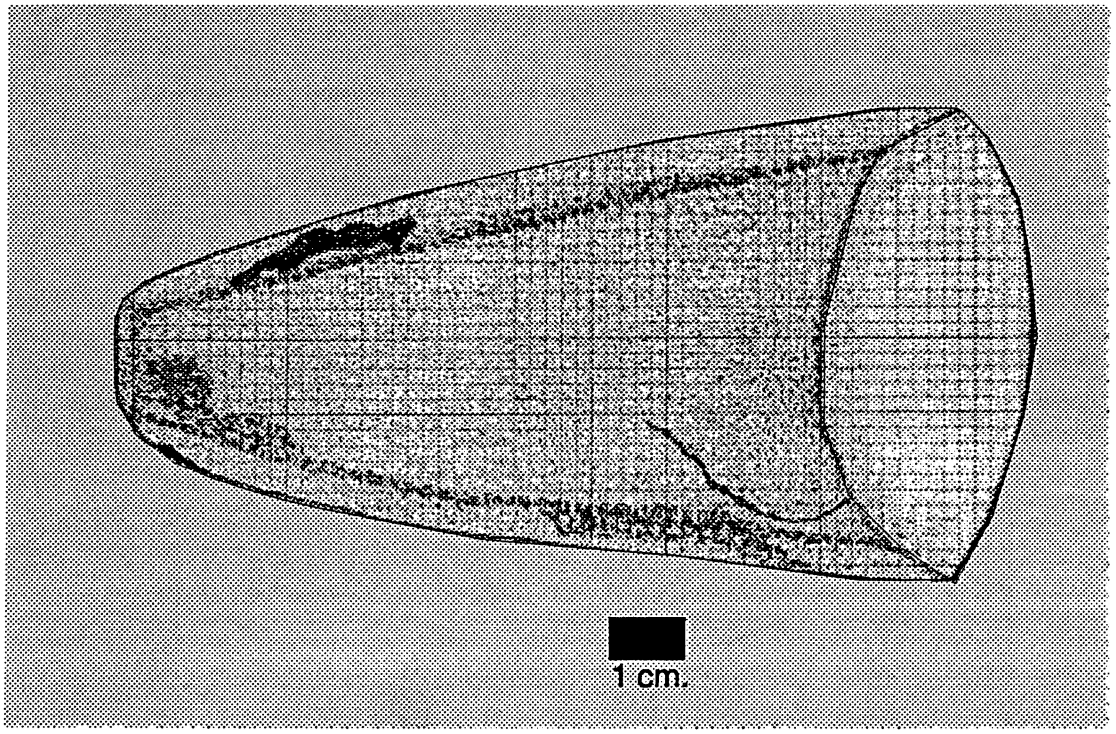


1993 Chaa Creek Reconnaissance

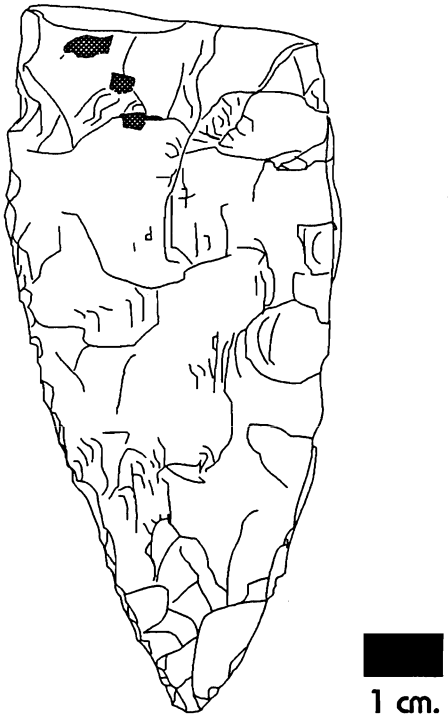


Selected Ceramic Profiles from Chaa Creek

Lithics Discovered Within 500m of Macal River



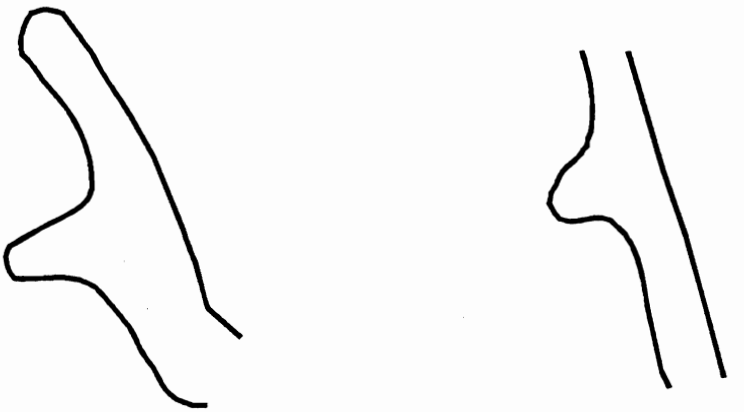
Greenstone Celt



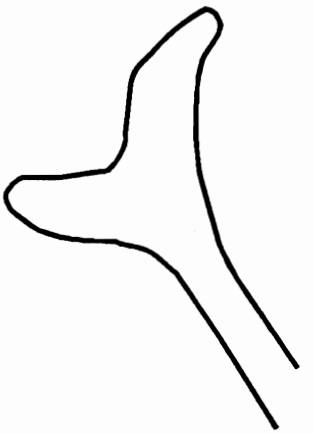
Chalcedony Biface

Medial Flanges from Chaa Creek

(Scale 1:1)



CC1c



CC1a

1993 Ceramic Research: Initial investigations into assemblage variation

Lisa LeCount
University of California, Los Angeles

This year's ceramic research advanced along two lines of investigation. First, work continued on refining the Late Classic ceramic chronology established last season (LeCount 1992). Although few stratified deposits were excavated this season, single occupation lots were recovered within elite and non-elite households. These single component deposits will not only help in establishing the stylistic differences between Late Classic II and Terminal Classic assemblages but advance our knowledge of the composition of household pottery assemblages, the second goal of this years ceramic research. Ultimately, these assemblage-based data relate directly to the primary research goal which is to determine the differential distribution of pottery styles and forms found within the full socio-economic range of households at Xunantunich. This ceramic analysis is focused on the broader theoretical examination of the conventional use of material possessions as indices of socio-political standing.

Ceramic Research Question

Traditionally archaeologists draw on a fixed set of luxury goods to assign social status, but do so without a clear understanding of how elites control their distribution nor how less privileged groups can gain access to these items. This uncritical assumption has led Maya archaeologists to consistently inflate the number of powerful individuals within a society and also limits our view of the complexity of prehistoric social organization (see critiques by Haviland 1970; Blanton 1978; Becker 1979; Adams 1981; Sanders 1981; Flannery 1983; Spores 1983; Webster 1985; Mike Smith 1987). Recently, Maya archaeologists have begun to challenge this static view of wealth as it relates to social status by documenting luxury goods in association with less privileged households and burials (Hansen, Bishop and Fahsen 1991; Feinman 1981; Chase 1985; R.E. Fry 1979). Clearly, if we are to understand the relationship between social status and luxury goods, we need to understand how wealth is controlled and distributed by elites. It has long been understood that there is a difference between the material possessions of elite and the less privileged social groups. The basis for this assumption has rested on the recognition that elites are a small group of rich and powerful individuals who control or greatly influence major social institutions within a society (G. Marcus 1983). Given their position at the apex of political and religious power, they have access to limited, high-value goods that other members of society cannot attain

(Rathje 1970, Tourtellot and Sabloff 1972, Pires-Ferreira 1975, Drennan 1976, Costin and Earle 1989, Chase and Chase 1992).

Using this model, archaeologists have defined the prehistoric Mesoamerican elite by the presence of jade (Leventhal, Demarest, and Willey 1987), greenstone (Grove 1984), pyrite mirrors (Flannery 1968), imported and local decorated pottery (M. Coe 1975; Coggins 1975; Ashmore and Sharer 1978; Sharer 1978; Leventhal, Demarest and Willey 1987), sea shells (Andrews IV 1969) and stingray spines (J. Marcus 1978). By using a fixed set of luxury items to assign social position, we do not fully recognize the difference between wealth items which signify social rank from those generalized luxury goods that elites control and use to forward their political and social goals (Hirth 1992). As Hirth suggests, the problem stems from the assumption that all wealth goods can be used to assign the social rank of their owner. On the contrary, many luxury goods are controlled and distributed by elites for the purpose of labor payments, gifts and establishing alliances with non-elite subordinates (Wolf 1966, G. Marcus 1983). This disposable wealth should be distinguished from those unique symbols used to proclaim social position or political authority. These unique symbols are rare, have precious value and are highly controlled by the office they represent. Given their powerful political nature, they infrequently circulate within society. Archaeologically, authority symbols should be relatively easy to identify due to their rarity and unique nature. For example, the presence of a Jester God image within a burial should indicate that the individual is a Maya King (Freidel and Schele 1988). On the other hand, disposable wealth such as jade and polychrome pottery found in household trash are less accurate indicators of social position precisely because of their widespread role as symbols of accumulated wealth, lineage affiliation or clientage relationships. Although elites may control the downward filtration of luxury goods into non-royal, non-elite households by gift giving, payment or simple kingly generosity, by doing so they blur the lines of social status when measured by disposable wealth.

Given the role of luxury goods as symbols of social relations, simple presence/absence analysis of wealth items will only mask the variability within the social categories and contribute to the idea that Maya society was based on a simple two-tiered social structure (see critiques by Haviland 1970; Blanton 1978; Becker 1979; Adams 1981; Sanders 1981; Flannery 1983; Spores 1983; Webster 1992). The polarization of Maya social groups into strictly elites and commoners has continued

despite ethnohistoric data which attest to the evidence that commoners could amass wealth (Hicks 1986), that "middle class" individuals existed in Maya society (Martinez Hernandez 1926, Tozzer 1941; Roys 1943; Barrera Vasquez et al. 1980), and that professions such as priests and merchants could be undertaken by qualified individuals of less than noble birth (Roys 1943). With the apparent multi-tiered nature of Maya social hierarchy and the complexity of vertical relationships, it is suggested here that more sophisticated analyses of luxury goods are required to elucidate social position from household remains.

Ceramics are an excellent medium to investigate the relationship between material possessions and social standing not only because they are ubiquitous in the archaeological record but because of the highly variable skills and raw materials used to produce them. Within the Maya lowlands, raw materials for pottery production have been shown to be differentially distributed (Ford and Glicken 1987). Maya ceramics also exhibit a full range of artistic skills with some styles requiring literate, highly talented artists to produce them. Given the nature of ceramic production, pottery production and distribution has the potential to be monopolized or controlled by elite individuals.

Maya pottery can be ranked by craftsman skills. At the top of the scale are "Codex-style" vases. These intricately rendered polychrome pictorial vases depict historical, mythical, and ritual scenes accompanied by hieroglyphic text. Although the function of these pieces and the interpretation of the scenes they depict are hotly debated (Coe 1973, Coggins 1975, Chase 1985, and Adams 1977, 1971), they are none the less highly unique pieces produced by literate and skilled craftsmen. At this time, there is little evidence to indicate that these vases were produced within workshops attached to royal residences. So far, only Taschek and Ball (1992) have found vase sherd concentrations at the Belize River valley site of Buenavista which may indicate the presence of an artisan workshop producing general Holmul-style pottery closely associated with a palace structure. Good evidence exists for these vessels to have been produced only at the largest Peten centers (Robicsek and Hales 1981, Bishop 1992).

Below these unique pieces are the vast majority of pottery usually described as "luxury goods". These items include polychrome vessels as well as fluted or gadrooned bichromes and monochromes which did not require literate scribes or

highly talented artists to produce. As Rice states there is little evidence to suggest that these vessels were manufactured by full-time craft specialists as there is no indication of workshops, kilns or concentrations of production debris within the Maya lowlands (1987a:78). Yet these elaborate pottery styles do exhibit differential regional and local distributions with fall-off curves interpreted as typical of centralized exchange (Rands and Bishop 1980; Fry 1980) or elite redistribution (Rice 1987a). In other words, although there is little evidence to suggest that full-time craft specialists produced polychrome ceramics, it does appear that they were controlled by elites. It is interesting to note that many of the distributional studies have shown that pottery producers specialized by form and composition, much like modern potting communities found today in the Maya highlands (McBryde 1947; Reina and Hill 1978). This factor would enhance the control of pottery styles by elites.

Like the more elaborate styles, there is good evidence to suggest that the bulk of the utilitarian pottery such as domestic cooking and storage vessels was produced by local part-time craft specialists. These potters resided both in the peripheries of the centers or at some distance from them (Rice 1987a:78). Although there is no evidence for the control and distribution of these vessels by elites, their size and frequency may help indicate differences in the scale and complexity of domestic activities. Ethnographically, Nelson (1981) found that the number and volume of cooking vessels and water storage jars correlate to social status and household size. In the highland Maya village of San Mateo Ixtatan, he found that wealthy families cook more frequently and in greater quantities than less-privileged families. This disparity is due to the exchange and hire of labor during planting season and the preparation of large amounts of food during ritual celebrations. This difference in the scale of food preparation and serving is reflected in the size and number of large volume household cooking jars, fiesta pots and water storage jars (1981:124-5).

More specialized serving vessels such as tall cylindrical vases used for the drinking of chocolate may also exhibit differential distribution. The significance of cacao in prehistoric rituals can be seen in a number of Late Classic pictorial vases. Tall cylindrical vases are shown held, presented or located near principal seated lords (see Houston, Stuart and Taube 1989; Stuart 1988). Ethnohistorically, it is known that chocolate mixed with maize meal was drunk at feasts and bapitisms by cacao plantations owners and the rich (Tozzer 1941:90). Given that cacao was one of the principal trade goods controlled by the prehistoric elite and may have served as a

possible Postclassic currency (Morley, Brainerd and Sharer 1983), I would expect to find greater frequencies of cacao drinking vases in royal household assemblages than in non-royal households.

Finally, since raw materials used to produce ceramics are not uniformly distributed over the Belize valley, this situation provides an opportunity for elite control of the means of ceramic production. Within the Belize valley, there is no known source of ash temper for the production of fine ashware pottery. The closest known source of volcanic ash is 150 km distant (Ford and Glicken 1987). There are a number of physical properties of volcanic ash temper that warrant the high cost of procurement. First, its fine paste consistency provides a smooth, non-gritty surface desired by potters for incised, notched and tooled decorative techniques. Second, its dense and highly plastic composition enables the production of thin-walled, elaborately shaped vessel forms. Given the restricted nature of ash deposits and its highly desirable physical properties, the distribution of ashware may also be found in varying quantities within social contexts.

It is because pottery is highly variable in its composition, style and form that make it an excellent medium for studying luxury items across domestic households. As domestic items used both to display as well as cook and store food, ceramic assemblages give us a good opportunity to view both private and public aspects of social status and privilege.

Methodology

The XAP ceramic study is thus designed to assess the kinds and proportions of pottery, across social and functional contexts. Pottery will be analyzed across public and household structures which are ranked by size, architectural complexity, and location within the site (Abrams 1984, 1987; B. Price 1978; Arnold and Ford 1980; cf. Haviland 1982; Sabloff, Tourtellot, and Carmean 1992). To determine whether differences exist in the pottery assemblages of social groups, this years' analysis will focus on comparing the frequency of compositional, formal and decorative attributes across architectural contexts.

The ceramic sample used to compare formal and stylistic variability between Late Classic II and Terminal Classic socio-political household was derived from the past two years excavations. The analysis will separate ceramics into non-royal elite

and commoner statuses based on size and location of the plazuela group. The elite assemblage is derived from a single non-royal elite complex found within the architectural core of Xunantunich (see Keller this volume, Figure 1). The non-elite ceramic sample is taken from ten middle to lower class mounds located 2 kms from the architectural core.

The elite residential complex, Group D, within the architectural core of Xunantunich is a complex arrangement of fifteen platforms centered around a family shrine, D-6 (Braswell 1992, also this volume). Unlike other residential complexes within the architectural core of Xunantunich, Group D exhibits far greater diversity in structures and features than other residential groups such as Group B. In addition, Group D contains two uncarved steli. One stela is placed in front of the family shrine while the other is located at the head of the sacbe. Clearly, the number and location of steli indicate the residential groups' elite socio-political standing within the community.

The non-elite ceramic sample is derived from the excavations conducted by Sabrina Chase (Rutgers) at the peripheral site of San Lorenzo (LeCount, Figure 1). The site is located approximately 2 km from Xunantunich focused on extensive horizontal excavations at a moderate sized plazuela group, Nabitunich Plaza Group 1 (1992, also see this volume). Extensive horizontal excavation at Nabitunich Plaza Group 1 revealed substantial trash deposits located in the corners of the plaza (see Chase this volume, Figure 1). These deposits yielded many well preserved, partial vessels from which excellent stylistic and formal information can be gained.

Chase also instigated a program of test pitting to locate midden deposits associated with 10 moderate to small mounds at San Lorenzo. Analysis of ceramics from all 10 mounds yielded temporally diagnostic sherds that date to the Late Classic and Terminal Classic periods, except 95J. Suboperation 95J exhibited mixed Early and Late Classic assemblages. Once I determined that all mounds were contemporaneous, the next question to be asked is whether they are all households. All Suboperations except 95J, yielded domestic assemblages composed of approximately 30% to 40% deep bowls and 20% jars. The Suboperation 95J lacked deep incurving bowls and may indicate an absence of typical domestic activities associated with maize meal preparation. Instead the assemblage was dominated by jars and small bowl forms which possibly suggest either short-term occupation or

special activities. Suboperations 95 F, G, I, J, and K all lacked dishes and incensarios, indicating that the full range of serving and ritual activities did not occur at these small single platform mounds. Interestingly, vases were found at all mounds except 95 G and J; therefore, although vases typically are present in smaller frequencies within an assemblage than dishes they actually have a greater distribution. Given the frequencies of deep bowls, jars and vases at all mounds except 95J, these suboperations will be used as an aggregate ceramic sample representing non-elite socio-economic households found outside the architectural core of Xunantunich.

The Distribution Of Ashware

The frequency of ashware within the Late and Terminal Classic assemblage is expected to vary with social status given the limited distribution of the raw material in the environment. It is assumed that the transportation cost of either the raw material or the finished product itself across long distances would increase the cost of ashware vessels to the local households. To test this statement, I calculated the frequency of ashware within elite versus non-elite deposits at Xunantunich. I separated the analysis of excavation lots by field season because of the possible errors which might have occurred during the first year of systematic recording. Rather than finding a greater amount of ashware within the elite Group D deposits, I found that San Lorenzo assemblages contained slightly greater frequencies of ashware (LeCount, Table 1). This pattern in ashware frequency occurred in lots excavated from both field seasons. These unpredicted results may indicate that the distribution of ashware pottery within households is not solely conditioned by economic factors such as cost.

Table 1

ASHWARE FREQUENCIES BY TOTAL NUMBER OF SHERDS

	NON-ELITE	ELITE
1992 lots	9.8% (924/ 9458)	7.7% (629/ 8198)
1993 lots	8.7% (4012/46027)	4.2% (513/12193)

Late And Terminal Classic Formal Assemblages

Much of the ceramic work this year focuses on constructing formal types in the ceramic assemblages of the Late Classic II and Terminal Classic phases. The goal

is to reconstruct the domestic ceramic assemblage within these time periods in order to compare specialized forms and styles across socio-political statuses. Ultimately, functional interpretation of these vessel forms will be established in order to determine differences in the scale and types of domestic activities which may have occurred among royal, elite and commoner households.

Formal types were defined using standard definitions for plates, dishes, bowls, vases and jars based on a ratio of maximum diameter to vessel height (Rice 1987b, Sabloff 1975). Specialty forms such as incensarios, drums, canteens, neckless ollas, vases and lids have been previously established using ethnographic and epigraphic data (Thompson 1958, Reina and Hill 1978, Houston, Stuart and Taube 1989:722). Within these broad major categories, secondary formal variation may be used to define new vessel types if they are present in significant quantities. One such type is Giffords' Mount Maloney, a deep incurving bowl form, found in high frequency within Xunantunich ceramic assemblages. A second type defined by secondary formal variation is made up of thin walled, slightly incurving open forms. These rims are currently being classified as possible vases as they may be associated with barrel shaped vases or round sided bowls. Based on epigraphic information, these forms probably were used to serve either chocolate or atole (Houston, Stuart and Taube 1989:722).

Jars are also separated into open and constricted forms if they are complete to the shoulder break. Open jars are those forms which would enable easy access to the contents of the vessel. Any prehistoric jar rim large enough to permit a hand or scoop is considered open. Currently, this is translated into jars having rim and collar diameters greater than 10 cms. Restricted mouthed jars are those rims with collar diameters less than 10 cms. Within the ethnographic literature (Thompson 1958), this open versus closed mouth distinction relates to the difference between water storage and water transportation vessels (Thompson 1958). Using Thompsons' jar data, I plan to investigate ways to determine prehistoric vessel function by measuring jar neck height, collar and rim diameters.

To determine the composition of domestic pottery assemblages of Late Classic II and Terminal Classic households, I selected single occupation excavation lots from both elite and non-elite contexts. Elite and non-elite contexts were analyzed together in order to increase the sample size of clean, temporally discreet pottery

assemblages. Analysis indicates that although significant political events were transpiring between the Late Classic II and Terminal time period, household domestic activities reflected by vessel forms remained surprisingly stable (LeCount, Table 2).

Table 2:

Ceramic Vessel Form By Time Period

FORM	LCII	TERMINAL
Open form (undifferentiated)	18.9% (96)	17.0% (107)
Plates	.2% (1)	
Dishes	1.4% (7)	2.0% (12)
Bowls (undifferentiated)	.8% (4)	1.1% (6)
Deep Incurving bowls	42.4% (216)	37.7% (238)
Vases	1.0% (5)	.9% (6)
possible vases	1.6% (8)	1.3% (8)
Jars (undifferentiated)	20.8% (106)	24.1% (152)
Constricted jars	4.7% (24)	6.4% (40)
Open jars	3.3% (17)	2.5% (16)
Canteens	.4% (2)	
Neckless ollas	.6% (3)	.7% (4)
Incensarios	1.0% (5)	1.3% (8)
Drum		.2% (1)
Lids	1.2% (6)	2.3% (14)
Worked sherds	1.4% (7)	2.5% (15)
Total	n=500	n=612

The household assemblage in both time periods is dominated by deep incurving bowls making up between 30 and 40% of the domestic vessels. The second most frequent vessel form is that of jars representing a total of 30% of the assemblage, with slightly higher frequencies during the Terminal Classic period. This indicates an overall increased interest in storage during the Terminal Classic period which is also represented in slightly higher frequencies of constricted jars. Serving and ritual vessels such as vases, possible vases, dishes and incensarios show

no change through time in their frequency. Although these form represents less than 2% of the total vessels found in trash deposits, it must be remembered that these vessels are less prone to heavy usage and their frequency within trash deposits do not reflect their actual percentage within a functioning domestic assemblage. I suggest that rare vessel forms such as plates, canteens and drums show no temporal differences, even though plates and canteens are absent in the Terminal Classic and drums are lacking in the Late Classic II period. The lack of these rare vessel forms is more likely due to sampling error than any real change in their usage.

Ceramic Assemblages As Indices Of Social Status

Now that general characteristics of the Late Classic II and Terminal Classic assemblages have been established, differences between pottery assemblages due to social standing can now be addressed. Since there is very little change in the formal assemblage due to temporal factors, differences between Xunantunich non-royal elite living in the site center can be compared to those less privileged San Lorenzo households using an aggregate sample of all lots from each provenience regardless of time period. Aggregate samples from each site will also be used because of the small sample of single occupation lots. This situation is due to the apparent lack of soil stratigraphy to differentiate between Terminal Classic and Late Classic II deposits. In addition, since Terminal Classic deposits are most often located in the first 20 cms of disturbed soil, these deposits are usually mixed with architectural fall and fill. At present, given this situation, the following pottery analyses view differences in pottery assemblages across social status using combined Terminal and Late Classic II assemblages. In the future, I hope to increase the sample sizes of each separate period to determine if a dramatic change in access to pottery forms and styles occur concurrent with socio-political reorganization during the Terminal Classic.

Like the temporal data, the domestic pottery assemblages show remarkable similarity between elite and non-elite households. Even though the sample size of the non-elite households is five times that of the elite household and represents a wide continuum of architectural types, utilitarian cooking and serving forms across the two social groups exhibit almost exact frequencies. This similarity is duplicated in ceremonial vessel forms such as incensarios, drums, vases and possible vases. The only significant formal differences that exist appear to be the frequency of jars and lids. Constricted jars, which were probably used for water transportation, are

almost twice as numerous in elite households and open jars, which were probably used for water storage, are almost three times as numerous than in commoner plazuelas. At first glance, these results appears to correlate highly with Nelsons' (1981) ethnoarchaeological study of highland Maya pottery assemblages where elite households exhibit greater frequencies of water storage and transportation jars due to their large extended households, greater acreage cultivated and expanded cooking during community festivals. On the other hand, the Xunantunich elites living on the ridge top may have more water storage and transportation vessels than the San Lorenzo commoners living along the banks of the Rio Mopan because of their greater distance to permanent water. To determine whether differences in the frequency of domestic cooking and water storage vessels is due to social status or environmental factors, a larger range of households both in the architectural core and at San Lorenzo will need to be excavated in the future.

Table 3:

Non-Elite Versus Elite Domestic Assemblages

FORM	NON-ELITE	ELITE
Open forms (undifferentiated)	20.1 (696)	20.7 (163)
Plates	.1 (3)	.1 (1)
Dishes	1.6 (57)	1.0 (8)
Bowls (undifferentiated)	1.2 (43)	.9 (7)
Deep Incurving bowls	38.6 (1335)	36.5 (287)
Vases	.6 (21)	.3 (2)
Possible vases	3.4 (117)	3.6 (28)
jars (undifferentiated)	24.2 (837)	18.0 (142)
Constricted jars	4.2 (145)	7.8 (61)
Open Jars	1.7 (60)	4.8 (38)
Neckless ollas	.5 (17)	5 (4)
Incensarios	2.2 (75)	1.9 (15)
Drums	.3 (10)	.1 (1)
Lids	1.2 (40)	3.8 (30)
Total forms	n=3457	n=787

The Function of Mount Maloney Incurving Bowls

One important result of the 1992 ceramic analysis was the recognition that Mount Maloney bowls made up between 30% and 40% of the household ceramic assemblage during the Late to Terminal Classic period (LeCount 1992). This high frequency was unexpected in a single bowl form and prompted intense speculation on its function. Its physical shape, that of a deep incurving vessel form with a slightly rounded conical base, would allow easy access to the contents of the vessel but would be unstable unless supported. No evidence of exterior sooting or interior organic remains were found. Given their form and lack of sooting, I suggested that Mount Maloney bowls were used to prepare corn for tamales. Recently, I reviewed Thompsons' (1958) ethnographic study of Yucatecan pottery and his study has shed considerable light on the function of this form.

Subhemispherical incurving bowls were quite common in Yucatan during the 1950's as cooking pots, water basins and ceremonial bowls (Thompson 1958:112-120). Cooking pots, cum, were made with calcite tempered clay sometimes decorated with organic stains on the exterior (LeCount, Figure 2c,f). Handles and lugs were rare but decorative fillets were common. In one village, potters sealed the interior with a mixture of fine white ash and water presumably to make it water tight and prevent food from sticking to the interior. The cum rests on three stones above the hearth and is used to boil foods. Thompson indicates that many cum were reserved for the cooking of particular foods -"often one pot is reserved for boiling water, one for cooking beans, one for meat and stews (1958:115)" presumably because they were seldom washed. As late as 1861, the cum was the main kitchen item (Saville 1921:163). In the absence of a cat, a water basin of the same shape and composition, the cum is used for "storing water for cooking and washing, preparing and washing the maize for making tortillas, and feeding and watering pigs and chickens" (1958:117).

The cat is a big basin exhibiting the same shape as a cum but lacking the exterior organic stain (LeCount, Figure 2a,b,e). In addition, the base of the cat is more flattened than those found on cum vessels. Redfield and Villa Rojas (1934:36) report this form is the second most frequent pottery form found at Chan Kom. The cat is a sascab (unconsolidated limestone) or calcite tempered form usually slipped red. In certain potting villages, nixtamal is used to seal the vessel interior after firing presumably to make it more water tight. These vessels are used for storing washing-

and cooking-water, preparing food which does not require cooking, such as atole, and for general storage. They are placed on the ground around the interior wall of the house or set in shallow depressions in the ground (Wauchope 1938:138). Once again, individual basins are reserved for particular uses during their lifetimes - "... maize is stored in one, lime in another, the maize and lime are mixed with water in a third, and lime-soaked maize washed in a fourth" (Thompson 1958:117).

Finally, the ceremonial basin, ocliz, is a sascab tempered form with a red slip used to hold food offerings in ceremonies (LeCount, Figure 2f). These vessels are produced upon commission only for special occasions. In the literature, references to the ocliz's physical shape and the presence of feet are very ambiguous. An ocliz has been described as 1) anything with feet, 2) a flat, wide and shallow bowl with an outcurved rim, and 3) a very large bowl lacking feet (Thompson 1958:119). The fact that very few ocliz were in use at the time of the ethnography contributes to the confusion concerning the shape. At the time of Thompsons' study, oclizes appeared to resemble large incurving bowls, and one potter considered this vessel to be a special type of cat.

Given that the cum, cat, and possibly the ocliz exhibit the same morphological characteristics as Mount Maloney incurving bowls (LeCount, Figure 2g), can we use simple ethnographic analogy to interpret the use of this prehistoric form? Clearly, the body and rim shape of all three of these ethnographic types are very similar to the prehistoric Mount Maloney bowls. All exhibit an incurving rim and subhemispherical body which would permit easy access to the vessels' content with some degree of containment security. The subhemispherical body permits a greater surface area for rapid heating and moisture loss if the pot was used for cooking. The same shape would also facilitate particle settling when used for water storage and washing. Clearly this body and rim shape is multi-functional and does not help in distinguishing cooking from preparation or water storage for the prehistoric Mount Maloney bowl type.

The cum, cat, and ocliz vessels do differ from one another in decorative techniques, paste composition, and base morphology indicating that these variables may be more important for distinguishing the function of Mount Maloney bowls. Decoratively, both the cum and the cat exhibit exterior slips, although the cum slip is a drizzled organic stain whereas the cat has an overall red

slip. The organic stain is made from the bark of several trees and produces a substance similar to that used for tanning leather or surfacing masonry floors. Although no explanation was given by the Yucatan Maya to the use of this organic stain, it could be suggested that the stain produces a very hard, water resistent finish on the exterior of the cooking pots. Yet the decorative aspect of the stain should not be over-looked. Similarly, the use of a red clay slip on the cat may be considered both functional and decorative, as red clay slips help seal porous vessels. The difference between the decorative techniques of the cum and cat may solely be one of durability with the organic stain capable of withstanding heat whereas the red clay need only resist water. Mount Maloney vessels are slipped black on the interior, exhibiting only a non-slipped, scraped exterior. The use of a black slip rather than a durable organic stain on the prehistoric form may thus indicate Mount Maloney bowls were used for preparation and water storage rather than cooking. This suggestion is supported by the fact that few Mount Maloney bowls show signs of sooting caused by prolonged contact with fire. I do not consider the difference in the location of the slip between the ethnographic and prehistoric vessels to hinder the validity of the analogy. The location of the slip may be conditioned by stylistic aspects rather than functional concerns.

One last aspect of Mount Maloney vessels which may argue for their interpretation as preparation and water storage bowls is the form of their bases. Although we have few complete vessels, most Mount Maloney bowls have small but flattened bases. Flattened bases are found on cat vessels and are more stable when placed on the ground than the pointed bases of cum vessels. This formal attribute suggests that Mount Maloney bowls were not used for cooking. Yet contrary to the decorative and base morphology evidence, Mount Maloney bowls were typically produced using calcite temper which is more suitable for cooking than sascab temper.

Clearly, Mount Maloney bowls show a mixture of attributes exhibited by the ethnographic vessel types, making the interpretation of their function anything but clear-cut. It must be noted that this ambiguity also exists in the ethnographic literature where the cum and the cat are not considered distinct vessel types by many Yucatan potters. Many people who use the vessels tend to merge their functions presumably because there are no clear-cut formal, decorative or compositional limitations exhibited by the vessels. I would suggest that Mount

Maloney bowls, like their modern counterparts, could be used for the full range of cooking, preparation and storage needs. This multi-functional aspect would help explain the large proportion of this vessel type in the prehistoric household deposits of Xunantunich.

Stylistic Analysis

To determine whether differences exist in pottery styles found in elite versus commoner households, I will compare the frequencies of decorative motifs, techniques and paints found on pottery vessels. I also will compare the number and frequency of Barton Ramie type varieties to determine if type-variety classification schemes can be used to address questions other than chronology.

The Barton Ramie type classification variety scheme is primarily based on the co-variation of surface treatments such as slip and paint color as well as decorative motif, appliques and attachments. Although paste composition and form are also important in the construction of type varieties, it is essential that the surface of the sherd is intact for reliable identification. Given the emphasis on stylistic attributes, I recorded type variety names only for those well-preserved rims which exhibited large portions of undamaged surface area.

Analysis of type varieties at Xunantunich show that Group D elite complex ceramic assemblages yielded only 26 known type varieties whereas the San Lorenzo assemblages produced 46 varieties. Based solely on the frequency of types, San Lorenzo appears to have access to a much wider range of pottery styles. Clearly this is not the case. While recording attributes in the lab, I noted that surface preservation of ceramics were quite variable, with Group D sherds consistently more eroded than San Lorenzo ceramics. Differential preservation of the sherd surface is probably due to dissimilarity in the depth of the deposits and local geology found in the two research areas. Group D soils are shallow, sitting less than 50 cms above the limestone bedrock. On the ridge top, rain water percolates rapidly through these shallow deposits and runs off down hill. Given that Group D is located on a limestone ridge, the bulk of the soil would be formed by deposition of organic remains and may be highly acidic. The combination of acidic soil and constant water percolation promotes rapid destruction of ceramics. On the other hand, San Lorenzo is situated within the flood basin of the Mopan river. Soil horizons are thick, with massive layers of clay underlying the Late Classic cultural remains.

Ceramics from San Lorenzo are consistently well-preserved probably because they are buried in less acidic, water saturated clay soils. At Xunantunich, variability in the geomorphology of the region makes type variety analysis an unreliable index of social status.

Conventionally, polychrome pottery has been the most commonly used identifier of elite households. Given the emphasis on the mode of painting, I will compare the number of slips and paints and the type of motif found on pottery across elite versus commoner complexes. In this manner, I can rank painted sherds not only by time investment but also by the degree of skill required to produce painted vessels.

In general, I found that San Lorenzo deposits have a slightly greater frequency of painted ceramics than the elite Group D assemblage (LeCount, Table 4). Within the San Lorenzo assemblages, slipped and/or painted pottery makes up approximately 16.9% of all sherds recovered; in the Group D assemblage only 15% of the sherds are slipped and/or painted. Within these decorated wares, San Lorenzo exhibited slightly greater frequencies of both bichrome and polychrome sherds but had slightly less double slipped ceramics. Given this data, the number of slips and paints found on pottery does little to differentiate social status at Xunantunich.

Table 4:
Non-Elite Versus Elite Painted Wares

SURFACE DECORATION	NON-ELITE	ELITE
Single slip	97.7	98.7
Single slip w/ 1 paint color	1.3	.8
Single slip w/ 2 paint colors	.7	.1
Double slip	.2	.4
	n=9363	n=3068

Although the number of paints and slips do not appear to differentiate Group D from San Lorenzo pottery assemblages, the type of motif found within these

assemblages do show important differences. Group D ceramics exhibit significantly greater frequencies of motifs requiring superior artistic abilities such as representational figures, scenes and hieroglyphs (LeCount, Table 5). This pattern is important for two reasons. First,

Table 5:

Painted Motifs By Social Status

MOTIF	NON-ELITE	ELITE
Single element	48.5	40.9
Simple repetitive	37.5	46.6
Geometric	11.3	4.3
Representative	1.8	7.5
Glyphic	-	.4
Composite Glyph and Figure	.9	.4
	n=791	n=281

it exists despite differential surface preservation and highly variable sample sizes at the two loci. If complex representational motifs were present in equal or larger quantities within the San Lorenzo assemblages, we would see greatly inflated differences due to the poor state of paint preservation at Group D. Clearly, this is not the case and I feel confident in stating that elite contexts may have significantly greater control over the distribution of elaborately painted vessels. Secondly, these data suggest that we cannot construct indices to determine social status based on simple measures of labor investment. Polychrome pottery is a good example. Although there may be some increase in time, energy or raw material requirements demanded by the production of vessels exhibiting two paint colors rather than one, it can be argued that there is little difference in the degree of craftsmanship or skill involved in their manufacture. A better indicator of ceramic quality would be those attributes which require special skills, training or artistic talent. This analysis suggests that decorative motif may be one such attribute.

Having established the idea that skill rather than time or labor investment may be a more fruitful avenue to distinguish elite versus commoner ceramic

assemblages, we can now view non-painted decorative techniques using the same line of reasoning. Non-painted decorative techniques are a common method of decoration in both the Late Classic II and Terminal Classic pottery assemblage. Research conducted as year revealed that although punctation, notching, and other tooling such as fluting decorative techniques appear to be restricted to the Late Classic assemblages, Terminal Classic ceramics exhibited higher frequencies of incising and modeling (LeCount 1992, Table 2). In this years' analysis, decorative techniques are summarized by the number and type of method used on individual pieces. Sherds exhibiting a single technique are classified as "Simple"; thus the category - "Simple incised" - denotes that incising is the only decorative technique performed on the sherd. Those sherds exhibiting two decorative techniques are labeled with both methods such as "Incised impressed" sherds. Lastly, many sherds exhibiting more than two techniques are considered to be complexly decorated. The McRae Impressed type is a good example. These dishes are usually incised and notched along the appliqued basal angle and many have incised rim borders.

Table 6:
Non-Painted Decorative Technique By Social Status

	NON-ELITE	ELITE
Simple incised	51.2%	34.2%
Simple textured	11.5%	20.7%
Simple impressed	10.4%	10.9%
Simple modeled	3.4%	9.1%
Simple applique	5.3%	4.7%
Simple tooled	7.2%	1.5%
Simple carved	1.2%	1.8%
Incised impressed	1.1%	2.2%
Incised tooled	.5%	.4%
Impressed applique	5.9%	8.0%
Complex applique	1.2%	-
Complex modeled	-	.7%
Complex tooled	.7%	5.1%
Complex carved	-	.7%
	n=733	n=275

Within the elite assemblage, simple textured, simple modeled, impressed applique and complex tooled vessels appear in significantly greater frequency than in non-elite assemblages (LeCount, Table 5). On the other hand, commoner households have greater frequencies of vessels exhibiting simple incised, simple tooled and complex applique decorative techniques. Although no clear cut patterns emerge, it can be suggested that elite households have higher frequencies of vessels exhibiting more than one decorative technique such as incised and impressed dishes or model carved vases. There is one exception, that of complex appliqued vessels such as McRae Impressed type. These tripod dishes have yet to be found in Group D deposits but are present at San Lorenzo and on top of temple A-1. Tripod dishes

frequently appear in painted scenes containing tamales or other foods and thus they may be a traditional form used to serve food at ceremonial feasts and festivals throughout the Maya area (Taube 1989; Houston, Stuart, and Taube 1989, f2; Chase 1985, f3,5). It could be argued that most households would thus strive to possess these vessels for use during festivals. At this time, it is unclear why this vessel type has yet to be found at Group D.

Conclusions

In general, this years analysis has shown that pottery styles and forms appear to be remarkably similar across social statuses. Regardless of differential surface preservation and unequal sample sizes, no differences exist in the frequency of many attributes and forms. For example, ashware pottery appears to have been rather evenly distributed across all households despite it being a rare clay resource. It can be suggested therefore that elites may have taken little interest in the control of this raw resource. Similarly, polychrome pottery shows no signs of differential distribution, despite an increased labor investment. And it is also surprising that some highly decorated pottery types such as McRae Impressed appears in higher frequencies in non-elite status households. Clearly, economic factors such as cost and labor investment are not the only factors in explaining the distribution of pottery across households. It can be suggested that certain elaborately decorated pottery types may have had a social value which transcended economic considerations. Beaudry (1987:243) also noted this pattern in the Copan ceramic assemblage. She found that the highly decorated Copador ceramics also were found widely distributed across Copan households. She suggests that certain polychrome styles played an important role in household-level ritual such as holding offerings at a household shrine.

At Xunantunich, ashware pottery is usually found in elaborately decorated plate, dish, bowl and vase forms probably used during either private or public feasts. During the Late Classic II period, most polychrome painting is performed on ashware. Thus in the Late Classic, the display of such visible symbols may help identify the households as part of the greater community and contribute to social solidarity within the immediate region. Local royalty may have contributed to the creation of these symbols by giving these type of vessels to non-elite households to solidify economic and kinship ties.

Finally, some attributes do appear to be differentially distributed across social groups. The most clearcut example is that of glyph and pictorial figure painting. In light of this pattern, future ceramic research will concentrate on quantifying and qualifying ceramic types based on attributes related directly to the skill of the artisan who produced them.

References Cited

Adams, R.E.W.

1981 Settlement Patterns of the Central Yucatan and Southern Campeche Regions. In *Lowland Maya Settlement Patterns*, ed. W. Ashmore pp. 211-57, Univ. of New Mexico Press, Albuquerque.

1977 Comments on the glyphic texts of the 'Altar vase' in N. Hammond, ed. *Social Process in Maya Prehistory*, New York, Academic Press.

1971 *The Ceramics of Altar de Sacrificios.* Papers of the Peabody Museum of Archaeology and Ethnology, vol 63 (1), Harvard Univ. Cambridge, Mass.

Abrams,

1987 Economic Specialization and Construction Personnel in Classic Period Copan, Honduras. *American Antiquity* 52(3):485-99.

1984 *Systems of Labor Orangization in Late Classic Copan, Honduras: The Energetics of Construction.* Ph.D. Diss., Dept. of Anthropology, Pennsylvania State Univ., Univ. Park.

Andrews, E.W. IV

1969 *The archaeological use and distribution of mollusca in the Maya lowlands.* Middle American Research Institute Publication 34, Tulane Univ., New Orleans.

Arnold, J.E. and A. Ford

1980 Some issues of method and theory in lowland Maya settlement archaeology. In *Lowland Maya Settlement Patterns*, ed. W. Ashmore, pp. 37-69. Albuquerque: University of New Mexico Press.

Ashmore, W., and R.J. Sharer

1978 "Excavations Quirigua, Guatemala: The Ascent of a Maya Elite Center." *Archaeology* 31(6):10-19.

Ball, J. W. and J. T. Taschek

1991 Late Classic lowland Maya political organization and central-place analysis: New insights from the upper Belize valley. *Ancient Mesoamerica* 2:

149-165.

Barnes, John A.
1972 *Social Networks*, Module in Anthropology no. 26. Reading, Mass.: Addison-Wesley.

Barrera Vasquez, A., et al.
1980 *Diccionario Maya Cordemex*. Ediciones Cordemex, Merida, Yucatan, Mexico.

Beaudry, M.P.
1987 Interregional Exchange, Social Status, and Painted Ceramics: The Copan Valley Case. In *Interactions on the Southeast Mesoamerican Frontier*, ed. E. J. Robinson, pp. 227-46, BAR International Series 327, Oxford.

Becker, M.
1973 Archaeological Evidence for Occupational Specialization among the Classic Period Maya at Tikal. *American Antiquity* 38(4):396-406.

1979 Priests, Peasants and Ceremonial Centers: The Intellectual History of a Model. In *Maya Archaeology and Ethnohistory*, pp. 3-20. eds. N. Hammond and G.R. Willey. Univ. of Texas Press: Austin.

Bishop, Ronald L.
1992 Compositional analysis of Pre-Columbian pottery: research in the Maya Region. Manuscript in the possession of the author.

Braswell, J.B.
1992 The excavations at Group D. In Xunantunich Archaeological Project: 1992 Field Season, ed. R.M. Leventhal, pp. 127-144. Belmopan and Los Angeles.

Blanton, R.E.
1978 *Monte Alban:Settlement Patterns at the Ancient Zapotec Capital*. Academic Press, New York.

Chase, Arlen F.

1985 Contextual Implications of Pictorial Vases from Tayasal, Peten. In *Fourth Palenque Round Table, 1980*, edited by M.G. Robertson and E.P. Benson, pp. 193-201. Pre-Columbian Art Research Institute, San Francisco.

Chase, A.F. and D.Z. Chase
1992 *Mesoamerican elites: an archaeological assessment*. University of Oklahoma Press: Norman and London.

Chase, Sabrina
1992 South Group Plaza 1 and Nabitunich Plaza Group. In Xunantunich Archaeological Project: 1992 Field Season, ed. R.M. Leventhal, pp. 127-144. Belmopan and Los Angeles.

Coe, M.D.
1975 Death and the Ancient Maya. In E.Benson, ed., *Death and the Afterlife in Pre-Columbian America*, pp. 87-104. Dumbarton Oaks, Washington D.C.

Coggins, C.C.
1975 *Painting and Drawing Styles at Tikal: An Historical and Iconographic Reconstruction*. Ph.D. diss., Harvard Univ. Cambridge Mass.

Costin, C. and Timothy Earle
1989 Status distinction and legitimation of power as reflected in changing patterns of consumption in Late Prehispanic Peru. *American Antiquity* 54 (4): 691-714.

Drennan, R.D.
1976 Religion and Social Evolution in Formative Mesoamerica. In K. Flannery, ed., *The Early Mesoamerican Village*, pp. 345-68. Academic Press, New York.

Feinman, Gary
1981 The production step measure: an ordinal index of labor input in ceramic manufacture. *American Antiquity* 46 (4): 871-884.

Flannery, K.V.

1983 The Legacy of the Early Urban Period: An Ethnohistoric Approach to Monte Alban's Temples, Residences, and Royal Tombs. In *The Cloud People*, ed. K. V. Flannery and J. Marcus, pp. 132-36. Academic Press, New York.

1968 The Olmec and the Valley of Oaxaca: A Model for Inter-regional Interaction in Formative Times. In *Dumbarton Oaks Conference on the Olmec*, ed. E. Benson, , pp. 79-110. Dumbarton Oaks, Washington, D.C.

Ford, Anabel and Harry Glicken

1987 The significance of volcanic ash tempering in the ceramics of the central Maya lowlands. In *Maya Ceramics*, ed. by P Rice and R. Sharer, pp. 479-502. BAR International series 345(ii) Oxford.

Freidel, D.A. and L. Schele

1988 Kingship in the Late Preclassic Lowlands: The Instruments and Places of Ritual Power. *American Anthropologist* 90 (3):547-67.

Fry, R.E.

1980 Models of exchange for major shape classes of Lowland Maya pottery, in R.E. Fry, ed., *Models and Methods in Regional Exchange*, pp. 3-18. (SAA Papers No.1). Washington: Soceity for American Archaeology.

1979 The Economics of Pottery at Tikal, Guatemala: Models of Exchange for Serving Vessels. *American Antiquity* 44(3):494-512.

Grove, D.C.

1984 *Chalcatzingo: Excavations on the Olmec Frontier*. Thames and Hudson, London.

Hansen, Richard D., Ronald L. Bishop, and Federico Fahsen

1991 Notes on Maya Codex-style ceramics from Nakbe, Peten, Guatemala. *Ancient Mesoamerica*, 2:225-243.

Haviland, W.A.

1982 Where the rich folks lived: Deranging factors in the statistical analysis of

Tikal settlement. *American Antiquity* 47: 427-429.
1970 Tikal, Guatemala and Mesoamerican Urbanism. *World Archaeology* 2:186-98.

Henderson, John S.
1992 Elites and Ethnicity along the Southeastern Fringe of Mesoamerica. In *Mesoamerican Elites: An Archaeological Assessment*, ed. D.Z. Chase and A.F. Chase, pp. 157-168. University of Oklahoma Press: Norman and London.

Hicks, F.
1986 Prehispanic Background of Colonial Political and Economic Organization in Central Mexico. In R. Spores, ed, *Ethnohisotry: Supplement to the Handbook of Middle American Indians*, vol. 4, pp. 35-54. univ. of Texas Press, Austin.

Hirth, Kenneth
1992 Interregional Exchange as Elite Behavior: An Evolutionary Perspective. In *Mesoamerican Elites: An Archaeological Assessment*. Ed. by D.Z. Chase and Arlen F. Chase, pp. 18-29. University of Oklahoma press: Norman and London.

Houston, Stephen D., David Stuart and Karl A. Taube
1989 Folk Classification of Classic Maya Pottery. *American Anthropologist* 91(3):720-726.

LeCount, Lisa
1992 Xunantunich ceramics - 1992. In Xunantunich Archaeological Project: 1992 Field Season, ed. R.M. Leventhal, pp. 127-144. Belmopan and Los Angeles.

Leventhal, R.M., A.A. Demarest, and G.R. Willey
1987 The Cultural and Social Components of Copan. In K. Trinkaus, ed., *Polities and Partitions: Human Boundaries and the Growth of Complex Societies*, pp. 179-205. Anthropological Research Papers no. 37, Arizona State Univ., Tempe.

Marcus, G. (ed.)
1983 *Elites: Ethnographic Issues*. Univ. of New Mexico Press, Albuquerque.

Marcus, J.
1978 Archaeology and Religion: A Comparison of Zapotec and Maya. *World Archaeology* 10:172-91.

Martinez Hernandez, J.
1929 *Diccionario de Motul: Maya Espanol*. Compania Tipografica Yucateca, Merida.

McBryde, F.W.
1947 *Cultural and Historical Geography of Southwest Guatemala*. Institute of Social Anthropology Publication 4, Smithsonian Institution, Washington, D.C.

Morley, Sylvanus G., George W. Brainerd, and R. Sharer
1983 *The Ancient Maya*. Standford, Calif.: Stanford University Press.

Nelson, Ben A.
1981 Ethnoarchaeology and paleodemography: a test of Turner and Lofgren's hypothesis. *Journal of Anthropology Research* 37 (2) 107-129.

Pires-Ferrerra, J.W.
1975 Exchange Netowrks in Formative Mesoamerica, with Special Reference to the Valley of Oaxaca. *Museum of Anthropology Memoirs 7*. Univ. of Michigan, Ann Arbor.

Price, Barbara
1978 Secondary State Formation: An Explanatory Model. In *Origins of the State: The Anthropology of Political Evolution*, ed. R. Cohen and E. Service. pp. 161-86. Institute for the Study of Human Issues, Philadelphia.

Rands, R.L. and Bishop, R.L.
1980 Resource procurement zones and patterns of ceramic exchange in the Palenque region, Mexico. In *Models and Methods in Regional*

Exchange, ed. R.E. Fry, pp. 19-46. (SAA Papers No.1) Washington: Society for American Archaeology.

Rathje, W.L.
1970 Socio-political Implications of Lowland Maya Burials: Methodology and Tentive Hypotheses. *World Archaeology* 1:359-74.

Redfield, R. and A. Villa Rojas
1934 *Chan Kom: A Maya Village*. CIW Publication 448.

Rice, P.M.
1987a Economic Change in the Lowland Maya Late Classic Period. In *Specialization, Exchange, and Complex Societies*, edited by E.M. Brumfield and T.K. Earle, pp.76-85. Cambridge University Press, Cambridge.
1987b *Pottery Analysis:A Source Book*. University of Chicageo Press: Chicago and London.

Robiscek, F. and Hales, R.
1981 *The Maya Book of the Dead. The Ceramic Codex*. Charlottesville, University of Virginia Museum.

Roys, R.L.
1943 *The Indian Background of Colonial Yucatan*. Carnegie Institution of Washington Publication 548, Washington, D.C.
1965 Lowland Maya Society at Spanish Contact. In *Handbook of Middle American Indians*, vol. 3, pp. 659-78.

Sabloff, J. A.
1975 *Excavations at Seibal, Department of Peten, Guatemala:ceramics*. Peabody Museum of Archaeology and Ethnology, Memoirs 13 (2).

Tourtellot, Gair, Jeremy A. Sabloff and Kelli Carmean
1992 "Will the Real Elites Please Stand Up?" An Archaeological Assessment of Maya Elite Behavior in the Terminal Classic Period. In *Mesoamerican elites: an archaeological assessment*. ed. Chase, A.F. and D.Z. Chase, pp.

80-98. University of Oklahoma Press: Norman and London.

Sanders, W.T.
1981 Classic Maya Settlement Patterns and Ethnographic Analogy. In *Lowland Maya Settlement Patterns*, ed. W. Ashmore, pp. 351-369, Univ. of New Mexico Press, Albuquerque.

Saville, M.
1921 *Reports on the Maya Indians of Yucatan*. Heye Foundation, Indian Notes and Monographs, Vol. 9(3). New York.

Sharer, R. J.
1978 Archaeology and History at Quirigua, Guatemala. *Journal of Field Archaeology* 5(1):51-70.

Smith, Mike
1987 Household possessions and wealth in agrarian states: Implications for Archaeology. *Journal of Anthropological Archaeology*: 6 (4):297-335.

Spores, R.
1983 The Origin and Evolution of the Mixtec System of Social Stratification. In *The Cloud People*, ed. K. V. Flannery and J. Marcus, pp. 227-38. Academic Press, New York.

Stuart, David
1988 The Rio Azul Cacao Pot: Epigraphic Observations on the Function of a Maya Ceramic Vessel. *Antiquity* 62:153-157.

Taschek, Jennifer T. , and Joseph W. Ball
1992 Lord Smoke-squirrel's cacao cup: the arcaheological context and socio-historical significance of the Buenvista "Jauncy Vase." In *The Maya Vase Book. A Corpus of Rollout Photographs of Maya Vases*, Vol. 3, by Justin Kerr, pp. 149-160. New York, Kerr Associates.

Taube, Karl A.
1989 The Maize Tamale, wah, in Classic Maya Epigraphy and Art. *American*

Antiquity 54 (1): 31-51.

Thompson, Raymond
1958 Modern Yucatecan Maya Pottery Making. *American Antiquity* 23 (4) part 2. Memoirs of the Society for American Archaeology #15.

Tourtellot, G. and J.A. Sabloff
1972 Exchange Systmes among the Ancient Maya. *American Antiquity* 37:126-35.

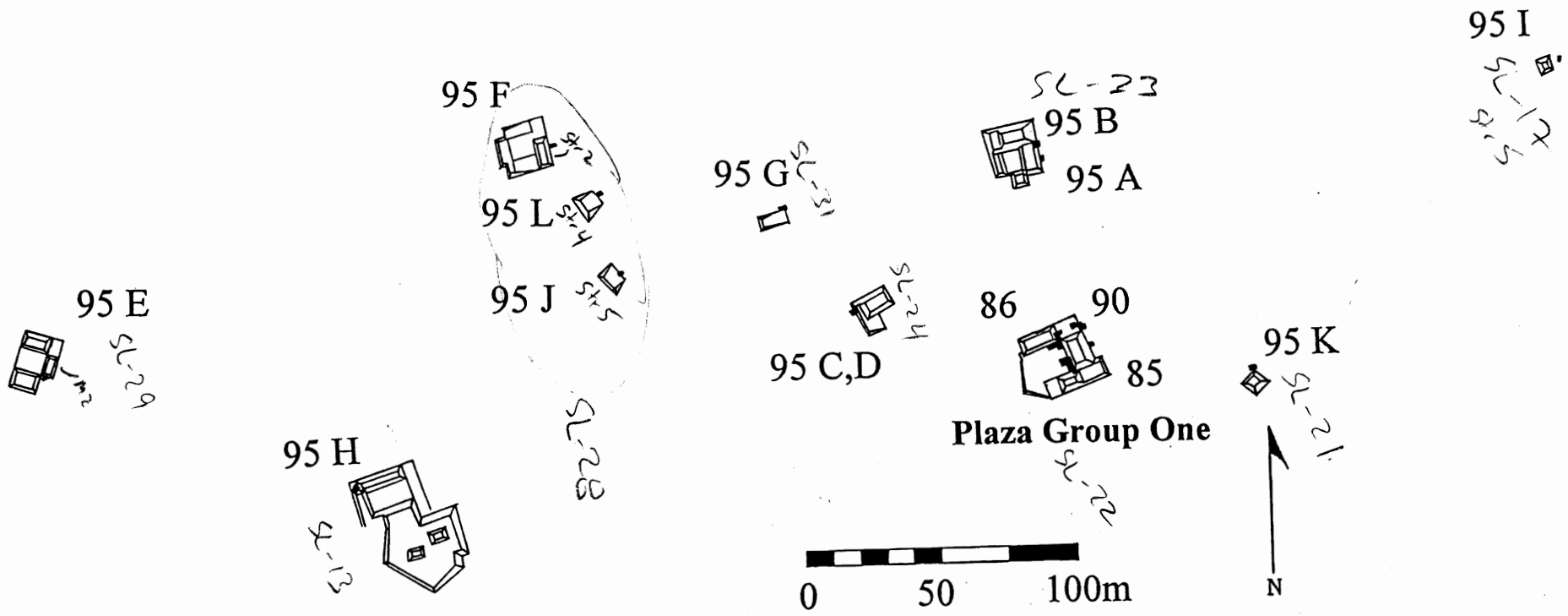
Tozzer, A.M.
1941 *Landa's Relacion de las Cosas de Yucatan.* Peabody Museum of Archaeology and Ethnology Paper 28. Harvard Univ., Cambridge, Mass.
1957 *Chichen Itza and Its Cenote of Sacrifice: A Comparative Study of Contemporaneous Maya and Toltec.* Memoirs of the Peabody Museum, vols. 11 and 12. Harvard Univ., Cambridge, Mass.

Wauchope, R.
1938 *Modern Maya Houses.* CIW Publication 436, CAA no.7.

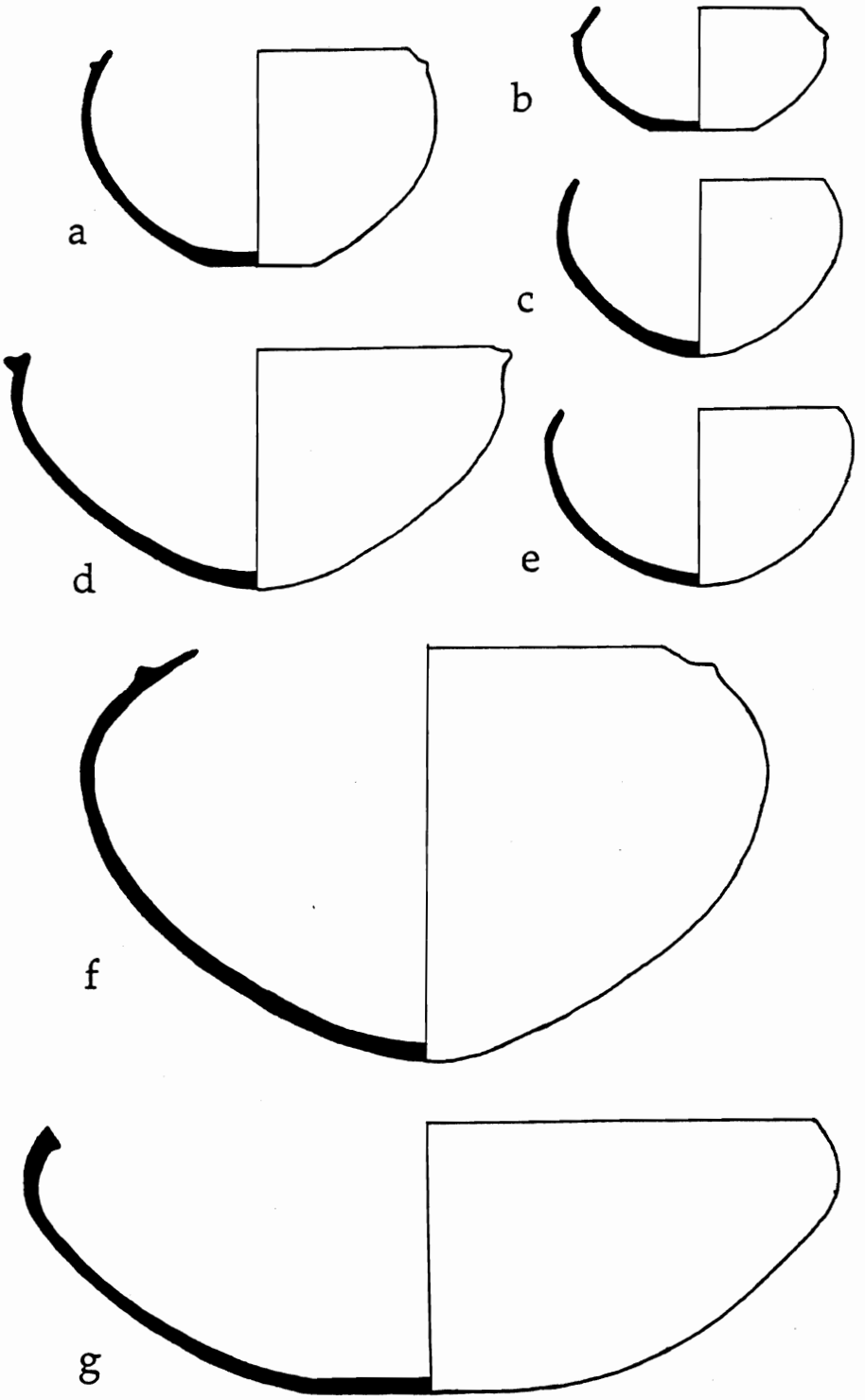
Webster, D.L.
1992 Maya Elites: The Perspective from Copan. In *Mesoamerican Elites: An Archaeological Assessment,* ed. D.Z. Chase and A.F. Chase, pp. 135-156. University of Oklahoma Press: Norman and London.
1985 Surplus, Labor and Stress in Late Classic Maya Society. *Journal of Anthropological Research* 41(4):375-99.

Wolf, Eric
1966 Kinship, Friendship and Patron-Client Relationships in Complex Societies," in *The Social Anthropology of Complex Societies,* ed. Michael Banton. London: Tavistock.

San Lorenzo Group 1993 Testpits



LeCount, Figure 1
Suboperations excavated at San Lorenzo group in 1993.



LeCount, Figure 2:
Profiles a-f are modern Yucatecan pots (redrafted from R. Thompson, 1958:f. 11a-f). A, b, and e are water basins ; c and f are cooking pots; and d is a ceremonial basin. Profile g is a prehistoric Mount Maloney bowl (redrafted from J. E. S. Thompson, 1940:f. 26).

Preliminary Notes on the West Façade of Structure A-6

Virginia M. Fields
Los Angeles County Museum of Art

Excavations of the west façade of Structure A-6 during the 1993 season brought to light sections of a fascinating carved frieze. The frieze, which was meant to be viewed from a distance, is rather poorly modeled and lacks the attention to detail seen, for example, in the Late Classic architectural sculpture at Palenque. Components of the frieze are badly eroded, although enough remains to attempt an identification of specific elements. What appears to be a skyband frames the upper section of the northern half of the frieze (see fig. 1). Skybands, which were recently identified with the ecliptic (Freidel, Schele, and Parker 1993:78), are found throughout the Maya area, adorning architecture as well as monumental sculpture, murals, ceramics, and codices. Composed of elements representing various celestial phenomena, skybands provide a symbolic canopy for historic action. Skybands are frequently associated with accession, appearing, for example, over the northern doorway of the eastern corridor at Palenque, House E, the place where Palenque's rulers assumed office. Accession monuments at Piedras Negras, including stelae 11 and 25, depict rulers seated in niches framed by skybands. The skyband on Structure A-6 appears as the upper frame over a badly eroded three-dimensional seated figure, who is flanked on either side by leaflike elements that terminate in knots. The seated figure, who most likely represents a ruler, wears elaborate knotted anklets. The obliteration of the upper portion of the figure may suggest deliberate defacement, a phenomenon recognized throughout Mesoamerica (Grove 1981).

Such "skyband niches" as those found at Piedras Negras may also create a place of emergence for the Maya ruler and his lineage (Carlson and Landis 1985:118). This theme is reinforced on the Structure A-6 frieze by the presence of at least one Paxlike figure on the southern side of the seated figure. A similar figure, who kneels on his left knee and who lacks his head with its identifying characteristics, appears on the northern side of the seated figure. The right foot of the standing Paxlike creature is raised in a dancing position, and he appears to clutch ropes in either hand. The ropes drop from the skyband overhead, a motif also seen on Quiriguá stelae A and C and Caracol stelae 3 and 6 (Taube 1993). Taube (1993) defines these ropes as birth ropes, which extend from a house beam and which women hold while giving birth. Drawing an analogy between the birth ropes and umbilical cords, Taube (1993) also cites the work of José Fernandez, who notes that the contemporary Quiché conceive of a celestial umbilicus linking the center of the

1m
0

sky to the underworld. Freidel, Schele, and Parker (1993:103) also relate the notion of umbilical cords to "sky ropes," which play a role in the creation mythology of the ancient and present-day Maya.

As at Xunantunich, some form of the supernatural being known as the patron of the month Pax is frequently associated with these birth and/or creation scenes. The patron of Pax is not yet well understood. First identified by Thompson (1971:116), the patron of Pax is a jaguar-related deity, who tends to have a toadlike ear and a Roman nose. His diagnostic feature is his jawless mouth, which typically spews a flowing substance. The month of Pax contains many allusions to warfare and sacrifice (Taube 1988:335), and according to Landa (Tozzer 1941:123), Yucatecan warriors removed the jaws of slain enemy warriors. Carlson and Landis (1985:123) also describe a certain symbol in the skyband as a jawless sun deity, identifying this Paxlike character as the underworld manifestation of the sun god.

On the upper portion of the Structure A-6 façade, a giant mask can be seen below the three-dimensional seated figure. Separating the seated figure from the mask is a plaited rope. Visible in the mask are eyes with axes, a characteristic of the head version of the numeral six (Thompson 1971:134, fig. 24). What may be earflares topped with scrolls appear on either side of the mask. This mask is an unusual feature of Structure A-6; pyramidal façades adorned with sculptured masks are much more common during the Late Preclassic period (Freidel and Schele 1988). Given the location of the mask, below the seated figure, the axe-eyed creature may represent a toponym, an expression of historical location or the actual name of the building (Stephen Houston, pers. com. 1994).

Dominating the southern side of the western façade is a large shell which sits on a thronelike base. Below the shell is a knotted border, which separates the image of the shell from a cartouche which contains an image of the upper part of a face with scrolls issuing from the eyes or forehead. The image may represent a supernatural named K'awil (previously known as God K) (Stuart 1987:15-16). K'awil is a serpent-footed god who wears a smoking axe through his forehead, and who is associated with lineages and blood sacrifices (Schele and Freidel 1990:245). Alternatively, this image may represent the Maya expression *il*, the root in Yucatec and Cholan for "to see, observe, or visit." The identity of this image may be confirmed by future excavations of this portion of the façade.

Adjacent to the shell is a vertical section of plaited rope and a column with hieroglyphlike emblems. Although the bottom emblem resembles the *k'in* glyph ("day" or "sun"), none of the other signs is readable.

Although the composition is unique in the Maya lowlands, the overarching theme of the western façade of Structure A-6 may be a common theme in Maya monumental art, that is, accession to office. The combined imagery of the ruler seated in a niche framed by a skyband and the possible presence of the deity K'awil, as well as the abundance of plaited cloth or rope implies an interpretation of the façade as one devoted to commemorating an accession to office.

References Cited

Carlson, John B., and Linda C. Landis

1985 Bands, Bicephalic Dragons, and Other Beasts: The Skyband in Maya Art and Iconography, in *Fourth Palenque Round Table, 1980*, edited by Elizabeth P. Benson, pp. 115-129. General editor, Merle Greene Robertson. Pre-Columbian Art Research Institute, San Francisco.

Freidel, David, and Linda Schele

1988 Symbol and Power: A History of the Lowland Maya Cosmogram, in *Maya Iconography*, edited by Elizabeth P. Benson and Gillett G. Griffin, pp. 44-93. Princeton University Press, Princeton.

Freidel, David, Linda Schele, and Joy Parker

1993 *Maya Cosmos: Three Thousand Years on the Shaman's Path.* William Morrow and Co., Inc. New York.

Grove, David C.

1981 Olmec Monuments: Mutilation as a Clue to Meaning, in *The Olmec and Their Neighbors*. Essays in Memory of Matthew W. Stirling, edited by Elizabeth P. Benson, pp. 49-68. Dumbarton Oaks Research Library and Collections, Washington, D.C.

Schele, Linda, and David Freidel

1990 *A Forest of Kings.* William Morrow and Co., Inc. New York.

Taube, Karl A.

1988 A Study of Classic Maya Scaffold Sacrifice, in *Maya Iconography*, edited by Elizabeth P. Benson and Gillett G. Griffin, pp. 331-351. Princeton University Press, Princeton.

1993 The Birth Vase: Natal Imagery in Ancient Maya Myth and Ritual, in *The Maya Vase Book*, Vol. 4, edited by Justin Kerr, in press. New York.

Thompson, J. Eric S.
1971 *Maya Hieroglyphic Writing: Introduction* (3rd edition). University of Oklahoma Press, Norman.

Tozzer, Alfred M.
1941 *Landa's Relación de las Cosas de Yucatán: A Translation.* Papers of the Peabody Museum Of American Archaeology and Ethnology 18. Harvard University, Cambridge.

The New Xunantunich Visitor's Center

Angela Hiltz
Architectural Consultant

As a prominent Maya site in the Belize River Valley, Xunantunich attracts many visitors interested in its architecture and archaeology each year. To learn more about the site and better present it to the public, many projects have recently been undertaken. Among these is the design and construction of a Visitor's Center to house the stelae now located in the central plaza at the site.

Design considerations for the stelae of Xunantunich were to protect the stelae from the elements, create a better viewing environment, and secure the building after park hours. The following is a summary of these and other concerns which were addressed during the design and construction process by the project team consisting of Dr. Richard Leventhal, Director, Fransisco Gongora, builder, Marcos Chulin, his apprentice, Rudy Larios V, Consultant, and A. Hiltz, Architectural Consultant.

In order to preserve the ancient character of the central plaza, it was determined that all modern structures should be confined to a particular area, away from the monuments and buildings but accessible to visitors arriving at the site. Near the entry, behind the existing ticket/storage building, the topography forms a natural bowl-like space with several large trees. It became evident that locating the Visitor's Center there would not only satisfy the requirement that new structures be kept in close proximity, but would also provide a pleasant place for visitors to relax in the shade and enjoy the view of the Castillo. The trees in front of the site form a natural screen which minimizes the visibility of modern structures from the central plaza. They also provide shade for the new building which creates an environment free of the large fluctuations in temperature so detrimental to ancient monuments.

The display of the stelae and the viewers' experience of them were also major considerations in the design of the Center. In order to discourage the public's physical contact with the stones, (which hastens their deterioration,) the two broken stelae (#1 and #8) were placed behind a low wall. To facilitate easy viewing, the stelae rest on sloped pedestals and an elevated walkway is provided. The third stela (#9), which remains intact, stands upright to afford a different perceptual experience of the monument and a fourth stela from Actuncan is mounted on an exhibit stand behind a low rail. Appreciation of each individual monument and its specific detail

was a high priority in the design process. Constructing two separate rooms with two stelae in each fulfilled this requirement while also creating a more interesting massing of the building on the site. During transport into the Visitor's Center, the front walls of both these rooms remained unconstricted in order to provide maximum maneuvering space for the stones.

Lighting and ventilation of the building were two other issues of importance addressed in the planning stage. The thatched roof which presently houses the stela extends down close to the ground, providing protection from the hot sun. To reproduce this favorable condition but in a different way in the new museum, awning windows beneath the roof eaves were chosen. This type of window allows ambient light and ventilation to enter but prevents harmful direct sunlight. Large openings on both sides of each stela and the absence of backlighting creates optimum viewing conditions for the public. All openings can be closed to protect the stelae from the rain and secure the building at night. This constitutes a major improvement over the previous condition.

Adequate ventilation is achieved through use of window openings as discussed above with vents at the peak ends of each roof, and a vented skylight over the major room of the museum. Also helpful is the reduction of concrete block in wall surfaces. Concrete block tends to retain heat and radiate it into the surrounding area at night. By minimizing the surface area of this material, replacing it with wood (which breathes better), and cross-ventilating the spaces, less total heat is gained by the building. Thus, the interior of the structure remains a cooler and more constant temperature. In procuring valuable information on the practical aspects of building simply in tropical climates, we would like to specially thank Murray Milne (UCLA) for his time and effort during the conceptual building phase.

Transport Installation Of Stelae

In mid-May, the stelae were moved from their location in the central plaza to the new Visitor's Center. 1x12 planks were cut to fit the width of each stela and laid across two 4x4 runners. The planks were then nailed to the runner, creating a skid-like bed. A 4" sponge pad covered the rough planks and cushioned the stela from sudden movement during transit. Hardwood 4x4's with large stones were used as levers and fulcrums. The ends of the 4x4's were cut at an angle to facilitate their placement beneath the stelae. With two levers on each side, and five or six men

operating each one, the stela was raised up and the bed on rollers was slid underneath. The monument was then slowly lowered onto the bed, a heavy rope was tied around the entire assembly and secured to the frame of a pickup truck. Small trees of especially hard wood found on the site were used for rollers and as the pickup moved across the central plaza, the rollers were transferred from back to front under the bed, continuing the forward motion. After the stela arrived safely at the Visitor's Center, the next phase of transport began. A large log was erected vertically in the small space between the pedestal and the exterior building wall. A heavy rope was tied around the log and a "come-along" (a heavy-duty pulling and lifting device) was secured between the log and the stela's bed assembly. With each crank of the lever on the come-along, the stela rolled slowly up the ramp of the pedestal and eventually into its final display location. The stela was then lifted once again and the bed with rollers was extracted from between the stela and the display pedestal. The entire transportation process for each monument was documented with photographs and video.

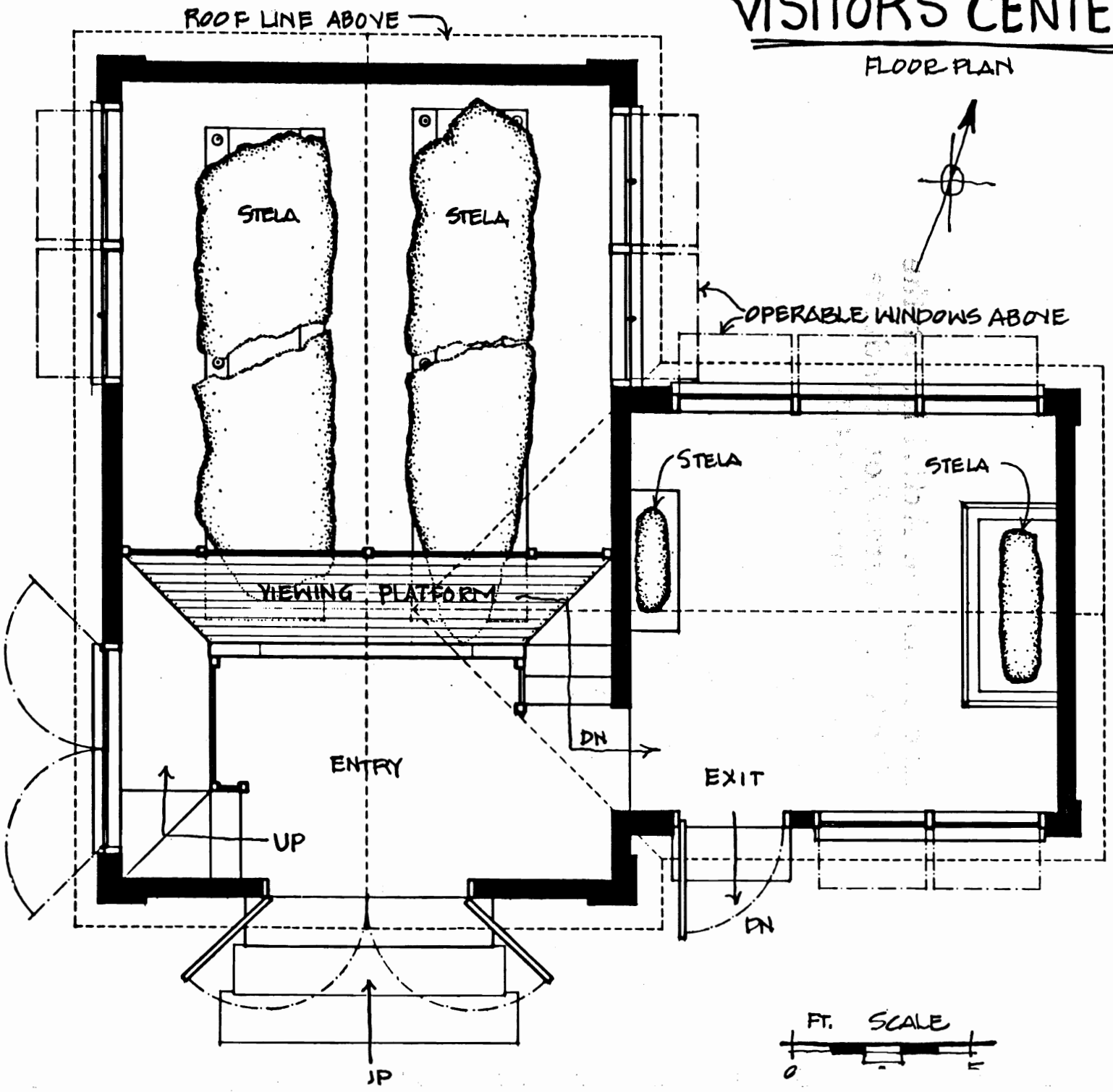
A special bed was constructed for the upright stela. To protect against possible shearing along a large crack running the entire side length of the stela, planks nailed to 4x4's were placed on both sides of the stela and held together by a nut-and-threaded-rod assembly. Two forked logs were erected at the inside corners of the building directly in line with the sunken stela display box. A large log was laid horizontally in each fork, creating a beam above the roof rafters onto which the come-along was attached and the stela to be hoisted into place. the stela was brought into the room horizontally and the top slowly lifted by operation of the come-along until it reached a vertical position. The stela was then slowly lowered into the prepared display box and the space between the box and the monument was packed tightly with sascab (pulverized limestone). A few minor adjustments were made during this process to obtain the final position of the stela. The "sandwich" of planks, 4x4's and sponge remained secured to the monument and the entire assembly covered with plastic until construction of the building was nearly complete. Before opening to the public, an epoxy mixture was used to repair broken pieces and cracks were filled to prevent moisture accumulation and further separation.

During the remaining weeks of finish work on the building, the stelae were covered with sponge pad and plastic in order to protect them. Before opening to the

public, an epoxy mixture was used to seal cracks and repair broken pieces. A thin layer of soft mix was also placed on top of the sascab around the upright stela about and inch below the curb on the exhibit box to cover the powdery sascab.

VISITOR'S CENTER

FLOOR PLAN



Report on the Activities of the Getty Conservation Institute at Xunantunich

During the 1993 field season at Xunantunich, the Getty Conservation Institute (GCI) carried out a number of activities as part of its collaborative conservation project with XAP and the Department of Archaeology in Belize. These activities are summarized in the reports that follow.

1. Advice and Consultation on architectural and stucco conservation at Xunantunich (Martha Demas)

Advice on architectural conservation at the site was provided by GCI consultant, Rudy Larios, architectural conservator at the site of Copan in Honduras. Mr. Larios visited Xunantunich for a week each month of the field season to work with Ruben Penados, head of ruins stabilization in Belize, and with the team of workmen assembled at Xunantunich by XAP. Efforts were concentrated mainly on the stabilization and structural consolidation of Structure A-1, which was partially excavated in 1992 and 1993. Consolidation of the north facade of A-1 was nearly complete at the end of the season.

Structure A-1 was in very unstable condition due to the loss of most of its facing stones and the poor quality of limestone and mortar used in its construction. Stabilizing the structure, therefore, required considerable intervention. The terrace walls were represented primarily of eroded core material. The lowest terrace was best preserved; the second terrace was preserved to only about 50% of its original length, the third to 25%, and the fourth was completely destroyed. The mortar used for stabilization had been developed by Larios and Penados in 1992, after testing for strength and color with various local soils and clays, mixed with lime. Structural stabilization and consolidation on A-1 incorporated minimal reconstruction, using stone quarried on site, along with the central staircase and the lowest terrace wall, in order to provide some interpretive context for visitors.

Severe erosion of the exposed section of A-6 second and the structural instability of this monumental structure were cause for concern to XAP and the Department of Archaeology. In order to Larios to investigate the causes of these structural problems, the west side of A-6 was partially excavated by XAP in 1993. Excavation revealed deep cracks within the structure, which are being monitored to

determine whether they are active. Based on results of monitoring and structural analysis, Larios will develop an appropriate strategy for stabilizing the structure.

Two conservators, Haydee Orea and Veronica Fernandez, were sent by the GCI as consultants to Xunantunich on consecutive trips to undertake conservation treatment on the frieze that was revealed on the west side of A-6. Both conservators were from the Direccion de Restauracion del Patrimonio Cultural (INAH) in Mexico. Larios worked with the conservators and XAP crew to design and implement a protective covering for the frieze at the end of the excavation season. The frieze was buried under a mantle of very fine marl, held in place by a rubble retaining wall.

2. Documentary Photography at Xunantunich (Kathleen McDonnell)

At the beginning of the field season, conservation documentation activities were undertaken at Xunantunich by the GCI. The purpose of these activities was to create a record of the condition of the site and its structures, illustrate standard procedures for documentary photography, and recommend protocols to the Xunantunich Archaeological project (XAP) team.

Planning and Preparation

GCI contracted with David DeVries of Mesa Technical to provide the technical advice and consultation to the GCI and XAP. Through discussions with GCI staff Martha Demas and Kathleen McDonnell, DeVries recommended both 35mm and mid-format cameras. DeVries provided all equipment and material: film, tripod, compass, measures, cameras, and a variety of lens, including wide-angle and telephoto.

Demas prepared a document, *Conservation Documentation: Guidelines for conservation documentation of the structures at Xunantunich,* to provide the members of XAP with the rationales and requirements of conservation documentation, with emphasis on documentation of structures typical of Maya sites. A format for undertaking a condition report of the structures was also established.

At the site, Demas and McDonnell met with two XAP team members, David Morin (Photographer) and Angela Hiltz (architect), to discuss protocols and implementation of the conservation documentation at Xunantunich. Hiltz provided field coordination for the conservation documentation and did architectural drawings of A-6 and A-1 under the supervision of Richard Leventhal and Rudy Larios. Morin was responsible for the photography and record keeping. The GCI provided advice and consultation on photographic documentation for recording condition and interventions, and demonstrated procedures for the photography during a February visit.

Field Activities

McDonnell and Demas toured the site with DeVries and Morin to discuss what was important in recording condition information and how to monitor, photographically, the progress of the excavations throughout the season. This photography team examined the site and structures to identify which images were needed and to plan when and how to capture them, considering intended uses of the images, movement and position of the sun, and appropriate cameras, lenses, and film.

The documentary photography started with the design of recording methodologies for logging the photographs and marking datum points for follow-up photography. DeVries recommended bracketing with three shots, one ideal and two overexposed.

Photographic coverage and priorities included general images of the overall site, including panoramic views from the top of Structure A-6, images of the plazas, and all structures in the plaza. Detail views of Structures A-6 and A-1 were intended to record architectural stability, original material, condition of the limestone, mortar and plaster, and biological growth prior to any conservation intervention. The tam discussed baseline and repeated images for monitoring the excavation and consolidation activities on the west facade of A-6 and on A-1, in order to capture both structures at various stages of clearing. Finally, the team identified a range of images that would be useful considering future excavation plans and site management concerns.

The photography proceeded according to our coverage and priority plan, following the sun and scheduling around XAP's clearing activities. On the last day, the photography team walked the site to review each datum point and decided whether or not it would be used for future photography and the frequency of repeated images.

DeVries also assessed the conditions affecting photography at some of the Xunantunich's outlying sites.

3. Program for testing chemical consolidants and biocides for use in humid tropical environments: problems addressed, testing rationale, and implementation (William Ginell)

At Xunantunich, deterioration of limestone masonry, decorative stucco, plaster, and mortar is in an advanced state. The principal reasons for this are: generally poor quality of these materials, active microfloral growth, cyclic changes in the humidity and temperature in the region, and exposure to the erosive effects of wind and water. In addition, much of the masonry and stucco immediately below the surface is damp throughout the year. To decrease the deterioration rate of these architectural materials, consolidation procedures that involve impregnation with appropriate substances is usually considered. Consolidation of structurally weak, but dry, limestone, mortar, or stucco can be accomplished readily using a variety of standard, organic-solvent-borne polymeric materials. However, it is not known if the consolidated stone will be able to resist the environment and environmental changes of the hot, humid tropical jungle. Moreover, it is not known whether or not the selected polymers will provide nutrients that can enhance the growth of microflora.

Consolidation of moist limestone, mortar or stucco requires a consolidant system that can penetrate the masonry and cure and bond in the presence of moisture or, at times, liquid water. The performance of candidate consolidants under these conditions is not known. In instances where microfloral growth, such as lichens, algae, fungi, or mosses, have penetrated, attacked chemically, or otherwise weakened the masonry, identification of suitable biocides that will be effective, long-lasting, inexpensive, and relatively non-toxic to humans is required.

The experimental tests initiated recently at Xunantunich were designed to determine: (1) if certain water-based consolidants would penetrate and cure within a moist limestone that is maintained in a high humidity atmosphere; (b) if limestone consolidated with certain water-borne consolidants or with organic-solvent-borne consolidants would be resistant to temperature and humidity cycling characteristics of both an exposed, sunny location and a humid, deep jungle location; (c) if a group of biocides that were found to effective at both Copan and Tikal would be effective again the microflora found at Xunantunich: (d) if these biocides would be capable of preventing microfloral infestation of virgin limestone; and (e) if the consolidants used would enhance the growth of microflora on treated stone.

The experimental consolidation program consisted of treatment of limestone samples with a variety of consolidants and exposure of the samples to the environment at two locations, one in the full sun, and the other, in the jungle shade. Environmental monitoring stations were set up at both locations to record pertinent data.

In all, 156 limestone samples (5x5x5cm) were prepared from moist, dry, hard, and soft limestone blocks that were obtained either from the newly reopened quarries or from the excavations at A-1. The samples were treated by spraying with the consolidants listed below until no further absorption occurred. The samples were mounted on aluminum racks (wired in place) that were placed on concrete pads at the two exposure locations. The consolidants used were:

Acrylic-Epoxy (514H + 4221) in water/alcohol
Acrylic-Epoxy (520 + 4221) in water/alcohol
Acrylic (Rhoplex AC-33) in water
Polyurethane (Bayhydrol 121) in water
Silane (SS-H) in methylethylketone
Acrylic (B-67) in mineral spirits
Acrylic (B-72) in toluene
Epoxy (1510 + 403) in alcohol

After exposure at Xunantunich for about one year, the samples will be retrieved and subjected to a variety of tests at the GCI. We expect this phase of the tests to occur in April 1994.

In addition to the limestone samples, a section of plaster floor in the B-7 area was treated with several of the consolidants. The areas treated consisted of intact plaster and cracked, deteriorated plaster. These areas were treated with the epoxy, polyurethane, and silane consolidants which were the only solutions that penetrated the hard, smooth plaster surface.

To evaluate the effectiveness of biocides for control of microflora on limestone, wall areas in B-2 were treated with aqueous solutions of the following of five biocides:

Polybor (a mixture of complex cyclic borates)
Bis (tri N-butyltin) oxide (TBT) + Quat A
Bis (tri N-butyltin) oxide + Quat B
Quat A (Cetyltrimethyl ammonium chloride)
Quat B (Cetyldimethyl benzyl ammonium chloride)

In addition, black and orange growths on the north face of A-6 were treated with Polybor, TBT + Quat B, and Quat B.

The areas were photographed before and immediately after treatment, and at weekly intervals until June to determine the short term effects. It was found that vegetation destruction occurred within 24 hours. The photographs taken by David after we left the site have not yet been examined to determine the rate of re-growth.

Samples of unconsolidated limestone were also treated with the five biocides and were included in the exposure rack that was mounted in the humid jungle area. The purpose of these tests was to determine if there was any difference in the behavior of consolidated and biocide-treated unconsolidated stone with respect to the appearance rate of microflora.

The two meteorological stations installed at Xunantunich were designed to obtain data on rainfall, relative humidity, wind speed and direction, solar irradiance

and air, ground, and stone sample temperatures. One station was installed in the area between A-14 and A-2, an open, sunny location and the other, in the jungle south of A-19. The stations are equipped with battery-powered systems that are recharged by solar panels and contain data acquisition modules that should be replaced at about 6 month intervals. Data were obtained from the sunny location for the months of April and May 1993 and a summary is given in the table below.

Data taken during the wet and dry seasons will be used to define test conditions for aging tests on consolidated Xunantunich stone samples that are in progress at the GCI. They will also be used in an attempt to correlate and evaluate the results obtained at the two exposure sites.

The on-site tests were performed by Rakesh Kumar, Morgan Phillips (GCI Consultant), and Bill Ginell during the April-June 1993 period.

4. GCI Training Program activities in Belize (Nicholas Stanley-Price)

As part of the GCI's larger goals of promoting appropriate practices in the conservation and management of archaeological sites in the region, the GCI's training program organized a seminar (July) and a training workshop (July) in Belize. The seminar was organized by GCI Deputy Director of the Training Program, Nicholas Stanley-Price for the Department of Archaeology in Belize. The seminar, which focused on policy planning for the Department, was attended by all Department staff. two GCI consultants with experience in architectural restoration practices and policy in the region, and in site management planning for natural and cultural sites, Richard Leventhal, representing the perspectives of the excavator, and GCI staff Nicholas Stanley-Price and Martha Demas.

The two-week training workshop held in Belmopan, *Collection Management Workshop*, was organized by Valerie Dorge, Training Program Coordinator. The workshop was held for the staff from the Departments of Archaeology, Museums, and Archives and focused on the care and management of collections.